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Whelan Associates v. Jaslow Dental Laboratory: Copyright Protection for the Structure and Sequence of Computer Programs

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WHELAN ASSOCIATES V. JASLOW DENTAL LABORATORY: COPYRIGHT PROTECTION FOR THE STRUCTURE AND SEQUENCE OF COMPUTER PROGRAMS

I. INTRODUCTION

In *Whelan Associates v. Jaslow Dental Laboratory*,[1] the Third Circuit Court of Appeals held that copyright protection for computer programs extends to the structure, sequence and organization of the program. This is a landmark decision because it grants copyright protection beyond the source and object code[2] of a program, and allows a finding of substantial similarity between two programs which lack similarities between the source and object code. Further, this increase in copyright protection for computer programs threatens the balance between rewarding authors for their original works and keeping ideas in the public domain. This Note examines the extension of copyright protection beyond the literal elements of a program—the source and object code—to its non-literal elements—structure, sequence and organization. Additionally, an appropriate substantial similarity test for computer programs is considered. Finally, a new test for delineating idea from expression in computer programs is analyzed and refined.

II. TECHNOLOGICAL BACKGROUND

A group of sights and sounds produced by a computer may be accomplished through an infinite number of completely different programs.[3] Just as a love story may be written in many different ways, a computer may be instructed to perform a specific task through an almost

1. 797 F.2d 1222 (3d Cir. 1986), *cert. denied*, 107 S. Ct. 877 (1987).

2. See *infra* notes 11-12 and accompanying text for a discussion of source code. See *infra* notes 16-17 and accompanying text for a discussion of object code.

3. "[M]any different computer programs can produce the same 'results,' whether those results are an analysis of financial records or a sequence of images or sounds." Stern Elecs., Inc. v. Kaufman, 669 F.2d 852, 855 (2d Cir. 1982). In *Stern*, the defendant sold a video game which was "virtually identical in both sight and sound" to the plaintiff's video game. *Id.* The defendant contended that only the computer program which produced the sights and sounds, and not the sights and sounds themselves, could be copyrighted. *Id.* The Second Circuit recognized that different programs had the capability of producing identical results. *Id.* Based on that recognition, the court dismissed the defendant's argument because the defendant's reasoning would not prevent a competitor from "replicat[ing] precisely the sights and sounds of [plaintiff's] audiovisual display" through a completely different program. *Id.*

infinite variety of programs.[4] Consequently, it is virtually impossible for two programmers to independently create programs which instruct the computer in identical or nearly identical ways.[5]

When a programmer begins to write a program, he or she must first "develop a generalized statement of the task to be performed."[6] The programmer must have a "complete understanding of the [task] and a complete general plan of attack" before starting to write a program.[7] To form a plan of attack, the programmer translates a general idea into a concrete statement of the functions which will be included in the program. For example, a general idea for a program would be a program to store student test scores, calculate a student's total score for all tests given and calculate a mean score for each individual test. The plan of attack for this program would be a function to input the scores, a function to calculate a total score and a function to calculate the mean score for each test.

After a programmer forms a plan of attack, he or she breaks the statement down "into ever smaller and smaller [sections or modules] that can be *quantified* and stated in algebraic and logical notation."[8] In the

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4. At the hearings for the National Commission on New Technological Uses of Copyrighted Works, Commissioner Arthur Miller introduced the concept of an infinite variety of ways to write both plays and programs. NATIONAL COMM'N ON NEW TECHNOLOGICAL USES OF COPYRIGHTED WORKS, FINAL REPORT 20 (1978). The Commissioner questioned Dan McCracken, vice-president of the Association for Computing Machinery:

> Commissioner Miller: How many ways are there to produce a program . . .?
>
> Dan McCracken . . . : An infinite number in principle, and in practice dozens, hundreds.
>
> Miller: So it is comparable to the theoretically infinite number of ways of writing *Hamlet*?
>
> McCracken: I belive so.

Id. (quoting NATIONAL COMM'N ON NEW TECHNOLOGICAL USES OF COPYRIGHTED WORKS, TRANSCRIPT MEETING No. 10, 44-45 (1978)).

5. *See* Whelan Assocs. v. Jaslow Dental Laboratory, 797 F.2d 1222, 1244 n.45 (3d Cir. 1986), *cert. denied*, 107 S. Ct. 877 (1987) (court noted that "[d]ifferent program codes in different computer languages are capable of producing identical screen outputs").

See also Midway Mfg. Co. v. Strohon, 564 F. Supp. 741 (N.D. Ill. 1983). In *Strohon*, defendant's enhancement kit was substituted for five of plaintiff's ROMs which controlled the video game, PAC-MAN. *Id.* at 744. The district court stated, "the uncontradicted expert testimony at the hearing was that there is virtually an infinite number of ways to write a set of program instructions that will produce the PAC-MAN game sequencing." *Id.* at 753. Based on this finding, the court held that the "high degree of identity of the two programs" compelled a holding of substantial similarity and copyright infringement. *Id.*

6. J. LAUTSCH, AMERICAN STANDARD HANDBOOK OF SOFTWARE BUSINESS LAW 28 (1985).

7. H. LEDGARD, P. NAGIN & J. HUERAS, PASCAL WITH STYLE: PROGRAMMING PROVERBS 71 (1979).

8. J. LAUTSCH, *supra* note 6, at 29 (emphasis in original).

above example, the function to calculate the mean score for a test would be reduced to modules that would:

1. Store that number.
2. Add together the students' scores.
3. Divide the total by the number of students.

Each section or module will perform a specific task.[9] This process results in module descriptions which can be converted into the instructions that the computer will execute.[10]

The conversion process is called encoding and results in computer instructions called source code.[11] "Source code usually is written in a 'high-level' computer language, meaning one that is similar to English."[12]

The code is then tested and debugged,[13] a procedure which eliminates the errors in the program. Most errors occur in one of two ways. First, an error may be a syntax error.[14] Computer programming language syntax is synonymous with grammar. When an instruction violates the syntax rules, the instruction contains a syntax error.[15] Second, an error may occur in the programmer's logic. The computer executes

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9. Conley & Bryan, *A Unifying Theory for the Litigation of Computer Software Copyright Cases*, 6 COMPUTER L.J. 55, 57 (1985).

10. Note, *The Future of Copyright Protection and Computer Programs—Beyond* Apple v. Franklin, 13 N. KY. L. REV. 97, 104 (1986).

11. Conley & Bryan, *supra* note 9, at 58.

12. *Id.* Examples of high-level programming languages include FORTRAN (FORmula TRANslation), BASIC (Beginner's All-purpose Symbolic Instruction Code), EDL (Event Driven Language) and APL (A Programming Language). *Id.* Most computer programs are written in high-level programming languages. The resulting code is called source code. Gesmer, *Developments in the Law of Computer Software Copyright Infringement*, Spring JURIMETRICS J. 224, 224 (1986). High-level programming languages "differ in their degree of closeness to natural or mathematical language . . . . They differ also in the type of problem for which they are best suited." A. AHO & J. ULLMAN, PRINCIPLES OF COMPILER DESIGN 26 (1977).

When encoded into a programming language called BASIC, the mean calculating module discussed in the text looks like this:

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Dim Scores (30)
TotalStudent = 30
TotalScores = 0
For I =1 to TotalStudent
  TotalScores = TotalScores + Scores(I)
Next I
Mean = TotalScores/TotalStudents
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13. Note, *supra* note 10, at 104.

14. Each programming language has rules which dictate the form of the instruction the computer will execute. Language syntax is a set of rules which determines whether an instruction is valid. A. AHO & J. ULLMAN, *supra* note 12, at 28.

15. *Id.*

instructions in the order they are presented. A logic error occurs when program code is not written in a logical order. For example, if the instruction to print an answer appears before the instruction to calculate the answer, the program contains a logic error.

Finally, the program must be translated from the source code, which is easily understood by the programmer, into a series of coded binary numbers, e.g., numbers which consist of only ones and zeros, which a computer can execute.[16] The resulting code is called object code.[17]

Once a program is written, it may be stored in many different ways.[18] Programs, in computer-readable form, are a series of electronic impulses.[19] These signals may be stored in the internal memory of the computer, called RAM (Random Acesss Memory),[20] on floppy disks[21] or hard disks.[22] Magnetic tapes, punch cards and computer chips are other methods of storage.[23] One common type of computer chip is a ROM (Read Only Memory) chip which permanently stores coded electronic

16. J. LAUTSCH, *supra* note 6, at 40.

17. The translation process is accomplished by using either a compiler or assembler. Object code is derived from source code by means of an automatic process, performed by a computer under the control of a program called a "compiler," which converts the source code into object code. Object code, which may be executed directly by a computer, bears no resemblance to English and is extremely difficult to comprehend.

Gesmer, *supra* note 12, at 225 n.2.

18. J. LAUTSCH, *supra* note 6, at 50.

19. *Id.* at 45.

20. RAM is an internal memory storage device that holds data in such a way that an item may be retrieved at any time regardless of its storage location. The RAM stores data like a phonograph record. The interaction between the computer and the RAM is similar to the interaction between a record player and the record. A record player can play any song (on one side of the record) at any time as directed. Conversely, a tape player must access songs sequentially from a cassette tape. R. HIPGRAVE, COMPUTING TERMS AND ACRONYMS: A DICTIONARY 91 (1985).

21. A floppy disk is a small flexible magnetic disk surrounded by a protective jacket which stores data and computer programs. Standard disks are five and one-quarter inches in diameter. *Id.* at 49.

22. J. LAUTSCH, *supra* note 6, at 12. A hard disk is an inflexible magnetic disk which can store considerably more data and may be accessed faster by the computer than a floppy disk. R. HIPGRAVE, *supra* note 20, at 53.

23. J. LAUTSCH, *supra* note 6, at 50.

A magnetic tape stores data on a plastic tape coated with magnetic particles. The average size tape is 2400 feet long, one-half inch wide and is wound on a reel. Magnetic tape is accessed sequentially. R. HIPGRAVE, *supra* note 20, at 70-71. See *supra* note 20 for a discussion of RAM, which may be accessed randomly.

A punch card is a thin card on which data is stored by punching holes in designated positions on the card. R. HIPGRAVE, *supra* note 20, at 20. Punch cards are not favored by most computer programmers because it is easy to mix up the order of the cards.

impulses on thin layers of silicon.[24]

III. COPYRIGHT LAW

A. Overview

Article I, section eight, clause eight of the United States Constitution provides that Congress has the power "[t]o promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."[25] The Copyright Act[26] derives from this grant of power. The Copyright Act protects "original works of authorship fixed in any tangible medium of expression . . . from which they can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device."[27] The Copyright Act of 1976 (Copyright Act) and its 1980 amendments specifically protect computer programs.[28]

Sections 106(1) and (2) of the Copyright Act give a copyright owner the exclusive right to "reproduce the copyrighted work in copies" and to "prepare derivative works based on the copyrighted work."[29] Further, section 101 defines a derivative work as "a work based upon one or more existing works . . . [in any form] in which a work may be recast, transformed, or adapted."[30] Therefore, the Copyright Act protects the copyright owner's interest in controlling the copying of his or her work, as well as the creation of works derived from his or her copyrighted work.

Copyright protection not only protects the author from exact replication of his or her work, such as an exact duplicate of a computer disk

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24. J. LAUTSCH, *supra* note 6, at 46-48.

25. U.S. CONST. art. I, § 8, cl. 8.

26. 17 U.S.C. §§ 101-810 (1982).

27. 17 U.S.C. § 102(a) (1982). This section of the Copyright Act lists the following categories as works of authorship: "(1) literary works; (2) musical works, including any accompanying words; (3) dramatic works, including any accompanying music; (4) pantomimes and choreographic works; (5) pictorial, graphic, and sculptural works; (6) motion pictures and other audiovisual works; and (7) sound recordings." *Id.*

The requirement that a work must be fixed in a tangible medium of expression is satisfied without regard for the "form, manner, or medium of fixation" as long as the "words, numbers, notes, sounds, pictures, or any other graphic or symbolic indicia" may be perceived by a machine or device. H.R. REP. NO. 1476, 94th Cong., 2d Sess. 52, *reprinted in* 1976 U.S. CODE CONG. & ADMIN. NEWS 5659, 5665.

28. *See* H.R. REP. NO. 1476, 94th Cong., 2d Sess. 51, *reprinted in* 1976 U.S. CODE CONG. & ADMIN. NEWS 5659, 5664; S. REP. NO. 473, 94th Cong., 1st Sess. 50-51 (1975). *See also* Act of Dec. 12, 1980, Pub. L. No. 96-517, § 10, 94 Stat. 3028 (1980) (codified at 17 U.S.C. §§ 101, 117 (1982)).

29. 17 U.S.C. §§ 106(1), (2) (1982).

30. *Id.* § 101.

onto another disk, but also copying into a different medium.[31] Just as copying a sketch or drawing from gift wrapping paper onto fabric constitutes an infringement of the design's copyright,[32] the process of transferring a computer program from a disk to the computer's memory is also a copyright infringement.[33] Further, exact duplication is not necessary for copying. The Copyright Act also protects "the various modes in which the matter of any work may be adopted, imitated, transferred, or reproduced . . . ."[34] The breadth of this definition of protected works has led to voluminous case law defining the similarity necessary between two nonduplicate works to constitute copying.[35]

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31. In Tandy Corp. v. Personal Micro Computers, 524 F. Supp. 171 (N.D. Cal. 1981), defendant contended that computer programs stored on Read Only Memory chips (ROMs) were not copies of the original programs, and therefore a ROM chip which is a copy of another ROM chip does not infringe the copyright protection of the original program. *Id.* at 173. In an alternate holding, the district court held that the program imprinted on the ROM chip was a copy of the program, and any duplication of plaintiff's program on defendant's ROM chip was a copyright infringement. *Id.* at 175. *See also* 2 NIMMER ON COPYRIGHT § 8.01[B] (1986) (hereinafter NIMMER).

32. Eden Toys, Inc. v. Florelee Undergarment Co., 697 F.2d 27 (2d Cir. 1982).

33. The report of the National Commission on New Technological Uses of Copyrighted Works (CONTU) stated that "the placement of a work into a computer is the preparation of a copy . . . ." NAT'L COMM'N ON NEW TECHNOLOGICAL USES OF COPYRIGHTED WORKS, FINAL REPORT 13 (1978). Therefore, § 117(1) includes a privilege which allows the owner of a computer program to make a copy of his program when it is an "essential step in the utilization of the computer program in conjunction with a machine," e.g., when the program is executed by the computer. 17 U.S.C. § 117(1) (West Supp. 1986). *See infra* text accompanying note 106. See 2 NIMMER, *supra* note 31, § 8.08 for a further discussion of reproduction rights and computer uses.

34. Universal Pictures Co. v. Harold Lloyd Corp., 162 F.2d 354, 360 (9th Cir. 1947).

35. Section 102 of the Copyright Act specifies that copyright protection extends to: "literary works . . . musical works . . . dramatic works . . . pantomimes and choreographic works . . . pictorial, graphic, and sculptural works . . . motion pictures and other audiovisual works; and . . . sound recordings." 17 U.S.C. § 102 (1982). *See supra* notes 25-28 and accompanying text.

Some of the earliest copyright cases evaluated infringement actions concerning nonduplicate copying of plays, books, music, lamps and statuettes.

In Mazer v. Stein, 347 U.S. 201, *reh'g denied*, 347 U.S. 949 (1954), plaintiffs created statuettes made of semivitreous china which they sold as statuettes and for use as lamp bases. *Id.* at 202. Defendants copied plaintiff's statuettes and also used them as lamp bases. *Id.* at 203. The Supreme Court held that the statutettes were works of art, and therefore protected under copyright law. *Id.* at 213-14.

In Baker v. Selden, 101 U.S. 99 (1879), although the Supreme Court acknowledged plaintiff's copyright protection for his accounting book, the Court found that "the ruled lines and headings of accounts must necessarily be used as incident to [the accounting system]." *Id.* at 104. The Court concluded that the blank pages were not copyrightable, and therefore defendant's duplication of the lines and headings did not constitute an infringement. *Id.* at 107. See *infra* note 232-35 and accompanying text for an analysis of *Baker* by the Third Circuit in Whelan Assocs. v. Jaslow Dental Laboratory, 797 F.2d 1222 (3d Cir. 1986), *cert. denied*, 107 S. Ct. 877 (1987).

In Arnstein v. Porter, 154 F.2d 464 (2d Cir. 1946), plaintiff alleged that defendant in-

When a copyright owner feels that his or her copyrighted work has been copied, he or she may bring an infringement suit in federal court.[36] To prove copyright infringement, "a plaintiff must prove ownership in the copyright and 'copying' by the defendant."[37] Ownership of the copyright may be shown through a registration certificate.[38] In the absence of direct evidence of copying, even when the defendant's work is an exact duplicate, a plaintiff must show "evidence of access to the copyrighted work and substantial similarity between the copyrighted work and the defendant's work."[39] Access to the copyrighted work may be proven by direct evidence or inferred from similarities in the two works which "preclude the possibility that the defendant independently arrived at the same result."[40] Therefore, the essential element in a copyright infringement

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fringed plaintiff's copyrighted musical compositions, *The Lord Is My Shepard* and *A Mother's Prayer*. *Id.* at 467. After the Second Circuit listened to the works, the court determined that the similarities were sufficient to warrant a finding of fact by the jury "that the similarities did not result from coincidence." *Id.* at 469. See *infra* notes 70-75 and accompanying text for a discussion of the substantial similarity test applied by the *Arnstein* court.

In Sheldon v. Metro-Goldwyn Pictures, 81 F.2d 49 (2d Cir.), *cert. denied*, 298 U.S. 669 (1936), both plaintiff's play and defendant's movie were based on the true story of a Scotch girl. *Id.* at 49. The court measured similarities in settings, character traits, such as social class and "waywardness," and scenes. *Id.* at 54-55. Although the dialogue of the defendant's movie was not compared to the dialogue of the plaintiff's play, the court held that "a play may be pirated without using the dialogue." *Id.* at 55.

In Nichols v. Universal Pictures, 45 F.2d 119 (2d Cir. 1930), *cert. denied*, 282 U.S. 902 (1931), the plaintiff owned a copyright in the play *Abie's Irish Rose*, a story of a "religious zealot who insists upon his child's marrying no one outside his faith; opposed by another who is in this respect just like him, and his foil. Their difference in race is merely an obbligato to the main theme, religion." *Id.* at 120, 121-22. In the defendant's motion picture, *The Cohens and The Kellys*, "zealotry is wholly absent; religion does not even appear. . . . The only matter common to the two [works] is a quarrel between a Jewish and an Irish father, the marriage of the children, the birth of grandchildren and a reconciliation." *Id.* at 120, 122. The court did not find a copyright infringement. *Id.* at 122.

In Dymow v. Bolton, 11 F.2d 690 (2d Cir. 1926), the Second Circuit stated that "copying which is an infringement must be something 'which ordinary observation would cause to be recognized as having been taken from' the work of another." *Id.* at 692 (quoting King Syndicate v. Fleischer, 299 F. 533 (1924)).

36. 28 U.S.C. § 1338(a) provides that "[t]he district courts shall have original jurisdiction over any civil action arising under any Act of Congress relating to patents, copyrights and trade-marks." 28 U.S.C. § 1338(a) (1982).

37. Sid & Marty Krofft Television Prods. v. McDonald's Corp., 562 F.2d 1157, 1161 (9th Cir. 1977). Plaintiffs, Sid and Marty Krofft, created the television show *H.R. Pufnstuf*. Defendant's McDonaldland television commericals infringed plaintiff's copyright in the television show. *Id.* at 1167.

38. 17 U.S.C. § 410(c) (1982).

39. *Krofft*, 562 F.2d at 1162.

40. 3 NIMMER, *supra* note 31, § 13.02[B] (citations omitted). "If evidence of access is absent, the similarities must be so striking as to preclude the possibility the plaintiff and defendant independently arrived at the same result." Arnstein v. Porter, 154 F.2d 464, 468 (2d Cir. 1946). The "striking similarity" test used to infer access is a separate test from the "sub-

suit is the proof of substantial similarity in the copyrightable portions of plaintiff's and defendant's works.

The purpose of the copyright law is to foster creativity through "assuring the author of an original work the exclusive benefits of whatever commercial success his or her work enjoys . . . ."[41] However, if protection of original works is too broad, creativity will be deterred when "authors are fearful that their creations will too readily be found to be substantially similar to preexisting works."[42] To balance these interests, copyright protection is limited to the particular expression of the idea. The idea itself is never protected.[43]

The distinction between idea and expression determines the copyrightable aspects of an original work. Therefore, a court must first distinguish the idea from the expression of a work. The courts in *Baker v. Selden*[44] and *Nichols v. Universal Pictures*[45] articulated tests to delineate between idea and expression.[46] However, these tests alone are not sufficient to establish copying. A second test must be applied to establish substantial similarity. The second test must focus on similarities in both ideas and expressions. Thus, substantial similarity of the ideas of two works cannot alone establish copying because ideas are not copyright-

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stantial similarity" test described in this Note. For a further discussion, see 3 NIMMER, *supra* note 31, § 13.02.

41. Warner Bros. v. ABC, 720 F.2d 231, 240 (2d Cir. 1983).

The balance between the interests of authors and the public was discussed in Miller v. Universal City Studios, 650 F.2d 1365 (5th Cir. 1981). In *Miller*, the plaintiff contended that research of factual matters was copyrightable. *Id.* at 1368. The Fifth Circuit noted that facts are not subject to copyright protection. *Id.* at 1369. The court stated that "[t]here is no rational basis for distinguishing between facts and the research involved in obtaining facts." *Id.* at 1372. Therefore, the court held that research was not entitled to copyright protection. *Id.*

The court reasoned that this holding was consistent with the "purpose and intended scope of protection under copyright law." *Id.* at 1371. The court stated, "[t]he line drawn between uncopyrightable facts and copyrightable expression of facts serves an important purpose in copyright law. It provides a means of balancing the . . . interest in stimulating creative activity, as embodied in the Copyright Clause, against the public's need for unrestrained access to information." *Id.*

42. *Warner Bros.*, 729 F.2d at 240.

43. Reyher v. Children's Television Workshop, 533 F.2d 87, 90 (2d Cir.), *cert. denied*, 429 U.S. 980 (1976). In that case, the plaintiffs, who owned the copyright to a children's book entitled *My Mother is the Most Beautiful Woman in the World*, alleged that defendants infringed plaintiff's copyright by publishing an illustrated story entitled *The Most Beautiful Woman in the World*. *Id.* at 88-89. The Second Circuit stated that "[t]he two stories are not similar in mood, details or characterization." *Id.* at 92. Therefore, the court held that there had been no copyright infringement. *Id.* at 93.

44. 101 U.S. 99 (1879).

45. 45 F.2d 119 (2d Cir. 1930), *cert. denied*, 282 U.S. 902 (1931).

46. See *infra* notes 51-54 and accompanying text for a discussion of the test articulated in *Baker*; see *infra* notes 55-56 and accompanying text for a discussion of *Nichols*.

able. Instead, copying of nonduplicate works is only established when both the ideas and the expressions of the works are substantially similar.[47]

B. The Idea/Expression Dichotomy and Substantial Similarity Tests

The distinction between the idea and the protectible expression is difficult to generalize.[48] Judge Learned Hand explained in *Peter Pan Fabrics, Inc. v. Martin Weiner Corp.*[49] that "no principle can be stated as to when an imitator has gone beyond copying the 'idea,' and has borrowed its 'expression.' Decisions must therefore, inevitably be *ad hoc*."[50]

1. Delineating idea from expression

Many courts have attempted to formulate tests to distinguish idea from expression. In *Baker v. Selden*,[51] the Supreme Court stated that while it is clear that a book may be subject to copyright protection, the idea it illustrates may not be copyrighted.[52] Therefore, a court must distinguish the idea from the expression describing the idea. The *Baker* Court held that the headings and columns on blank pages of a book describing a system of bookkeeping were methods of operation of the art.[53] "[W]here the [idea of the work] cannot be used without employing the methods and diagrams used to illustrate the [work]," the Court stated, "such methods and diagrams are to be considered as necessary incidents to the [idea]" and are not protected under copyright law.[54]

A second idea/expression test was formulated in *Nichols v. Universal Pictures*.[55] To draw a line between idea and expression, Judge

47. The courts in Reyher v. Children's Television Workshop, 533 F.2d 87 (2d Cir.), *cert. denied*, 429 U.S. 980 (1976), Roth Greeting Cards v. United Card Co., 429 F.2d 1106 (9th Cir. 1970) and Atari, Inc. v. North Am. Philips Consumer Elecs., 672 F.2d 607 (7th Cir.), *cert. denied*, 459 U.S. 880 (1982), have created tests to evaluate substantial similarity.

48. Reyher v. Children's Television Workshop, 533 F.2d 87, 91 (2d Cir.), *cert. denied*, 429 U.S. 980 (1976). The court in *Reyher* found that the defendant "borrowed the 'idea' embodied in the story from her mother," yet the "presentation of the story line was entirely her own." *Id.* at 90. The defendant's story was based on a Russian folk tale told to her by her mother. *Id.* at 89. The defendant could not recall the exact story she had been told, and therefore, she wrote her own story. *Id.* at 90.

49. 274 F.2d 487 (2d Cir. 1960) (court upheld ruling that defendants infringed plaintiff's copyright in ornamental design used in creation of printed cloth).

50. *Id.* at 489 (emphasis in original).

51. 101 U.S. 99 (1879).

52. *Id.* at 102.

53. *Id.* at 101, 103.

54. *Id.* at 103.

55. 45 F.2d 119 (2d Cir. 1930), *cert. denied*, 282 U.S. 902 (1931). In *Nichols*, the Second Circuit stated that "while we are as aware as any one that the line [between idea and expres-

Learned Hand in *Nichols* formulated the following "abstractions test":

> [U]pon any work . . . a great number of patterns of increasing generality will fit equally well, as more and more of the incident is left out. . . . [B]ut there is a point in this series of abstractions where they are no longer protected, since otherwise the [author] could prevent the use of his "ideas," to which, apart from their expression, his property is never extended.[56]

2. Substantial similarity tests

Once the expression of the work has been defined, a court must use a substantial similarity test to determine copyright infringement. The Second, Seventh and Ninth circuits have each developed substantial similarity tests. The Second Circuit, in *Reyher v. Children's Television Workshop*,[57] restated Learned Hand's "abstractions test."[58] The court stated, "the essence of infringement lies in taking not a general theme but its particular expression through similarities of treatment, details, scenes, events and characterization."[59] Similarly, the Ninth Circuit test of substantial similarity of expression described in *Roth Greeting Cards v. United Card Co.*,[60] compares the "total concept and feel" of the defendant's and plaintiff's works to measure similarity.[61] Finally, in *Atari, Inc.*

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sion], wherever it is drawn, will seem arbitrary, that is no excuse for not drawing it; it is a question such as courts must answer in nearly all cases." *Id.* at 122. *See supra* note 35.

56. *Id.* at 121. Learned Hand began applying the abstractions test with a detailed description of the two scripts. Next, Judge Hand analyzed the plays by removing details, incidents and character traits, thereby creating more abstract descriptions of the scripts, until he arrived at an abstract description of plaintiff's play which matched an equally abstract description of defendant's play. *Id.* at 120-22. As his most abstract description of the plays, Judge Hand characterized the idea of the two plays as "[a] comedy based upon conflicts between Irish and Jews, into which the marriage of their children enters . . . ." *Id.* at 122. The Second Circuit held that despite similarities between the theme and characters of the works, plaintiff's theme and stock characters were too abstract to warrant copyright protection. *Id.* at 122-23. See *supra* note 35 for a further description of the two works.

57. 533 F.2d 87 (2d Cir.), *cert. denied*, 429 U.S. 980 (1976). *See supra* note 48.

58. *Reyher*, 533 F.2d at 91. Judge Learned Hand first enunciated his "abstractions test" in Nichols v. Universal Pictures, 45 F.2d 119 (2d Cir. 1930), *cert. denied*, 282 U.S. 902 (1931). In *Nichols*, he noted,

> [u]pon any work . . . a great number of patterns of increasing generality will fit equally well, as more and more of the incident is left out. . . . [T]here is a point in this series of abstractions where they are no longer protected, since otherwise the playwright could prevent the use of his "ideas," to which, apart from their expression, his property is never extended.

Id. at 121.

59. *Rehyer*, 533 F.2d at 91.

60. 429 F.2d 1106 (9th Cir. 1970).

61. *Id.* at 1110.

v. North American Philips Consumer Electronics,[62] the Seventh Circuit stated that, "the test is whether the accused work is so similar to the plaintiff's work that an ordinary reasonable person would conclude that the defendant unlawfully appropriated the plaintiff's protectible expression by taking material of substance and value."[63] The variety of tests demonstrates the inherent difficulties that courts face in evaluating substantial similarity in copyright infringement actions.[64]

3. Application of the substantial similarity test

In applying a substantial similarity test, the Second and Ninth Circuits have focused on two issues: 1) similarity of ideas; and 2) misappropriation of expression.[65] Further, the standard for establishing substantial similarity varies with the idea expressed.[66] When an idea may be expressed through many different expressions, substantial similarity may be established through similarities which fall short of close paraphrase.[67] Conversely, when the idea may only be expressed in a limited number of ways, copyright protection for the expression of the idea will be limited.[68] When copyright protection is limited, substantial similarity may only be established through virtually identical expressions. Finally, expression which is indispensable in the treatment of an idea is given no copyright protection. Similarity of uncopyrightable expression does not establish substantial similarity.[69]

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62. 672 F.2d 607 (7th Cir.), *cert. denied*, 459 U.S. 880 (1982) (defendant's K.C. Munchkin video game with "gobblers" and "ghost monsters" held substantially similar to plaintiff's PAC-MAN game).

63. *Id.* at 614.

64. The Second Circuit in *Reyher* literally focused on the similarities in specific elements of the work, such as scenes and characterization. *Reyher*, 533 F.2d at 91. However, in *Reyher*, when the court was unable to apply a "pattern analysis" test because children's stories lack complexity of characterization and scenes, the court was forced to compare the "total concept and feel" of the two works, as dictated by the Ninth Circuit's test in *Roth*. *Id.* Similarly, the "pattern analysis" test was inapplicable in analyzing similarities of video game characters as described in *Atari*, 672 F.2d 607. The *Atari* test measuring appropriations of materials of substance and value is merely a third attempt to formulate a distinction between idea and expression. *Id.* at 614-15. See text accompanying note 59 for a statement of the test in *Reyher*; see text accompanying note 61 for a statement of the *Roth* test; see *supra* note 43 for a description of the children's stories in *Roth*; see *supra* note 62 for a discussion of *Atari*.

65. Arnstein v. Porter, 154 F.2d 464 (2d Cir. 1946); Sid & Marty Krofft Television Prods. v. McDonald's Corp., 562 F.2d 1157 (9th Cir. 1977).

66. *See infra* notes 80-93 and accompanying text.

67. Landsberg v. Scrabble Crossword Game Players, Inc., 736 F.2d 485, 488 (9th Cir.), *cert. denied*, 469 U.S. 1037 (1984). *See infra* notes 79-81 and accompanying text.

68. *Id. See infra* notes 82-83 and accompanying text.

69. *Id.* at 489. *See infra* notes 89-93 and accompanying text.

In *Arnstein v. Porter*,[70] the Second Circuit stated that "two separate elements [are] essential" in a copyright infringement suit: "(a) that defendant copied from plaintiff's copyrighted work and (b) that the copying (assuming it to be proved) went so far as to constitute improper appropriation."[71]

The Ninth Circuit in *Sid & Marty Krofft Television Productions v. McDonald's Corp.*[72] modified the *Arnstein* test and renamed the two elements as an "intrinsic test" and an "extrinsic test."[73] The *Krofft* court stated that an "extrinsic test" examines the substantial similarity between the ideas of the two works.[74] This test admits expert testimony to aid the trier of fact.[75] The "intrinsic test" determines whether the copy constitutes an improper misappropriation.[76] This test examines the similarities between the expression of the works.[77] However, it does not admit any expert testimony. Instead, it relies on the response of the ordinary lay observer.[78]

The application of the *Arnstein/Krofft* test does not require proof of exact duplication to establish an infringement. In *Nichols*, Judge Learned Hand stated that the protection of literary property "cannot be limited literally to the text, else a plagiarist would escape by immaterial variations."[79] However, where the idea and expression are inseparable, broad protection may be limited.[80] For example, the general idea of boy

70. 154 F.2d 464 (2d Cir. 1946). *See supra* note 35.

71. *Id.* at 468.

72. 562 F.2d 1157 (9th Cir. 1977).

73. *Id.* at 1164.

74. *Id.* The *Arnstein* court did not call this test an "extrinsic test." *Arnstein*, 154 F.2d at 468.

75. *Krofft*, 562 F.2d at 1164.

76. *Id.*

77. *Id.*

78. *Id.* The *Arnstein* court stated that "[i]f copying is established, . . . the test [for illicit copying] is the response of the ordinary lay hearer" and expert testimony is irrelevant. *Arnstein*, 154 F.2d at 468. In Roth Greeting Cards v. United Card Co., 429 F.2d 1106 (9th Cir. 1970), the Ninth Circuit did not use a bifurcated test. The court considered the work in its entirety, rather than distinguishing the idea and expression. The court stated that " 'the test of infringement is whether the work is recognizable by an ordinary observer as having been taken from the copyrighted source.' " *Id.* at 1110 (quoting White-Smith Music Pub. Co. v. Apollo Co., 209 U.S. 1, 17 (1907)). In contrast to the greeting cards considered in *Roth*, the complexity of computer programs renders useless the response of the ordinary lay observer. See *infra* text accompanying notes 124 and 141 for a discussion of this problem.

79. Nichols v. Universal Pictures, 45 F.2d 119, 121 (2d Cir. 1930), *cert. denied*, 282 U.S. 902 (1931).

80. "Some ideas can be expressed in myriad ways, while others allow only a narrow range of expression." *Landsberg*, 736 F.2d at 488. The Ninth Circuit stated that fictional ideas may generally be expressed with "infinite variations in setting, sequence of incident, and characterization." *Id.* In contrast, factual works can only be expressed in a narrow range of ways. *Id.*

meets girl may be expressed through many different expressions. When an author does not express a broad idea through original expression, and instead uses expression which is nearly identical to another author's expression, "[a] resemblance in details of setting, incident, or characterization that falls short of close paraphrase may be enough to establish substantial similarity and infringement."[81]

In contrast, some ideas, such as "the boy ran across the street" may only be expressed in a limited number of ways. Subsequent expressions of the idea will necessarily be substantially similar to the original expression.[82] Consequently, when an idea may only be expressed in a limited number of ways, "similarity of expression may have to amount to verbatim reproduction or very close paraphrasing before a . . . work will be deemed infringed."[83]

Similarly, copyright protection of historical works does not extend to facts or explanatory hypotheses.[84] In *Echevarria v. Warner Brothers Pictures*,[85] the court stated that "[o]ne cannot build a story around a historical incident and then claim exclusive right to the use of the incident."[86] If this were true, "all the novels, short stories, and dramas written about the Civil War" would infringe upon the work of the first author and cause him or her to claim an exclusive right to the incident.[87] The court held that if historical works were given broad protection, an author would be granted a monopoly over historical facts.[88]

A final example of how the standard establishing substantial similarity varies with the idea expressed is the *scenes a faire* doctrine.[89] *Scenes a faire* are given no copyright protection. *Scenes a faire* are defined as " 'incidents, characters or settings which are as a practical matter indis-

81. *Id.*

82. *Id.*

83. *Id.*

84. Hoehling v. Universal City Studios, 618 F.2d 972, 974 (2d Cir.), *cert. denied*, 449 U.S. 841 (1980). *Hoehling* involved three historical accounts of the events surrounding the Hindenburg. Although the court acknowledged the plaintiff's copyright in his book, it stated, "[t]o avoid a chilling effect on authors who contemplate tackling an historical issue or event, broad latitude must be granted to subsequent authors who make use of historical subject matter, including theories or plots." *Id.* at 977, 978.

85. 12 F. Supp. 632 (S.D. Cal. 1935).

86. *Id.* at 638.

87. *Id.*

88. "In works devoted to historical subjects . . . a second author may make significant use of prior work, so long as he does not bodily appropriate the expression of another." *Hoehling*, 618 F.2d at 980.

89. *Landsberg*, 736 F.2d at 489.

pensable, or at least standard, in the treatment of a given topic.' "[90] Under the *scenes a faire* doctrine, forms of expression that "flow[ ] necessarily from common . . . ideas" are not protectible.[91] Therefore, a second author may reproduce verbatim any expression which is standard or stock in the treatment of an idea without infringing a copyright.[92] To hold otherwise would give an author a copyright in stock scenes and grant a monopoly in commonplace ideas.[93]

C. Summary

Copyright law provides protection for original works of authorship. However, protection is limited to the expression of the work and does not extend to the idea. The circuit courts have developed two separate prongs of analysis for use in copyright infringement actions. The first prong, as exemplified by Hand's abstractions test in *Nichols v. Universal Pictures*,[94] distinguishes the idea from the expression of the work.[95] This analysis determines the copyrightable elements of a work. The second prong measures the substantial similarity of the works. The *Reyher v. Children's Television Workshop*,[96] *Roth Greeting Cards v. United Card Co.*[97] and *Atari, Inc. v. North American Philips Consumer Electronics*[98] tests each focus on general similarities between two works.[99] Application of the substantial similarity test as mandated by the courts in *Arnstein v. Porter*[100] and *Sid & Marty Krofft Television Productions v. McDonald's Corp.*[101] requires a two-step evaluation of, first, the similarity of ideas, and second, the similarity of expressions.[102]

The degree of duplication or similarity necessary to prove infringement varies with the type of work before the court. Ideas which may only be expressed in a limited number of ways require almost verbatim

90. *Hoehling*, 618 F.2d at 979 (quoting Alexander v. Haley, 460 F. Supp. 40, 45 (S.D.N.Y. 1978)).

91. See v. Durang, 711 F.2d 141, 143 (9th Cir. 1983) (court held that ten similarities "follow obviously from the unprotected idea of a surprised understudy, and are therefore unprotected 'scenes a faire' ").

92. *Landsberg*, 736 F.2d at 489.

93. *Id.*

94. 45 F.2d 119 (2d Cir. 1930), *cert. denied*, 282 U.S. 902 (1931).

95. *See supra* note 56 and accompanying text.

96. 533 F.2d 87 (2d Cir.), *cert. denied*, 429 U.S. 980 (1976).

97. 429 F.2d 1106 (9th Cir. 1970).

98. 672 F.2d 607 (7th Cir.), *cert. denied*, 459 U.S. 880 (1982).

99. *See supra* notes 57-68 and accompanying text.

100. 154 F.2d 464 (2d Cir. 1946).

101. 562 F.2d 1157 (9th Cir. 1977).

102. *See supra* notes 70-78 and accompanying text.

copying to establish infringement,[103] while ideas which may be conveyed through a broad range of expressions require less similarity between the works to constitute copying.[104] *Scenes a faire* are given no protection because the available forms of expression are indispensable to the idea.[105]

Although most members of the public are unfamiliar with computer programs, the ordinary observer test has been used to evaluate similarities between complex and highly technical programs. Only when the complexity of computer programs has rendered useless the value of the ordinary observer test have the courts modified the principles of copyright law developed in other areas.

IV. COMPUTER COPYRIGHT LAW

A. Overview

In 1974, Congress created the National Commission on New Technological Uses of Copyrighted Works (CONTU) to "study and report on the problems and issues of new technology and copyright."[106] In 1980, Congress replaced section 117 of the Copyright Act with a new section 117 which codified the CONTU Report's recommendations without alteration.[107] Based on the CONTU Report, Congress also added a definition of "computer program" to section 101 of the Copyright Act.[108]

For the purposes of copyright protection, computer programs are considered literary works.[109] Section 101 of the Copyright Act defines literary works as "works, other than audiovisual works, expressed in words, numbers, or other verbal or numerical symbols or indicia, regardless of the nature of the material objects, such as books, periodicals, manuscripts, phonorecords, film, tapes, disks, or cards, in which they are embodied."[110]

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103. *See supra* note 83 and accompanying text.

104. *See supra* notes 81 and accompanying text.

105. *See supra* notes 90-93 and accompanying text.

106. Whelan Assocs. v. Jaslow Dental Laboratory, 797 F.2d 1222, 1240 (3d Cir. 1986), *cert. denied*, 107 S. Ct. 877 (1987).

107. *Id.* at 1241. Section 117 allows the user of a computer program to make copies of the program when the new copy or adaptation is necessary for use with a machine or for archival purposes. 17 U.S.C. § 117 (West Supp. 1986). *See supra* note 33.

108. *Whelan*, 797 F.2d at 1241. Section 101 of the Copyright Act defines "computer program" as "a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result." 17 U.S.C. § 101 (West Supp. 1986).

109. H.R. REP. NO. 1476, 94th Cong., 2d Sess. 51, *reprinted in* 1976 U.S. CODE CONG. & ADMIN. NEWS 5659, 5667. The report states that " 'literary works' . . . includes . . . computer programs." *Id.*

110. 17 U.S.C. § 101 (1982).

B. Copyrightability of Computer Programs

Judicial decisions have extended copyright protection to computer programs regardless of their form or embodiment. In *Williams Electronics, Inc. v. Artic International, Inc.*,[111] the Third Circuit stated that the 1980 amendments to the Copyright Act firmly established the copyrightability of computer programs.[112] The court further stated that copyright protection extends to source code, object code and object code stored on a Read Only Memory Chip (ROM).[113]

In *Apple Computer, Inc. v. Franklin Computer Corp.*,[114] the Third Circuit affirmed its decision in *Williams*,[115] and held that computer programs which coordinate the internal functions of a computer, called operating systems, are protected under copyright law.[116] In *Franklin*, defendants argued that an operating system is either a " 'process', 'system', or 'method of operation' and hence" excluded from copyright protection under section 102(b) of the Copyright Act.[117] Defendants noted that these areas are not eligible for copyright protection.[118] In response, the court observed that defendants had conceded that application programs are copyrightable.[119] The court also commented that both operating systems and application programs "instruct the computer to do something."[120] Therefore, the court concluded that for the purpose of the Copyright Act, both operating systems and application programs are

111. 685 F.2d 870 (3d Cir. 1982). In *Williams*, plaintiffs manufactured and sold an electronic video game called DEFENDER. *Id.* at 872. The computer program, which controlled the sights and sounds of DEFENDER, was stored on a ROM chip. *Id.* Defendants sold electronic components for video games. *Id.* Among defendant's sales were ROMs which contained a program virtually identical to plaintiff's DEFENDER game. *Id.* See *supra* note 31 and accompanying text for a discussion of ROM chips.

112. *Id.* at 875.

113. *Id.* at 876-77. The court rejected defendant's contention that a copy must be intelligible to humans to be protected under the Copyright Act. This reasoning would not protect object code stored on ROMs. *Id.* The court emphasized that § 101 of the Copyright Act extends protection "to include a material object in which a work is fixed 'by *any* method, . . . and from *which the work can be perceived* . . . either directly or *with the aid of a machine or device*.' " *Id.* at 877 (emphasis in original) (citing 17 U.S.C. § 101 (1982)).

114. 714 F.2d 1240 (3d Cir. 1983), *cert. dismissed*, 464 U.S. 1033 (1984).

115. *Id.* at 1248-49.

116. *Id.* at 1252.

117. *Id.* at 1250. Section 102 of the Copyright Act states that "[i]n no case does copyright protection . . . extend to any idea, procedure, process, system, [or] method of operation . . . ." 17 U.S.C. § 102(b) (1982).

118. *Franklin*, 714 F.2d at 1251.

119. *Id.* Application programs are programs such as a computer assisted tax return program. *Id.*

120. *Id.*

appropriate subjects for copyright protection.[121]

C. Substantial Similarity

The first cases involving computer program copyright infringement almost all involved an exact copy of the copyrighted work. For example, in *Apple Computer, Inc. v. Franklin Computer Corp.*,[122] defendants' programs were virtually identical to the copyrighted works, and defendants did not dispute that they copied plaintiff's programs.[123] However, even where exact copying can be shown, the plaintiff must establish a substantial similarity between the two programs.[124] To establish substantial similarity, a plaintiff must first delineate the idea from the expression of the program,[125] and then prove substantial similarity between both the ideas and expressions of the works.[126] This test is difficult when dealing with computer programs because the highly technical nature of computer programs makes line by line comparisons nearly impossible.[127]

The initial problem of distinguishing idea from expression is amplified with computer programs because many programming structures organize data. These structures create specified memory locations where data is stored and retrieved.[128] As such, these programming structures

121. *Id.*

122. 714 F.2d 1240 (3d Cir. 1983), *cert. dismissed*, 464 U.S. 1033 (1984).

123. *Id.* at 1245. *See also*, Data Cash Sys. v. JS&A Group, Inc., 628 F.2d 1038, 1040 (7th Cir. 1980); Apple Computer, Inc. v. Formula Int'l, Inc., 562 F. Supp. 775, 777 (C.D. Cal. 1983), *aff'd*, 725 F.2d 521 (9th Cir. 1984).

124. *See supra* note 39 and accompanying text.

125. *See supra* notes 43-46 and accompanying text.

126. *See supra* note 47 and accompanying text.

127. Computer programs involve many lines of code comprised of variables, programming terms and directions to the computer. Two programs can produce the exact same output, yet a programmer can completely change the "total look and feel" of a program by simply changing the variable names. This change has no effect on the output of the program, but it can completely change the appearance of the program to the ordinary observer.

A second quality of computer programs which can easily confuse ordinary observers is the ability of a computer to execute a program in many different orders. A computer does not always execute a program from top to bottom, nor from first line of code to last. Instead, a computer may execute a group of lines, called a subroutine, many times over the course of one execution. In addition, the order in which the computer executes the program may vary depending on the type of data which is used.

The voluminous number of lines in a program can also make line by line comparisons difficult. A program consisting of 2000 lines of source code is not unusual. However, an ordinary observer does not have the background or knowledge needed to compare two programs of over 2000 lines of code each. This problem is further compounded by the fact that differences in variable names and ordering of the program code may be irrelevant to the computers execution of the source code. *See supra* note 78 and *infra* note 141 and accompanying text.

128. Two examples of programming structures which order data are input and output for-

have been analogized to blank forms which also organize data.[129] However, whether input formats and other programming structures which sequence data are sufficiently complex to warrant copyright protection is unclear based upon analogy with prior copyright law concerning blank forms.[130]

The court in *Synercom Technology, Inc. v. University Computing Co.*[131] held that input formats were not copyrightable.[132] In *Synercom*, the court reiterated the axiom that copyright protection only extends to the expression of the idea.[133] Defendants argued that input formats are forms not intended to convey information, and therefore are not copyrightable.[134] In response, the court determined that forms which express ideas and communicate information may be the subject of copyright protection.[135] The court found that protection exists when the idea is expressed through the sequencing and ordering of the data.[136] However, the court questioned, "[i]f sequencing and ordering is expression, what separable idea is expressed?"[137] The sequence of the input formats, the court held, could not be distinguished from the idea or principle behind the form, and therefore it was not protected under copyright law.[138]

Substantial similarity of computer programs was addressed by the Eighth Circuit in *E.F. Johnson Co. v. Uniden Corp. of America*.[139] In *E.F. Johnson*, the court stated that the substantial similarity test was

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mats. Input formats sequence the data which is used by the computer to execute a program. Synercom Technology, Inc. v. University Computing Co., 462 F. Supp. 1003, 1012 (N.D. Tex. 1978). Output formats define the sequencing of the data as it is visually reproduced on the screen or printer. R. HIPGRAVE, *supra* note 20, at 50, 83.

129. *Synercom*, 462 F. Supp. at 1011.

130. See *supra* notes 51-54 for a discussion of Baker v. Selden, 101 U.S. 99 (1879).

131. 462 F. Supp. 1003 (N.D. Tex. 1978). In *Synercom*, the defendant copied plaintiff's copyrighted program manuals and incorporated plaintiff's input formats into their program to allow users to use defendant's program without reformatting data which had been input with the plaintiff's program. *Id.* at 1009.

132. *Id.* at 1014.

133. *Id.* at 1011.

134. *Id.*

135. *Id.*

136. *Id.* at 1013.

137. *Id.* The court concluded that "in the usual case sequence, choice and arrangement have only stylistic significance, rather than constituting as they would here, the essence of the expression." *Id.* at 1014. The court analogized the input formats to the "figure-H" pattern of an automobile stick shift. *Id.* at 1013. "[C]opyright protects copying of the particular expressions of the pattern, and does not prohibit another manufacturer from marketing a car using the same pattern." *Id.*

138. *Id.*

139. 623 F. Supp. 1485 (D. Minn. 1985). In *E.F. Johnson*, plaintiff created software which allowed a more efficient use of radio waves in mobile radio systems. *Id.* at 1487. Defendant wished to create a mobile radio compatible with plaintiff's radio. *Id.* at 1489. Consequently,

based on whether an ordinary observer would perceive the alleged copy to have been taken from the original.[140] The court, however, acknowledged that the "application of the ordinary observer test in a computer software context has proven problematic."[141] This is because the complexity of software and the use of computer languages creates an absence of easily perceived characteristics in computer programs.[142] Consequently, the court applied a single test[143] which focused on an expert's analysis of the " 'quantitative and qualitative evidence of similarities' " between the two works.[144] In its "iterative" test, the court required that

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defendant disassembled and examined plaintiff's source code and then developed and created a program which was substantially similar to plaintiff's copyrighted work. *Id.* at 1490, 1497.

140. *Id.* at 1492. The court cited substantial similarity tests from Atari, Inc. v. North Am. Philips Consumer Elecs., 672 F.2d 607, 614 (7th Cir.), *cert. denied*, 459 U.S. 880 (1982); Warner Bros. Inc. v. ABC, 654 F.2d 204, 208 (2d Cir. 1981); Whitol v. Crow, 309 F.2d 777, 780 (8th Cir. 1962) and Animal Fair v. Amfesco Indus., 620 F. Supp. 175, 188 (D. Minn. 1985), *aff'd without opinion*, 794 F.2d 678 (8th Cir. 1986). *Id.*

141. *E.F. Johnson*, 623 F. Supp. at 1493. See *supra* notes 76-78 and accompanying text for a statement of the ordinary observer test.

142. *E.F. Johnson*, 623 F. Supp. at 1493. See *supra* notes 130-31 and accompanying text for a discussion of the difficulties in distinguishing idea from expression in input formats. See *infra* notes 146-52 and accompanying text for a discussion of the difficulties in comparing source code.

143. The court called this test an "iterative test." *E.F. Johnson*, 623 F. Supp. at 1493. Iterative reproduction is "a restatement in substantially the same form (*i.e.* a literal copy or translation) of a substantial portion of the copyrighted work." Note, *Copyright Infringement of Computer Programs: A Modification of the Substantial Similarity Test*, 68 MINN. L. REV. 1264, 1265 n.6 (1984).

144. *E.F. Johnson*, 623 F. Supp. at 1493. In Williams Elecs., Inc. v. Artic Int'l, Inc., 685 F.2d 870 (3d Cir. 1982), the court based its finding of copying of the plaintiff's program, not on the response of an ordinary observer, but on evidence of specific similarities between two programs. *Id.* at 876 & n.6. The evidence included: (1) errors from early versions of plaintiff's program; (2) duplication of plaintiff's president's initials in screens of the video game; (3) proof that 85% of defendant's program intructions were identical to plaintiff's; and (4) plaintiff's copyright notice was hidden in defendant's instructions. *Id.* at 876 n.6.

In *E.F. Johnson*, the court considered expert testimony concerning error samples, duplicate tables of numbers and duplicate methods of loading data into the computer as evidence of substantial similarity. *E.F. Johnson*, 623 F. Supp. at 1494-95.

In SAS Inst. v. S & H Computer Sys., 605 F. Supp. 816 (M.D. Tenn. 1985), the court held that the programs were substantially similar based on expert testimony of 44 examples of copying. *Id.* at 822, 830. See *infra* note 146 for a discussion of the defendant's use of the plaintiff's program.

In Midway Mfg. Co. v. Strohon, 564 F. Supp. 741 (N.D. Ill. 1983), the court based its holding of copyright infringement on expert testimony. *Id.* at 752-53. Plaintiff established that 89% of defendant's ROM instructions were identical to plaintiff's ROM instructions. *Id.* at 752. Further, plaintiff established that over 97% of the instructions which control the sequencing of play in the video games were identical in both sets of ROMs. *Id.* at 752-53. See *supra* notes 3-5 for a further discussion of the inference of substantial similarity from nearly identical programs based on testimony establishing the infinite variety of ways to instruct a computer to perform a specific task.

the defendant's work must not only be substantially similar to the plaintiff's work but must also be produced by "exact duplication of substantial portions of the copyrighted work."[145]

The issue of substantial similarity of expression was considered again in *SAS Institute v. S & H Computer Systems.*[146] In *SAS,* the court noted that "the critical issue is whether S & H appropriated from SAS only ideas and concepts, or whether it also appropriated expression."[147] To establish that the S & H product was a copy or derivative work based upon the SAS product, the court employed a substantial similarity test.[148] The court stated that substantial similarity does not require literal identity; therefore, the expressions of the two works must only be substantially similar.[149] The court established "as a matter of fact that the expression, and not merely the idea[ ]," of plaintiff's work was duplicated.[150] Additionally, the court was unwilling to state that forty-four "specific examples of copying [were] as a matter of law insubstantial."[151] The court also considered pervasive similarities in the organization and structural details of the two works to be further evidence of copying.[152] Thus, the court found the two products to be substantially similar based on examples of specific copying and structural similarities.[153]

Although the court in *SAS* considered the similarities and structures of the two programs, its decision was primarily based on the examples of literal copying of the specific code of the programs.[154] Correspondingly, the decisions in *Williams Electronics v. Artic International, Inc.,*[155] *Franklin*[156] and *E.F. Johnson*[157] were all based on similarities between

145. *E.F. Johnson,* 623 F. Supp. at 1493.

146. 605 F. Supp. 816 (M.D. Tenn. 1985). In *SAS,* defendants acquired the source code for plaintiff's program. *Id.* at 821. Plaintiff's program could only be operated on an IBM or IBM compatible computer. *Id.* at 819. To use the source code on the VAX computer, defendants translated the code into a language which the VAX computer could execute. *Id.* at 821. The defendants then used plaintiff's source code "extensively and systematically" in developing its product. *Id.* at 822. *See supra* notes 11-17 and accompanying text for a discussion of the technological background involved in developing computer programs.

147. *SAS,* 605 F. Supp. at 829.

148. *Id.*

149. *Id.*

150. *Id.*

151. *Id.* at 830.

152. *Id.* The court stated, "to the extent that it represents copying of the organization and structural details of SAS, such copying pervades the entire S & H product." *Id.*

153. *Id.*

154. *Id.*

155. *See supra* notes 111-13 and accompanying text.

156. *See supra* note 123 and accompanying text.

157. *See supra* note 139.

the actual source or object codes of the programs.[158] However, the use of structural similarities as a basis for a copyright infringement action has been expanded in *Whelan Associates v. Jaslow Dental Laboratory*.[159]

V. STATEMENT OF THE CASE

A. Facts of the Case

Jaslow Dental Laboratory, Inc. (JDL) manufactured dental prosthetics and devices.[160] In 1978, Rand Jaslow, an officer and shareholder in JDL, purchased a personal computer.[161] Although he lacked expertise in writing computer programs, Mr. Jaslow attempted to write a program to take care of JDL's business needs.[162]

When Mr. Jaslow was unable to write such a program, he hired the Strohl Systems Group, Inc. (Strohl), a small corporation that developed custom software.[163] An agreement between Strohl and JDL stated that Strohl would retain ownership of the software developed, and JDL would receive a ten percent royalty on sales of the basic package.[164] Elaine Whelan, an officer and half owner of Strohl and an experienced programmer, was in charge of the JDL account.[165] Ms. Whelan visited Jaslow Lab, interviewed Mr. Jaslow and visited other dental laboratories before writing the program Dentalab.[166] Dentalab was written in a computer language called EDL (Event Driven Language)[167] because JDL needed to use the program on an IBM Series 1 computer.[168] The program was completed around March 1979.[169]

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158. *See supra* note 144.

159. 797 F.2d 1222 (3d Cir. 1986), *cert. denied*, 107 S. Ct. 877 (1987).

160. Whelan Assocs. v. Jaslow Dental Laboratory, 797 F.2d 1222, 1225 (3d Cir. 1986), *cert. denied*, 107 S. Ct. 877 (1987).

161. *Id.*

162. *Id.* These needs included "registering receipt of orders; processing orders; maintaining inventory, cost controls, and customer lists; performing invoicing, billing and accounting functions; and performing other related functions and services." Whelan Assocs. v. Jaslow Dental Laboratory, 609 F. Supp. 1307, 1309 (E.D. Pa. 1985), *aff'd*, 797 F.2d 1222 (3d Cir. 1986), *cert. denied*, 107 S. Ct. 877 (1987).

163. *Whelan*, 797 F.2d at 1225.

164. *Id.* at 1225 n.2.

165. *Id.* at 1225.

166. *Id.* at 1225-26. The district court found that Elaine Whelan "conferred extensively with Rand Jaslow" in an effort to learn the business methods "used by Jaslow Laboratory in receiving, processing and delivering orders, invoicing, billing, controlling inventory, accounting and, in substance, the detailed manner in which Jaslow Laboratory conducted its business . . . ." *Whelan*, 609 F. Supp. at 1310.

167. See *supra* notes 11-12 for a discussion of high-level programming languages.

168. *Whelan*, 797 F.2d at 1226.

169. *Id.*

In November, 1979, Whelan Associates was formed and acquired Strohl's interest in Dentalab.[170] In 1982, Mr. Jaslow began to develop a program with essentially the same functions as Dentalab to run on a second computer, the IBM-PC, which many smaller dental laboratories owned.[171] This program, called Dentcom, was written in a programming language called BASIC.[172] Mr. Jaslow used a copy of the source code of Dentalab to develop Dentcom.[173] On May 31, 1983, JDL sent a letter to Whelan Associates terminating the agreement between Whelan Associates and JDL.[174] The letter also stated that JDL considered itself to be the exclusive marketer of Dentalab.[175] On August 1, 1983, a new company called Dentcom was formed to sell the Dentcom program.[176] Dentcom sold the Dentalab system under the names of both Dentalab and Dentlab, in addition to its sales of the Dentcom program.[177] In its advertising of the Dentcom program, Dentcom described the program as " 'a new version of the Dentlab [sic] computer system.' "[178] However,

170. *Whelan*, 609 F. Supp. at 1311. Two later agreements terminated all of Strohl's marketing rights relating to Dentalab, and all of Strohl's interest in the " 'Dentalab Package.' " *Id.* The Dentalab Package "expressly included all related technical sales and operating manuals, advertising materials, program source codes, flow charts and related material as well as all copyright entitlements . . . ." *Id.*

171. *Whelan*, 797 F.2d at 1226; *Whelan*, 609 F. Supp. at 1314.

172. *Whelan*, 797 F.2d at 1226. See *supra* notes 11-12 for a discussion of BASIC and other high-level programming languages.

173. *Whelan*, 609 F. Supp. at 1314. Although the source code for Dentalab was to be kept in the exclusive possession of Whelan Associates, and Rand Jaslow was never authorized to have a copy of this source code, Mr. Jaslow "surreptitiously and without consent of either Strohl Systems or Whelan Associates obtained a copy of the source code which he utilized in trying to develop [Dentcom]." *Id.* Rand Jaslow, who had been unable to create the Dentalab program without Elaine Whelan's assistance, was similarly unsuccessful at writing the Dentcom program. Consequently, JDL hired Jonathan Novack to develop the newest program. *Id.* at 1314-15. Mr. Novak found the work done by Rand Jaslow "to be the work of a talented but unskilled amateur, containing many errors, and showing a lack of expertise in computer programming and designing." *Id.* at 1315.

174. *Whelan*, 797 F.2d at 1226. The letter was inadvertedly dated January 31, 1983 by the district court. *Id.* at n.5 (citing Whelan Assocs. v. Jaslow Dental Laboratory, 609 F. Supp. 1307, 1313 (E.D. Pa. 1985), *aff'd*, 797 F.2d 1222 (3d Cir. 1986), *cert. denied*, 107 S. Ct. 877 (1987). In the letter, JDL "demanded return of 'all materials related to the Dentalab Package including source and object codes and other pertinent documents.' " *Whelan*, 609 F. Supp. at 1313.

175. *Id.* In district court, JDL claimed that it was the sole owner of the Dentalab source and object codes because the program was written exclusively for Jaslow Laboratory. *Whelan*, 609 F. Supp. at 1316. However, the district court found that "Jaslow Laboratory did not own or hold a proprietary interest in the computer software system or its source or object codes . . . ." *Id.* at 1318.

176. *Whelan*, 797 F.2d at 1226-27.

177. *Whelan*, 609 F. Supp. at 1315.

178. *Whelan*, 797 F.2d at 1227.

Whelan Associates also continued to sell Dentalab.[179]

B. Procedural History

On June 30, 1983, JDL filed suit in state court alleging trade secret misappropriation by Whelan Associates through its sales of Dentalab.[180] JDL claimed that Dentalab contained "valuable trade secrets of Jaslow Dental Laboratory."[181] In response, Whelan Associates filed suit in the District Court for the Eastern District of Pennsylvania alleging that the sale of the Dentalab and Dentcom programs infringed Whelan Associates' copyright in Dentalab, "that Dentcom's use of the terms 'Dentlab' or 'Dentalab' violated Pennsylvania common law and 15 U.S.C. § 1125(a), . . . and that Dentcom's activities violated various other federal and state laws pertaining to unfair competition and tortious interference with contractual relations."[182]

JDL and the other defendants denied all liability, claiming that Whelan Associates' copyright was invalid, and even if it were valid, Mr. Jaslow did not violate the copyright because he developed the Dentcom program independently.[183] JDL also claimed that the terms "Dentalab" and "Dentcom" were "general descriptions of goods and services, not names of particular products."[184] Therefore, according to JDL, Dentcom's use of those terms did not violate state or federal law.[185] JDL counterclaimed that Whelan Associates had infringed its copyright and engaged in unfair competition through its sales of Dentalab.[186] JDL's trade secret action was removed from state court, and became a counterclaim to the federal suit.[187]

JDL filed a motion for a preliminary injunction to enjoin Whelan Associates from using JDL's trade secrets.[188] However, the court denied any preliminary relief, and the case was brought to trial.[189]

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179. *Id.*

180. Whelan Assocs. v. Jaslow Dental Laboratory, 797 F.2d 1222 (3d Cir. 1986), *cert. denied*, 107 S. Ct. 877 (1987).

181. Letter from JDL to Strohl giving notice of termination of agreement. *Id.* at 1226-27.

182. *Id.* at 1227 (citations omitted).

183. *Id.* The Third Circuit explained that § 106 of the Copyright Act "forbids the copying of copyrighted works. The independent creation of even identical works is therefore not a copyright infringement, and independent creation is a complete defense to a claim of copyright infringement." *Id.* at 1227 n.7.

184. *Id.* at 1227.

185. *Id.*

186. *Id.*

187. *Id.* at 1227-28.

188. *Id.* at 1228.

189. *Id.*

At trial, JDL continued to deny all of Whelan Associates' allegations.[190] Dr. Moore testified as a computer expert for Whelan Associates.[191] In his testimony, Dr. Moore stated that the person who wrote the Dentcom program "either worked from the source code or had a thorough knowledge of the Series 1 system."[192] He also testified that "most of the file structures, and the screen outputs, of the programs were virtually identical"[193] and "five particularly important 'subroutines' within both programs . . . performed almost identically in both programs."[194]

JDL called Mr. Ness who testified as its computer expert.[195] In contrast to Dr. Moore's testimony, Mr. Ness compared "the similarities and differences in the source and object codes"[196] and found that "the Dentcom system [was] not directly derived from . . . the [Dentalab] system[ ]."[197] However, Mr. Ness "did not examine the actual operation of any of the systems in dispute."[198]

The district court ruled for Whelan Associates on almost all grounds.[199] It found that JDL did not own the source or object codes for Dentalab,[200] and that Whelan Associates was the owner of a valid copyright in the Dentalab system.[201]

Finally, the district court weighed the evidence of substantial similarity between Dentalab and the Dentcom program.[202] It concluded "that the IBM-PC Dentcom system is a copy of the IBM-Series 1 Dentalab system, and that it was an improper appropriation constituting a copyright infringement."[203] On appeal, JDL only challenged the district court's finding "that the Dentcom program infringe[d] the copyright

190. *Id.* At trial, JDL abandoned the trade secrets claim. *Id.*

191. *Whelan*, 609 F. Supp. at 1316.

192. *Id.*

193. *Whelan*, 797 F.2d at 1228.

194. *Id. See infra* note 285.

195. *Whelan*, 797 F.2d at 1228. Mr. Ness was incorrectly identified as Mr. Hess by the district court. *Whelan*, 609 F. Supp. at 1316.

196. *Whelan*, 797 F.2d at 1228; *Whelan*, 609 F. Supp. at 1316.

197. *Whelan*, 797 F.2d at 1228.

198. *Whelan*, 609 F. Supp. at 1316.

199. *Whelan*, 797 F.2d at 1228.

200. *Whelan*, 609 F. Supp. at 1320.

201. *Id.*

202. *Id.* at 1321-22.

203. *Id.* at 1322. The district court found that defendants did not violate 15 U.S.C. § 1125 through their use of the name Dentlab. *Id.* at 1323. However, it did not rule on Whelan Associates' allegations of Pennsylvania common law violation. The district court stated that damages for this cause of action had not been established. *Id.*

of plaintiffs' Dentalab system."[204]

C. The Court's Reasoning

In determining whether the Dentcom program was copied in writing the Dentalab program, the Third Circuit in *Whelan Associates v. Jaslow Dental Laboratory*[205] stated that copying may be inferred from evidence "that the defendant had access to the . . . copyrighted work *and* that the allegedly infringing work is substantially similar to the copyrighted work."[206] Access to the copyrighted work had not been established.[207] Therefore, the appellate court had only to determine whether the Dentcom and Dentalab programs were substantially similar.[208]

1. The scope of copyright protection of computer programs

Although the *Whelan* court recognized that copyright protection for source and object codes had been established through case law,[209] the court reasoned that the issue in this case was "whether a program's copyright protection covers the structure of the program or only the program's literal elements, *i.e.*, its source and object codes."[210] The court stated that for the purpose of copyright protection, computer programs

204. *Whelan*, 797 F.2d at 1229.

205. 797 F.2d 1222 (3d Cir. 1986), *cert. denied*, 107 S. Ct. 877 (1987).

206. *Id.* at 1232 (emphasis added) (citing Ferguson v. NBC, 584 F.2d 111, 113 (5th Cir. 1978); Sid & Marty Krofft Television Prods. v. McDonald's Corp., 562 F.2d 1157, 1162 (9th Cir. 1977); Universal Athletic Sales Co. v. Salkeld, 511 F.2d 904, 907 (3d Cir.), *cert. denied*, 423 U.S. 863 (1975); Midway Mfg. Co. v. Strohon, 564 F. Supp. 741, 753 (N.D. Ill. 1983)).

The *Whelan* court examined two requirements to determine if the copyright on Dentalab had been infringed. *Whelan*, 797 F.2d at 1231. The court examined Whelan's ownership of the copyright and whether the Dentalab program was copied in writing Dentcom. *Id.* (citing Sid & Marty Krofft Television Prods. v. McDonald's Corp., 562 F.2d 1157, 1162 (9th Cir. 1977); Reyher v. Children's Television Workshop, 533 F.2d 87, 90 (2d Cir.), *cert. denied*, 429 U.S. 980 (1976)); 3 NIMMER, *supra* note 31, at § 13.01. As to the first element, the district court had found that Whelan Associates owned the copyright on Dentalab. Whelan Assocs. v. Jaslow Dental Laboratory, 609 F. Supp. 1307, 1320 (E.D. Pa. 1985), *aff'd*, 797 F.2d 1222 (3d Cir. 1986), *cert. denied*, 107 S. Ct. 877 (1987).

207. *Whelan*, 609 F. Supp. at 1314. On appeal, Jaslow did not contest either the finding of Whelan's ownership of the Dentalab program copyright nor the finding of access to the Dentalab source code. *Whelan*, 797 F.2d at 1231-32.

208. *Id.* at 1232.

209. Apple Computer, Inc. v. Franklin Computer Corp., 714 F.2d 1240, 1246-47 (3d Cir. 1983), *cert. dismissed*, 464 U.S. 1033 (1984) (computer program is copyrightable whether in its object or source code version); Williams Elecs., Inc. v. Artic Int'l, Inc., 685 F.2d 870, 875-76 (3d Cir. 1982) (court held that copyright protection extends to object code of computer program). See *supra* notes 111-58 and accompanying text for a further discussion of computer copyright law.

210. *Whelan*, 797 F.2d at 1234. The court also stated that the issue is "whether mere similarity in the overall structure of programs can be the basis for a copyright infringement." *Id.*

are classified as literary works,[211] and that the Copyright Act protects original works of authorship, including literary works.[212] The court explained that the copyright of literary works such as books and plays may be violated through a copying of the plot, a nonliteral device.[213] Through analogy, the court reasoned that a computer program may be infringed by a copying of program structures, despite complete dissimilarities in literal elements.[214]

JDL had argued against copyright protection of a program's structure for two reasons.[215] First, JDL had argued that the CONTU Report[216] recommended copyright protection be limited to the literal elements of a computer program.[217] Second, JDL had contended that copyright protection extends to the expression of an idea, not the idea itself.[218] Therefore, JDL had reasoned, the structure of a computer program could not be copyrighted because it is "by definition the idea and not the expression of the idea."[219]

a. the CONTU report

The CONTU Report has been followed by some courts as the legislative history of section 117 because the report was adopted "without

211. *Id.* at 1234. *See* H.R. REP. No. 1476, 94th Cong., 2d Sess. 51, *reprinted in* 1976 U.S. CODE CONG. & ADMIN. NEWS 5659, 5667. *See supra* notes 109-10 and accompanying text.

212. *Whelan*, 797 F.2d at 1234 (citing 17 U.S.C. § 102(a)(1) (1982)).

213. *Id. See* Twentieth Century-Fox Film Corp. v. MCA, 715 F.2d 1327, 1329 (9th Cir. 1983) (thirteen plot similarities were sufficient basis for trial court to determine copyright infringement); *Kroffi*, 562 F.2d at 1167 (McDonald characters infringed copyright on H.R. Pufnstuf characters without duplication or near identity); Sheldon v. Metro-Goldwyn Pictures, 81 F.2d 49, 54-55 (2d Cir.), *cert. denied*, 298 U.S. 669 (1936) (similarities in sequence of event action in the movie *Letty Lyntor* violated copyright of *Dishonored Lady* despite differences in dialogue); Nichols v. Universal Pictures, 45 F.2d 119, 121 (2d Cir. 1930), *cert. denied*, 282 U.S. 902 (1931) (examination of literary works for copyright infringement "cannot be limited literally to the text, else a plagiarist would escape by immaterial variations").

214. *Whelan*, 797 F.2d at 1234.

215. *Id.* at 1235, 1240.

216. *See* text accompanying note 106.

217. *Whelan*, 797 F.2d at 1241. Brief for Appellant at 15-21, Whelan Assocs. v. Jaslow Dental Laboratory, 797 F.2d 1222 (3d Cir. 1986), *cert. denied*, 107 S. Ct. 877 (1987) (No. 85-1358). JDL cited Arthur J. Levine, Executive Director of CONTU, as stating that "CONTU was primarily concerned with protecting computer programs against direct duplication of the program code by photocopying or other means." Brief for Appellant at 17 (citation omitted). JDL also argued that "[n]owhere in [the discussion of the scope of copyright in computer programs was] mention made of the appropriation of the structure, organization, or logic of a program. The CONTU Report clearly manifest[ed] an assumption that the scope of protection is limited to the language of the program." Brief for Appellant at 18.

218. *Whelan*, 797 F.2d at 1235.

219. *Id.*

alterations and without any committee reports."[220] JDL had argued that, as such, the CONTU Report's recommendation that copyright protection be limited to the literal elements of a program was persuasive legislative history.[221] In response, the court stated that the CONTU Report, instead of limiting copyright protection to the literal code of a program, demonstrates that the commission intended nonliteral elements to be protected.[222] As support for this argument, the court quoted a section of the CONTU Report which discussed the idea/expression dichotomy: "*Flow Charts*, source codes, and object codes are works of authorship in which copyright subsists" and may not be copied without the author's consent.[223]

Although the court recognized that the CONTU Report recommended that copyright protection should be extended to the nonliteral elements of computer programs, it was not willing to consider the report persuasive legislative history. The court stated that the CONTU Report and its indication of the legislative history only applies to section 117 of the Copyright Act, which was amended as a result of the Report.[224] Based on the determination that the only statutory provision at issue in *Whelan* was section 102(b), the court held that the concepts contained in the CONTU Report were not binding on the court in *Whelan*.[225]

b. classification of the structure of a computer program as expression rather than idea

In its second argument, JDL had stated that copyright protection cannot extend to the structure of a program because the structure of a program is by defininition the idea of a program.[226] The Third Circuit acknowledged that copyright protection, as embodied in 17 U.S.C. section 102(b), solely protects expression of ideas.[227] This distinction is not

220. *Id.* at 1241. In Micro-Sparc, Inc. v. Amtype Corp., 592 F. Supp. 33 (D. Mass. 1984), the court held that the "CONTU Report . . . compromises the entire legislative history of § 117." *Id.* at 35 n.7. The district court in Midway Mfg. Co. v. Strohon, 564 F. Supp. 741 (N.D. Ill. 1983), noted: "Although the Congressional action in 1980 does not appear to be supported by a legislative history, it is fair to conclude, since Congress adopted its recommendations without alteration, that the CONTU Report reflects the Congressional intent." *Id.* at 750 n.6.

221. *See supra* note 217.

222. *Whelan*, 797 F.2d at 1241.

223. *Id.* (quoting NATIONAL COMM'N ON NEW TECHNOLOGICAL USES OF COPYRIGHTED WORKS, FINAL REPORT 21 (1978)) (emphasis in original).

224. *Id.* at 1241-42.

225. *Id.*

226. *Id.* at 1235.

227. *Id.* at 1234. 17 U.S.C. § 102(b) (1982) states: "In no case does copyright protection . . . extend to any idea . . . regardless of the form in which it is described . . . or embodied in

only embodied in statute,[228] but also in the legislative history of section 102(b). This history states "that the basic dichotomy between expression and idea remains unchanged" after the amendment to the Copyright Act, which specifically protects computer programs.[229] The court examined case law concerning the idea/expression dichotomy to articulate a rule for evaluating the two concepts in the context of computer programs.[230]

First, the court stated that the purpose of copyright law is to balance the interest in protection of the programmer's work with the public interest in dissemination of information to promote learning, culture and development.[231] If the distinction between idea and expression is made imprecisely, then the balance of interests will favor one side, to the detriment of the other. Consequently, if expression is defined to include a broad range of computer programs, programmers will receive more protection than is necessary, and if expression is limited to the most detailed level of a computer program, the public will unduly benefit from the programmer's efforts.

The court then examined *Baker v. Selden*[232] for a method to distinguish idea from expression.[233] In *Baker*, the Supreme Court stated that when methods and diagrams are necessary for the practical application of the art, the methods and diagrams are not copyrightable.[234] The Third Circuit in *Whelan* suggested that the *Baker* test establishes that "the line between idea and expression may be drawn with reference to the end sought to be achieved by the work in question."[235] The court stated, "the purpose or function of a utilitarian work would be the work's idea, and everything that is not necessary to that purpose or function

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such work." The court cited several cases which enunciated this distinction, including: Baker v. Selden, 101 U.S. 99, 107 (1879) (blank pages and account books illustrating system of bookkeeping were not subject of copyright because they were necessary to use of system); Universal Athletic Sales Co. v. Salkeld, 511 F.2d 904, 906 (3d Cir.), *cert. denied*, 423 U.S. 863 (1975); Mazer v. Stein, 347 U.S. 201, 217, *reh'g denied*, 347 U.S. 949 (1954) ("Unlike a patent, a copyright gives no exclusive right to the art disclosed; protection is given only to the expression of the idea—not the idea itself."); and Dymow v. Bolton, 11 F.2d 690, 691 (2d Cir. 1926).

228. *See supra* note 227.

229. H.R. REP. NO. 1476 at 57, *reprinted in* 1976 U.S. CODE CONG. AND ADMIN. NEWS at 5670.

230. *Whelan*, 797 F.2d at 1235.

231. *Id.*

232. 101 U.S. 99 (1879).

233. *Whelan*, 797 F.2d at 1236.

234. *Baker*, 101 U.S. at 103. See *supra* note 35 for a discussion of the copyrightability of ruled lines and headings as discussed in *Baker*. See *supra* text accompanying notes 51-54 for a discussion of delineating idea from expression as formulated in *Baker*.

235. *Whelan*, 797 F.2d at 1236.

would be part of the expression of the idea."[236] The court reasoned that when a purpose may be achieved through many different methods, the means chosen will be the expression of the work and therefore the subject of copyright protection.[237]

The court noted that *scenes a faire* and fact intensive works are not protected under copyright law.[238] The court defined *scenes a faire* as "incidents, characters or settings" which can only be expressed through one means.[239] The court also defined fact intensive works as material in which there is a limited number of ways to express the idea.[240] The court stated that giving these types of works, in which expression cannot be separated from idea, copyright protection would have the effect of giving a monopoly on a commonplace idea to the author.[241]

Similarly, the court noted that the scope of copyright protection is limited for works whose purpose is to perform a certain function in a specific manner.[242] The court stated that when the structure of a program is essential to performing a task in a specific way, the idea and expression will be inseparable, and therefore the structure of the program will not be given copyright protection.[243] Further, the court noted that when a variety of methods are available to organize data or perform tasks within a copyright program, the detailed structure of the program may be given copyright protection without granting a monopoly to the author on a commonplace idea.[244]

In its analysis of two programs, the *Whelan* court held that the structure for the Dentalab program was not essential to the purpose of aiding the business of a dental laboratory.[245] Instead, other programs on the market which accomplished the same purpose, yet used different structures, demonstrated that the structure of Dentalab was separable

236. *Id.* (emphasis in original).

237. *Id.* at 1236.

238. *Id.*

239. *Id.* (quoting Atari, Inc. v. North Am. Philips Consumer Elecs., 672 F.2d 607, 616 (7th Cir.), *cert. denied*, 459 U.S. 880 (1982)). The *Atari* court stressed the concept that when an idea and its expression are indistinguishable, copyright of the expression will grant a monopoly over the idea. *Atari*, 672 F.2d at 615-16. See *supra* notes 80-81 and accompanying text for an example of this concept.

240. *Whelan*, 797 F.2d at 1236-37. Only a limited number of ways exist in which an author may tell the story of George Washington's life, a fact-intensive work, without losing the factual nature of the work.

241. *Id.* at 1236 (quoting Landsberg v. Scrabble Crossword Game Players, Inc., 736 F.2d 485, 489 (9th Cir.), *cert. denied*, 469 U.S. 1037 (1984)).

242. *Whelan*, 797 F.2d at 1238 n.34.

243. *Id.* at 1238 & n.34.

244. *Id.* at 1240.

245. *Id.* at 1238.

from its purpose. Thus, the structure of Dentalab could properly be classified as part of the expression of the program.[246]

JDL had argued that only the literal elements of a program should be subject to copyright protection because creating the complete code for a program using only the structure would still require a great deal of time and effort.[247] The court responded that the protection of the structure of a program will enable a programmer to gain an advantage over competitors who do not have the benefit of the effort used to organize the program.[248] The court added that copyright law is not concerned with the amount of effort an infringer must spend to copy an original work.[249] The issue is only whether the copyright of the original work had been infringed, not the difficulty encountered in copying the work.[250]

Next, the court supported its holding with an economic argument that copyright protection beyond the literal code of a program would provide an incentive for programmers to create new works by protecting their efforts while allowing other programmers to write programs which accomplish the same purpose.[251] The court stated that structure and logic constitute significant costs in writing a computer program, and, therefore, should be given copyright protection.[252]

Finally, the *Whelan* court responded to one commentator's argument, that progress in the computer field is "significantly different from that in other fields."[253] This argument concluded that progress in the area of computer technology could only be made through the copying of advances made in preexisting programs.[254] According to this commentator, the difference necessitates a restricted application in computer program cases of copyright standards that were developed for other types of literary works.[255]

The court rejected the notion that the area of computer technology is different from other areas of science in its use of the work of predeces-

246. *Id.* at 1239.

247. *Id.* at 1237.

248. *Id.*

249. *Id.*

250. *Id.*

251. *Id.*

252. *Id.* The court was referring to a statement it made that the coding process was a small part of programming in comparison with the expense and time attributable to the development of the structure and logic, as well as debugging and documentation. *Id.* at 1231.

253. *Id.* at 1238. The court was responding to the arguments made in Note, *supra* note 143, at 1292 (footnote omitted).

254. Note, *supra* note 253, at 1292.

255. *Whelan*, 797 F.2d at 1238.

sors.[256] Therefore, the court held that it is appropriate to apply copyright principles derived from other areas.[257] Consequently, in its analysis of the copyright infringement claim, the Third Circuit first distinguished the expression of the Dentalab program, and then compared the similarities between the two works.[258]

2. Application of copyright concepts

In applying the concept that the expression of a computer program extends beyond its literal elements, the court first determined that the purpose of the Dentalab program was to manage the business operations of a dental laboratory.[259] The court cited the district court's finding that evidence revealed that other programs performed functions similar to those in the Dentalab program, yet Whelan Associates did not contend that they infringed on the Dentalab copyright.[260] Therefore, the district court had reasoned, the multiple methods of creating a structure for the purpose desired in a program indicate that the expression of a computer program is the manner in which the program controls the computer in executing computer programs.[261] The Third Circuit agreed with this reasoning and ruled that "the detailed structure of the Dentalab program is part of the expression, not the idea, of that program."[262]

The court cited *SAS Institute v. S & H Computer Systems*[263] as support for its reasoning. The *Whelan* court mimicked the *SAS* court's use of evidence of copying of the organizational and structural similarities to support a finding of copying.[264] The *Whelan* court also reasoned that the Copyright Act of 1976 indicates congressional intent to protect works which are formed by sequencing or arrangement in a way that creates an original work.[265] The court relied on definitions of "compilation" and

256. *Id.* The court quoted Sir Isaac Newton who explained that "if [he] had seen further than other men, it was because [he] had stood on the shoulders of giants." *Id.* at 1238 n.33.

257. *Id.* at 1238.

258. See *supra* notes 44-47 for a discussion of the application of a two-step procedure for evaluating copyright infringement claims.

259. *Whelan*, 797 F.2d at 1238 (footnote omitted).

260. *Id.* at 1238 (citing Whelan Assocs. v. Jaslow Dental Laboratory, 609 F. Supp. 1307, 1320 (E.D. Pa. 1985), *aff'd*, 797 F.2d 1222 (3d Cir. 1986), *cert. denied*, 107 S. Ct. 877 (1987)).

261. *Whelan*, 609 F. Supp. at 1320.

262. *Whelan*, 797 F.2d at 1239.

263. 605 F. Supp. 816 (M.D. Tenn. 1985). In *SAS*, the court found 44 examples of copying, although the court did not discuss the nature of the copying. *Id.* at 829-30. See *supra* notes 146-47 and accompanying text for a further discussion of *SAS*.

264. *Whelan*, 797 F.2d at 1239 (quoting SAS Inst. v. S & H Computer Sys., 605 F. Supp. 816, 830 (M.D. Tenn. 1985)). *See supra* note 152 and accompanying text.

265. *Whelan*, 797 F.2d at 1239. Section 103 of the Act extends copyright protection to compilations and derivative works. 17 U.S.C. § 103 (1982). Section 101 defines a "compila-

"derivative work"—which include the words "arranged" and "recast"[266]—to conclude that "Congress was aware of the fact that the sequencing and ordering of materials could be copyrighted."[267]

The Third Circuit then addressed and distinguished *Synercom Technology, Inc. v. University Computing Co.*,[268] which denied copyright protection for the sequence and order of a computer program.[269] Stating that the *Synercom* decision was based on the judge's finding that the structure of input formats was inseparable from the program's idea,[270] the *Whelan* court noted that it had previously shown that "Congress intended sequencing and ordering to be protectible" when the sequencing and order constitute expression.[271] The court added that input formats lacked the structural complexity of full programs and may be distinguishable.[272]

Finally, the *Synercom* court asked, "if sequencing and ordering is expression, what separable idea is being expressed?"[273] The *Whelan* court answered by stating that the variety of structures available for expressing a program's idea demonstrates that the expression is not indistinguishable from the idea.[274] Therefore, the *Whelan* court determined that the court in *Synercom* was incorrect in distinguishing the copyrightability of the sequence element in a computer program from that of any other element.[275]

3. A single, integrated substantial similarity test

After the *Whelan* court determined that the structure of a program was copyrightable, the court addressed the similarities between the struc-

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tion" as "a work formed by the collection and assembling of preexisting materials . . . that are selected, coordinated or arranged in such a way that the resulting work as a whole constitutes an original work of authorship." 17 U.S.C. § 101 (1982).

Section 101 also defines "derivative work" as "a work based upon one or more preexisting works, such as . . . musical arrangement . . . or any other form in which a work may be recast, transformed or adapted." *Id.*

266. *See infra* note 274.

267. *Whelan*, 797 F.2d at 1239.

268. 462 F. Supp. 1003 (N.D. Tex. 1978).

269. *Whelan*, 797 F.2d at 1239. In *Synercom*, the court held that input formats, which control the sequence of the information entered into the program, were ideas and therefore not protected by copyright law. *Synercom*, 462 F. Supp. at 1013.

270. *Whelan*, 797 F.2d at 1239.

271. *Id.* at 1240.

272. *Id.* at 1239.

273. *Synercom*, 462 F. Supp. at 1013.

274. *Whelan*, 797 F.2d at 1240. According to the *Whelan* court, the *Synercom* court was unclear on whether the idea of input formats could be accomplished through any other sequencing. *Id.* at 1240 n.36.

275. *Whelan*, 797 F.2d at 1240.

tures of the Dentcom and Dentalab programs. To determine the proper substantial similarity test to use in computer program cases, the court examined the bifurcated test enunciated in *Arnstein v. Porter*[276] and *Sid & Marty Krofft Television Productions v. McDonald's Corp.*[277] This test consists of an extrinsic examination of the similarities between the two works in question to determine if the copyrighted work was used to create the second program and an intrinsic examination of whether the defendant appropriated the expression.[278] Expert testimony may be used to prove the first element of the test.[279] Once the extrinsic test is met, the intrinsic test must be applied. Under the intrinsic test, the trier of fact, from the perspective of a lay observer and without expert testimony, examines the evidence to decide whether the allegedly infringing program was an "illicit" or "unlawful appropriation" of the copyrighted work.[280] The *Whelan* court chose to eliminate the extrinsic test because of the public's unfamilarity with the complex nature of computer programs. The court reasoned that triers of fact in cases concerning computer programs may find it difficult to ignore the expert opinion establishing the extrinsic test, and examine the program from the view of a lay observer.[281]

Instead of using the bifurcated test, the *Whelan* court adopted a substantial similarity test which collapses both tests using lay and expert testimony into a single, integrated inquiry.[282] In applying its single test, the court considered expert testimony as to similarities of file structures,[283] screen outputs[284] and five subroutines[285] between the two works.[286] Next, based again on expert testimony, the court evaluated the

276. 154 F.2d 464 (2d Cir. 1946).

277. 562 F.2d 1157 (9th Cir. 1977).

278. *Id.* at 468. *See supra* note 71 and accompanying text.

279. *Arnstein*, 154 F.2d at 468; *Whelan*, 797 F.2d at 1233.

280. *Arnstein*, 154 F.2d at 468. *See supra* notes 70-78 and accompanying text.

281. *Whelan*, 797 F.2d at 1232-33.

282. *Id.* at 1233. As support for its decision, the Third Circuit court cited several cases where courts had rejected the bifurcated test in favor of a standard which relies entirely on expert testimony. The court cited E.F. Johnson Co. v. Uniden Corp. of America, 623 F. Supp. 1485, 1493 (D. Minn. 1985), Hubco Data Prods. Corp. v. Management Assistance Inc., 2 Copyright L. Rep. (CCH) ¶ 25,529 (D. Idaho 1983), Midway Mfg. Co. v. Strohon, 564 F. Supp. 741, 752-53 (N.D. Ill. 1983), and FED. R. EVID. 702. *Whelan*, 797 F.2d at 1233.

283. A file structure is the arrangement of data within a file. R. HIPGRAVE, *supra* note 20, at 49.

284. Screen outputs are the audiovisual displays on the screen of a computer. *See supra* note 128.

285. A subroutine is "a self-contained routine that is part of either another routine or program. Subroutines often take the form of common standardized operations, such as . . . the execution of a standard mathematical equation." R. HIPGRAVE, *supra* note 20, at 104.

286. *Whelan*, 797 F.2d at 1242-45.

importance of the substantially similar elements of the programs, and made a "qualitative" judgment as to the degree of similarity between the structures of the programs.[287]

4. Evidence of substantial similarity

JDL had attacked the district court's holding of substantial similarity based upon similarities between the structures of the programs.[288] JDL had argued that copyright protection only extends to the program code—the object and source codes—and the district court found no similarity between these elements of the Dentalab and Dentcom programs.[289] JDL had also objected to the district court's holding on the ground that the evidence of substantial similarity was insufficient to find a copyright infringement.[290] The court addressed both of JDL's arguments.

a. findings of substantial similarity without similarity of source or object code

In response to JDL's argument that substantial similarity had not been established because the district court had not found any similarities between the object and source codes of the Dentcom and Dentalab programs, the court declared that it was unnecessary to find substantial similarities between the literal elements of the programs.[291] Instead, the *Whelan* court held that the district court's finding of substantial similarity between the copyrightable structures of the Dentalab and Dentcom programs was sufficient to warrant a holding of copyright infringement.[292]

b. evidence of substantial similarity through nonliteral elements of a computer program

JDL had attacked the existence of substantial similarity from four fronts. It argued that even if copyright protection were not limited to the literal elements of a computer program, the evidence of substantial similarity between the Dentalab and Dentcom programs was insufficient to support a ruling of copyright infringement.[293] First, JDL stated that the testimony of Whelan's expert as to the similarity of the programs was

287. *Id.* at 1245-46.
288. *Id.* at 1233.
289. *Id.*
290. *Id.*
291. *Id.* at 1233-39.
292. *Id.* at 1248. *See supra* notes 247-50 and accompanying text.
293. *Whelan*, 797 F.2d at 1242.

flawed.[294] JDL asserted that Dr. Moore's testimony concerning similarities in the file structures of the Dentcom and Dentalab programs was irrelevant because file structures are not copyrightable.[295] JDL argued that file structures of a computer program are similar to blank forms because they merely provide a structure to hold information.[296] Further, JDL claimed that based on *Baker v. Selden*,[297] blank forms and therefore file structures may not be copyrighted.[298]

JDL had also argued that similarity in screen outputs is irrelevant to a finding of copyright infringement because screen outputs are protected by a different copyright than computer programs[299] and bear no relation to the underlying program used to produce them.[300] Thus, according to JDL's argument, a finding of similarities in screen outputs is not indicative of similarities in the underlying programs.

Next, JDL had argued that Dr. Moore's comparison of the five subroutines in both the Dentcom and Dentalab programs was insufficient to establish substantial similarity between the overall structure of the two programs.[301] As interpreted by the court, JDL's argument asserted that substantial similarity between two works cannot be shown without a comparison of the greater part of the works.[302]

Finally, JDL had alleged that the district court erred in its determination of the strength of the differing expert testimonies.[303] JDL con-

294. *Id.* Whelan stated that "Dr. Moore's, [Whelan's] expert, testimony firmly establishes that Dentcom's data files and control programs are substantially identical to those data files and programs in the Whelan Dentalab program." Brief for Appellee at 35, Whelan Assocs. v. Jaslow Dental Laboratory, 797 F.2d 1222 (3d Cir. 1986), *cert. denied*, 107 S. Ct. 877 (1987) (No. 85-1358).

295. *Whelan*, 797 F.2d at 1242.

296. *Id. See* Brief for Appellant, *supra* note 217, at 35.

297. 101 U.S. 99 (1879).

298. *Whelan*, 797 F.2d at 1242.

299. Sections 101 and 102(a)(5) classify screen outputs as audiovisual works. Brief for Appellant, *supra* note 217, at 38; 17 U.S.C. §§ 101, 102(a)(5) (1982). Appellant's brief cites Atari, Inc. v. North Am. Philips Consumer Elecs., 672 F.2d 607 (7th Cir.), *cert. denied*, 459 U.S. 880 (1982), and Midway Mfg. Co. v. Dirkschneider, 543 F. Supp. 466 (D. Neb. 1981), for the theory that "the copyright in a computer program does not protect against creation by another of a similar audiovisual display." Brief for Appellant, *supra* note 217, at 39.

300. *Whelan*, 797 F.2d at 1244. See *supra* note 127 and accompanying text for a discussion of the infinite number of ways to write a computer program to perform one specific task.

301. *Whelan*, 797 F.2d at 1245.

302. *Id.*

303. *Id.* at 1246. Although the district court concluded that it is difficult for someone with little knowledge of the computer field to judge the credibility of experts in the area, it found Dr. Moore's "testimony more credible and helpful because of his detailed and thorough analysis of the many similarities." Whelan Assocs. v. Jaslow Dental Laboratory, 609 F. Supp. 1307, 1321-22 (E.D. Pa. 1985), *aff'd*, 797 F.2d 1222 (3d Cir. 1986), *cert. denied*, 107 S. Ct. 877 (1987).

tended that Dr. Moore's testimony concerning the similarity of the structure of the programs was insufficient to establish substantial similarity.[304] In contrast, JDL asserted that its expert's testimony, that of Mr. Ness, was sufficiently strong to disprove copyright infringement.[305]

The Third Circuit addressed each of JDL's four arguments individually. First, the court stated that although JDL's definition of file structures as merely structures to store and collect information is correct,[306] a majority of courts have allowed copyright protection for blank forms which "are sufficiently innovative that their arrangement of information is itself informative."[307] The court found that the file structures for the Dentalab program "[were] sufficiently informative to deserve copyright protection."[308] Therefore, the court employed similarities in the Dentcom and Dentalab file structures as probative evidence in a finding of substantial similarity between the overall structure of the two programs.

Second, the court addressed JDL's argument that similarities in screen outputs are irrelevant to a finding of substantial similarity between program structures. The court admitted that screen outputs are protected by a different copyright than computer programs.[309] However, the court found screen outputs to be sufficiently related to the program which produces them to have evidentiary value as proof of copyright infringement.[310]

Third, the court stated that although Dr. Moore compared only five subroutines, a finding of substantial similarity does not require that the

304. *Whelan*, 797 F.2d at 1246.

305. *Id.*

306. *Id.* at 1242.

307. *Id.* at 1243. The court cited several cases which permitted copyright protection for blank forms. *See* Edwin K. Williams & Co. v. Edwin K. Williams & Co.—East, 542 F.2d 1053 (9th Cir. 1976), *cert. denied*, 433 U.S. 908 (1977) (gas station account books); Baldwin Cooke Co. v. Keith Clarke, Inc., 383 F. Supp. 650 (N.D. Ill.), *aff'd per curium*, 505 F.2d 1250 (7th Cir. 1974) (a combined calendar, appointment, diary and information book); and Harcourt Brace & World, Inc. v. Graphic Controls Corp., 329 F. Supp. 517 (S.D.N.Y. 1971) (answer sheets for achievement tests). *Whelan*, 797 F.2d at 1243 n.41.

308. *Whelan*, 797 F.2d at 1243.

309. *Id.* at 1244.

310. *Id.* The Third Circuit added that the admissibility of screen outputs "does not necessarily mean that such evidence would be alone sufficient to withstand motions of summary judgment or directed verdict." *Id.* at 1244 n.45. The court also refuted Jaslow's argument that testimony concerning screen outputs, because they are easily understood, would have an undue influence on the trier of fact. *Id.* at 1245. The court reasoned that this argument was unpersuasive as proof that the district court erred in its finding of substantial similarities between the programs' structures because the record showed no record of JDL's objection to the testimony. *Id.* The circuit court ruled that the objection was waived based on the Appellants failure to object to evidence concerning screen similarities. *Id.*

majority of two works be compared.[311] The court found that an analogy to other areas of copyright law demonstrated that a "court must make a qualitative, not quantitative judgment about the character of the work as a whole and the importance of the substantially similar portion of the work."[312] Therefore, the court concluded, the proper analysis for substantial similarities between computer programs is an analysis of the most significant portions of the programs.[313]

Fourth, the court addressed JDL's argument that Dr. Moore's testimony was insufficient to establish substantial similarity. The court stated that the determination of the credibility of witnesses is a matter for the district court.[314] JDL's expert, Mr. Ness, examined the differences in the source and object codes of the two programs,[315] while Dr. Moore, Whelan's expert, examined the "similarities and differences in the programs' *structures*."[316] The Third Circuit stated that Dr. Moore's testimony, which showed a "marked similarity between the programs,"[317] was relevant to the issues before the court. Therefore, the court concluded that the evidence was sufficient to find substantial similarity.[318]

5. Summary of findings

The Third Circuit concluded that "(1) copyright protection of computer programs may extend beyond the programs' literal code to their structure, sequence and organization, and (2) the district court's finding of substantial similarity between the Dentalab and Dentcom programs was not clearly erroneous."[319] Therefore, the *Whelan* court upheld the district court's judgment.[320]

311. *Id.* Dr. Moore, Whelan's expert, testified that he had examined the portions of the program which showed the flow of information through the system and performed the important tasks of the system. *Id.* at 1246.

312. *Id.* at 1245. The court cited *Atari* where the court warned, "when analyzing two works to determine whether they are substantially similar, courts should be careful not to lose sight of the forest for the trees." *Id.* (quoting Atari, Inc. v. North Am. Philips Consumer Elecs., 672 F.2d 607, 618 (7th Cir.), *cert. denied*, 459 U.S. 880 (1982)).

313. *Whelan*, 797 F.2d at 1246.

314. *Id.*

315. *Id.* at 1246-47. The court emphasized that while Mr. Ness examined the computer code, he never observed the programs at work on the computers, and he was unfamiliar with EDL, the programming language that was used in Dentalab. *Id.*

316. *Id.* at 1247 (emphasis in original).

317. *Id.* at 1248.

318. *Id.*

319. *Id.*

320. *Id.*

VI. ANALYSIS

The court in *Whelan Associates v. Jaslow Dental Laboratory*[321] ruled that copyright protection for a computer program extends beyond the literal code to the program's structure, sequence and organization.[322] In addition, the court held that in evaluating substantial similarity of computer programs, a bifurcated test, which determines substantial similarity of the expressions of the two works based solely on the response of an ordinary lay observer, is inappropriate.[323] Instead, the court applied a single, integrated test which admits both lay and expert testimony in a single inquiry.[324] Finally, the court stated that the appropriate rule for distinguishing idea from expression in cases involving copyright programs is a rule which delineates the idea as the purpose or function of the work, and the expression as those elements that are not necessary to that purpose or function.[325]

The following analysis will demonstrate that: (1) the court's extension of copyright protection to a program's structure creates an incentive for programmers to create new works, and fosters technology; (2) the court's use of a single, integrated substantial similarity test in cases involving computer programs is appropriate; (3) the court's idea/expression dichotomy test based on the purpose or function of a program fosters the goals of copyright law; but (4) when evaluating substantial similarity betweeen two programs, a court should look beyond the copyrightable expression of the programs, and evaluate the impact of uncopyrightable elements of expression.

A. Extension of Copyright Protection to a Program's Structure

The Third Circuit in *Whelan Associates v. Jaslow Dental Laboratory*[326] extended copyright protection far beyond the scope of protection granted by previous courts. The court held that copyright protection extends not only to the literal elements of a program, the source and object codes,[327] but beyond to the nonliteral elements of overall struc-

321. 797 F.2d 1222 (3d Cir. 1986), *cert. denied*, 107 S. Ct. 877 (1987).

322. *Id.* at 1248.

323. *Id.* at 1233.

324. *Id.*

325. *Id.* at 1236.

326. 797 F.2d 1222 (3d Cir. 1986), *cert. denied*, 107 S. Ct. 877 (1987).

327. Copyright protection for source and object codes was established in Apple Computer, Inc. v. Franklin Computer Corp., 714 F.2d 1240 (3d Cir. 1986), *cert. dismissed*, 464 U.S. 1033 (1984) and Williams Elecs., Inc. v. Artic Int'l, Inc., 685 F.2d 870 (3d Cir. 1982). *See supra* notes 111-21 and accompanying text.

ture, sequence and organization of programs.[328]

Computer programs are literary works[329] which require a great deal of time and effort to create.[330] If copyright law is to foster creativity, an author must be rewarded for his or her original creations.[331] Courts have rewarded literary authors by extending copyright protection beyond the literal elements, such as dialogue.[332] Instead, copyright protection extends to the plot, character traits and settings.[333] Similar rewards should be given to software authors. Computer programs are more than specific instructions that are grouped together into a rigid order. A program may contain expression which renders the program superior to other programs which perform the same function. For example, a completed program may have menus, which an ordinary lay user can easily use,[334] it may process information quickly[335] or it may be well-suited for use in dental labs.[336]

All of these superior qualities are the result of the structure, sequence and organization of the program. Just as an author of a play chooses his or her words and the sequence of his or her scenes carefully to achieve a desired effect on the audience, a programmer organizes his or her program to appeal to the user.

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328. *Whelan*, 797 F.2d at 1248.

329. *See supra* note 109.

330. See *supra* notes 6-17 and accompanying text for a discussion of a method used to create a computer program.

331. See *supra* notes 41-43 for a discussion of the purpose of copyright law.

332. Sheldon v. Metro-Goldwyn Pictures, 81 F.2d 49 (2d Cir.), *cert. denied*, 298 U.S. 669 (1936). *See supra* note 35 and accompanying text.

333. *Sheldon*, 81 F.2d at 54-55.

334. *See* Broderbund Software, Inc. v. Unison World, Inc., 648 F. Supp. 1127 (N.D. Cal. 1986). In *Broderbund*, plaintiff's program allowed users to create greeting cards. *Id.* at 1130. However, the program could only be operated on Apple computers. *Id.* When plaintiff wanted to convert its program for use on IBM computers, it hired defendant. Defendant's programmer attempted to create an exact duplication of plaintiff's program, until negotiations between plaintiff and defendant broke down. *Id.* at 1131. At this time, defendant instructed his programmers to create an enhanced version of plaintiff's program, and to use the work they had already completed. *Id.* The court stated that "[t]he 'total concept and feel' of these programs is virtually identical." *Id.* at 1137 (quoting Sid & Marty Krofft Television Prods. v. McDonald's Corp., 562 F.2d 1157, 1167 (9th Cir. 1977)). Therefore, the court held that defendant's program infringed plaintiff's copyright. *Id.*

335. *See* E.F. Johnson Co. v. Uniden Corp. of Am., 623 F. Supp. 1485 (D. Minn. 1985). *See supra* note 139.

The organization of data may determine the speed at which a computer may process the information. A programmer must take into consideration the amount of available memory when designing a program. An efficient program will use the available memory to its fullest capacity and attain maximum speed of execution. D. DRURY, THE ART OF COMPUTER PROGRAMMING 30-31 (1983).

336. *See Whelan*, 797 F.2d 1222.

One characteristic of computers is that programs can be produced in an almost infinite number of ways.[337] Limiting copyright protection to the literal code of a program would allow a programmer to duplicate attractive attributes of an economically successful program, yet avoid copyright infringement through a completely different source code. The second programmer would save the time and effort expended in creating an original program.

In contrast, copyright protection for nonliteral elements, such as structure, sequence and organization, which are not necessary to the idea of the program, provides computer programmers with an incentive to create new programs which they know will be protected. Technology will be fostered when other programmers independently create programs which express the same idea through original expression.[338]

B. A Single, Integrated Substantial Similarity Test for Computer Programs

The second element of the *Arnstein/Krofft* test measures substantial similarity between the expressions of two works based solely on the response of an ordinary lay observer.[339] Originally, the ordinary lay observer test was used to evaluate similarities between plays,[340] musical compositions[341] and characters from children's television shows.[342] The ordinary lay observer is familiar with each of these areas of literary works. Furthermore, the ordinary lay observer, a person without any special education or knowledge in the field of plays, music or children's characters, may discern similarities between works in these fields through viewing or listening to a work. However, as the Third Circuit correctly stated, an ordinary lay observer—a person without any special education or knowledge in the field of computers—cannot easily discern similarities between computer programs.[343] The highly technical nature of computer programs necessitates a background in computer programming to make analysis of similarities between programs meaningful.[344]

337. *See supra* notes 3-5 and accompanying text.

338. For a contrary opinion, see Note, *supra* note 143, at 1288-94. See also *supra* notes 253-55 and accompanying text for a discussion of this Note's argument.

339. Sid & Marty Krofft Television Prods. v. McDonald's Corp., 562 F.2d 1157, 1164 (9th Cir. 1977). *See supra* notes 77-78 and accompanying text.

340. Twentieth Century-Fox Film Corp. v. Stonesifer, 140 F.2d 579, 582 (9th Cir. 1944).

341. Arnstein v. Porter, 154 F.2d 464, 468-69 (2d Cir. 1946). See *supra* notes 70-75 and accompanying text for a discussion of the copyright infringement test developed by the *Arnstein* court.

342. *Krofft*, 562 F.2d at 1164.

343. *See supra* note 127 and accompanying text.

344. *See supra* note 281 and accompanying text.

The Third Circuit's use of a single, integrated substantial similarity test recognizes the inability of an ordinary lay observer to analyze computer programs. Without expert testimony concerning similarities between elements of computer programs, such as identical instructions[345] or buried copyright notices and programmer's names,[346] a fact finder's analysis of substantial similarity of two programs would be based solely on a response to the functions and output of the programs. This analytical process is flawed in two respects.

First, the functions and output of a program are not protected as literary works.[347] Two completely different programs can produce the same screen outputs and results.[348] Therefore, evidence of similar screen outputs and functions alone is not sufficient to establish substantial similarity between two programs.[349]

Second, some computer programs merely analyze data and produce little or no output. When two programs produce little output, the lack of visible results may render difficult a lay observer's analysis of substantial similarity. For example, a program which calculates the total scores for 300 students, the mean of all the total scores and sorts the students by total score, will produce an output that has little or no difference from the output of any other program which performs the same test. However, some programming techniques may perform this task faster and more efficiently than other techniques.[350] Similarly, some file structures may store information in such a way that the data is easier to access than when it is stored in other file structures.[351] Without expert testimony, an

345. Midway Mfg. Co. v. Strohon, 564 F. Supp. 741, 752 (N.D. Ill. 1983).

346. *See* Williams Elecs., Inc. v. Artic Int'l, Inc., 685 F.2d 870, 876 n.6 (3d Cir. 1982). *See also* Apple Computer, Inc. v. Franklin Computer Corp., 714 F.2d 1240, 1245 (3d Cir. 1983), *cert. dismissed*, 464 U.S. 1033 (1984) (system programmer's name was buried in source code of defendant's program). *See supra* note 144.

347. Functions are not protectible under copyright law because, under the *Whelan* analysis, they are the idea of the program. Screen outputs are protected as audiovisual works. *See Midway*, 564 F. Supp. 741.

348. *See supra* notes 3-5 and accompanying text.

349. *See supra* note 310 and accompanying text.

350. *See, e.g., infra* note 374 and accompanying text.

351. A sequential access file stores data in a contiguous block on a storage medium such as a hard disk or magnetic tape. To retrieve an item of data from a sequential access file, a program must begin at the first data entry, and examine each item until the desired data entry is found. N. HAMPSHIRE, LIBRARY OF PET SUBROUTINES 111 (1982).

A random access file is the most useful form of storing data on a disk. A random access file is actually two files. The first file, a data file, holds the data in non-contiguous memory locations. The second file is an index file which holds the memory location and a keyword for each data entry. For example, an employment record might contain a name, street address, city, state, zip code, previous employment and schools attended. The index file would use the name as the keyword. Each entry in the index file would contain the employee's name and the

ordinary lay observer would be unable to evaluate similarities or differences in these types of programming techniques. The lay observer's response would be based solely on similarities between two lists of students and their total scores.

In contrast, the single, integrated substantial similarity test which the Third Circuit applied in *Whelan Associates v. Jaslow Dental Laboratory*[352] admits both lay and expert testimony. This sensible approach to analysis of substantial similarity in computer programs provides the fact finder with critical facts concerning highly technical elements of the programs that are not readily ascertainable by the ordinary lay observer. Without these facts, it would be difficult to establish similarity of computer programs based on the ordinary lay observer's response to a program's screen outputs and results.

C. Idea/Expression Dichotomy Based on the Purpose or Function of a Program

Copyright law protects the expression of ideas, not the ideas themselves.[353] Therefore, before a fact finder can compare the expressions of two computer programs, he or she must first distinguish the idea from the expression.[354] In copyright infringement actions concerning computer programs, the idea/expression dichotomy should be performed in a two-part test. First, the idea of a computer program should be distinguished from the expression based on the particular purpose or function of the program. Second, both the ideas and the expressions must be compared to establish substantial similarity.[355]

The court in *Whelan Associates v. Jaslow Dental Laboratory*[356] distinguished idea from expression by defining the program's idea as the purpose or function of a utilitarian work, and the expression as the elements of the program which are not necessary to that purpose or function.[357] Further, the court held that when the purpose of the program is to accomplish a specific result in a specific manner, the structure of the program may be essential to accomplishing the purpose.[358] For example,

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location on the disk where the other data is stored in the data file. *Id.* at 120. See *supra* note 20 for a discussion of Random Access Memory (RAM).

352. 797 F.2d 1222 (3d Cir. 1986), *cert. denied*, 107 S. Ct. 877 (1987).

353. *See supra* note 43 and accompanying text.

354. *See supra* notes 44-45 and accompanying text.

355. See *supra* notes 44-47 and accompanying text for a discussion of this two-step analysis.

356. 797 F.2d 1222 (3d Cir. 1986), *cert. denied*, 107 S. Ct. 877 (1987).

357. *Id.* at 1236. *See supra* note 230 and accompanying text.

358. Whelan Assocs. v. Jaslow Dental Laboratory, 797 F.2d 1222, 1238 n.34 (3d Cir. 1986), *cert. denied*, 107 S. Ct. 877 (1987). *See supra* notes 242-45 and accompanying text.

a program that produces a screen which is based on a standardized form and conveys standardized information will have a limited number of structures available for the sequencing and organization of information.[359] This can be contrasted to *Whelan*, where evidence existed of other computer programs which performed the same function—aiding the business of a dental laboratory—yet had dissimilar structures.[360] As a result, the *Whelan* court concluded that Rand Jaslow was not limited in his choice of available structures for his computer programs.[361]

A court should also examine the idea of a program to determine whether its purpose is to perform a specific function in a specific manner. The *Whelan* court stated that if this threshold test is satisfied, then the structure, sequence and organization of a program will be indispensable to the program's idea, and therefore will not be protected by copyright law.[362] Consequently, copying of such a program's structure would not constitute copyright infringement. If the idea of a program is not the performance of a specific function in a specific manner, then the program's structure will be given copyright protection. Copying of this structure would be grounds for a copyright infringement action.

After a court delineates idea from expression in a program, the court must examine the similarities between the two expressions.[363] The *Whelan* court properly admitted evidence of similarities of file structure, screen outputs and five subroutines.[364] As each of these elements is part of the organizational structure of a program, similarity of these elements indicates a similarity of organizational structure.

Although each of these elements of computer programming expression alone may not be sufficient to establish substantial similarity,[365] they

359. Plains Cotton Cooperative Assoc. v. Goodpasture Computer Serv., 807 F.2d 1256 (5th Cir.), *reh'g denied*, 813 F.2d 407 (1987). In *Plains*, the Fifth Circuit denied plaintiff's application for a preliminary injunction to prevent defendant from marketing, distributing and otherwise using software allegedly copied from plaintiff. *Id.* at 1264. Defendant hired four of plaintiff's former employees in order to write a program similar to plaintiff's program, but for use on a different computer. *Id.* at 1258. Although defendant's program "[was] very similar to [plaintiff's program] on the functional specification, programming and documentation levels," the four employees denied copying plaintiff's program and claimed that they had drawn on their "expertise in copyright programming and design gained over a number of years." *Id.* at 1259. Based on expert testimony, the court held that insufficient evidence existed to support a finding of copying the organizational structure of plaintiff's program. *Id.* at 1260-61.

360. *Whelan*, 797 F.2d at 1238. *See supra* note 245 and accompanying text.

361. *Whelan*, 797 F.2d at 1238.

362. *Whelan*, 797 F.2d at 1238-39.

363. *See supra* notes 95-102 and accompanying text.

364. *See supra* notes 306-13 and accompanying text.

365. *See supra* note 310.

are indicia of similarity between the organizational structures of two programs. Therefore, a court should consider these elements when considering substantial similarity of expression. For example, evidence that two programs contain five substantially similar subroutines which perform the important tasks of each program may not be sufficient to establish copyright infringement. Instead, a court should weigh the importance of each subroutine to the functioning of the program when analyzing substantial similarity. The greater the importance of the similar subroutines, the greater the likelihood of copyright infringement.

In contrast to these indicia of copyright infringement, other elements of expression exist in computer programs which, despite exact duplication, do not indicate similarity between program structures. Instead, only the methods used to link these elements to the other elements of two programs should be compared to establish copyright infringement. These elements are programming *scenes a faire*.[366] In this Note, "programming *scenes a faire*" are defined as programming styles and techniques or general routines which are as a practical matter indispensable or standard when developing a program to perform a certain purpose. Programming *scenes a faire* should not be considered copyrightable expression.[367] Programming *scenes a faire* include programs in the public domain and common complex programming structures which may not be copyrighted.

Public domain software is software that is public property and may be used without compensation to the author.[368] Public domain software differs from most public domain literary works because public domain software may be copyrighted. However, although some of these programs may be copyrighted, the author grants a license to the public to freely use the work.[369] Commercial use of copyrighted public software is then reserved to the author.[370] Thousands of copyrighted and uncopyrighted public domain programs are available.[371] Irrespective of

366. See *supra* notes 90-93 and accompanying text for a discussion of *scenes a faire*.

367. In Apple Computer, Inc. v. Franklin Computer Corp., 714 F.2d 1240, 1245 (3d. Cir. 1983), *cert. dismissed*, 464 U.S. 1033 (1984), the Third Circuit stated that copyright protection will not extend to expression in a program which is dictated by the underlying idea. *Id.* at 1253. Although the court did not define these elements as programming *scenes a faire*, the court held that when few ways of expressing an idea in a computer program are available, idea and expression will merge and the expression will not be copyrightable. *Id.*

368. R. FROEHLICH, THE IBM PC (AND COMPATIBLES) FREE SOFTWARE CATALOG AND DIRECTORY 3 (1986).

369. *Id.*

370. *Id.*

371. *Id.* See R. FROEHLICH, *supra* note 368 for a catalog of over 625 disk volumes and over 12,000 disk files of free software.

whether public domain software is copyrighted, when it is included in a copyrighted program, the expression of the program which owes its origin to the public domain software is not considered part of the protected expression.[372] Original work is limited to work created by the author.[373] Therefore, a programmer who includes public domain software in his or her program may not claim copyright protection for any portion of the program created by another author. Furthermore, when a court evaluates substantial similarity between computer programs, the elements of the program which owe their origin to public domain software must be considered uncopyrightable expression. As such, they are programming *scenes a faire*.

A second example of programming *scenes a faire* is common, complex programming structures. Common, complex programming structures are common routines that have been developed and refined and are well-known to computer programmers. Some of the best examples of common, complex programming techniques are sorting routines. Sorting routines order data, *e.g.* alphabetically.[374] The commonality of these routines renders their expression in a computer program uncopyrightable. To give an author a copyright in common, complex programming structures would grant a monoploy over commonplace ideas.[375]

In summary, public domain software and common, complex programming structures are stock programming expressions which cannot be copyrighted without granting a monopoly over standardized expression to the author. Just as a court should not consider *scenes a faire* as part of the copyrightable expression of a play or novel, programming *scenes a faire* should not be considered as part of the expression of a computer program.

The Third Circuit's evaluation of substantial similarity between the two programs based on similarities among the file structures, screen outputs and subroutines ignores the impact of uncopyrightable expression in

372. 1 NIMMER, *supra* note 31, § 2.01[A]. Only original works of authorship may be protected under the Copyright Act. 17 U.S.C. § 102(a) (1982). *See* Roth Greeting Cards v. United Card Co., 429 F.2d 1106 (9th Cir. 1970) and Leeds Music, Ltd. v. Robin, 358 F. Supp. 650 (S.D. Ohio 1973).

373. 1 NIMMER, *supra* note 31, § 2.01[A].

374. Some common examples of sorting routines are: Bubblesort, Quicksort, Heapsort and Bucketsorts. S. BAASE, COMPUTER ALGORITHMS: INTRODUCTION TO DESIGN AND ANALYSIS 52-78 (1978). A Bubblesort is a straightforward search which bubbles the smallest (or largest) data item to the top. *Id.* at 52. A Quicksort sorts data faster than a Bubblesort, yet it uses more computer memory. *Id.* at 58. Therefore, although using a Quicksort will produce an ordered list of data elements faster than a Bubblesort, if the computer's memory is limited, it may be necessary to use a Bubblesort.

375. *See supra* note 93.

computer programs. The *Whelan* court did not have to consider programming *scenes a faire* when it evaluated substantial similarity between file structures, screen output and subroutines. The evidence presented by Whelan's expert, Dr. Moore, did not address public domain software or common, complex programming structures.[376] However, in the future, programming *scenes a faire* may contribute significantly to two similar programs. For example, two programs could possibly be completely created using common, complex programming structures which are considered programming *scenes a faire*. In this case, a court should not consider similarities of programming *scenes a faire* in a second program as indicia of copyright infringement of the first program. Instead, a court should examine the method each program uses to link together the programming *scenes a faire*. This linking method is also part of the organizational structure of a program. If, based on expert testimony, a court finds that the linking methods of the programs are substantially similar, a court should find that the structure of the second program has infringed the former. However, if a court finds that the structures are not substantially similar, each programmer's original expression—the method he or she used to link together the programming *scenes a faire*—should be protected.

A program which solely uses programming *scenes a faire* illustrates the need for courts to extend copyright protection. Courts must expand their analysis beyond delineation of idea and expression based on the function of a program, and consider the impact of common programming *scenes a faire* between two programs. Only when programming *scenes a faire* are no longer considered as indicia of substantial similarity will copyright protection be limited to the author's original expression. If a court fails to analyze programming *scenes a faire* as uncopyrightable expression, it may grant copyright protection to elements which are not part of the author's original work, thus depriving the public of expression which is public property.

VII. CONCLUSION

A. Protection for Computer Program Structure

Copyright protection for computer programs should not be limited to the literal elements of a program, the source and object code. The Constitution grants Congress the power "[t]o promote the Progress of

376. See Whelan Assocs. v. Jaslow Dental Laboratory, 609 F. Supp. 1307, 1316, 1320-22 (E.D. Pa. 1985), *aff'd*, 797 F.2d 1222 (3d Cir. 1986), *cert. denied*, 107 S. Ct. 877 (1987) for Dr. Moore's testimony.

Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."[377] Further, copyright law fosters creativity by assuring authors of original works that they will receive the "exclusive benefits of whatever commercial success his or her work enjoys . . . ."[378] Authors will be further encouraged to create new works if copyright protection is extended to the nonliteral elements of a program.

A computer program can perform a particular function in many different ways. Each programmer who creates a program which causes, organizes and sequences the data and programming elements in an original manner must receive the exclusive benefits of his or her work.[379] Limiting copyright protection in computer programs to the literal elements would only encourage creativity in new source and object codes. In contrast, copyright protection for a program's structure, sequence and organization would provide further incentive for programmers to create new methods of interaction between the elements of the program.

B. A Single, Integrated Substantial Similarity Test

The average lay observer cannot easily understand computer programs.[380] This handicaps an ordinary lay observer's ability to evaluate similarities between the expression of two computer programs. Therefore, the ordinary lay observer's response to similarities is imprecise for determining copyright infringement of a computer program.

A single, integrated substantial similarity test allows the ordinary lay observer to make a precise decision on similarities between computer programs. With the assistance of expert testimony, a fact finder can accurately compare and assess the similarities between two highly technical works. Thus, the inherent, highly technical nature of computer programs mandates that courts admit both lay and expert testimony through a single, integrated test in copyright infringement actions involving computer programs.

C. Idea/Expression Dichotomy Based on the Purpose or Function of a Program

The purpose of copyright law is to foster creativity without depriving the public of ideas which may only be expressed in a limited number

377. U.S. CONST. art. I, § 8, cl. 8.

378. Warner Bros. v. ABC, 720 F.2d 231, 240 (2d Cir. 1983).

379. *See supra* note 41 and accompanying text.

380. See *supra* note 127 and accompanying text for a discussion of the technical nature of computer programs and the response of the ordinary observer.

of different ways.[381] However, the highly technical nature of computer programs renders difficult the delineation of idea and expression.[382]

The *Whelan Associates v. Jaslow Dental Laboratory*[383] court's bifurcation of idea and expression based on the purpose or function of a program provides a pragmatic method for determining the expression of a program. This test allows programmers to benefit from copyright protection for non-literal program elements. The test also allows programmers to receive the benefits of their work if the program they create may be expressed through different structures. In contrast, if the available methods of expressing a program's function are limited, a program's structure will not be copyrightable. The purpose of copyright law is to balance a programmer's interest in reaping the benefits of his or her work with the public's interest in ideas which may only be expressed in a limited number of ways.[384] The *Whelan* test achieves this purpose by giving authors the economic benefit of their copyrightable works without depriving the public of nonprotectible expression.

D. Substantial Similarity and Programming Scenes a Faire

When determining substantial similarity between two programs, courts should consider all similar copyrightable expression as indicia of similarity of organizational structure. Although these elements alone may not be sufficient to establish substantial similarity, they serve as probative evidence of similarity between the underlying structures of the programs. In contrast, programming *scenes a faire* are elements of expression which should not be considered indicia of substantial similarity of structures. Programming *scenes a faire* should be considered uncopyrightable expression. Accordingly, the presence of identical programming *scenes a faire* should not influence a court's analysis of substantial similarity. Instead, to protect an author's original work, a court should limit its evaluation of evidence to the method used to link programming *scenes a faire.* This analysis would provide an incentive to programmers to create new programs which organize programming *scenes a faire* into new structures, while allowing uncopyrightable expressions to remain public property.

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381. See *supra* notes 41-43 and accompanying text for a discussion of the purpose of copyright law.

382. *See supra* notes 78 and 141 and accompanying text.

383. 797 F.2d 1222 (3d Cir. 1986), *cert. denied*, 107 S. Ct. 877 (1987).

384. *See supra* notes 41-43 and accompanying text.

E. Summary

The Third Circuit's decision in *Whelan Associates v. Jaslow Dental Laboratory*[385] expanded copyright protection for computer programs beyond the source and object codes, to the structure, sequence and organization of the program. The court held that the appropriate test of substantial similarity between computer programs is a single, integrated test which admits both lay and expert testimony. Finally, the court formulated a new idea/expression dichotomy which examines the purpose or function of the program to establish the idea. While the Third Circuit's opinion is a strong step in providing greater incentives for computer programmers, the court's ruling fails to recognize programming *scenes a faire* as elements of a computer program which must be defined as uncopyrightable expression.

This Note proposes an additional requirement to the *Whelan* dichotomy of idea and expression. The addition of the programming *scenes a faire* requirement will restrict the definition of expression in computer programs to the copyrightable elements. Use of the *Whelan* test in combination with the programming *scenes a faire* requirement will provide computer programmers with a stronger incentive to create and develop new programs.

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385. 797 F.2d 1222 (3d Cir. 1986), *cert. denied*, 107 S. Ct. 877 (1987).