



## **Computer Programming 101**

### **The Beginners Starting Guide**

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# **COMPUTER PROGRAMMING 101**

I truly cannot fathom a life without a computer, yet I know many people in their 50's who are very intimidated by the computer. Some of them are actually afraid to touch it. This is because when they were in grade school and high school, computers were not available the way they are now. At that time "computer" meant a machine that filled a good size room, a monolith that none of them ever dreamed would some day fit on the top of a table, or in their lap. While many of the 50+ crowd have come into the 21<sup>st</sup> century and now own and operate a home computer, or work with one on the job, there are still many out there who are wary.

There is really no reason anyone should feel intimidated, especially with all of the computer instruction courses available. Many of these lessons can be obtained on CD or by download to your computer, and will take you step by step through tutorials on how to use your computer. There are others that will teach you how you can program your computer to do just about anything you wish.

Most home PC users are interested in the basics: letter writing, game playing, shopping, news etc., and most of them would like to be able to use the programs that are downloaded on their computers. These include writing programs, Photo applications, printer applications, computer upkeep, and so much more.

This is where you will need to begin, by learning all you can about how to use your PC, you will be taking the first step in opening up a new and vital world for yourself. You will then be able to go on to other applications. Computer programming is a must for anyone who wishes to get a job using a computer, and is a big help for those who just want to get connected.

## **WHAT IS COMPUTER PROGRAMMING AND WHY SHOULD I CARE?**

If you have a personal computer, you have probably already used the software for word processing, to solve problems, or set up spreadsheets. We thought maybe you would be curious about how programmers write the software you have used.

A Program— is a set of instructions that tell the computer, step by step, how to perform the tasks you command it to, and produce the results you have in mind. There are three great reasons for learning computer programming:

- Programming will help you understand computers. The computer is a tool, and if you learn how to write simple programs, you will also learn how the computer works.
- After writing a few simple programs your confidence level will increase. There is a personal satisfaction in creating a program that will solve a problem.
- Learning basic programming will show you whether you like programming and possess an analytical mind, which is needed in computer programming. If it should become

apparent that programming is not your cup of tea, you will find that an understanding of the programming process will increase your knowledge of the computer and your appreciation for the tasks that programmers and computers can perform.

Computer programming is a set of rules that tell a computer what operations the user needs it to perform, this is a programming language. There are many computer languages and they are listed later in this ebook.

### ***What a Programmer Does***

The programmers job is generally to solve problems by formulating instructions for the computer. The programmer will prepare the instructions for the program and run those instructions on a computer to test the new program to make sure it is working properly. If they find the program does not give the correct outcome, they must make corrections and then test the program again. The programmer will also write a report on the program in the form of use instructions.

A programmer could probably perform this programming by themselves, but they usually interact with others. If a program is part of a system containing several programs, the programmer will work with other programmers to assure that all the programs will work together. A programmer may also have coordination meetings with managers, system analysts, and computer users.

Developing a program means using steps as you would in any problem solving task. These are the steps in the programming process:

- Analyzing the problem– A programmer will meet with a client to check out the system and find the problem, or consult with a systems analyst who will outline project needs. To analyze the problem you must identify what you know, and figure out the outcome you want to obtain. The programmer will then formulate a written agreement with the client that outlines the programming plan.
- Planning the best way to form a solution– there are a couple of common ways to plan the solution to a problem, one is to draw a flowchart and the other is to write pseudocode. A flowchart is a picture of a step by step solution to the particular problem. The flowchart uses arrows to show the direction the program takes and other symbols to show the action the solution will take to solve the problem. Pseudocode is a nonstandard form of the English language used to explain the steps to a solution, with more precision than it could be explained in plain English, and less precision than when using programming language. This language is not compatible with the computer and meant only as a planning tool.
- Writing the program– This step is where you write the new program in a computer language by translating the information on the planning tool to the computer. You will be writing the program in the computer language compatible with the computer operations you are working on. To get your program to work you will need to follow the rules of the

language you are using. Using the language correctly is not a guarantee that your program will work. The correct use of the computer language is the first step, then your written program must be keyed by using a computer in a form the computer will recognize.

- **Testing the program for bugs**– Newly written programs usually contain a few errors. This is a bit disappointing, as programmers tend to be a careful, precise, detail oriented lot who take a good deal of pride in their work. If mistakes are found during testing, the program will need to be gone over and changed. This process will be repeated until the desired outcome is reached.
- **Writing instructions for the new program**– Documentation is a necessary process that can be quite boring to programmers who wish to move on to the more exciting task of working on a new project. This is a detailed description of the program you have written, containing the origin of the problem, the cycle and facts about the program, what tools were used (flowchart etc.), program listings, data record descriptions, and test results. Any comments on the program are also considered essential to the documentation. Documentation is used by others who may have an interest in the program, such as other programmers who are part of a programming team. Other programmers that may need to make changes to the program down the road, can use this documentation

## SOFTWARE LESSONS FOR BEGINNERS

There are quite a few websites that offer computer lessons for beginners. These are CDs and tutorials that will teach you how to use the programs on your computer with ease. You will be surprised at how fast you will learn from these straight forward lessons.

1. **Video Professor:** Offers free computer lessons, all you need to pay is the shipping and handling. They offer computer training on a number of computer programs for a nominal price (no more than \$6.95 each) for shipping and handling. The lessons are easy to use and you will find you know about the program in record time. These lessons are great, whether you want to learn how to use a program to get a promotion at work, or simply wish to improve your computer skills. Video Professor is a leader in computer software tutorials that you can learn at your own pace.

They offer lessons in Access®; Money Quiken®; ebay®; Office Integration; Windows; Excel®; Outlook®; Wireless Networking; Photoshop®; Frontpage®; Word; WordPerfect®; HTML PowerPoint®; Internet; Publisher; Works; Lotus®; and Quickbooks®. Visit the Video Professor website to order.

2. **Hewlett-Packard** has online tutorials in Everyday Computing. Once you have signed up for a lesson you will have access to the lessons on the website 24 hours a day, 7 days a week. The instructors at HP online, are experts on the subjects they teach, and really enjoy teaching and student-teacher interaction.

When you enroll in a class you will receive a conformation by email that your enrollment

was a success. They will also send emails to advise you when new lessons are posted.

**Lessons include:**

- Digital Photography
  - Beyond Auto Mode– understand how to use your camera's auto settings
  - Professional Digital Photography Made Simple
  - Digital Imaging From Camera to Printer– Photosmart Essential
  - Digital Entertainment
  - Is Your Digital Media Collection Outgrowing Your PC?
  - Getting Started With LightScribe
  - Streamline Your Digital Media With MediaSmart TV
  - Tune Up Your PC
  - Understanding Windows® Vista Home Basic and Home Premium
  - Security Solutions
  - Security Boot Camp
  - Protect yourself from spam and spyware
  - Home Office
  - Getting Started With Microsoft® Excel 2003
  - Scanning Basics
  - Stay Connected While You Traveling
- And more!

Another company offering smaller lessons is CustomGuide, these lessons allow a computer user to master topics they choose, in a matter of minutes. The online lessons and the course CDs can be customized to fit any training situation. A student is able to use the course and online lessons separately, or combine them to blend their learning experience. This is a very easy and convenient way to learn.

CustomGuide allows the user to interact with the online lessons. They are able to type and click along with the lessons, and learn by hands on experience. This helps to bring the skill home to them better than watching someone else perform the action, on a video. These lessons are quite affordable. You will receive quality training and not break the bank.

The training titles include:

- Microsoft Access
- Microsoft Outlook
- Microsoft Project
- Mac OS
- Microsoft Excel
- Microsoft PowerPoint

- Microsoft Windows
- Intuit Quickbooks
- Microsoft Word– and many more

This company offers

- Content that is focused– completely covers the essentials for the beginner.
- One price, paid up front. No monthly commitment.
- Shipping costs are reasonable.

Volume One will answer the most vital questions. All information is given in straight forward manner. The important details are covered as if you had never touched a computer before. The key security issues are discussed so you will be able to use the internet safely and securely. These lessons will teach you about email use quickly. You will be writing emails and sending them within a few minutes. This volume is 1 hour 41 minutes long and is packed with outstanding information.

Volume two will show you how to customize your computer to fit your needs. This group of lessons will teach you how to personalize the operation, look, and feel of your PC to make it work best for you. You will also learn to keep old programs that you don't use off your computer by removing them, and how to add new programs. You will be shown how to speed up a slow computer using maintenance tools already installed on your computer to get rid of clutter that can slow down your PC. This volume shows you how to find and play internet radio, listen to CDs, find essential internet sites, and even access blog and learn about blogging. Running time is 1 hour and 23 minutes.

Each volume, 1 & 2, sell on the website for \$19.95. If you purchase a jumbo pack you will pay \$35.90 and save \$5. This price excludes shipping and handling. Visit the CustomGuide website for more information and ordering.

### ***Other Places to Find Computer Instruction***

Many Libraries, local school districts and community colleges offer courses in basic computer learning, if you prefer to attend classes yourself. These classes are longer and take more time, but are a good excuse to get out of the house and learn something new. Some of the topics of these classes are, keyboarding, basic computer operations, safety and security, among others.

Many of these classes are free, especially when you are taking them at the library, and the local school district. You will need to check in your area for any computer classes you may be interested in, and what the cost to you might be.

Colleges will teach you the basics, and they also offer courses that go beyond basics for those who wish to learn more about the computer so they may find a job, or gain a promotion through their present job. You may also major in computer Science to get your degree. These classes will cost you a bit of money and none of them are free of charge.

### ***Comprehensive Computer Training for the Beginner***

Are you looking for computer training and A+ certification, office training, and a 30 day satisfaction guarantee? If so, it is time you visit MCSE and order their comprehensive computer training videos or CDs.

Thousands of Corporations, Educational Institutions, and Governments use this software as training materials for their employees. The VHS tapes provide a classroom type presentation, and are presented by Microsoft Certified Trainers. The CDs feature graphics, audio, and full motion video. You are able to complete the training at your own pace and pay less than you would at a college.

In this A+ Certification Training Bundle, you will find:

- MCSE Training Suite
- A+ Certification Suite
- Network + Certification
- Security + / Linux +
- CCNA/MCSA/CAN
- MCAD Certification

Categories:

- Adobe Training
- Access Training
- Autodesk Courses
- IT Certification Training
- Photoshop Premier
- Access User
- IT Certification Training
- IT Exams-Test Simulators
- Microsoft Comp TIA
- Access, Excel, Word, Outlook– etc.
- Microsoft Office Training
- Photoshop Training
- Adobe Photoshop
- .Net, Visual Basic, C#, etc.



The most popular software:

- MCSE 2003 Training
- Microsoft Office 2003
- A+ Certification
- Access 2003 Course
- Access 2003 Development
- SQL Server 2000 Complete
- AutoCAD 2007
- Visual Basic .NET Complete
- Visual Basic 6 Complete
- ASP . NET Programming
- .NET Programming Bundle
- Adobe Photoshop CS2

MCSE Training:

- MCSE Offers free online demo's of their training CDs and videos, and when you purchase the MCSE 2003 Certification Suite, and you will get 9 complete Certification Suites free.
- With MCSE Certification Training, you will be certified as an A+ Computer Technician, IT Professional, Security + Specialist, MCSE Network Engineer, among other certifications.
- The MCSE 2003 Training Suite offers, Complete MCSE training for all of the seven exams for certification. The video based course allows interactive exam simulations, labs and much more.
- A+ Certification Training Suite features, CompTIA A+ Certification training for the A+ Hardware exam 220-301 and A+ Operating System exam 220-302. Get certified as a PC technician with: training in computer software, networking, hardware, and much more.
- MCSE Training for Windows 2000, offers complete preparation for exams 70-210 through 70-221 with interactive labs on video.
- Microsoft Office Training has many desktop programs for PowerPoint slides, Word processing, Access databases, Excel spreadsheets, and so much more.
- Office 2003 Training offers, training from beginner to advanced Office training for MS Excel, MS PowerPoint, Outlook, MS Word, and MS Access.
- Office 2002 Training teaches beginner to advanced level Office courses.
- Access 2003 Development teaches the student how to master the Access database development features.

- Excel 2003 Training teaches Microsoft Office Excel spreadsheet with self paced learning
- AutoCAD Training uses computer aided design and drafting application to create a drawing of physical objects in 2 or 3 dimensions.
- AutoCAD Training 2007 is a complete training course covering basic and advanced ideas, as well as all subjects between the two, for AutoCAD 2007 design and drafting application.
- AutoCAD Training 2006 has over 14 hours of instruction, with interactive applications for Autodesk's AutoCAD 2006 computer aided drafting, design software.
- Architectural Desktop 2007 offers beginner to advanced lessons on how to use the tools found in AutoCAD Architectural Desktop 2007.
- Land Desktop 2007 teaches the student to use Autodesk Land Desktop.
- Photoshop Training will teach image changing and the creation of graphics software. Photoshop is a leader in image editing.
- Photoshop Training for CS3 will teach all of the features of Adobe Photoshop CS3 software with 8 hours of instruction .
- Photoshop Training for CS2 will allow a student to explore professional digital imaging with this 3 DVD set for Adobe Creative Suite 2.
- Photoshop Elements 5 will give you 6 hours of useful techniques when working with Adobe Photoshop.
- Advanced Photoshop CS2 Training features advanced lessons for users of Photoshop CS2.

MCSE offers many Training lessons for the computer operator who is just beginning to learn how to use the machine, as well as, the advanced operator who wishes to learn more about the programs they are using. These are affordable teaching tools and will have anyone using the particular programs efficiently, in a very short time. Businesses find these training sessions very cost effective, as they can be used many times over when teaching employees how to use programs that are new to them.

### ***A Course in Computer Literacy.***

Us Career Institute will prepare you to use all aspects of your computer within 4 months. Although you are able to learn at your own pace, it is possible to finish this course in a short time. This course will teach you word processing, spreadsheets, multimedia, graphics and Web

pages.

The lessons are easy to understand and will guide you every step, from basic to advanced techniques. The course is delivered in 5 Instructional Packs.

PC Literacy Instruction Pack 1 includes:

- Importance of Computers– This lesson will show you how important computers are in your personal life and in your business dealings. You will be shown the many careers that are available to those who possess the right computer skills. This is a preview of how easily you can use a computer.
- How People Use Computers– Computer Applications– In this lesson you will learn how computers and software are used to improve the lives of the user. You will learn about desktop publishing, word processing software, spreadsheets, graphics and multimedia, database management and virtual reality programs.
- Other items in Pack 1 include: Quiz Answer Sheets and Envelopes, Course Introduction and Study Guide, School Catalog, US Career Institute Letter Opener, and US Career Institute Post-it Notes.

PC Literacy Instruction Pack 2:

- Word Processing and Desktop Publishing– In this lesson you will learn the most common functions and features of word processing programs. You will learn to edit text, format your document and save and print your work. This lesson will also teach the beginner, the similarities and differences in word processing and desktop publishing programs.
- Spreadsheets– Will teach about the common features of spreadsheet programs, including how to organize spreadsheets and how to use them in presentation and financial situations. You will be taught to enter numbers and formulas into a spreadsheet, and how to create graphs and charts.
- Database Management– You will learn how to create database programs, and how they help organize larger amounts of data.
- Graphics and Multimedia– Will teach you how computers are able to use and manipulate graphics, drawings, photographs, graphs and charts. This lesson will show you how to use multimedia functions to generate and store sound recordings and video images.
- Other items included in Pack 2: Quiz Answer Sheets and Envelopes, Professional Development Supplement, and Part 1 Ergonomics– How to Create a Healthy Work Environment.

PC Literacy Instruction Pack 3 includes:

- How Computers Process Information– This lesson will teach you how a computer

processes information. You will learn about the hardware of the computer and the central processing unit.

- Getting information Into and Out of the Computer– In this lesson you will learn how to input information into the computer, and what the computer uses to perform this task. You will also learn how the computer outputs the information to the user.
- Storing Information– Will teach how the computer is able to store large amounts of information. You will learn about the storage devices a computer uses, and how to protect and organize this information.
- Other items included in Pack 3: Quiz Answer Sheets and Envelopes, Professional Development Supplement, Part 2, and Computers A Buyer and User's Guide.

PC Literacy Instruction Pack 4 includes:

- Operating Systems and System Software– This lesson will teach the functions of an operating system. You will learn about the most popular systems in use today, the different types of operating systems, and utility programs that are a help in managing computer functions.
- Networks and Communications– This lesson teaches how to share information on your computer with other people. These programs transfer information between computers with ease. You will learn about the networks and communications programs that are most common, and how to use them.
- Management Information Systems– Will teach you about how computers help business professionals manage huge amounts of information they will need to perform daily tasks. You will learn about information systems and MIS departments.
- System Design and Program Development– Teaches about the system development life cycle and how computer programmers are able to analyze the needs of Individuals and businesses. You will also learn the program languages most commonly used.
- Career Opportunities– You will learn about the many career opportunities available to those who possess computer skills. These careers are in the business and computer industry. You will be taught how to use your skills in your current career and how you can plan for a wonderful career working in the computer or business field.
- Other items included in Pack 4: Quiz Answer Sheets and Envelopes, Professional Development supplement, Part 3, and a US Institute Mouse Pad.

PC Literacy Instruction Pack 5 includes:

- Trends and Issues in the Information Age– With this lesson, you will learn automated factory and automated office, and how computers are used in the home. You will learn

about the World Wide Web and the internet, and how they function. This lesson will teach you about computer crime, how to keep your computer secure and protect your privacy, and other issues about the information age.

- Introduction to Windows and Windows concepts– Learn the transition from DOS to Windows. You will explore the basics of Windows, and how to maximize, minimize, and close windows, and how the desktop functions. This lesson will teach you how to manage your files with Windows Explorer, and the functions of the Start button.
- Word Processing Using StarOffice Writer– You will learn how to edit and enter text, how to format paragraphs, pages, and characters, and how to print and save your work. You will also learn how to copy and move blocks of text, and how to use bold and centering commands on the StarOffice word processing program.
- Creating Spreadsheets Using StarOffice Calc.– This lesson will teach you how to enter information into a spreadsheet, how to edit spreadsheet entries, how to format a spreadsheet, and how to print and save your work.
- Additional Star Office Programs: Draw, Impress, Writer/Web, Frameset and Schedule– You will learn how to use each of these utilities, and have an opportunity to use each of them.
- Using Templates and Samples in StarOffice– The last lesson in the series provides in depth demonstrations on how to use samples and templates to create business or personal desktop published documents.
- Also included in Pack 5– Quiz Answer Sheets and Envelopes, US Computer Jobs Finder, StarOffice Software, How to Connect to the Internet Supplement.

Unless you are physically unable to work or retired, you most generally could use a good paying career. I know you must have heard this a million times, but you can actually have a great job. Before you get that fabulous job and start that wonderful career, you need to become educated on the subject.

Education can be a costly and time consuming challenge. You may find that you will need to work while you go to school. You may face a number of challenges while you train for a new career. At USCI they understand the problems you may have or encounter while trying to better your life.

This company has helped thousands of people improve their lives and get a better career. USCI does not make you take classes that are not about your chosen career, and they understand you need to learn as much as you can in a short time. This will help you get on your way to starting that new career sooner. Their curriculum is focused and easy to understand.

## **A LOOK AT COMPUTER PROGRAMMING**

Computer programmers are the people who write, test and maintain all information, that a computer follows to perform tasks, called programs. Programmers are also responsible for the conception, design, and testing problem solving structures the computer uses. The role of the programmer has been redefined and been changed in the face of technical innovations in programming, sophisticated new languages and programming tools.

Each organization may have their own names for programming jobs within their company. The overall definition of a computer programmer is: an individual whose main job is programming. Computer Programmers are a group with a big range of responsibilities and educational backgrounds.

Computer programs tell the computer what to do next, what information to identify and access, what equipment to use, and how to process the information. There are many varied programs depending upon the type of information that needs to be accessed. Each has their own set of instructions on how to proceed to perform the tasks needed.

Simple programs take only a few hours to write, other programs using complex mathematical formulas that need to draw data from other existing programs may require more than a year to write. In this case there are usually several programmers that work together in a team that is supervised by a senior programmer.

Programmers write programs for the specifications set down by computer software engineers or system analysts. After the design process is finished, the programmer is called upon to convert the design to a series of instructions that make sense to the computer. The programmer codes the instructions in a conventional programming language. Different programming languages are used according to the purpose of the program.

Programmers are usually familiar with more than one programming language, and because many computer languages are similar, programmers will find it easy to learn a new language. Programmers are usually referred to by the type of programming language or type of programming they perform, such as database programmers or Java programmers.

Many programmers update, modify, expand and repair existing programs. When there are changes made to a section of code, programmers make other users aware of the task the change is to perform. This is accomplished by inserting certain comments in the coded instructions so that the program is understood by other users. Many programmers use computer software engineering tools to automate a great deal of the coding process. These tools automate various parts of the of the program being built so the programmer is able to concentrate on writing the more unique parts of the program. The tools can generate entire sections of code automatically, rather than one line at a time. There are also libraries of basic code that can be modified to fit each program. This eliminates many steps for the programmer, increasing productivity.

Programmers test the program after they have created it, by running it to make sure the instructions are correct and the program performs the desired outcome. If errors are found, the

programmer must make adjustments to the program and retest it. This process is repeated until the desired outcome is achieved. Programmers will repair these problems throughout the life of the program, this is called debugging.

Programmers who work in a mainframe environment, involving a large, centralized computer, might work out instructions for a computer operator who will be running the program. Programmers may also add information to a manual for those who will use the program.

Computer programmers are usually grouped into two types, systems programmers, and applications programmers. Systems programmers write programs to control or maintain computer systems software, such as database systems, operating systems, and networked systems. These programmers make changes in the instructions that control the workstations, network, and central processing unit, to handle the various processing jobs and communications knowledge of the computer system.

Application programmers write programs for a specific job. They specialize in customizing generic application according to what the company or client needs, and writing programs the company needs to run their operations. Systems programmers will help applications programmers find the source of problems in their programs, because of their work with other equipment like, disk drives and terminals.

Programmers working at companies that develop software, may work directly with experts in the field they are writing the software on. These programs are either designed for a client or packaged software for public use, and range from educational software and games, to programs for desktop publishing and word processing. There is a great deal of growth in the programming of already established software in the computer services industry.

In small organizations programmer analysts are responsible for work in programming and systems analysis. The advancement of programming languages and the capability of object specific programming have increased the productivity of both users and programmers. The move from mainframe to personal computers, has softened the description of programmer and user. Once a user learns the ropes they are able to program their PC to do what they require eliminating the use for outside programmers. The use of packaged software has grown to allow users to write simple programs for their own use.

## **THE LANGUAGE OF THE COMPUTER**

Computer language is a set of codes used that enable the computer will understand the commands of the user to perform certain tasks. Below you will find a list of computer languages.

- 1. ABC**
- 2. Ada**
- 3. ADL**

4. **Algol 60**
5. **Algol 68**
6. **APL**
7. **AppleScript**
8. **Assembly**
9. **AWK**
10. **Basic**
11. **Befunge**
12. **BETA**
13. **Bigwig**
14. **Bistro**
15. **Blue**
16. **Brainfuck**
17. **C**
18. **C++**
19. **Caml**
20. **Cecil**
21. **CHILL**
22. **Clarion**
23. **Clean**
24. **Clipper**
25. **CLU**
26. **Cobol**
27. **CobolScript**
28. **Cocoa**
29. **Component Pascal**
30. **C-sharp**
31. **Curl**
32. **D**
33. **DATABUS**
34. **Delphi**
35. **DOS Batch**
36. **Dylan**
37. **E**
38. **Eiffel**
39. **ElastiC**
40. **Erlang**
41. **Euphoria**
42. **Forth**
43. **Fortran**
44. **Fortress**
45. **FP**
46. **Frontier**
47. **Goedel**
48. **Groovy**
49. **Haskell**



50. **HTML**
51. **HTMLScript**
52. **HyperCard**
53. **ICI**
54. **Icon**
55. **IDL**
56. **Intercal**
57. **Io**
58. **Jal**
59. **Java**
60. **JavaScript**
61. **Jovial**
62. **LabVIEW**
63. **Lagoona**
64. **LaTEX**
65. **Leda**
66. **Limbo**
67. **Lisp**
68. **Logo**
69. **Lua**
70. **M4**
71. **Maple**
72. **Mathmatica**
73. **MATLAB**
74. **Mercury**
75. **Miranda**
76. **Miva**
77. **ML**
78. **Modula-2**
79. **Modula-3**
80. **Moto**
81. **Mumps**
82. **Oberon**
83. **Objective Caml**
84. **Objective-C**
85. **Obliq**
86. **Occam**
87. **Oz**
88. **Pascal**
89. **Perl**
90. **PHP**
91. **Pike**
92. **PL**
93. **Pliant**
94. **PL-SQL**
95. **POP-11**

- 96. PostScript
- 97. PowerBuilder
- 98. Prograph
- 99. Prolog
- 100. Proteus
- 101. Python
- 102. R
- 103. REBOL
- 104. Refal
- 105. Rexx
- 106. Rigal
- 107. RPG
- 108. Ruby
- 109. SAS
- 110. Sather
- 111. Scheme
- 112. Self
- 113. SETL
- 114. SGML
- 115. Simkin
- 116. Simula
- 117. Sisal
- 118. S-Lang
- 119. Smalltalk
- 120. Snobol
- 121. SQL
- 122. Squeak
- 123. Tcl-Tk
- 124. Tempo
- 125. TeX
- 126. TOM
- 127. TRAC
- 128. Transcript
- 129. T3X
- 130. UML
- 131. VBScript
- 132. Verilog
- 133. VHDL
- 134. Visual Basic
- 135. Visual DialogScript
- 136. Visual FoxPro
- 137. Water
- 138. XML
- 139. XOTcl
- 140. YAFL
- 141. Yorick

## 142. Z

Computer programmers work with some or all of the languages on the above list, as you can see there are a number of them.

### ***Computer Program Definitions***

1. **FORTTRAN**– This was the first High-Level computer language and was developed by IBM and introduced in 1954, the name is short for FORMula TRANslator. In the early days the computer was used mostly for mathematical, engineering and scientific research. This computer language is still popular, and is very apt at serving the use it was created for. It is suited for the execution of very complex formulas like those used in engineering and economic analysis. The capabilities of this language have been greatly improved.
2. **COBOL**– This computer language is business oriented. The US Department of Defense was interested in formulating a standardized computer language. The department called together representatives from various industries (including the computer industry) and government agencies. CODASYL (COncference of DAta SYstem Languages). In 1959 this organization introduced COBOL ( Common Business Oriented Language). The government insisted that anyone wishing to win a contract with them had to use COBOL. COBOL was standardized in 1968 and new standards were issued for another version called ANSI-COBOL in 1974. There was some controversy over the new version and 7 years later the standard known as COBOL 85 was approved. This made COBOL a more usable form of software.
3. **BASIC**– Short for Beginner's All purpose Symbolic Instructional Code, this computer language and is very easy to learn. Developed in 1965 at Dartmouth College, it was intended for students. In the late 60's it became widely used in time-sharing in Universities and Colleges. The use of BASIC has been extended to business and personal computers. Basic is used by programmers and non-programmers alike, such as business people who use it for problem solving. Newer versions like QuickBASIC, include vast improvements.
4. **Pascal**– was developed as a teaching language in Switzerland in 1971. This language has become very popular, in Europe and the US, mostly in Colleges and Universities in the computer science departments. Pascal is a much simpler language than most, and has fewer features. It has been used as a more sophisticated alternative to BASIC. This language has been improved over the years and the newest version has less drawbacks than the original. Turbo Pascal is often used by the business community and is often chosen by nonprofessional programmers who desire to write their own programs.
5. **Ada**– This software was sponsored by the pentagon, and was intended to be a standard language for weapon systems, but was found to be a software for commercial applications. Since 1980, Ada has been supported by the government, as well as, industry heavyweights as IBM and Intel. Ada is also available for some home computers.

6. C, C++, Java, and Javascript– this language was invented at Bell Labs in 1972, C produces a code that approaches assembly language and still offers high-level features. This language was designed to write systems software, but is now a general purpose language. C includes some of the best features borrowed from other languages, including Pascal.

### ***Choosing a Language***

There are several possibilities when choosing a computer language to write your program, there are several possibilities. In a work environment, your supervisor may announce that everyone on a specific project will use a particular language.

You may need to use a certain language at work, because there is a need to interface with other languages on the project. If there are two programs are to work together, it would be the best practice for everyone involved to use the same language.

You will usually want to choose a language based on how compatible it is for the task. A business program that contains large files should be written in a business language, such as COBOL.

For a program that is to be run on different computers, it will need to be written in a language that is suitable on all of the computers. This way the program will need to be written only once. The language may be limited to the knowledge of the programmer. The program may need to be written in a language the programmer knows.

The simplest language an amateur programmer can use is BASIC. It may have already been installed on the computer you wish to use. If it wasn't it is a cheaper alternative to more costly software when it comes to personal computers.

## **A LOOK AT JOB STATISTICS**

### ***Computer Programming***

The tasks of programming are becoming more sophisticated and employers are asking for higher levels of skill and experience. Computer programming graduates with less than a 2 year degree or an equivalent in work experience, will find fierce competition for jobs. The competition for level entry programmers may also affect those with a bachelors degree.

Job prospects will probably be best for college graduates with knowledge of, and experience with, various programming languages and tools. C++, Java, and other languages that are object oriented, as well as, domain-specific languages for database management, networking, and

internet application development. Those who obtain a vendor or language specific certificate may have a bit of an edge over the competition. Because demand is always changing, programmers should keep up with and learn the latest skills and technologies. A smart individual, seeking employment as a programmer, will improve their chances by combining practical work experience with appropriate formal training.

Employment of computer programmers is expected to grow a bit slower than the average for all occupations, through the year 2014. The new, sophisticated, computer software is now able to write basic code, thus eliminating the need for programmers to perform this work. The growth in systems and applications, advancement in computer languages and tools, new developments in packaged software, and new growth in the ability of computer users to design, write and use more of their own programs, will mean that more programming can be transferred to other information workers.

One thing that is limiting the growth in the employment of programmers, is the fact that many jobs are being outsourced to other countries. New technology allows a computer programmer to perform their job from anywhere in the world and transmit their programs to employers by email. Programmers face a much bigger risk of having their jobs taken by a freelancer, than workers who are able to program more complex and more sophisticated information technology functions. Computer programming has become an international language that requires very little specialized training, and the work of programmers can be made routine once an individual learns a particular programming language.

Employers will still need programmers with an understanding of the employers business and programming needs, and those with strong technical skills. It is vital that a programmer keep up with changing program languages and techniques. With all of these changes, organizations will be looking for programmers who will be able to support data communications, and help create electronic commerce and intranet strategies.

There will be a growing demand for programmers with strong object oriented program abilities and technical specialization in other areas such as wireless applications, multimedia technology, client-server programming, and graphic user interface. Programmers will also be needed to maintain systems and embed these technologies with more products. Programmers that are familiar with digital security issues and skilled in security technology, will be in demand because of the growing popularity on cyber security.

Systems and applications programmer jobs should be plentiful in software houses, computer systems, and data-processing service firms. This sort of company is part of computer systems design, software publishers related services. These are projected to be one of the fastest growing industries in the economy from 2004 to 2014. As companies attempt to keep costs down and keep up with changing technology, they will need programmers to assist in converting existing programming to new computer languages and systems. There will be many job opportunities open from the need to replace programmers who will leave the labor force or promote to manager or systems analyst.

Some programmers have taken additional courses in programming to add to their degree in fields

such as inventory control and accounting, among others. With the rise in the level of training and education required by employers on the rise, there should be an increase in the number of programmers with college degrees in the future. More than  $\frac{2}{3}$  of all computer programmers had a bachelor's degree or higher in 2004.

Each job has its own skill requirements, yet the demand for a programmer with various skills are available because of changes in technology. Employers who use computers for engineering or scientific applications, will generally prefer programmers with a college degree in computer or information science, engineering, mathematics, or the physical sciences. Some jobs require graduate degrees in related fields.

Employers who use computers for business applications prefer programmers who have taken college courses in business and management information systems, and have strong programming skills. A knowledge of the traditional languages is still important, employers are looking for those with knowledge of newer, object oriented programming languages and tools. Employers are also looking for programmers familiar with fourth and fifth generation computer languages that involve systems programming and graphic user interface. A preference for programmers who have skills in general business and experience in company related operations. A programming student can improve the chance of landing a great job by getting into a college work-study program, or accepting an internship.

When an employer is looking to fill a programming position, they want someone with the necessary programming skills who is also able to think logically and pay close attention to detail. A job like this calls for persistence, patience, and an ability to work on exacting analysis, especially under pressure. A creative eye and ingenuity are very important when it comes to designing solutions and testing product for potential problems. The ability to perform technical analysis and work with abstract concepts is vitally important for a system programmer, because they work with the software that controls computer operations. Programmers are expected to work in teams and work closely with users, employers are looking for programmers who are skilled in the ability to communicate with non technical personnel.

An entry level programmer may be required to work alone on simple assignments after a bit of instruction, or assigned to a team with more experienced programmers. Beginning programmers will most always work under supervision. Because of the rapid changes in technology, programmers are called upon to update their knowledge and skills by taking courses sponsored by their employer, the software vendors affiliated with them, or those courses offered through community colleges or universities.

Promotional prospects are good for those who keep up with the latest technology, a promotion to lead programmer with supervisory responsibilities. Applications programmers may move into systems programming after they take courses in systems software and gain experience in this area. Programmers with specialized knowledge and experience with operating systems or language, may work in research and development for internet technology or multimedia and may

even become computer software engineers. As companies take on programming jobs with outside firms, there will be more opportunities for experienced programmers with specific skills to work as a consultant.

Certification is an excellent way to show a programmer's skill level, and can give a job seeker a competitive advantage. In addition to language specific certificates, software firms also offer certification and often require professionals working with their products be certified.

### ***Employment Outlook***

In 2004 computer programmers held nearly 455,000 jobs. Nearly every industry employs programmers, the largest number work in computer system designs and related services. A huge number work for software publishers, telecommunication companies, financial institutions, educational institutions, insurance carriers, and government agencies.

There are many computer programmers who are employed on a temporary or contract basis. They work as independent consultants, providing expertise in new programming languages, or specialized applications. Employers would rather contract with temp agencies, consultant firms, or with freelance programmers directly, than they would to hire a person for one project and lay them off after the job is completed. Many companies need programmers for specific jobs only, and bringing in an independent contractor or consultant with the experience for the job is faster and easier than retraining an existing employee to do one job. Depending upon the complexity of the job, it may last from several weeks to a year or more. There were 25,000 self-employed programmers in 2004.

In 2004, the median annual earnings for a computer programmer was \$62,890. The middle 50 % earned between \$47,580 and \$81,280 per year. The highest 10% earned more than \$99,610, and the lowest 10% earned less than \$36,470 yearly. Shown below are the median annual earnings in industries employing the largest number of programmers in May 2004.

- Software publishers—————\$73,060
- Computer systems design + related services—\$67,600
- Data processing, hosting + related services—\$64,500
- Insurance carriers—————\$62,990

- Management of companies and enterprises—\$62,160

Starting salaries for computer programmer graduates with a bachelor's degree Averaged \$50,820 a year in 2005.

- Average annual starting salaries in 2005 ranged from \$52,500 to \$83,250 a year in 2005 for applications analysts and development programmers.
- Average annual starting salaries in 2005 ranged from \$55,000 to \$88,250 for software developers.
- Average starting salaries for mainframe system programmers ranged from \$50,250 to \$67,500 in 2005.

### ***How to Find A Great Job After Graduation***

Even after you are hired as a computer programmer, you may still have difficulty in the areas of training, compensation, peer respect, benefits, and a choice of more respected clients. Here are some of the reasons find it hard to find good career choices, even after they have been hired:

- **Not Enough Experience**— Many companies require a job candidate to have hands on experience before they will hire them. At times, even after they have been hired they may find they are placed in positions that do not offer a chance for career advancement.
- **Poor Negotiation Skills**— It is vital that a person develop good negotiation skills when to use when job hunting. This is something not taught while you are training, and will need to be learned on your own. If you lack the skills to negotiate better pay and a more challenging position, they probably will get what they ask for— not much. Remember that you and your employer are both adults, and you should speak up for what you want in a career.
- **Poor Job Search Skills**— Do not choose the first job that is offered to you, unless it is the job you are looking for. You need the self confidence to know you can do the job you have set your sights on. If you do not go after the job you desire, you may find yourself stuck in a job that does not pay well and one you do not like, for many years.
- **Lack of Self Confidence**— If you are hired as an entry level programmer, this is how your co-workers see you and how you see yourself. You are probably capable of performing the same job as mid or senior level programmers. By not going after the job you are capable of, you give up the ability to determine the outcome of your life.

If you lack the ability to take charge of your career path, you will most certainly be miserable in your chosen career. Your resume should reflect your abilities, and you need to have confidence



when you are in an interview. You need good negotiation skills to be able to get a better position and a higher salary. If you start out as entry level, make sure there is room for advancement once your trial period is up. If you are capable of doing a higher level job, make sure your employers know this from the beginning. You may never need to step into that entry level position at all. Do not let fear keep you from the career you deserve.

If you are a beginner computer programmer and find you are not in the job you desire you can use these tips to get motivated:

- **Show Them Your Value**– Show your ability to do your job with efficiency and speed. Keep in mind that your abilities are strong, and know you are able to perform the job you are aiming for.
- **There is Always room for Improvement**– Your job performance is based directly on your computer programming skills, knowledge and experience. You should never stop learning better ways to perform your job, and use these skills at work.
- **You Are A Professional**– You will need to be sure that your professionalism shines through in your interviews and on your written resume. Think and dress like a Professional at all times.
- **Learn to Negotiate**– You need a good self image and when you negotiate, come across as a person who knows what they are worth in the job market. Once you have negotiated the job and salary you desire, take it and make sure you show your employer every day the excellent job you can do. Remember, never stop learning new things about your career and use them to perform your job more efficiently.
- **You Are In Charge**– Be confident about what your computer programming skills are worth on today's job market. If you find you and your employer don't see eye to eye, or you are not getting the respect you deserve on the job, look elsewhere for employment. Whatever the reason you and your boss don't get along, it is better to move on than to be miserable in your career. Other employers will see your worth and you will be able to move on to what you really want.

The main thing to remember is the fact that your skills are worth the money you are asking (if they aren't, they better get there quick). You simply need to show that you have confidence in your abilities, and make sure you prove yourself on the job, after you have negotiated the job and salary requirements you desire.

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