Assignment -1

FUNDAMENTALS OF IT & PROGRAMMING

Fundamentals Of IT & Programming

Computer programming (often shortened to programming) is a process that leads from an original formulation of a computing problem to executable computer programs. Programming involves activities such as analysis, developing understanding, generating algorithms, verification of requirements of algorithms including their correctness and resources consumption, and implementation (commonly referred to as coding) of algorithms in a target programming language.

This course comprises nine lessons on the fundamentals of computer programming. Each lesson includes a combination and Internet-based readings, YouTube videos, and hands-on, interactive learning activities. Examples are provided using flowcharts, pseudocode, and a wide variety of computer programming languages.

This entire course can be downloaded in book form by selecting Download Learning Guide in the sidebar. The corresponding Wikipedia reading collection can be downloaded in book form by selecting Download Reading Guide.

Introduction to Computer Program

Before getting into computer programming, let us first understand computer programs and what they do.

A computer program is a sequence of instructions written using a Computer Programming Language to perform a specified task by the computer.

The two important terms that we have used in the above definition are −

- Sequence of instructions
- Computer Programming Language
- A computer program is also called a **computer software**, which can range from two lines to millions of lines of instructions.
- Computer program instructions are also called program source code and **computer programming** is also called **program coding**.

- A computer without a computer program is just a dump box; it is programs that make computers active.

As we have developed so many languages to communicate among ourselves, computer scientists have developed several computer-programming languages to provide instructions to the computer (i.e., to write computer programs). We will see several computer programming languages in the subsequent chapters.

Introduction to Computer Programming

If you understood what a **computer program** is, then we will say: the act of writing computer programs is called computer programming.

As we mentioned earlier, there are hundreds of programming languages, which can be used to write computer programs and following are a few of them −

- Java
- C
- C++
- Python
- PHP
- Perl
- Ruby

Uses of Computer Programs

Today computer programs are being used in almost every field, household, agriculture, medical, entertainment, defense, communication, etc. Listed below are a few applications of computer programs −

- MS Word, MS Excel, Adobe Photoshop, Internet Explorer, Chrome, etc., are examples of computer programs.
- Computer programs are being used to develop graphics and special effects in movie making.
- Computer programs are being used to perform Ultrasounds, X-Rays, and other medical examinations.
- Computer programs are being used in our mobile phones for SMS, Chat, and voice communication.

Computer Programmer

Someone who can write computer programs or in other words, someone who can do computer programming is called a Computer Programmer.

Based on computer programming language expertise, we can name a computer programmers as follows −

- C Programmer
- C++ Programmer
- Java Programmer
- Python Programmer
- PHP Programmer
- Perl Programmer
- Ruby Programmer

Algorithm

From programming point of view, an **algorithm** is a step-by-step procedure to resolve any problem. An algorithm is an effective method expressed as a finite set of well-defined instructions.

Thus, a computer programmer lists down all the steps required to resolve a problem before writing the actual code. Following is a simple example of an algorithm to find out the largest number from a given list of numbers −

1. Get a list of numbers L_1, L_2, L_3....L_N
2. Assume L_1 is the largest, Largest = L_1
3. Take next number L_i from the list and do the following
4. If Largest is less than L_i
5. Largest = L_i
6. If L_i is last number from the list then
7. Print value stored in Largest and come out
8. Else repeat same process starting from step 3

The above algorithm has been written in a crude way to help beginners understand the concept. You will come across more standardized ways of writing computer algorithms as you move on to advanced levels of computer programming.