1. Introduction to Programming

Lesson 1:

What is Programming?

1.1 What is Programming?
1.1.1. Programming

- A <u>programming language</u> is an artificial language that can be used to control the behavior of a computer.

- <u>Source code</u> is any series of statements written in a programming language.

- <u>Computer programming</u> (often shortened to programming or coding) is the process of writing, testing, and maintaining the source code of computer programs.

1.1 What is Programming?
1.1.2. Computer Programs

- Source code cannot be directly understood by a computer, and hence must be converted into a computer-executable form before it can run.

- The source code is either converted into an executable file (compilation), or executed on the fly (interpretation).

- The term computer program may refer to source code, written in a programming language, or to the executable form of this code.

1.1 What is Programming?
1.1.3. Compilers and Interpreters

- Computers cannot directly understand Source code. Computers understand their own language known as Machine Language or <u>Machine Code</u>. Different computer platforms have different Machine Languages.
  - For example, each of Microsoft Windows on Intel Pentium Architecture and Mac OS X on Apple Macintosh Architecture would not "understand" the others machine code.

- Hence, a programming language's source code needs to be converted into Machine Code before it can be used to control the behaviour of a computer.

- This conversion is done either by a <u>compiler</u> or an <u>interpreter</u>.

1.1 What is Programming?
1.1.4. Compilers

- **Compiler** is a computer program that converts programmer friendly symbols in to machine friendly instructions.

- Compilers are often used to convert source code into machine code.

- Compilers convert the entire source code into machine code at one go. The machine code is executed only once all the source code has been converted.

- Since, different computer platforms have different machine languages, source code compiled into machine code for one architecture might not run on another.

1.1 What is Programming?
1.1.5. Interpreters

- Interpreters differ from Compilers in that they never convert the whole source code at one go.

- An interpreter usually converts one source code statement, executes the resulting machine code and then converts the next source code statement and so on.

1.2 Steps in writing a program

- There are four general phases during the development of any computer program
  - Specify the problem
  - Analyze and break down into a series of steps towards solution
  - Write the code
  - Compile, test and run the program