C PROGRAMMING NOTES

What is code?

* Code refers to a set of instructions written in a programming language that a computer can understand and execute.

What is coding?

* Coding is the process of writing code.

What is program?

* A program is a complete set of code that performs a specific task.

What is programming?

* Programming is the broader process of creating programs.
* It involves planning, designing, writing, testing, and debugging code.
* Coding is one of the part of programming.

Types of programming: -

1. Procedural Oriented Programming 2. Object-oriented Programming

What is programming language?

* A programming language is a special set of instructions with its own grammar and syntax, just like English or French.
* There are many different programming languages, each suited for different tasks.
* For example, C,C++,Java, Python etc

Levels of programming language: -

This refers to how close the programming language is to the computer's hardware.

There are two main Levels of programming based on abstraction: -

1. Low level language
2. High level language

1.Low level language: -

* Low level languages are closer to the machine’s native language.
* These languages are more difficult to read, write and debug.
* It offers great control over computer hardware resources.
* There are two categories in low level language.

1. Machine language 2. Assembly language
   * 1. Machine language: -

* It is in the form of Binary.
* Binary contains 0’s and 1’s called as bits.
* This is the most basic language that the computer can directly execute.
* Example: - 1010001001, 0010001001 etc.

ii)Assembly language: -

* This language uses Mnemonics (abbreviated codes) to represent machine code instruction.
* It is more readable than machine code instructions.
* To write this low level language, we have a deep understanding of the computer’s architecture.
* Example: - ADD R1, R2

SUB R2, R1

2.High level language: -

* These languages are designed to be easier to human to read and write.
* It is defined in English words and symbols.
* Writing code and debugging is easy.
* They requires less knowledge about the computer’s architecture.
* Example: - C, C++, Java, Python.

What is language Translator?

* A language translator is a software which is used to translate one language to another language.
* The programs are written mostly in high-level languages like Java, C++, Python etc. and are called source code. These source code cannot be executed directly by the computer and must be converted into machine language to be executed. Hence, a special translator system software is used to translate the program written in a high-level language into machine code
* There are generally three translators. They are: -
  + Assembler
  + Compiler
  + Interpreter

1. Assembler: -

It is a software that converts a assembly code to machine code.

Examples: - NASM, GAS

1. Compiler: -

* A compiler translates high level language (Source code) into intermediate form (or) machine code
* It converts complete code into machine code, if the code does not contain any errors.
* Compiler is faster than interpreter.
* Compiler gives more than one line error.
* Example of compiler languages are: - C, C++ etc.

1. Interpreter: -
   * Interpreter translate code line-by-line and execute it immediately.
   * It doesn’t generate any intermediate code.
   * Interpreter is slower than compiler.
   * Interpreter gives one line error.
   * Examples of interpreter languages are: - Python, Perl , Javascript.