Concept of Programming

introduction

A computer is an electronic machine output in the form of useful information. A computer accepts input in different forms such as data, programs A computer is an electronic machine that takes input from the user, processes the given input and generates output in the form of useful information. A computer accepts input in different forms such as data, programs and user reply. Data refer to the raw details that need to be processed to generate some useful information. Programs refer to the set of instructions that can be executed by the computer in sequential or non sequential manner.

programming languages

The communication between two parties, whether they are machines or human beings, always needs a common language or terminology. The language used in the communication of computer instructions is known as the programming language. The computer has its own language and any communication with the computer must be in its language or translated into this language.

The operations of a computer are controlled by a set of instructions (called a computer program). These instructions are written to tell the computer:

1. what operation to perform
2. where to locate data
3. how to present results
4. when to make certain decisions

Three levels of programming languages are available. They are:

1. machine languages (low level languages)
2. assembly (or symbolic) languages
3. procedure-oriented languages (high level languages)

Machine languages

As computers are made of two-state electronic devices they can understand only pulse and no-pulse (or ‘1’ and ‘0’) conditions. Therefore, all instructions and data should be written using binary codes 1 and 0. The binary code is called the machine code or machine language.

Assembly languages

The assembly language, also referred to as the second-generation programming language, is also a low-level language. In an assembly language, the 0s and 1s of machine language are replaced with abbreviations or mnemonic code(**Mnemonic code** refers to symbolic representations or abbreviations used in programming and assembly language to make the code more human-readable and easier to understand.).

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High-Level languages

High-level languages further simplified programming tasks by reducing the number of computer operation details that needed to be specified. High-level languages like COBOL, Pascal, FORTRAN, and C are more abstract, easier to use, and more portable across platforms compared to low-level programming languages.

Compiler

The compiler is a computer program that translates the source code written in a high-level language into the corresponding object code of the low-level language. This translation process is called compilation. The entire high-level program is converted into the executable machine code fi le.

Interpreter

The interpreter is a translation program that converts each high-level program statement into the corresponding machine code. This translation process is carried out just before the program statement is executed. Instead of the entire program, one statement at a time is translated and executed immediately.

Problem Solving Technique

In today's world, a computer is used to solve various types of problems because it takes very less time as compared to a human being. The following steps are performed while solving a problem: LO 1.13 Know various problem solving techniques and computer applicati ons

1. Analyse the given problem.

2. Divide the process used to solve the problem in a series of elementary tasks.

3. Formulate the algorithm to solve the problem.

4. Express the algorithm as a precise notation, which is known as a computer program.

5. Feed the computer program in the computer. CPU interprets the given program, processes the data accordingly, and generates the result.

6. Send the generated result to the output unit, which displays it.