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COMPUTER LANGUAGES

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Computer languages

- Computer language is a language acceptable to a computer system ,and the proceed of writing instructions in such a language is called programing or coding. The goal of this chapter is to introduce some popular programing languages.

❖**Types of computer languages**

➢ Machine language
➢ Assembly language
➢ High-level language

MACHINE LANGUAGE

Although we can design a computer to make it understand many different computer languages , every computer understand only one language without using a translation program. This language is called machine language of the computer. The machine language of a computer is written as string of binary 1's and 0's.

   A machine language instruction normally has a two-part format . The first part is operation code that tells the computer what function to perform, and the second part is operand that tells where to find or store the data on which the computer has to perform the function.

Advantages of machine level language

1. Machine level language are directly interacting with computer system.
2. There is no requirement of software of conversion like compiler or interpreters.
3. It take very less time to execute a program , because there is no conversion take place.

Disadvantages of machine level language

1. Its machine dependent language i.e. Individual program required for each machine.
2. Its time consuming to develop new programs.
3. Machine language is not portable language .

ASSEMBLY LANGUAGES

Assembly language programming , introduced in 1952 ,helped in overcoming these limitations of machine language programing in the following in the following manner:

1. By using alphanumeric mnemonic codes instead of numeric codes for the instructions in the instruction set. For example, using ADD instead of 1110 or 14 for the instruction to add , SUB instead of 1111 or 15 for the instruction to subtract , and so on. With this feature programmers can remember easily and use the instruction in the instruction set.

2. By allowing use of alphanumeric names instead of numeric addresses for representing addresses of fixed storage locations. For example , we may choose to represent memory location 1000,10001, and 1002 as FRST ,SCND, and ANSR, respectively in an assembly language program.

3. By providing additional instructions, called pseudo-instruction , in the instruction set for instructing the system how we want it to assemble the program in computer's memory .For example, there may be pseudo-instruction for telling the system things like:

START	PROGRAM	AT	0000		
START	DATA	AT	1000		
SET	ASIDE	AT	ADDRESS	FOR	FRST
SET	ASIDE	AT	ADDRESS	FOR	SCND
SET	ASIDE	AT	ADDRESS	FOR	ANSR

Advantages of high-level language

1. It is easier to understand and use as compared to machine language.
2. It is easy to locate and correct errors.
3. It is modified easily.

Disadvantages of high-level language

1. Like machine language it is also machine dependent.
2. Since it is machine dependent, the programmer also needs to understand the hardware.
3. Many instruction are required to achieve small tasks.

HIGH-LEVEL LANGUAGE

High-level programing languages overcome limitation of low-level programing languages. They have following features:

1. They are machine independent. That is, we can easily port and execute a program written in a high−level language on any computer having translator software for the high−level language.

2. They do not require programmers to know anything about the internal structure of the computer, which will execute their high−level language programs.

3. Each statement of a high−level language is normally a macro instruction that is translated into several machine language instruction . This id one−to−many translation. for example , let us consider the same problem of adding two number (FRST and SCND), and storing the sum in ANSR.

$$ANSR = FRST + SCND$$

ADVANTAGES OF HIGH-LEVEL LANGUAGE

1. In this instruction and commands much easier to remember by programmer.
2. Its logic and structure are much easier to understand.
3. Less time consuming to writing new programs.
4. High−level language are described as being portable language.

Disadvantages of high-level language

1. It takes addition translation times to translate the source to machine code.
2. This programing language execute slowly.
3. Cannot communicate directly with the hardware.
4. Compared to low level programs, they are generally less memory efficient.