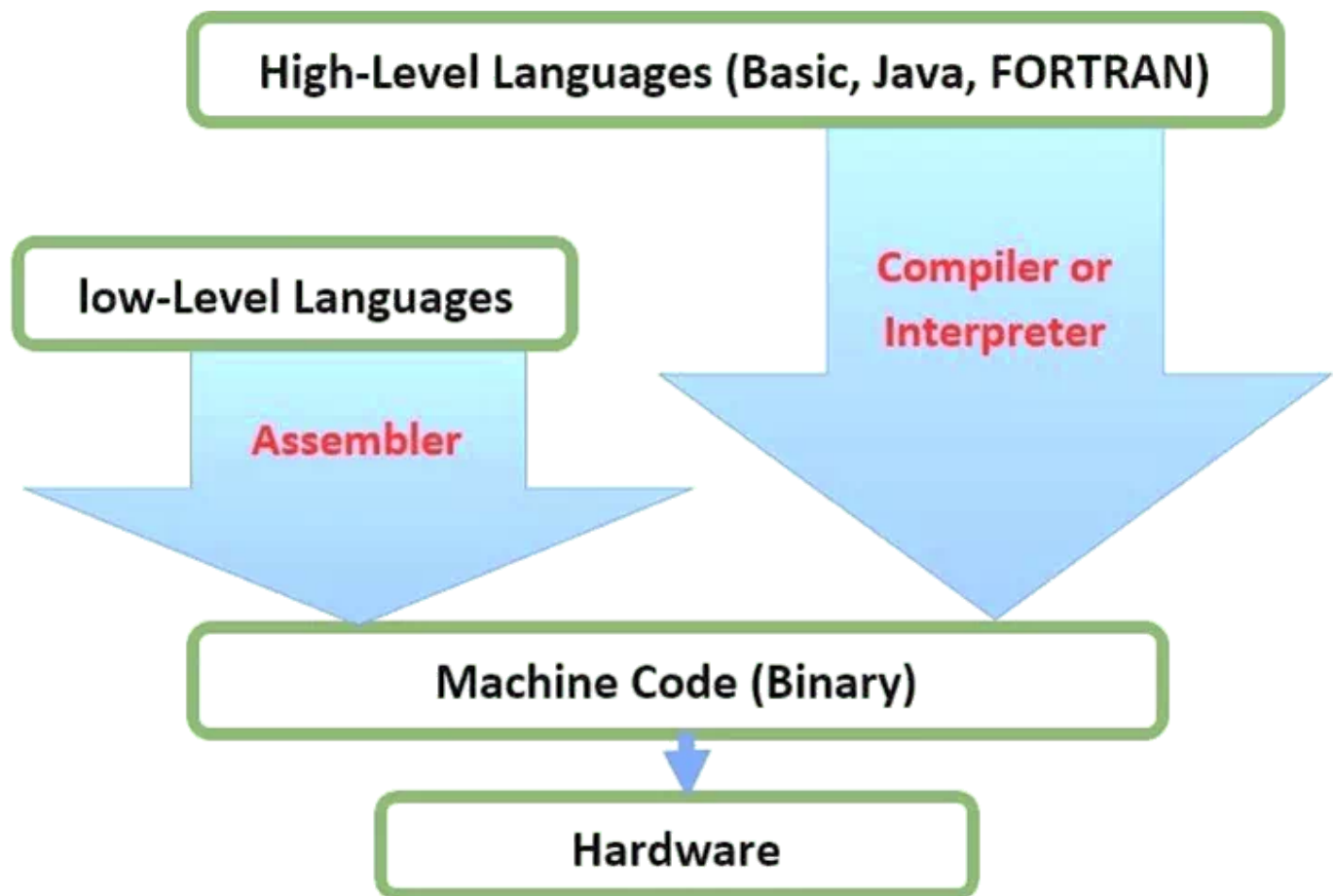


## Computer Languages for Competitive Exams

**Computer language or programming language** is a coded syntax used by computer programmers to communicate with a computer.

Computer language establishes a flow of communication between software programs.

### Two Basic Types of Computer Language



*Types of Computer Language*

**Low-Level Languages:** A language that corresponds directly to a specific machine.

**High-Level Languages:** Any language that is independent of the machine.

**There are also other types of languages, which include**

**System languages:** These are designed for low-level tasks, like memory and process management.

**Scripting languages:** These tend to be high-level and very powerful.

**Domain-specific languages:** These are only used in very specific contexts.

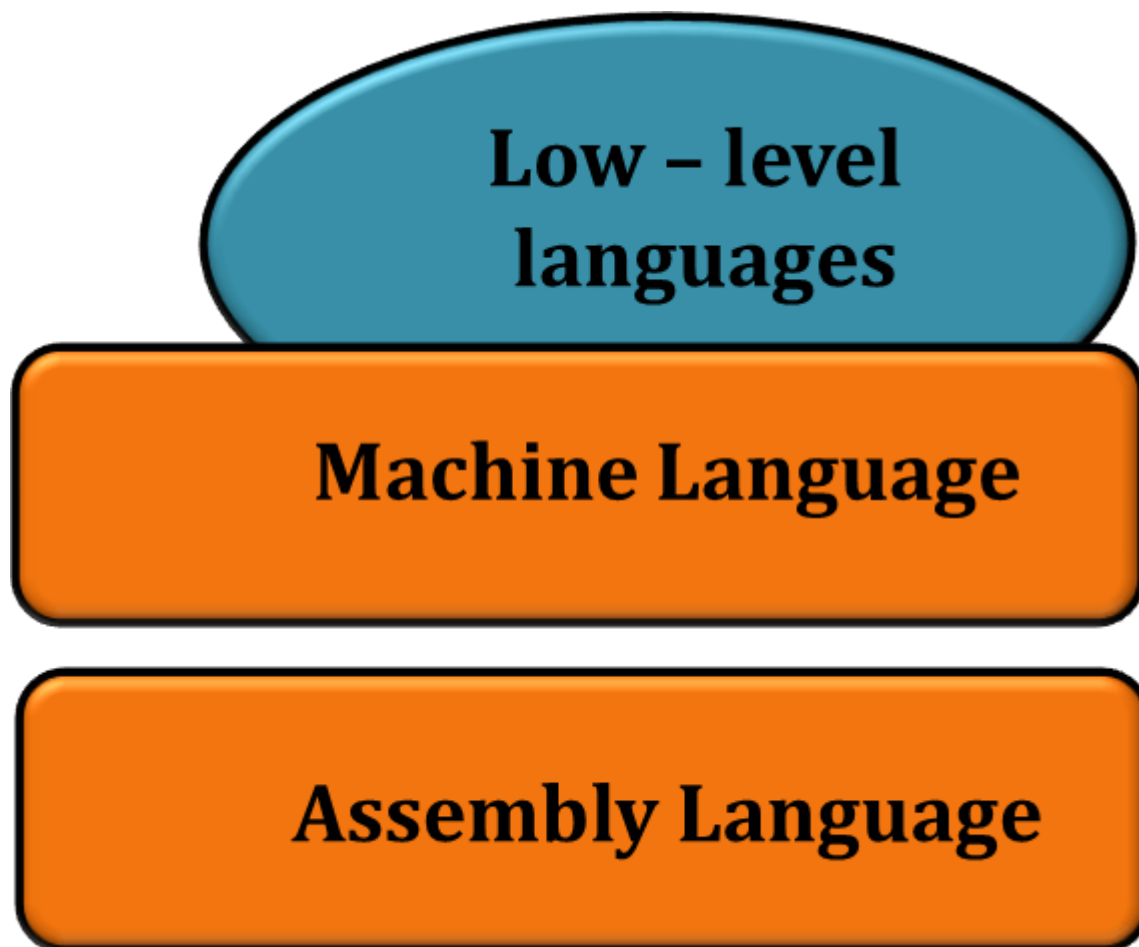
**Visual languages:** Languages that are not text-based.

**Esoteric languages:** Languages that are jokes or are not intended for serious use.

### Low-Level Languages

- Low-level computer languages either are machine codes or are very close them.
- A computer cannot understand instructions given to it in high-level languages or in English.
- It can only understand and execute instructions given in the form of machine language I.e. binary.

There are two types of low-level languages:



*Types of Low-Level Languages*

**Machine Language:** a language that is directly interpreted into the hardware.

**Assembly Language:** a slightly more user-friendly language that directly corresponds to machine language.

### Machine Language

- Machine language is the lowest and most elementary level of programming language and was the first type of programming language to be developed.

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- In fact, a manufacturer designs a computer to obey just one language, its machine code, which is represented inside the computer by a string of binary digits (bits) 0 and 1.
- The symbol 0 stands for the absence of an electric pulse and the 1 stands for the presence of an electric pulse.

## Machine Language Advantages & Dis-advantages

### Advantages

Machine language makes fast and efficient use of the computer.

It requires no translator to translate the code.

It is directly understood by the computer.

### Dis-advantages

All operation codes have to be remembered

All memory addresses have to be remembered.

It is hard to amend or find errors in a program written in the machine language.

### *ADVANTAGES AND DISADVANTAGES OF MACHINE LANGUAGE*

## Assembly Language

- Assembly language was developed to overcome some of the many inconveniences of machine language.
- This is another low-level but very important language in which operation codes and operands are given in the form of alphanumeric symbols instead of 0's and 1's.
- **These alphanumeric symbols are known as mnemonic codes** and can combine in a maximum of five-letter combinations e.g. ADD for addition, SUB for subtraction, START, LABEL etc. Because of this feature, assembly language is also known as 'Symbolic Programming Language.'

## Assembly Language Advantages & Dis-advantages

### Advantages

Assembly language is easier to understand and use as compared to machine language.

It is easy to locate and correct errors.

### Dis-advantages

Like machine language, it is also machine dependent/specific.

Since it is machine dependent, the programmer also need to understand the

hardware.

It is easily modified.

#### *ADVANTAGES AND DISADVANTAGES OF ASSEMBLY LANGUAGE*

### **High-Level Languages**

- A high-level language is a programming language with strong abstraction from the details of the computer.
- The purpose of developing high-level languages was to enable people to write programs easily, in their own native language environment (English).
- High-level languages are symbolic languages that use English words and/or mathematical symbols rather than mnemonic codes.
- Each instruction in the high-level language is translated into many machine language instructions that the computer can understand.

### **High-Level Languages Advantages & Dis-advantages**

#### **Advantages**

High-level languages are user-friendly.

They are similar to English and use English vocabulary and well-known symbols.

#### **Dis-advantages**

A high-level language has to be translated into the machine language by a translator, which takes up time.

The object code generated by a translator might be inefficient compared to an equivalent assembly language program.

#### *ADVANTAGES AND DISADVANTAGES OF HIGH LEVEL LANGUAGE*

- They are easier to learn and maintain.
- A program written in a high-level language can be translated into many machine languages and can run on any computer for which there exists an appropriate translator.
- The language is independent of the machine on which it is used i.e. programs developed in a high-level language can be run on any computer text.

### **Types of High-Level Languages**

Many languages have been developed for achieving a variety of different tasks. Some are fairly specialized, and others are quite general.

These languages, categorized according to their use, are:

### **1) Algebraic Formula-Type Processing**

These languages are oriented towards the computational procedures for solving mathematical and statistical problems.

Examples include:

- BASIC (Beginners All Purpose Symbolic Instruction Code)
- FORTRAN (Formula Translation)
- PL/I (Programming Language, Version 1)
- ALGOL (Algorithmic Language)
- APL (A Programming Language)

### **2. Business Data Processing**

These languages are best able to maintain data processing procedures and problems involved in handling files. Some examples include:

- COBOL (Common Business Oriented Language)
- RPG (Report Program Generator)

### **3. String and List Processing**

These are used for string manipulation, including search patterns and inserting and deleting characters. Examples are:

- LISP (List Processing)
- Prolog (Program in Logic)

### **4. Object-Oriented Programming Language**

In COP, the computer program is divided into objects. Examples are:

- C++
- Java

### **5. Visual Programming Language**

These programming languages are designed for building Windows-based applications. Examples are:

- Visual Basic

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- Visual Java
- Visual C