

嗨，好中午

مرحبًا ، ظهرًا جيدًا

**Hola**

**Bon Jour**

Hi  
Good Noon

শুভ দুপুর  
কেমন আছেন?

## Language

of two types:

1. Natural Language
  - is used to communicate between person to person
  - such as English, Bangla, Arabic, Hindi etc .
2. Programming Language
  - is used to communicate between a person and a machine with a problem.
  - such as C, C++, Java, etc..

## Programming Language

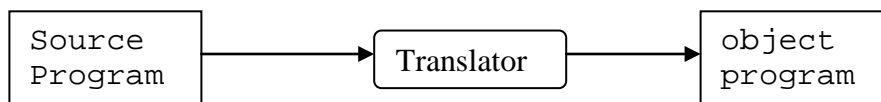
→ Serves as a means of communication between the person with a problem and the computer used to help solve it.

## Hierarchy of Programming Language

1. Machine-level languages
  - lowest form of computer language
  - each instruction is represented by a numeric code
  - numerical addresses are used to locate memory
2. Assembly languages
  - symbolic version of machine-level language
  - each operation code is given a symbolic code (ADD,MUL)
3. Higher-level languages
  - offers most of the features of assembly language
  - offers a more enriched set of language features such as structured control constructs, nested statements, blocks and procedure
  - are presented by human understandable instructions.
4. Problem-oriented languages
  - works for a specific application or problem area
  - such as SEQUEL for database, COGO for civil engineering application.

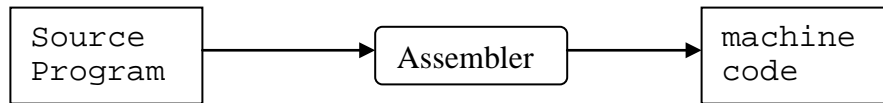
## Translator

- takes a source program as input and converts it into an object or target program



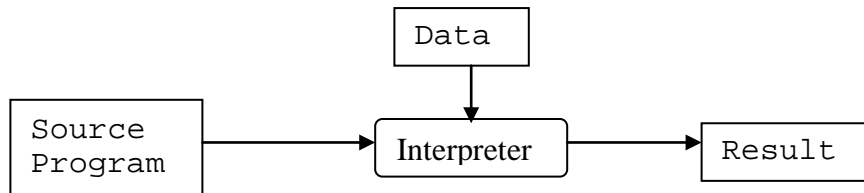
### Assembler

- converts assembly language program into machine language



### Interpreter

- processes an internal form of the source program and data at the same time
- interpretation of the internal source form occurs at run time
- no object program is created
- no compile time
- After finding an error, it stops the execution and does not check to find remaining errors.



### Compiler

- translate a high-level language such as FORTRAN, PASCAL, COBOL into a particular computer's machine or assembly language
- the conversion time from source program to object program is called compile time
- List all the errors at compile time.
- object program's execution time is called run time

