



جامعة المستقبل
AL MUSTAQBAL UNIVERSITY

Programming Fundamental

Lecture 1 Introduction

By

Asst. Lect. Ali Al-khawaja

Computer Hardware components

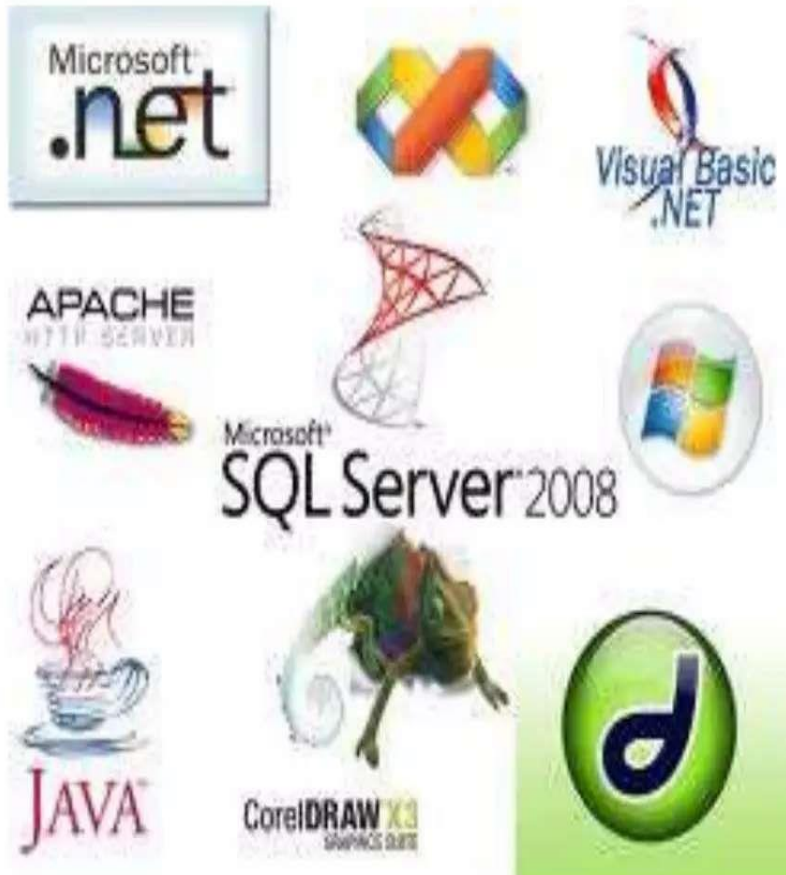
Computer hardware refers to the physical parts or components of a computer such as monitor, keyboard, Computer data storage, hard drive disk, mouse, printers, CPU (graphic cards, sound cards, memory, motherboard and chips),



Computer Software Components

Computer software, or just software, is any set of machine-readable instructions (most often in the form of a computer program) that directs a computer's processor to perform specific operations.

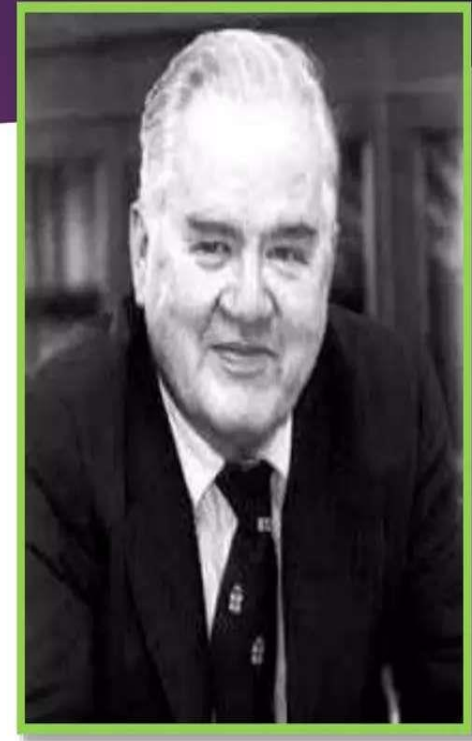
Examples ?



Origin of Software

- ✓ Coined 1953 by Paul Niquette
- ✓ First used in print by John Tukey in 1958

JOHN TUKEY	
Born	(1915-06-16) June 16, 1915 New Bedford, Massachusetts, USA
Fields	Mathematician
Institutions	Bell Labs, Princeton University
Known for	Coining the term 'bit'



Types of Software



System softwares



Application softwares

Do you know !

- ✓ Microsoft employee is called "Softie".
- ✓ Average salary for a developer coming in at 1,11,30,000.
- ✓ Microsoft currently employs 88,180 people
- ✓ Pakistan's IT industry's global share is estimated at US\$2.8 billion.
- ✓ Pakistan Software Export Board is national public sector organization dealing with Software/software houses
- ✓ PASHA –Pakistan Software House Association

About Operating System

- ✓ An operating system (OS) is a collection of software
- ✓ Manages computer hardware resources and provides common services for computer programs.
- ✓ Application programs usually require an operating system to function.
- ✓ Acts as an intermediary between programs and the computer hardware.



Operating System Service

- ✓ In a **multitasking** operating system where multiple programs can be running at the same time, the operating system determines which applications should run in what order and how much time should be allowed for each application before giving another application a turn.
- ✓ It **handles input and output** to and from attached hardware devices, such as hard disks, printers, and dial-up ports.
- ✓ On computers that can provide **parallel processing**, an operating system can manage how to divide the program so that it runs on more than one processor at a time.

About Compiler

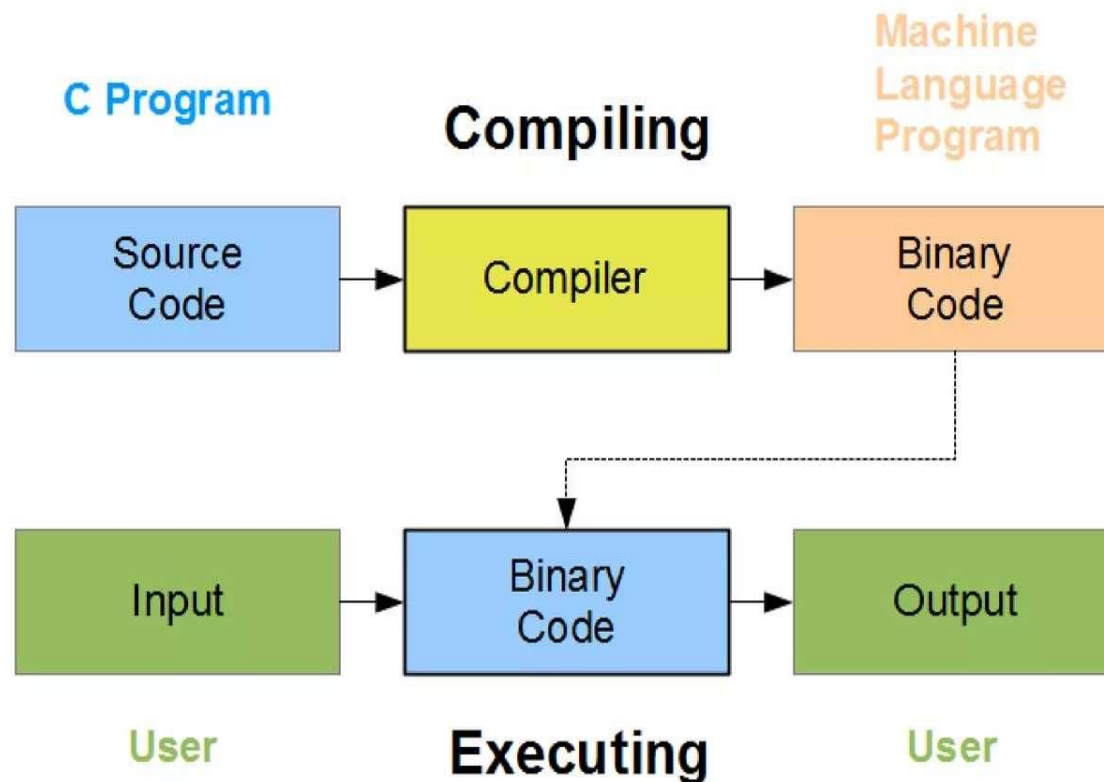
- ▶ A compiler is a computer program (or a set of programs) that transforms source code written in a programming language (the source language) into another computer language (the target language), with the latter often having a binary form known as object code. If you create any error in code then output not found or get error message.
- ▶ The first compiler was developed by Grace Hopper while working on the Harvard Mark I computer.

About Compiler

GRACE HOPPER	
Born	December 9, 1906 New York City, New York, U.S.
Rank	U.S. Chief Technology Officer , (Rear admiral (lower half)) US Navy
Known for	Coining the term compiler



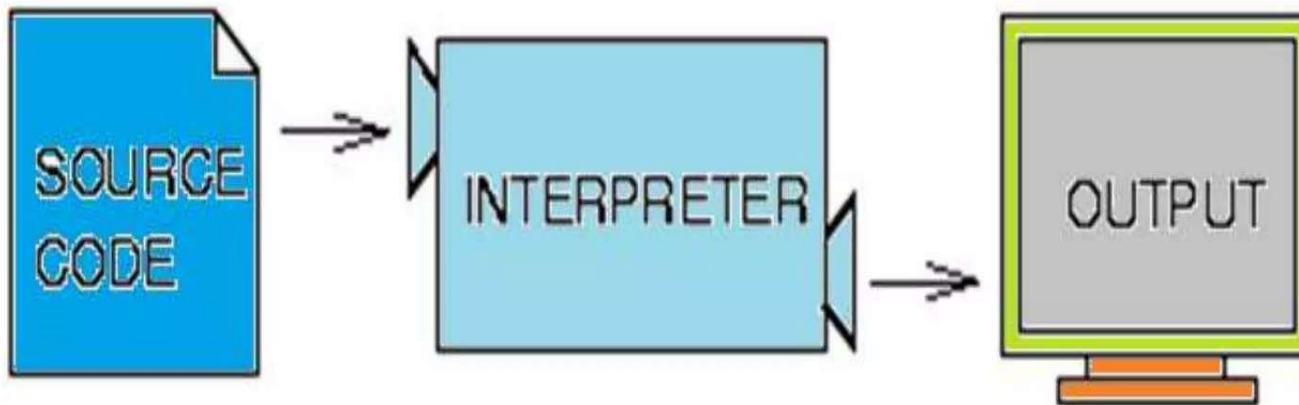
How compiler works?



About Interpreter

- ▶ An interpreter is a computer program that directly executes, i.e. performs, instructions written in a programming or scripting language, without previously compiling them into a machine language program.

How Interpreter works?



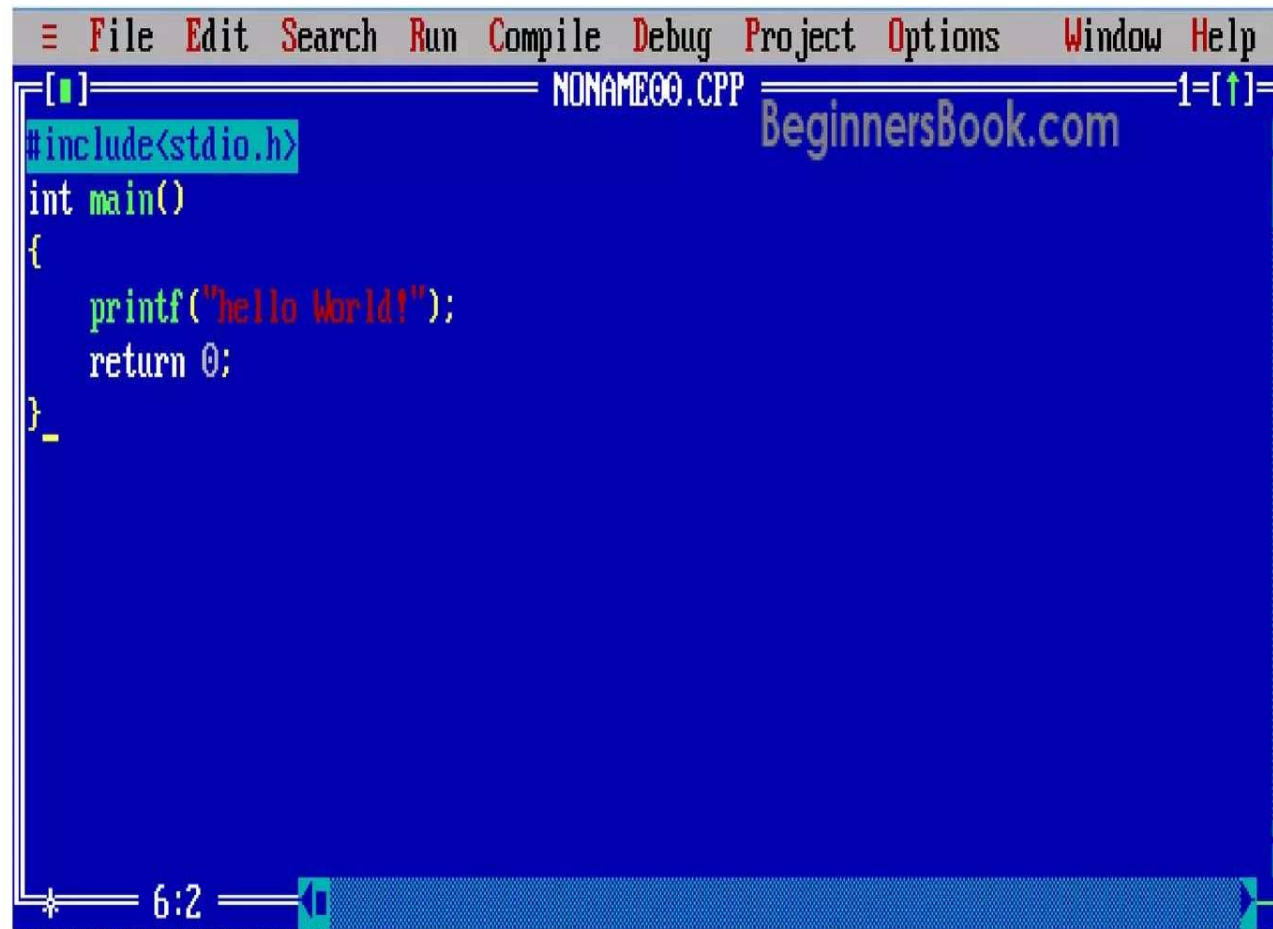
Compiler vs Interpreter

No	Compiler	Interpreter
1	Compiler Takes Entire program as input	Interpreter Takes Single instruction as input .
2	Conditional Control Statements are Executes faster	Conditional Control Statements are Executes slower
3	Memory Requirement : More (Since Object Code is Generated)	Memory Requirement is Less
4	Program need not be compiled every time	Every time higher level program is converted into lower level program
5	Errors are displayed after entire program is checked	Errors are displayed for every instruction interpreted (if any)
6	Example : C Compiler	Example : BASIC

About editor

- ▶ Sometimes called text editor, a program that enables you to create and edit text files. There are many different types of editors, but they all fall into two general categories:
- ▶ The distinction between editors and word processors is not clear-cut, but in general, word processors provide many more formatting features. Nowadays, the term editor usually refers to source code editors that include many special features for writing and editing source code.

Example of Editor



The image shows a screenshot of a C++ code editor window. The title bar at the top contains the menu items: File, Edit, Search, Run, Compile, Debug, Project, Options, Window, and Help. Below the title bar, the editor displays the code for a program named NONAME00.CPP. The code is as follows:

```
#include<stdio.h>
int main()
{
    printf("hello World!");
    return 0;
}
```

The text "#include<stdio.h>" is highlighted in blue. The editor has a status bar at the bottom left showing the cursor position as 6:2. A watermark "BeginnersBook.com" is visible in the upper right area of the editor.

About Source Code

- ▶ The source code consists of the programming statements that are created by a programmer with a text editor or a visual programming tool and then saved in a file. For example, a programmer using the C language types in a desired sequence of C language statements using a text editor and then saves them as a named file. This file is said to contain the source code.

Example of Source Code

```
# include <stdio.h>
int main ()

{
    printf (" Am I Dr. AQ Khan or politician?");
    return 0;
}
```

About Object Code

- ▶ Source code is compiled with a C compiler and the resulting output, the compiled file, is often referred to as object code. The object code file contains a sequence of instructions that the processor can understand but that is difficult for a human to read or modify.

Example of Object Code

Source Code

```
# include <stdio.h>
int main ()

{
    Printf (" Am I Dr. AQ Khan or politician?");
    Return ();
}
```



Compiler

Object Code

```
10101010111111010101011000
01010100101001010010111010
10101011010111010101010101
01010101010010101010101001
01001010010101011100001010
00000001111111100000101100
10101010010100101011111010
1110110
```



Thank you