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DEPARTMENT OF GRAPHICS AND CREATIVE DESIGN

COURSE NAME : Object Oriented Programming

I YEAR /II SEMESTER

Unit 1- BASICS OF C++

History of C++:

The C++ programming language was created by Bjarne Stroustrup and his team at Bell Laboratories (AT&T, USA) to help implement simulation projects in an object-oriented and efficient way.

- C++ is a superset of C because; any valid C program is valid C++ program too but not the vice versa is not true.

- C++ can make use of existing C software libraries with major addition of "Class Construct".

- This language was called "C with classes" and later in 1983, it was named "C++" by Rick Mascitii. As the name C++ implies, C++ was derived from the C programming language: ++ is the increment operator in C.

OOPs characteristics

➢ **Modularity:** Module is a logically self-contained unit that can be tested and executed independently.

➢ **Abstraction:** It represents the essential features of an entity without including explanations or any background details about it.

➢ **Data Encapsulation:** Wrapping of data and functions into a single unit is called data encapsulation.

➢ **Inheritance:** The process by which objects of one class acquires the properties of the objects of another class.

➢ **Polymorphism:** The ability for a message to be processed in more than one form.

➢ **Dynamic Binding:** Linking of a procedure call to the code to be executed when it is called.

➢ **Message Passing:** Passing message objects and invoking the function by the object by sending a message is known as message passing.

OOPs Benefits

➢ OOPs model the real world entity very well.

➢ Inheritance eliminates the redundancy (repetition) of code and hence supports code reusability.

➢ Data hiding helps to build secured programs.

➢ Multiple instances (objects) can be created.

➢ Work can be divided easily.

➢ OOPs can be easily upgraded from small to large systems.

➢ Complexity can be easily managed.

➢ Message passing concept helps the objects to communicate and share data.

Characteristics of C++:

Flexibility:

➢ It is highly flexible language and versatility.

Wide range of library functions:

➢ It has huge library functions; it reduces the code development time and also reduces cost of software development.

System Software Development:

➢ It can be used for developing System Software Viz., Operating system, Compilers, Editors and Database.

C++ Character Set:

Character Set means the valid set of characters that a language can recognizes.

➢ The character set of C++ includes the following:

Letters	A-Z, a-z
Digits	0-9
Special Characters	Space + - * / ^ \ () [] {} = != <> ` " $, ; : % ! & ? _ # <= >= @
Formatting characters	backspace, horizontal tab, vertical tab, form feed, and carriage return

Why Use C++

- C++ is one of the world's most popular programming languages.

- C++ can be found in today's operating systems, Graphical User Interfaces, and embedded systems.

- C++ is an object-oriented programming language which gives a clear structure to programs and allows code to be reused, lowering development costs.

- C++ is portable and can be used to develop applications that can be adapted to multiple platforms.

- C++ is fun and easy to learn!

- As C++ is close to C# and Java, it makes it easy for programmers to switch to C++ or vice versa

Translating a C++ program

➢ Computers execute binary instructions.

➢ These binary instructions are known as machine instructions or machine code.

➢ The program creation process consists of the following steps:

Step 1 – Write the program in a computer language humans can read and understand (like C++),

Step 2 – Save the programs in text files as (**.cpp**) extension. Programs can be a few lines long and reside in one file or can consist of many millions of lines of code and span thousands of files,

Step 3 – Run the source code files through a program called a compiler to generate object code for the target computer,

Step 4 – Run the object files through a program called a linker to produce an executable image.

Translating a C++ program

➢ C++ Install IDE: download and *Install Turbo C++* or Install Codeblocks

➢ The program execution process consists of the following steps:
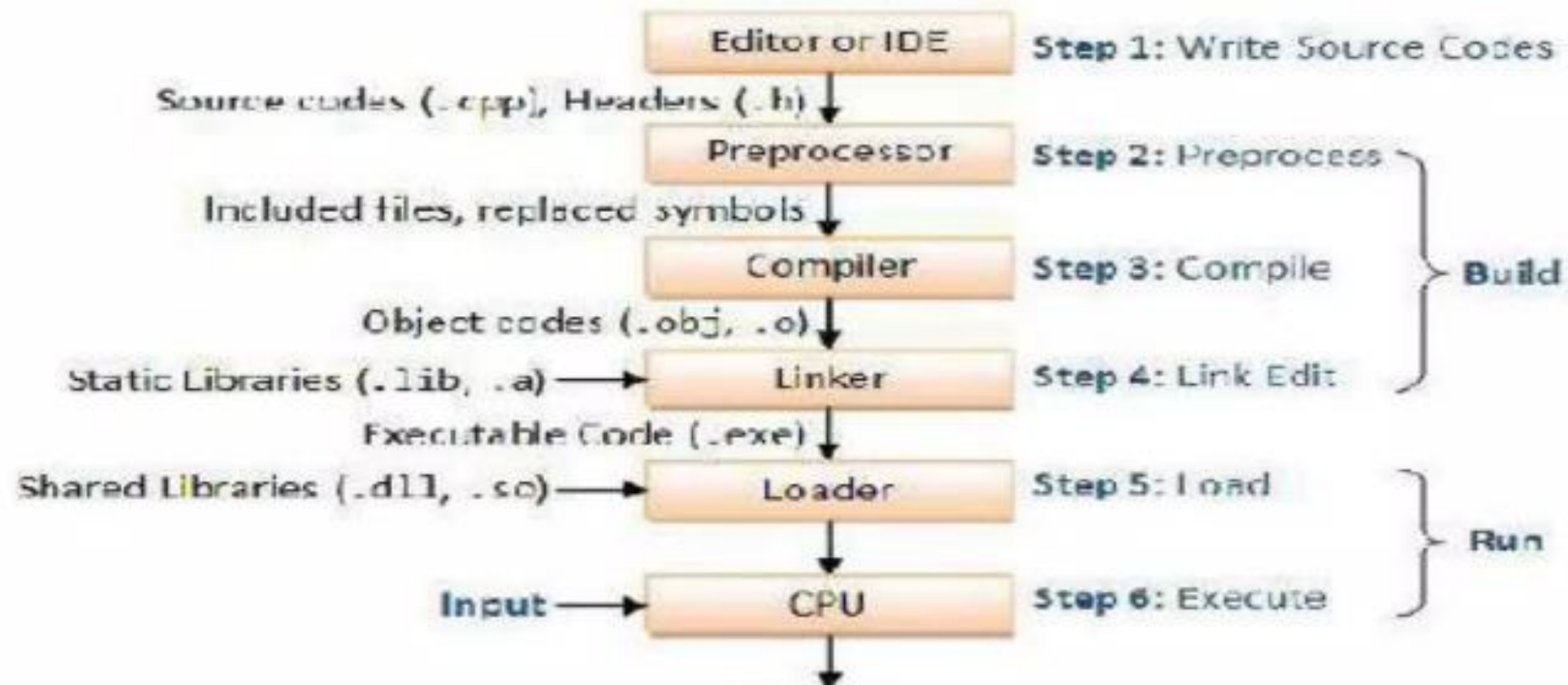
General Structure of C++ Program.

☐ Different programming languages have their own format of coding.

☐ The basic components of a C++program are:

- **Comments or Documentation Section**
- **Pre-processor Directives (Linker Section):**
- **Definition**
- **Global Declaration**
- **main ( ) function**
- **Declarations**
- **Statements**

General Structure of C++ Program

➢ The basic components of a C++program are:

Simple C++ Program

```
// Hello World program                    ←——— comment

#include <iostream.h>                      ←——— Allows access to an I/O
                                                library

int main()
    {                  ←——— Starts definition of special function
                            main()

    cout << "Hello World\n";
                                   ←——— output (print) a
                                        string

    return 0;  ←———
    }                        Program returns a status
                             code (0 means OK)
```

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    return 0;
                                  ←——————— Program returns a status
    }                                      code (0 means OK)
```

Characteristics of C++:

C Compatibility:

➢ Any code written in C can easily be included in a C++ program without making any changes.

Speed:

➢ The resulting code from a C++ compilation is very efficient due to its duality as high-level and low-level language.

Machine independent:

➢ It is a Machine Independent Language.

THANK YOU