Introduction to c

1)C is a high-level programming language developed in the early 1970s by Dennis Ritchie at Bell Labs. It was designed for system programming and has influenced many other programming languages, including C++, Java, and Python.This language is used for develop system software and operating systems.

PROGRAMMING:- it is an medium which creat communication between use and system.
Based on technology program has been classified into 3 types.
1)Low level
2)Medium level
3)high level

History of c:-
In 1988 c program language is standardized by ANSI.
IN 2000 C program language is standardized by ISO that version is called c-99.

Low-Level Languages

1. Definition: Low-level languages are closely related to machine code and provide little abstraction from the hardware.

They allow direct manipulation of memory and hardware resources.

Characteristics:

• Hardware Specific: Low-level languages are often specific to a particular type of hardware architecture.

• Efficiency: They offer high performance and efficiency, as they can directly control hardware resources.

• Complexity: Programming in low-level languages can be complex and error-prone due to the need for detailed management of memory and resources.

Examples:• Assembly Language: A symbolic representation of machine code that is specific to a computer architecture.

Use Cases:

• Operating systems• Embedded systems• Device drivers

2. MEDIUM-LEVEL LANGUAGES

Definition: Medium-level languages provide a balance between low-level and high-level languages.

They offer some abstraction from hardware while still allowing for low-level operations.

Characteristics:

- Portability: Medium-level languages can be more portable than low-level languages, as they are not tied to a specific hardware architecture.

- Control: They provide a good level of control over system resources while still being easier to use than low-level languages.

- Efficiency: They maintain a good balance between performance and ease of use.

Examples:

- C Language: Often considered a medium-level language because it allows for both high-level programming constructs and low-level memory manipulation.

Use Cases:

• System programming• Application development• Game development

USES

C is mainly used for

- 1)Operating systems
- 2)Language compiler
- 3)Database
- 4)Language interpretes
- 5)Utilites
- 6)Network drivers
- 7)assemblers.

FEATURES

- 1)simple
- 2)portability
- 3)powerful
- 4)platform dependent
- 5)structure orenited
- 6)case sensitive
- 7)compiler
- 8)medium level user
- 9)syntax based
- 10)use of pointer.

Source code

Definition: Source code is the human-readable set of instructions written in a programming language.
It is the original code that a programmer writes and can be understood and modified by humans.

Features:•
Human-Readable: Source code is written in a high-level programming language (like C, Python, Java, etc.) that is understandable by programmers.

- Editable: Programmers can easily modify, debug, and enhance the source code.

- Structured: Source code is organized into functions, classes, and modules, making it easier to manage and understand.

- Comments: Programmers can include comments in the source code to explain the logic, making it easier for others (or themselves) to understand later.

Use:• Source code is used during the development phase of software.
It is written, tested, and debugged by programmers

Object Code

Definition: Object code is the machine-readable output generated from the source code after it has been compiled.

It is in binary format and can be executed by a computer's CPU.

Features:

- Machine-Readable: Object code is in a format that the computer can understand and execute directly.
- Not Human-Readable: Unlike source code, object code is not meant to be read or modified by humans.
- Intermediate Representation: Object code may not be a complete executable program; it can be an intermediate step that requires linking with other object files or libraries to create a final executable.
- Platform-Specific: Object code is often specific to the architecture of the machine it was compiled for.

Use:• Object code is used during the execution phase of software. It is what the computer runs to perform the tasks defined in the source code.

- It can be linked with other object files to create an executable program.

Example: The object code generated from the above C source code would be in binary format and not human-readable