

① What is C language?

C is a general-purpose, procedural programming language created in the 1972 by Dennis M. Ritchie at Bell Labs. It is one of the most influential programming languages in computer science.

Key Features:-

- Low-level control :- offer direct access to memory through pointer.
- High performance :- Compiles to fast machine code, making it ideal for system programming.
- Portability :- C programs can run on many different computer architectures with minimal changes.
- Small, powerful standard library :- Provides essential function without essential abstraction.
- Foundation for other languages :- C is heavily influenced C++, Java, C#, Objective-C, Rust, and many others.

② What is the applications of C.

C has a wide range of applications because it is fast, efficient, and close to the hardware. Here are the major areas where C is commonly used:

① Operating Systems:-

C is used to build core parts of operating system such as:

- Linux
- Unix
- Windows Kernel components its low-level control makes it ideal for managing memory and hardware.

② Embedded Systems:-

C is the dominant language for:

- Microcontrollers
- Firmware
- IOT devices

Because it generates compact, fast code that runs directly on hardware.

③ System Software:-

C is widely used to develop:

- compilers
- interpreters
- device drivers.
- File systems

This requires direct hardware interaction and high performance.

④ Game Development:-

older and high-performance game engines or core engine parts are written in C due to speed and control.

⑤ Database Systems :-

Many popular DBMS are written in C, such as:

- MySQL
- PostgreSQL
- Oracle Database (core parts)

⑥ Networking :-

C is used for:

- Network drivers
- Protocol implementations
- High performance servers (like NGINX)

③ What is variable?

① A variable is a named storage location in a program that holds a value.

② A variable has a name.

③ It is a data type. (like int, float)

④ It holds a value (like, 10, 3.14)

⑤ The value stored in a variable can change during program execution.

④ What are different data types in C?

C provides several data types to store different kinds of values. They are grouped into categories.

① Basic Data Types :-

These are the fundamental types.

Integers

Used to store whole numbers.

- int
- short
- long
- long long
- unsigned, int, unsigned long, etc.

Floating-point numbers:

Used to store real numbers (decimals),

- float
- double
- long double

Characters:

- stores a single character.
- char

② Derived Data Types :-

- Arrays \rightarrow `int a[10];`
- Pointers \rightarrow `int *ptr;`
- Function \rightarrow return accept values
- Structures \rightarrow (struct)
- Unions (union):

③ Enumeration Data Type :-

Used to define a set of named integer constants.

- enum

④ Void Type :-

Represents "nothing" or "no value".

- void

⑤ What is Format specifier?

A Format specifier in C is a symbol used inside functions ~~to~~ tell the compiler what type of data you want to print or read.

It acts as a placeholder for a variable's value.

- In C language, C needs to know,
 - what kind of value you are printing
 - How to read input safely.

Data type	Format specifier
Integer	%d or %i
Float	%f
Double	%lf
Character	%c
String	%s
Long integer	%ld
Unsigned int	%u
Pointer	%p
long long int	%lld
Short int	%hd
long double	%Lf