“चला तर, Coding शिकू आपल्या भाषेत!”

Marathi Coding Shala

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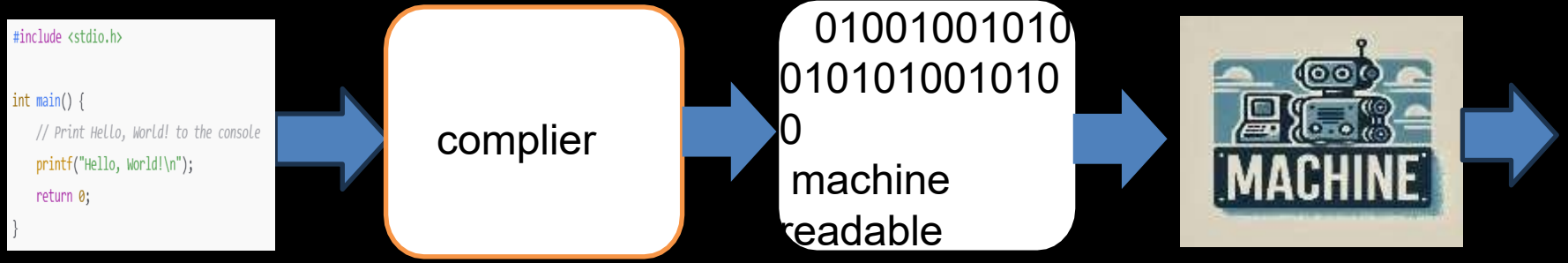
❑ What is Complier:

A **compiler** is a program that translates high-level code (like C, Java) into machine code or binary code that a computer can understand and execute.



❑ Basic Structure of a C Program

```c
#include <stdio.h>   // Preprocessor directives (header files)

int main()           // Main function – entry point of program
{
    // Variable declaration
    int a, b, sum;

    // Input
    printf("Enter two numbers: ");
    scanf("%d %d", &a, &b);

    // Processing
    sum = a + b;

    // Output
    printf("Sum = %d\n", sum);

    return 0;   // Exit status
}
```

❑ .c vs .h extensions

Feature	.c Files	.h Files
Purpose	Contains function definitions and main logic.	Contains declarations and prototypes.
Compilation	Compiled into object code.	Not compiled; included in .c files.
Content	Has variable definitions and implementations.	Contains function prototypes and constants.
Usage	Implements program functionality.	Shared declarations among multiple files.

❑ Variable

Being able to vary (change)

Example:

Email id:

Password:

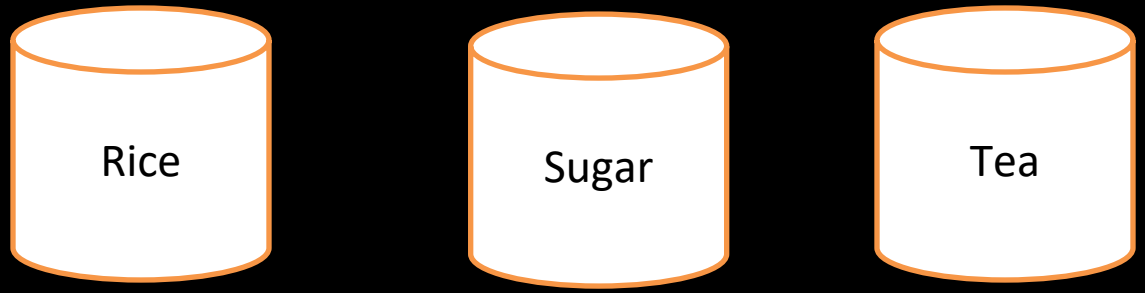
Example :

y=3x

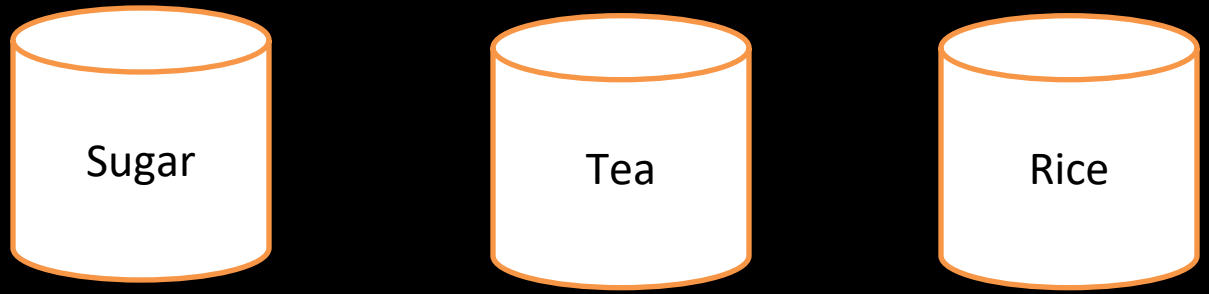
x	y=3x
1	3
2	6
3	9

❑ Variable just like container:

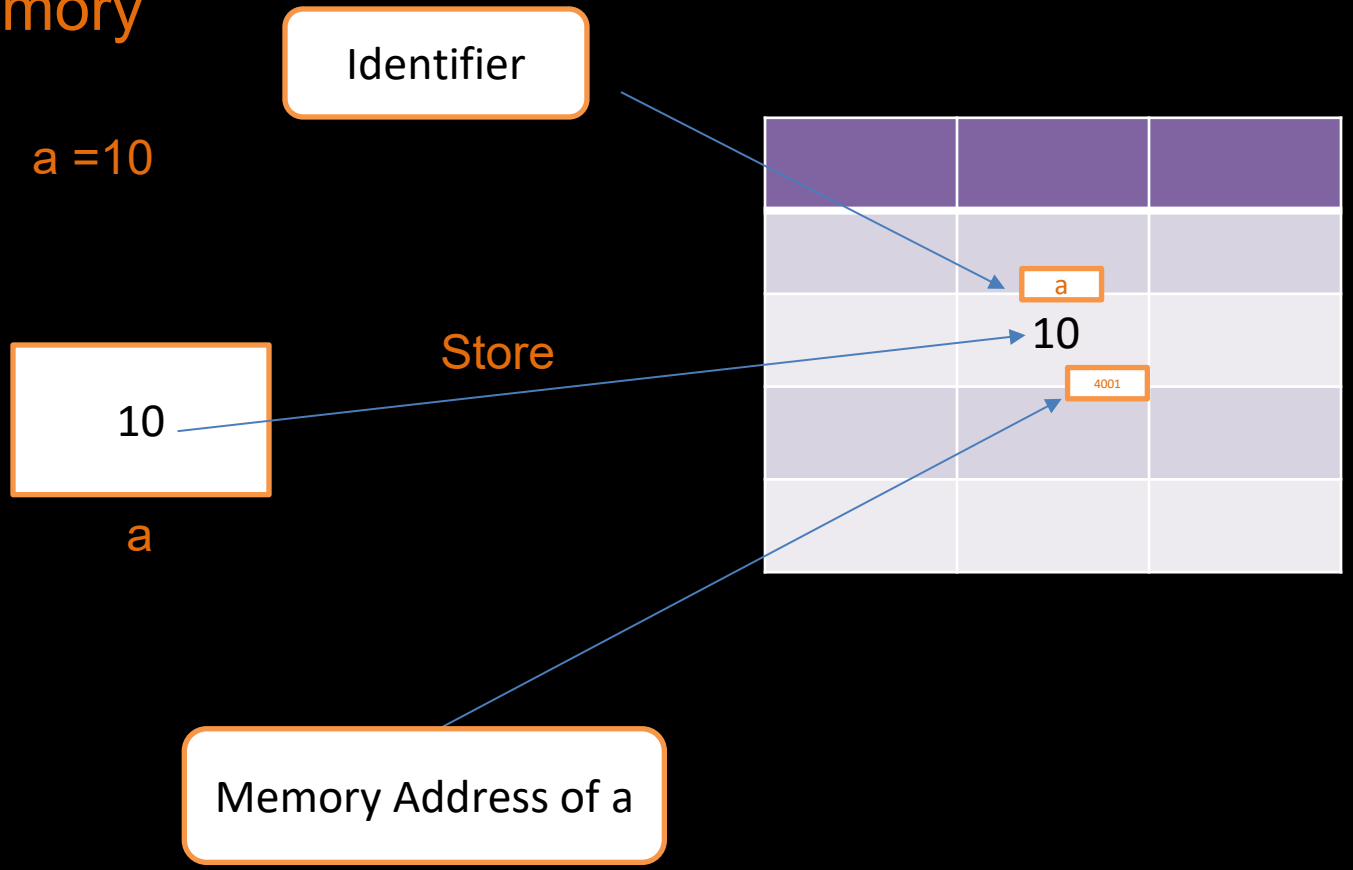
T =1



T =2



❑ How Variables are Stored in Memory



❑ Key Rules for Identifiers in C:

- **Allowed Characters**: Identifiers can include letters (A-Z, a-z), digits (0-9), and underscores (_))
- **Starting Character**: They must start with a letter or an underscore. (e.g., count, _total)
- **Case Sensitivity**: Identifiers are case-sensitive, so Value and value are considered different
- **Reserved Words**: Identifiers cannot be keywords (like int, return, for, etc.).

❑ Examples of Valid and Invalid Identifiers

- **Valid**: myVar, _temp, count2, max_value
- **Invalid**: 2ndValue (starts with a digit), int (a reserved word)

❑ Common Uses of Identifiers in C:

- **Variable Names**: int age;
- **Function Names**: void calculate();
- **Array Names**: int numbers[5];

Understanding the Need for Data Types in C :

Google Map:

Your location

Choose destination

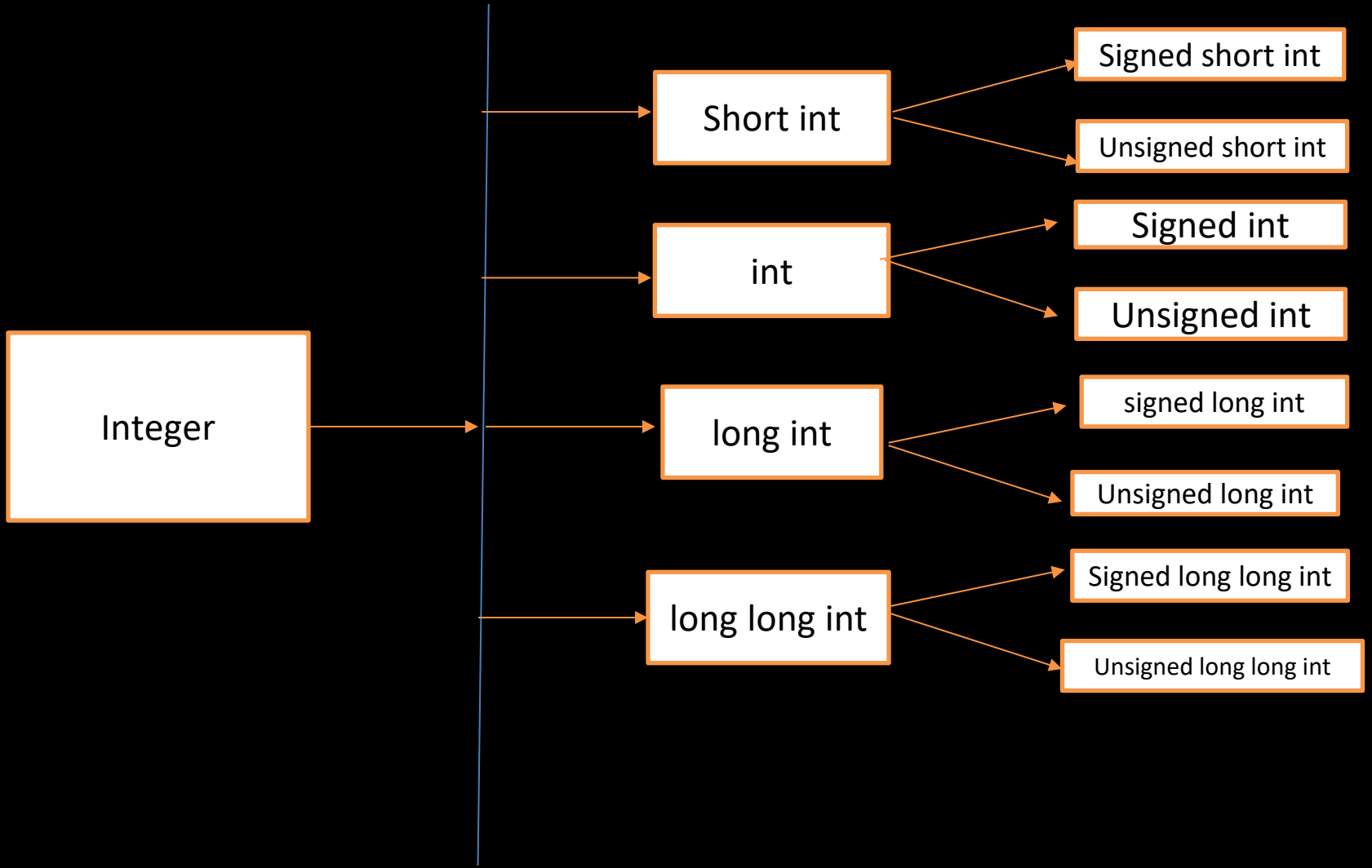
Atm Pin:

abcd

1234

❑ Data Types in c

Primitive	Derived	user defined
int	array	structure
Float	pointer	union
char	string	enum
Void & other		typedef


Integer
Short int
Signed short int
Unsigned short int
int
Signed int
Unsigned int
long int
signed long int
Unsigned long int
long long int
Signed long long int
Unsigned long long int

n bit =2^n byte

8 bit=1byte=2^3

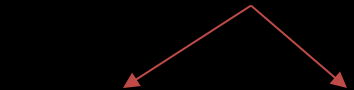
Data Type	Typical Size (Bytes)	Range (Signed)	Range (Unsigned)	Example (Signed)	Example (Unsigned)
`short int`	2	-32,768 to 32,767	0 to 65,535	`short int x = -32768;`	`unsigned short x = 65535;`
`int`	4	-2,147,483,648 to 2,147,483,647	0 to 4,294,967,295	`int x = -2147483648;`	`unsigned int x = 4294967295;`
`long int`	4 (or 8 on some systems)	-2,147,483,648 to 2,147,483,647 (or larger on 8-byte systems)	0 to 4,294,967,295 (or larger on 8-byte systems)	`long int x = -2147483648L;`	`unsigned long x = 4294967295UL;`
`long long int`	8	-9,223,372,036,854,775,808 to 9,223,372,036,854,775,807	0 to 18,446,744,073,709,551,615	`long long x = -9223372036854775807LL;`	`unsigned long long x = 18446744073709551615ULL;`

n bit (int/short/long int/long long int)

Unsigned: n bit =>2^n Values

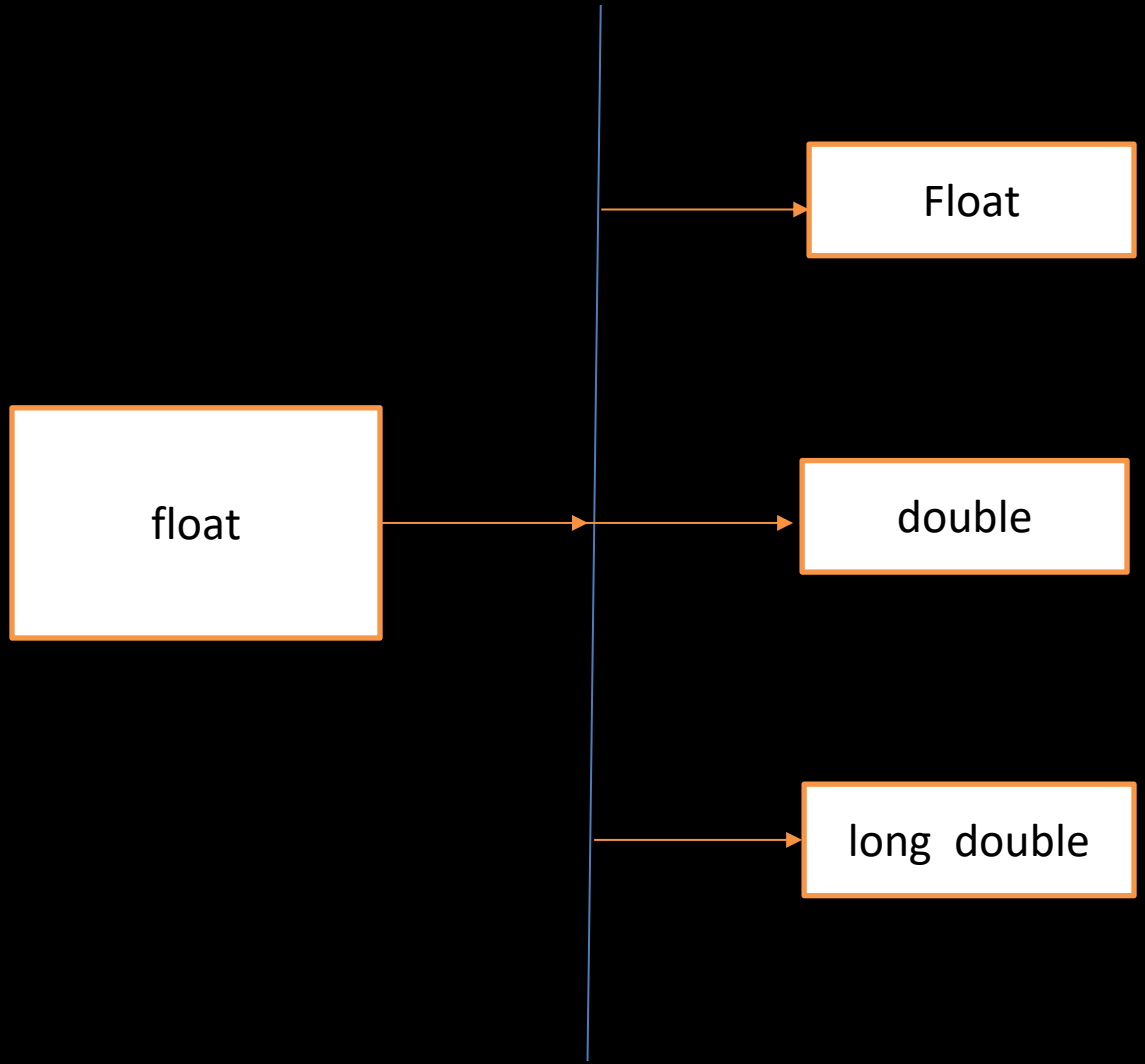
0 to 2^n-1

Signed : n bit =>2^n Values

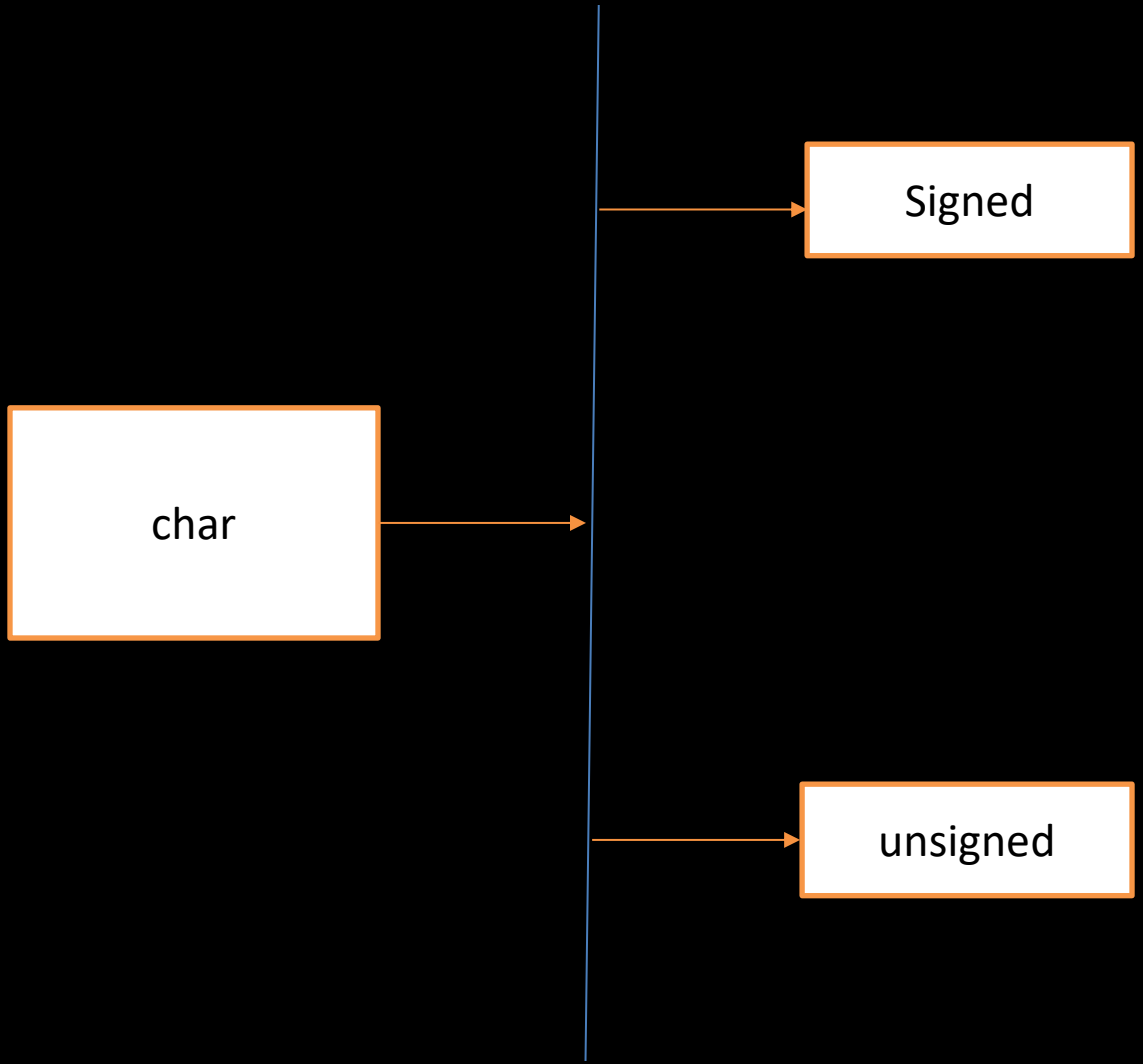


2^n -1 2^n-1

Range=-2^(n-1) to 2^(n-1)


Float
float
double
long double

Data Type	Size (bytes)	Approximate Range	Example
`float`	4	±1.5 × 10^−45 to ±3.4 × 10^38	`float a = 3.14f;`
`double`	8	±5.0 × 10^−324 to ±1.7 × 10^308	`double b = 3.141592653589793;`
`long double`	8 (or 16 on some systems)	±3.4 × 10^−4932 to ±1.1 × 10^4932 (depends on architecture)	`long double c = 3.14159265358979323846264338327950288L;`


Signed
char
unsigned

Data Type	Size (bytes)	Range	Example
`char`	1	-128 to 127 (or 0 to 255 if unsigned)	`char ch = 'A';`
`signed char`	1	-128 to 127	`signed char sch = -42;`
`unsigned char`	1	0 to 255	`unsigned char uch = 250;`

Format Specifier	Description	Example
`%d`	Signed integer	`printf("%d", -42);`
`%u`	Unsigned integer	`printf("%u", 42);`
`%f`	Floating-point number	`printf("%f", 3.14);`
`%c`	Single character	`printf("%c", 'A');`
`%s`	String of characters	`printf("%s", "Hello");`
`%x`	Hexadecimal integer (lowercase)	`printf("%x", 255);`
`%o`	Octal integer	`printf("%o", 8);`
`%p`	Pointer address	`printf("%p", (void*)&var);`
`%%`	Percent sign	`printf("100%% done");`

❑ printf – printing output

•Printf is used to display text and variables on the screen.

• You provide a format string, which can include text and format specifiers (like %d for integers, %f for floats, etc.) that tell printf how to display the data.

❑ scanf– reading input

•scanf is used to take input from the user and store it in variables.

•You need to provide format specifiers and variable addresses where the input data should be stored.

1. Which of the following is the correct way to declare an integer variable in C?
   - A) int number = "10"
   - B) float number = 10
   - C) int number = 10
   - D) char number = 10

2. What will be the output of the following code?

```
#include <stdio.h>
int main() {
    int a = 5;
    printf("a = %d\n", a);
    return 0;
}
```

   - A) a = 5
   - B) a = %d
   - C) a = a
   - D) Error

3. Which format specifier is used to read a floating-point number using `scanf`?
   - A) `%d`
   - B) `%f`
   - C) `%c`
   - D) `%s`

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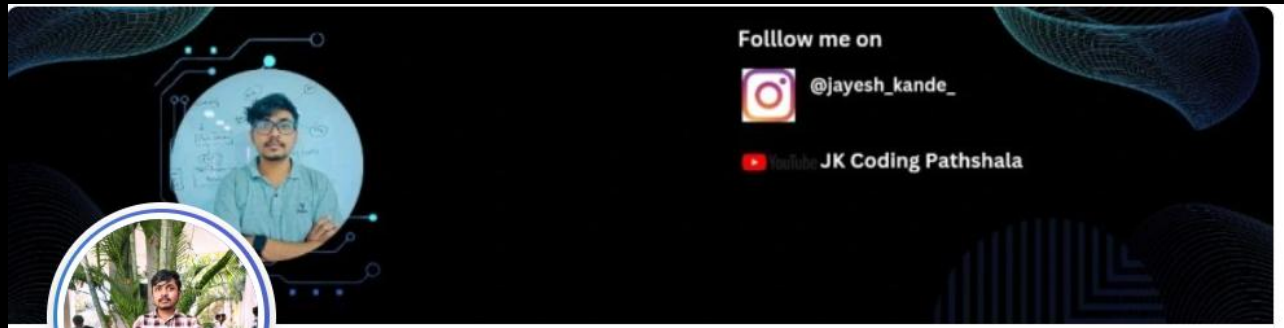

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