

"समय न लगाएँ इसमें कि क्या करना है,  
वरना समय ये तय करेगा कि आपका क्या कराना है।"

Beyond the Basics

# DSA LAUNCH PAD WITH CPP

A 3D character of a person with blonde hair, wearing a red shirt and white pants, stands next to a white flipchart on a tripod stand. The flipchart displays a bar chart with four bars of increasing height in blue, green, yellow, and orange. Below the chart is a pie chart. The background behind the character is a large blue circle. The overall theme is educational and professional.

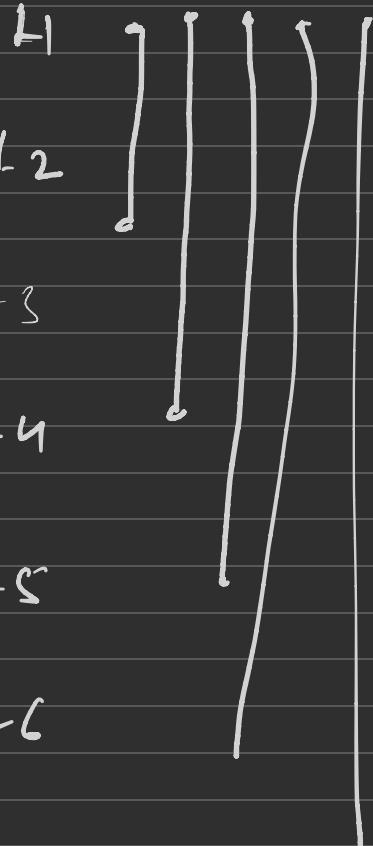
# Welcome & Vision

Why you started this course.

"I don't just want you to learn coding.....

Don't Mug up - You are Engineer

Change Studying methods



# Course Roadmap

Roadmap

CPP → OOPs → STL →

DSA

A  
L  
Pattern

HomeWork Problems

Class Code

Notes



120%

- Present (Solo)
- Up / Pub

Where they'll stand after completing the course.

✓ How to Revise

7 - 8

80 (10).

10

11 / 12

My Expectation and Your Expectations

*Let's Start the CPP 😊*

*What is Programming ?*

*Programming means giving instructions to a computer to do something for us.*

*What is C++ Programming ?*

# PROGRAMMING LANGUAGES AND THEIR USES

## PYTHON

- 1) Data Science ✓
- 2) Machine Learning ✓
- 3) Web Development ✓
- 4) Automation ✓
- 5) Game Development ✓
- 6) Data analysis ✓
- 7) Data visualization ✓
- 8) Artificial intelligence ✓

## JAVA

- 1) Android Apps ✓
- 2) Server-Side Apps ✓
- 3) Enterprise Apps ✓
- 4) Web Based Apps ✓
- 5) Big data ✓
- 6) Game Development ✓
- 7) Internet of things ✓
- 8) Cloud computing ✓

## C++

- 1) Games Development ✓
- 2) GUI Apps ✓
- 3) OS ✓
- 4) Database Systems ✓
- 5) Embedded ✓
- 6) Networking ✓
- 7) Virtual Reality ✓
- 8) Computer Vision ✓

## JAVASCRIPT

- 1) Server-side Dev ✓
- 2) Web Dev and Apps ✓
- 3) Mobile Apps ✓
- 4) Machine Learning ✓
- 5) IoT ✓
- 6) Automation ✓
- 7) Embedded system ✓
- 8) Chatbot Development ✓

## SWIFT

- 1) IOS App Dev ✓
- 2) Deep Learning ✓
- 3) IOT ✓
- 4) Server-side Dev ✓
- 5) Open-source Dev ✓
- 6) MacOS App Dev ✓
- 7) Machine Learning ✓
- 8) Automation ✓

## C#

- 1) Games Development ✓
- 2) Web Dev and Apps ✓
- 3) IOT ✓
- 4) Backend Services ✓
- 5) Windows App Dev ✓
- 6) Robotics ✓
- 7) Cloud computing ✓
- 8) Database program ✓

AI/ML

SB/IH

Assembly

C / C++

## Structure of C++ Programming

Execute  
Start of  
program

```
#include <iostream>           Header
using namespace std;          Namespace
int main(){                  Function
    ...
}
return 0;                   Return
```

Contain

num  
fun  
var N

int x  
int y

void sum()  
{  
 cin >> x  
 cin >> y  
 cout <<  
 cout << x + y  
}

Error  
variable  
undefined

main()

{ int x=10

10

printf(x)  
sum()

scanf()

(in >)

cout <<

}

## *Writing First “Hello World” Program*

*How to Print ?*



We have printf().... Then What is this cout << 

cout → Used to print (output) something on the screen.

cout << "Print the Message";

What the heck << is .....

<< → Is called as Insertion Operator, also called as left shift operator.

It is mainly used with cout to send data to the output (screen).

## What is namespace

Namespace is like a special container that holds a group of names - like variables, functions, or classes - to avoid confusion when we have the same name used in different parts of the program.

```
#include <iostream>

using namespace std;

int main(){

    return 0;
}
```

## *Behind the Scenes*

*What exactly happens when we compile the code and run the code.*

*Stuff you never taught by anyone*

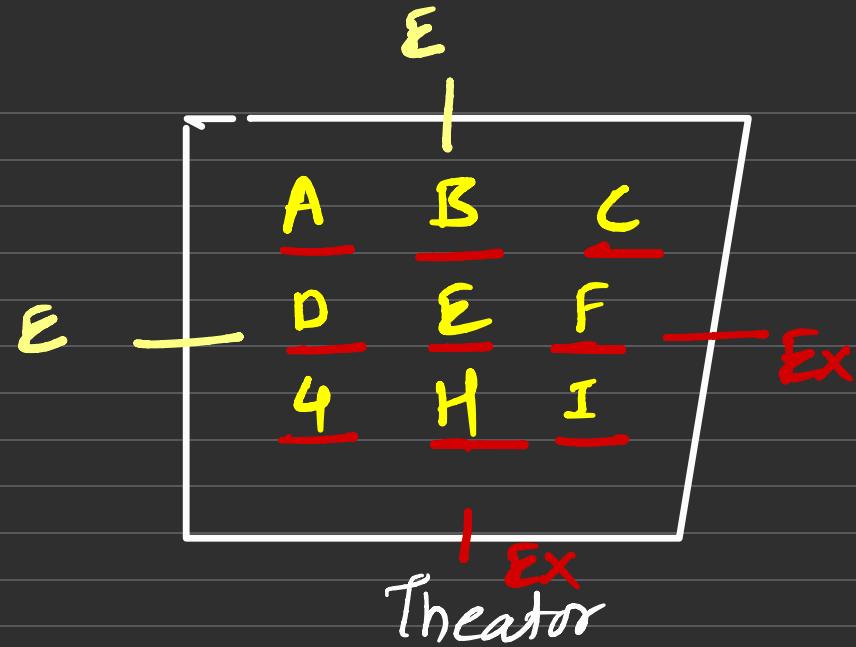




## Variables & Data Types

What is Variable

sahil  
○  
Bhumika = F

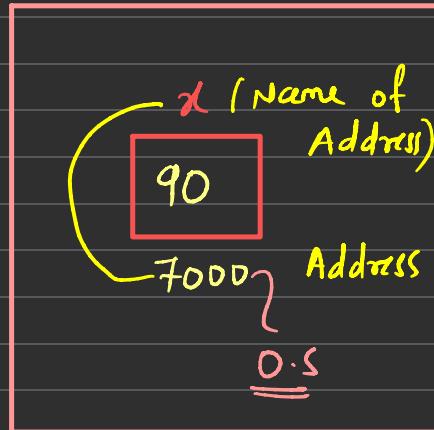


Bhumika → Name of sit

Pramod → Address

int  $x = 90$   
    |

Variable



Ram

Variable:

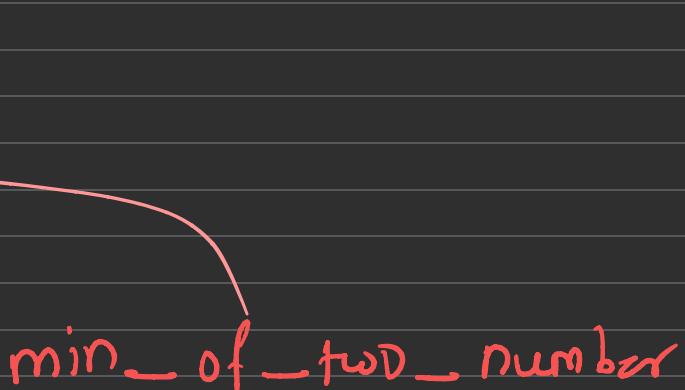
Name given to memory location

How to give names to the variables

min of two Number



minOfTwoNumber



min\_of\_two\_number

Camel Case

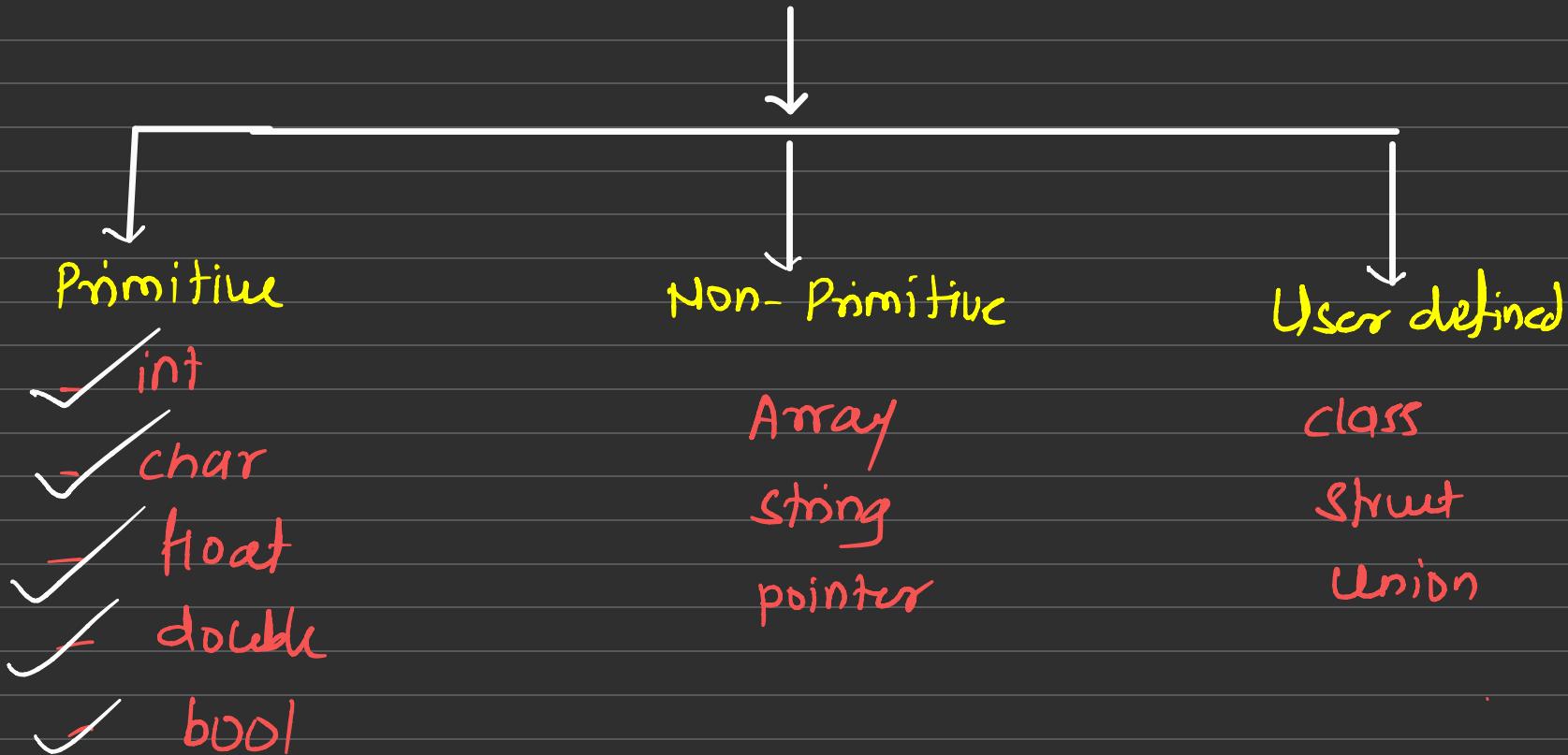
## What is Data Types

- What type of value it store
- What type of operations we can do on it



C.B (plastic)

## Types of Data Types



(int) :

mainly stores integer values.

size = 4 B (32 bits)

12 B (16 bits)

1 B = 8 bits

2 B = 16 bits

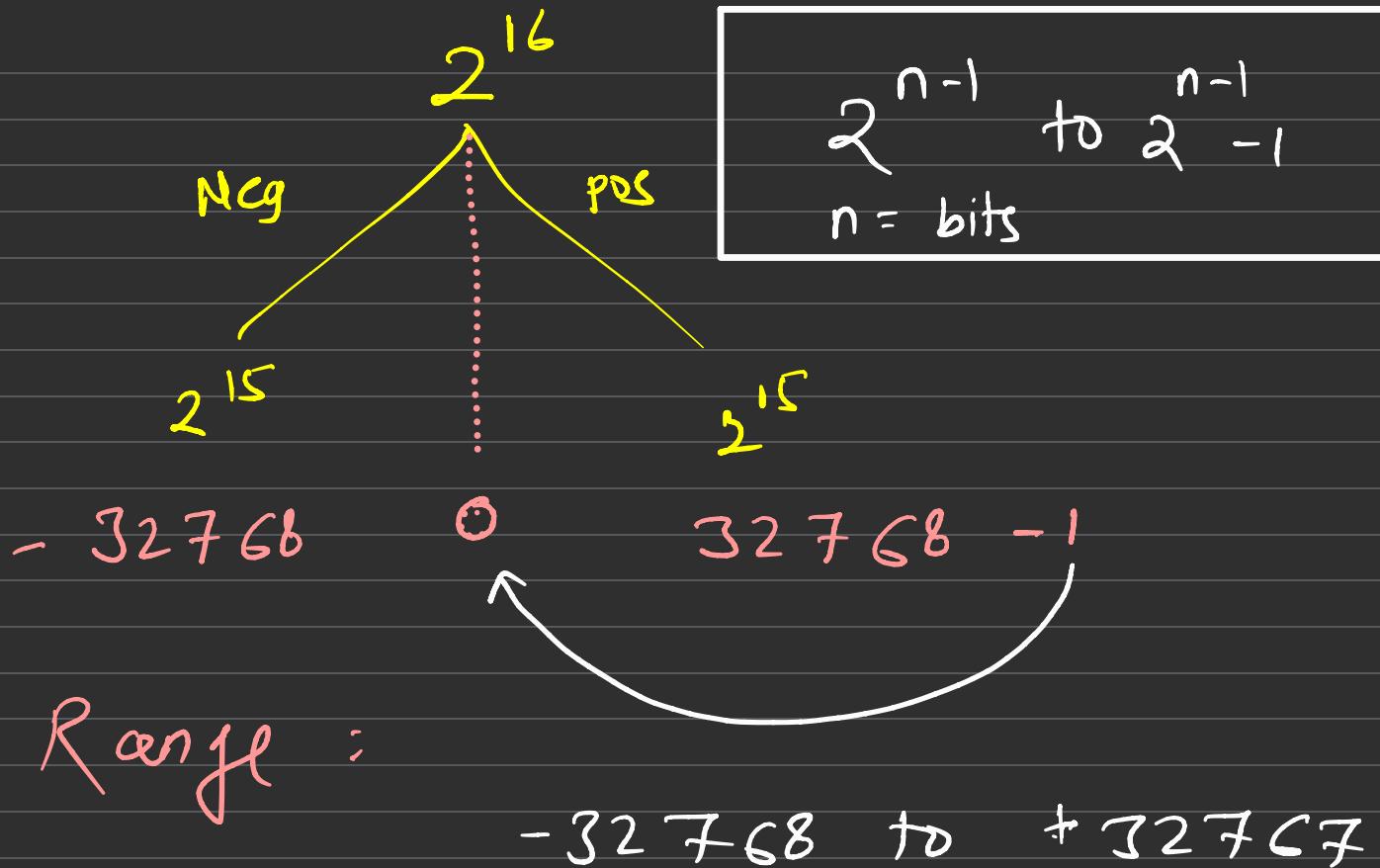
Range =  $n = 16 \text{ bits} = \left\{ \begin{array}{l} 0 \\ 1 \\ 2^{16} \end{array} \right.$

Neg  
pos

$$\frac{2^{16}}{2} = 2^{16} \times 2^{-1}$$

$$= 2^{16+(-1)}$$

$$= 2^{15}$$



(char)

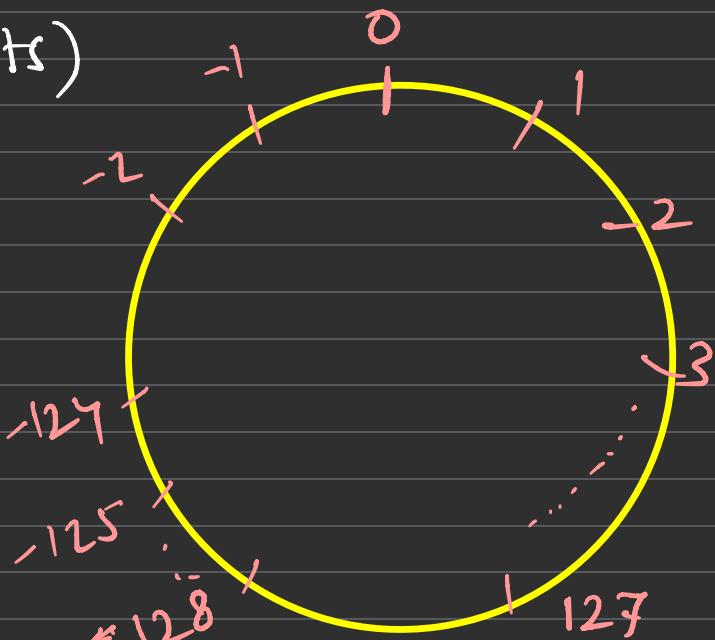
mainly store char values

- **char varName**
- Size = 1 Byte = ( 8 bits)

Range =  $2^{n-1}$  to  $2^{n-1} - 1$

$2^7$  to  $2^7 - 1$

-128 to +127



( float)      ( double)

mainly stores decimal values

float  $x = 10.8$

double  $y = 90.90$

( b00 )

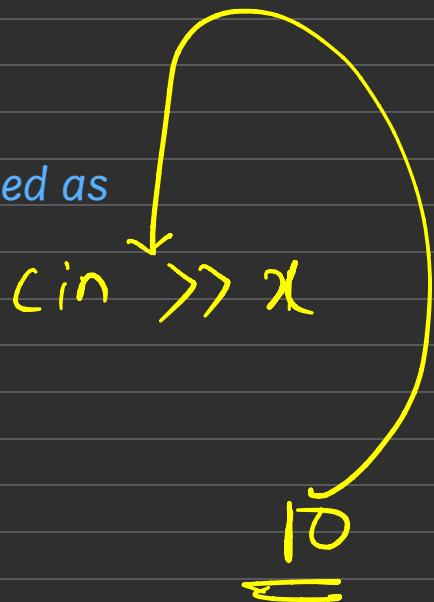
b00)  $\neq$  {      false  $\rightarrow$  0  
                                true  $\rightarrow$  1

## Taking Input from User

`cin` → Used to take input – something from user.

What the heck `>>` is .....

`>>` → Is called as Extraction Operator, also called as right shift operator.



It is mainly used with `cin` to take input from the user.

`cout <<`

`cin >>`

## Operators

Arithmetic Operators = + - / \* %

High priority = / \* %

Low priority = + -

Associativity = Left to Right

+ = Addition      \* = Multiplication      % = Modulo

- = Subtraction      / = Divide

int  $x = 10$      $y = 3$ ,  $c$

$$c = x + y$$
$$= 13$$

$$c = x - y$$
$$= 7$$

$$c = x * y$$
$$= 30$$

$$c = x / y$$
$$= 3$$

$$3 \overline{)10} \overline{)9}$$
$$\underline{10}$$

$$c = x \% y$$
$$= 1$$
$$3 \overline{)10} \overline{)9}$$
$$\underline{9}$$

Remainder



## *Control Flows*

*If*

*If else*

*Nested If else*

*Loops*

*For Loop*

*While Loop*

## *Do While Loop*

*Break*

*Continue*