

# Doubts with Lakshay Bhaiya [Week 1]

Special class

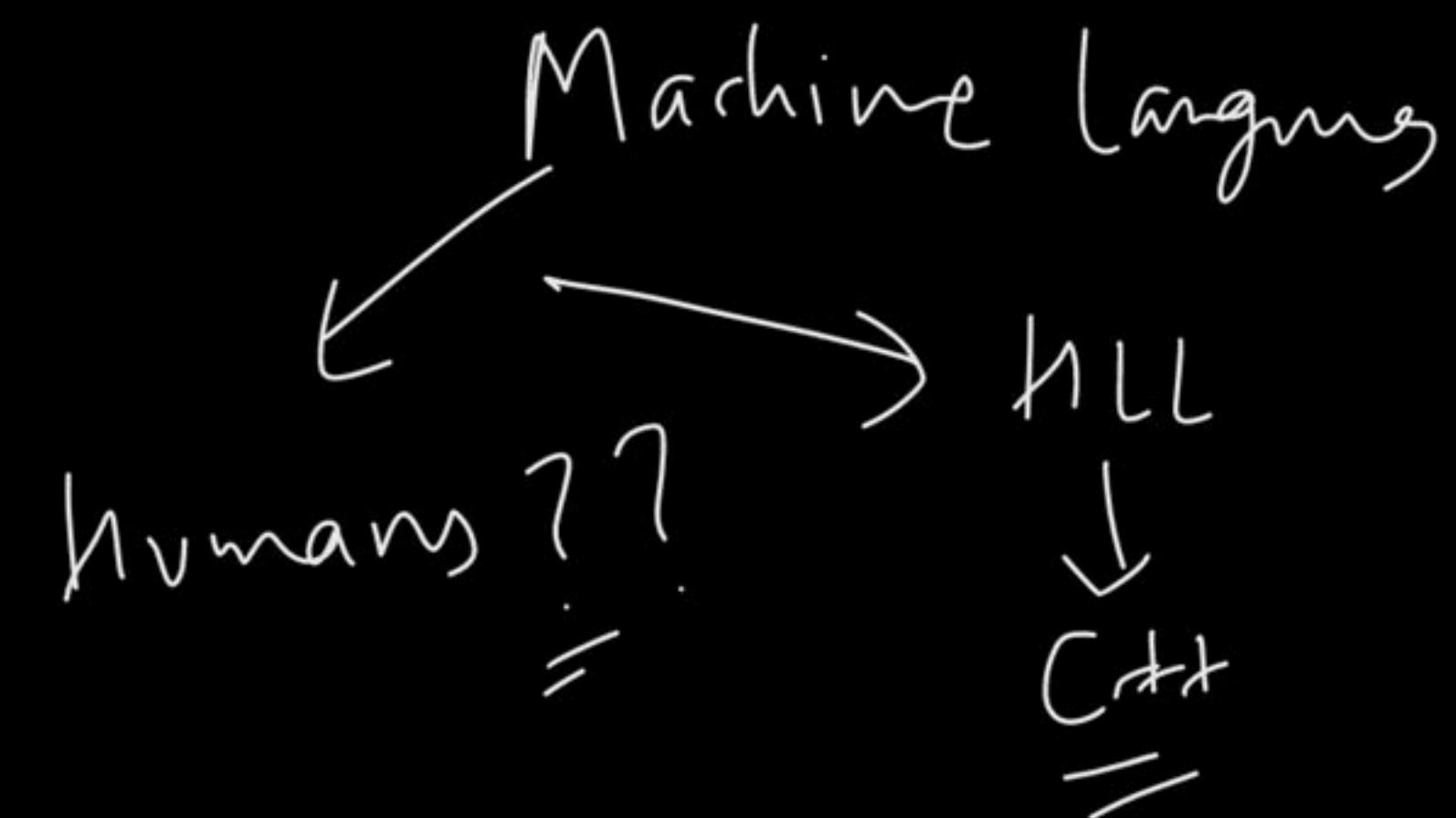
# Introduction to Programming

Instructor: Love Babbar

# How to Approach a Problem ?

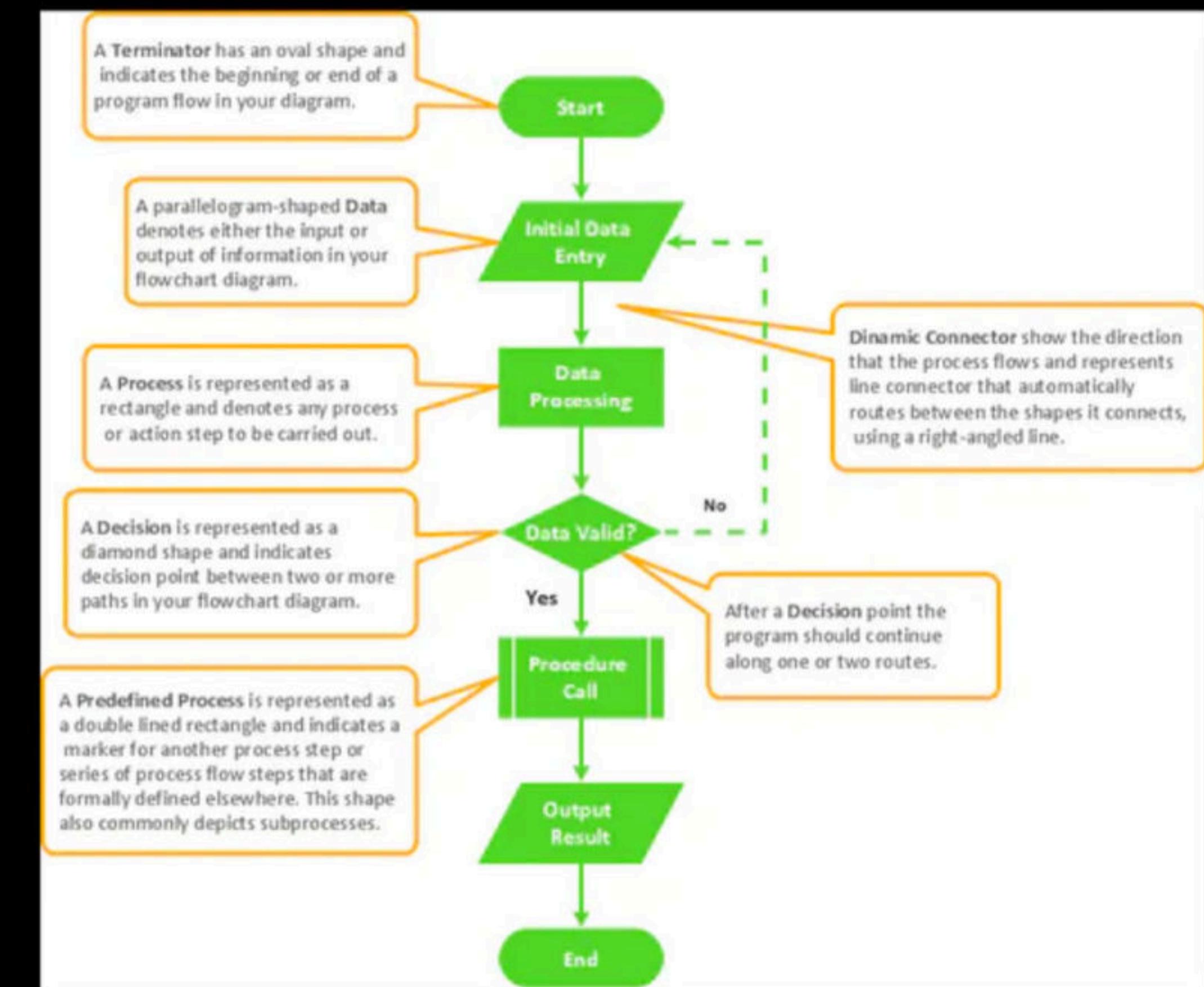
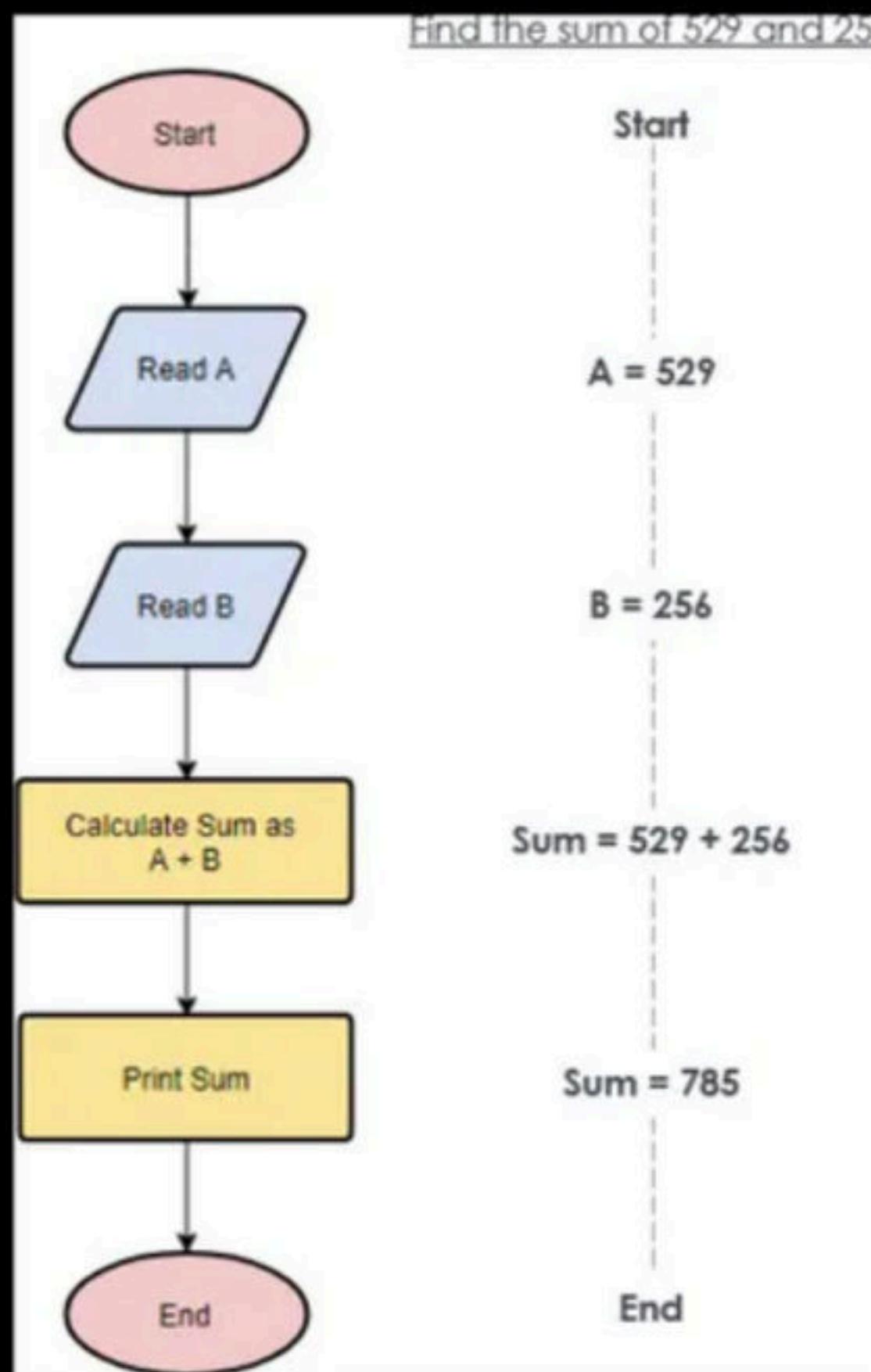
Thought Process

# Using Computer to solve a problem ?



# FlowCharts:

A flowchart is a type of diagram that represents an algorithm, workflow or process. The flowchart shows the steps as boxes of various kinds, and their order by connecting the boxes with arrows. This diagrammatic representation illustrates a solution model to a given problem. Flowcharts are used in analyzing, designing,



# FlowChart Components:

# PseudoCode:

Pseudocode literally means 'fake code'. It is an informal and contrived way of writing programs in which you represent the sequence of actions and instructions (aka algorithms) in a form that humans can easily understand

The screenshot shows a Microsoft WordPad window titled "Document - WordPad". The document contains the following text:

## Pseudocode Examples

Enter value

if value greater than 10

say "Your number is greater than 10"

if value less than 10

say "Your number is less t

At the bottom of the screen, there is a Google Hangouts sharing notification: "Google Hangouts is sharing your screen with hangouts.google.com." with "Stop sharing" and "Hide" buttons. The zoom level is set to 100%.

**Chaliye Sahru karte hai**

# Adding 2 numbers by taking input

# Find Area of a Square

**Calculate Overall percentage from marks:**

# Check num is Even or Odd

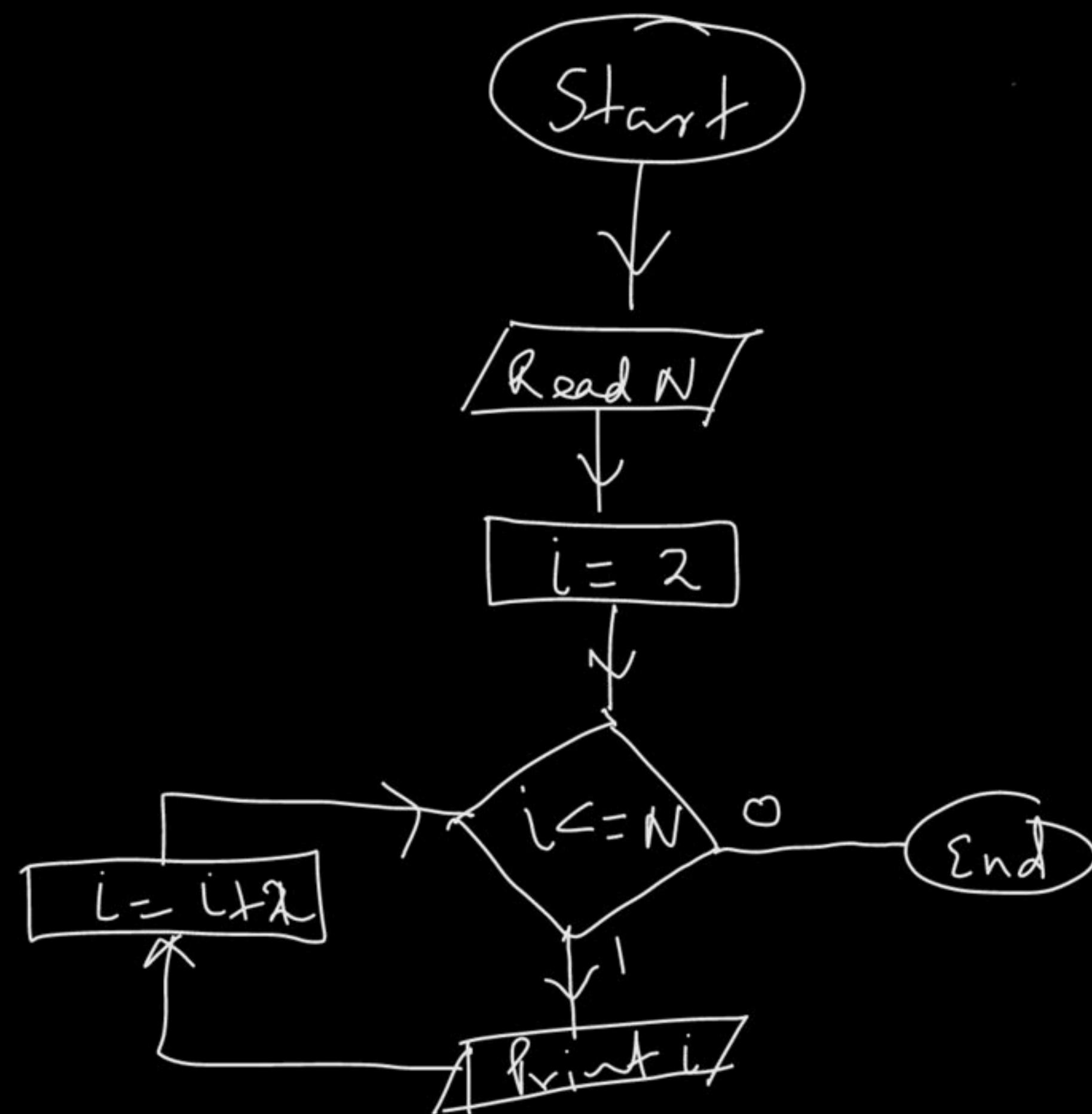
**Check +ve , -ve or 0**

# Student && Grade FlowChart

# Print Counting from 1 to N

# Multiply N numbers from User

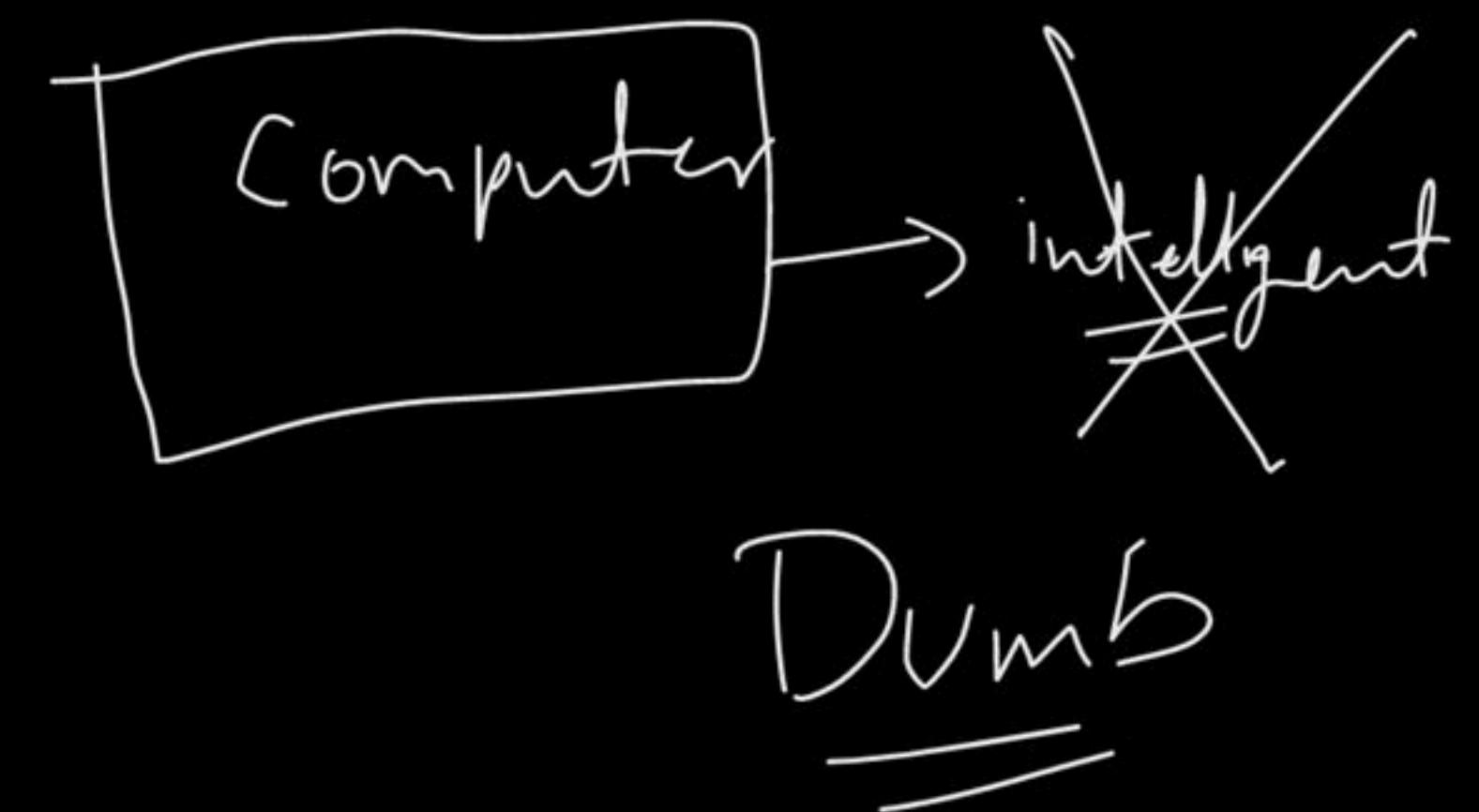
# Print 1 to N , but only Even numbers



2  
↓  
③  
↓  
2  
↓  
4  
↓  
6  
↓  
8  
- - -

# What is a Programming Language ?

Why do we need it ?



# HomeWork:

- Multiply 2 Numbers by taking input
- Find perimeter of a triangle
- Find Simple Interest
- Find Compound Interest
- Print Counting from N to 1
- Find Factorial of a Number
- Check if a number is Prime or not
- Check Valid Triangle or not
- Print max of three number

printf -> C



C++

cout << ch << endl

✓

IDE -> ?

VS Code

Clion -> Paid ??

# Write your First C++ Program

<iostream> -> printf ✓

cout ✓

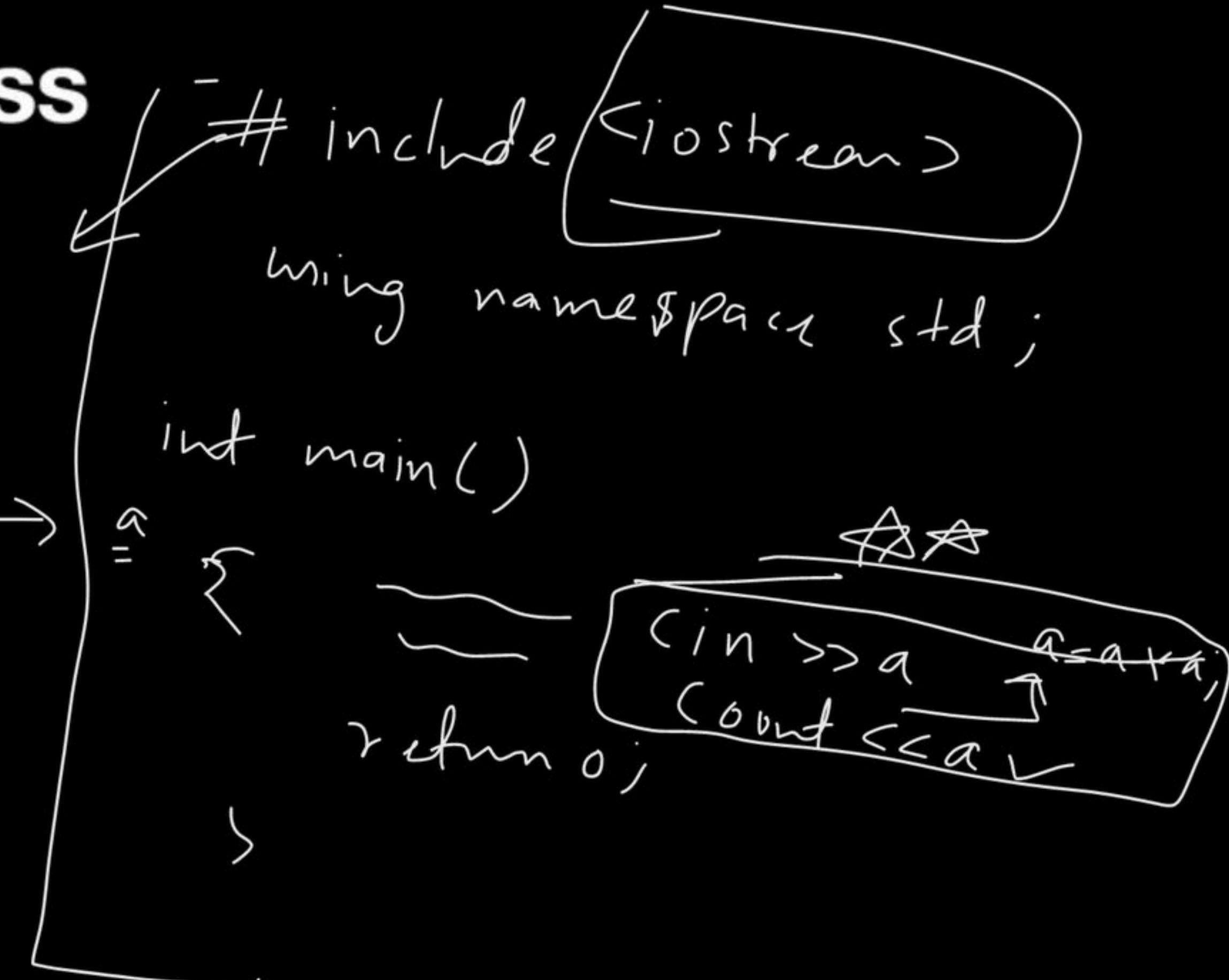
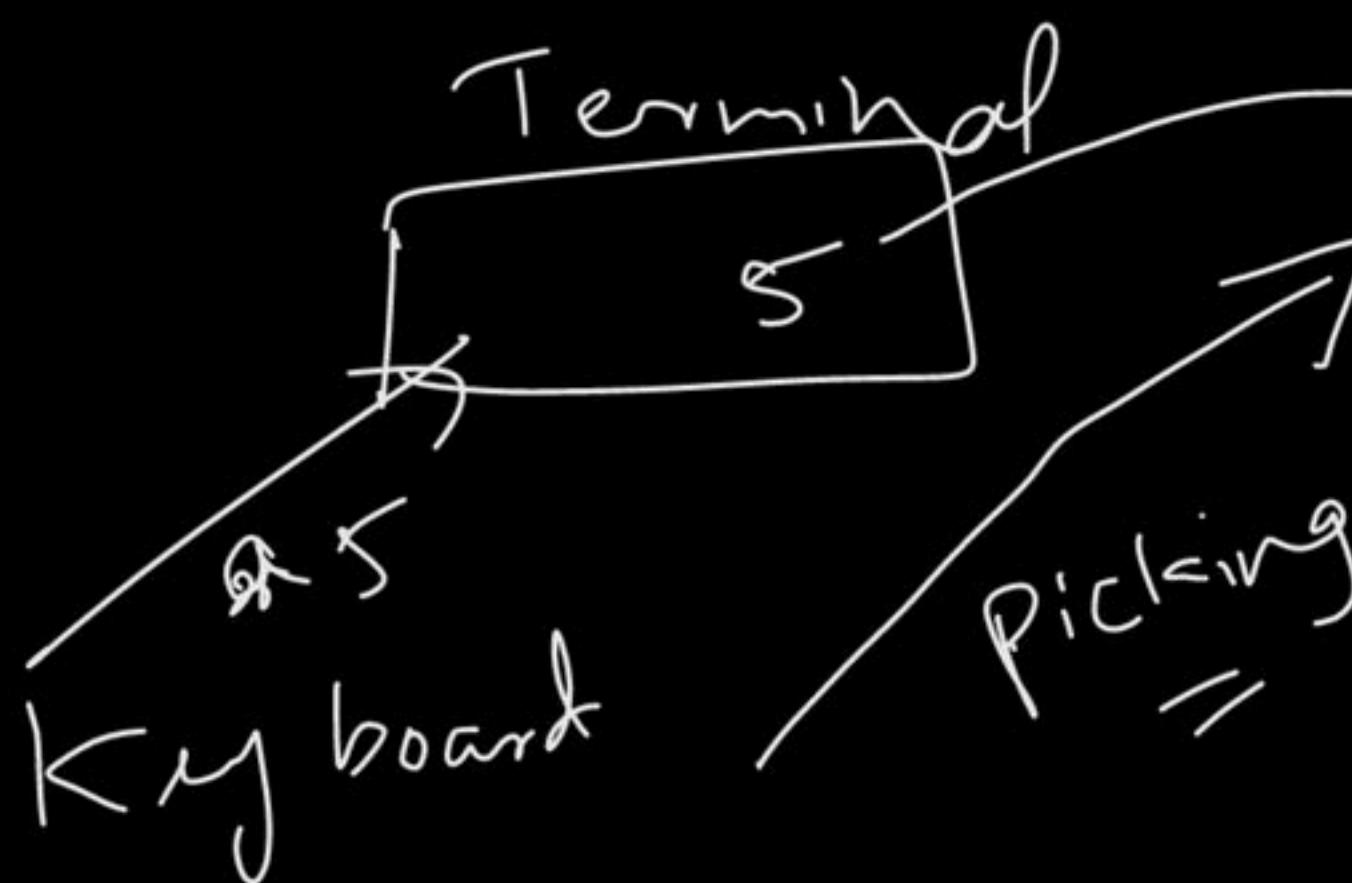
# Programming Languages

## Why do we need it ?

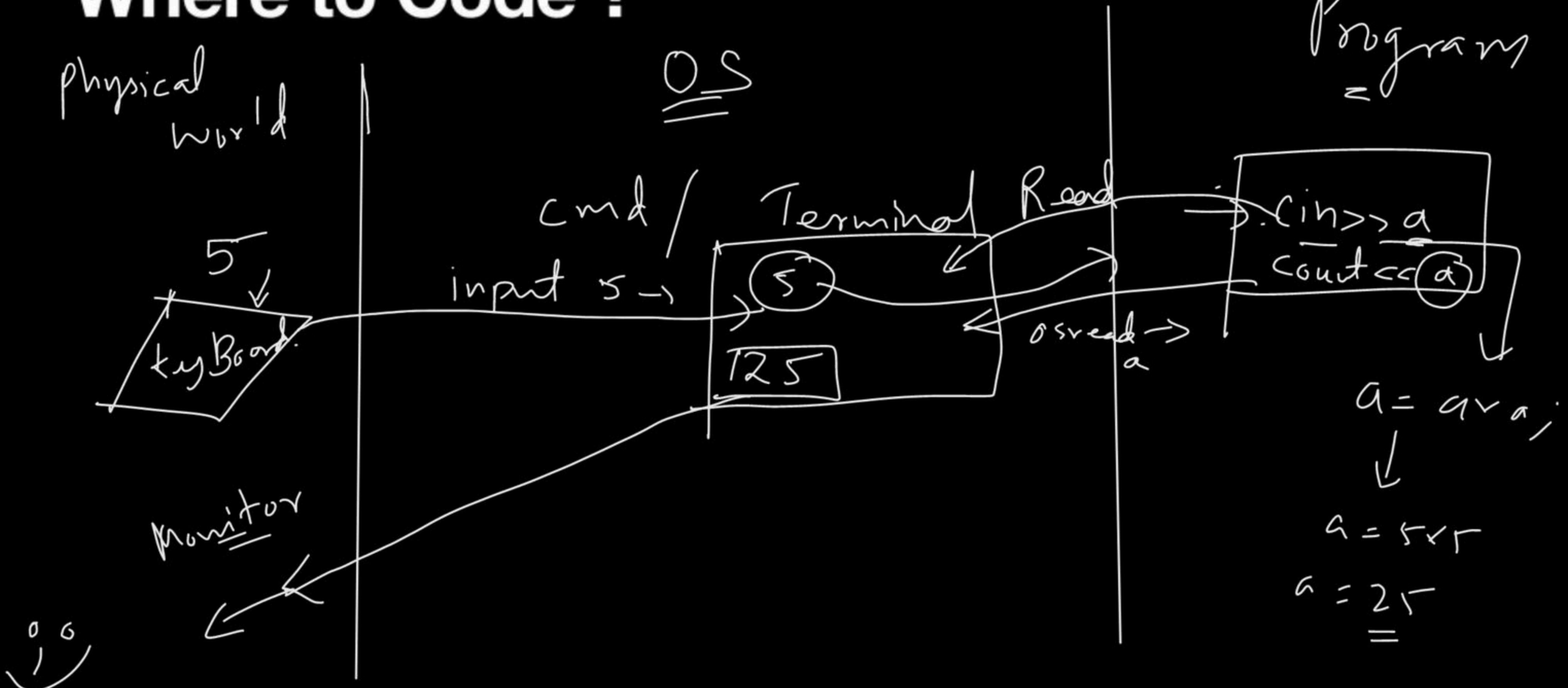
- A Language using which, we can instruct the computer to carry out real life tasks and computations is called a programming language. It acts as a language in which we could easily express our thoughts to the machine.
- Like natural languages, programming language has a fixed set of rules according to which programs could be written in it. These programs are then converted into a language which machines can understand. This task is carried out by a special software called compiler.
- Every language has its own compiler/Interpreter.
- Once a program is compiled and linked, its executable is created and the computer can run our program now.

# Compilation Process

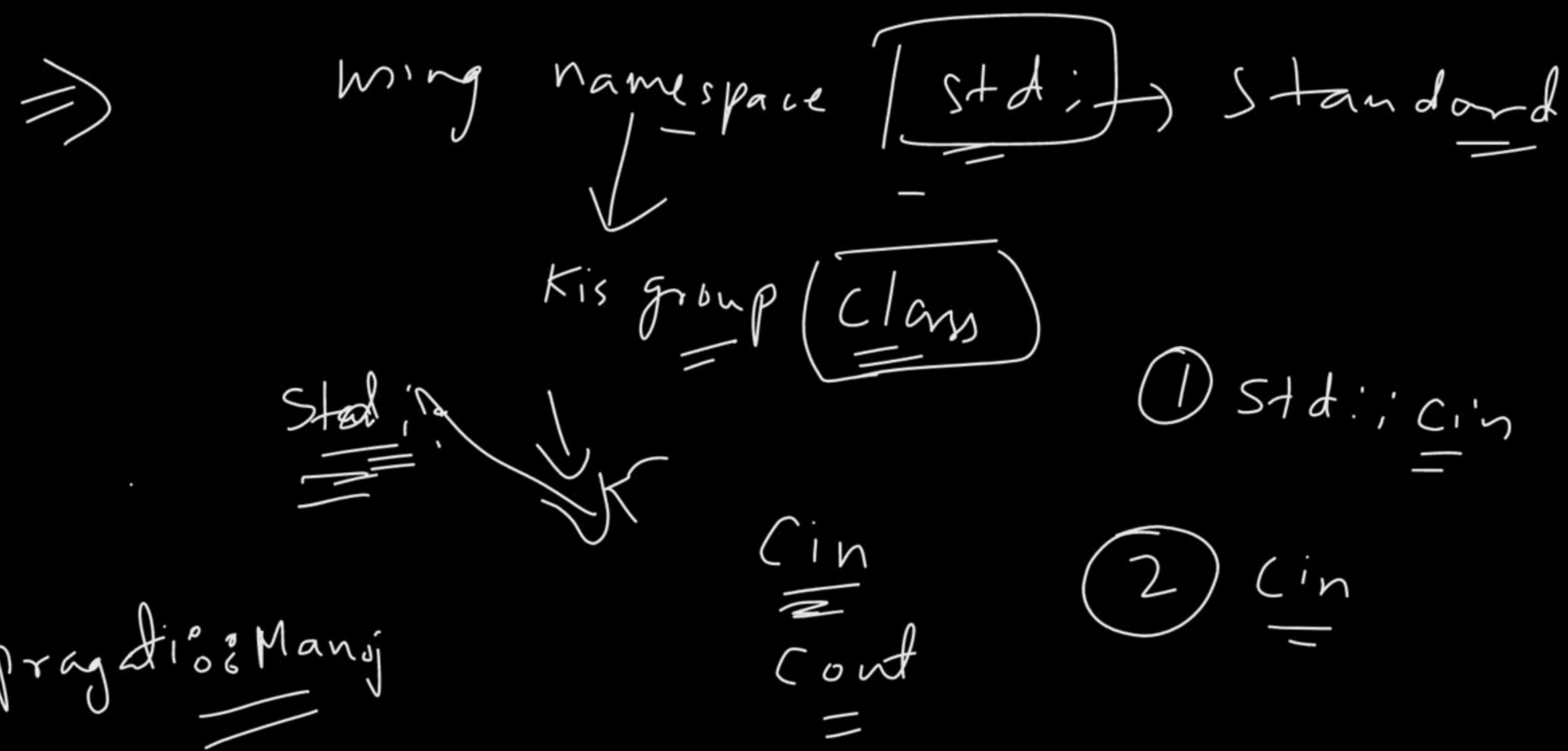
⇒ tent → .cpp →



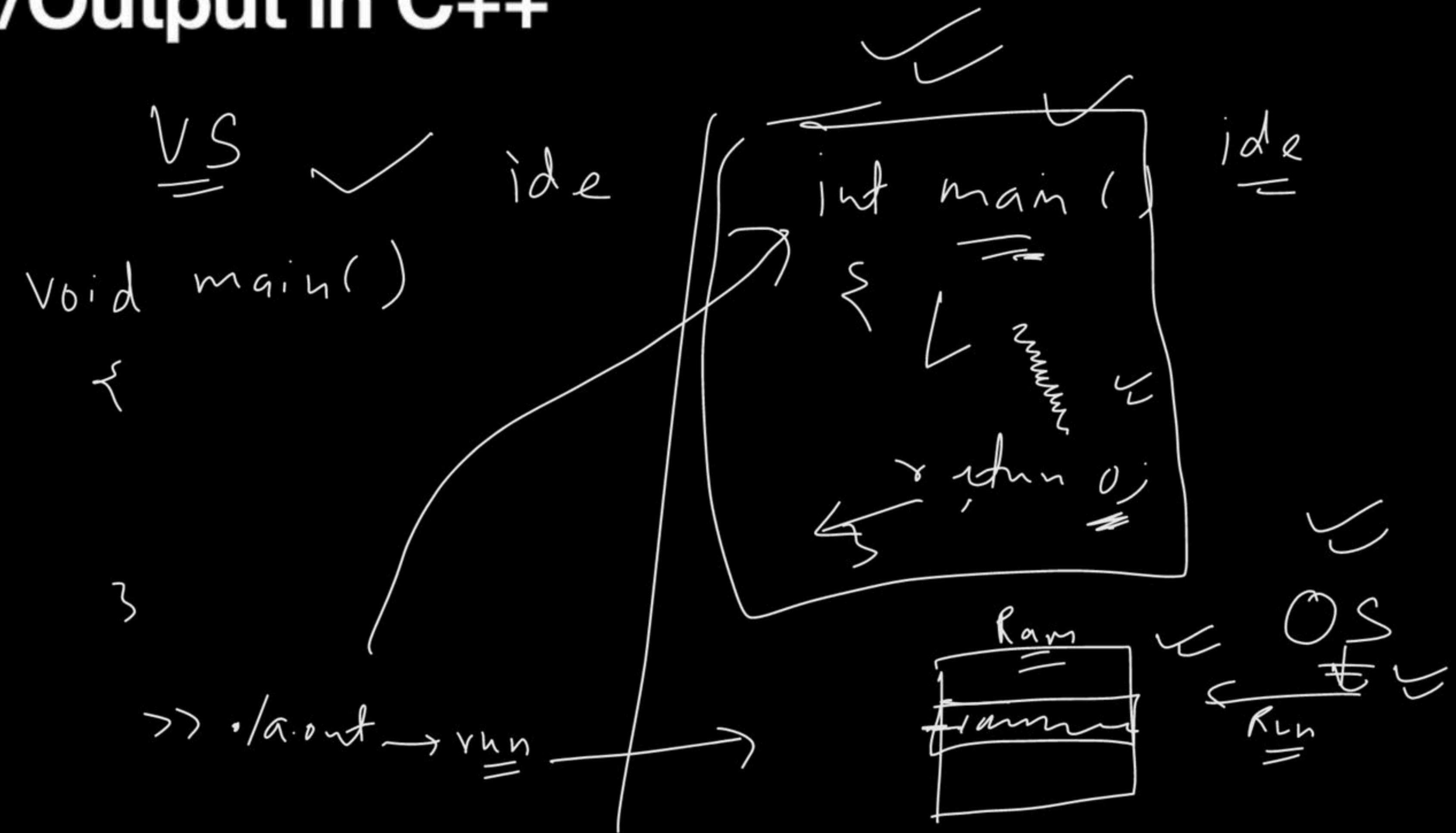
# Where to Code ?



# Let's write down the 1st Code

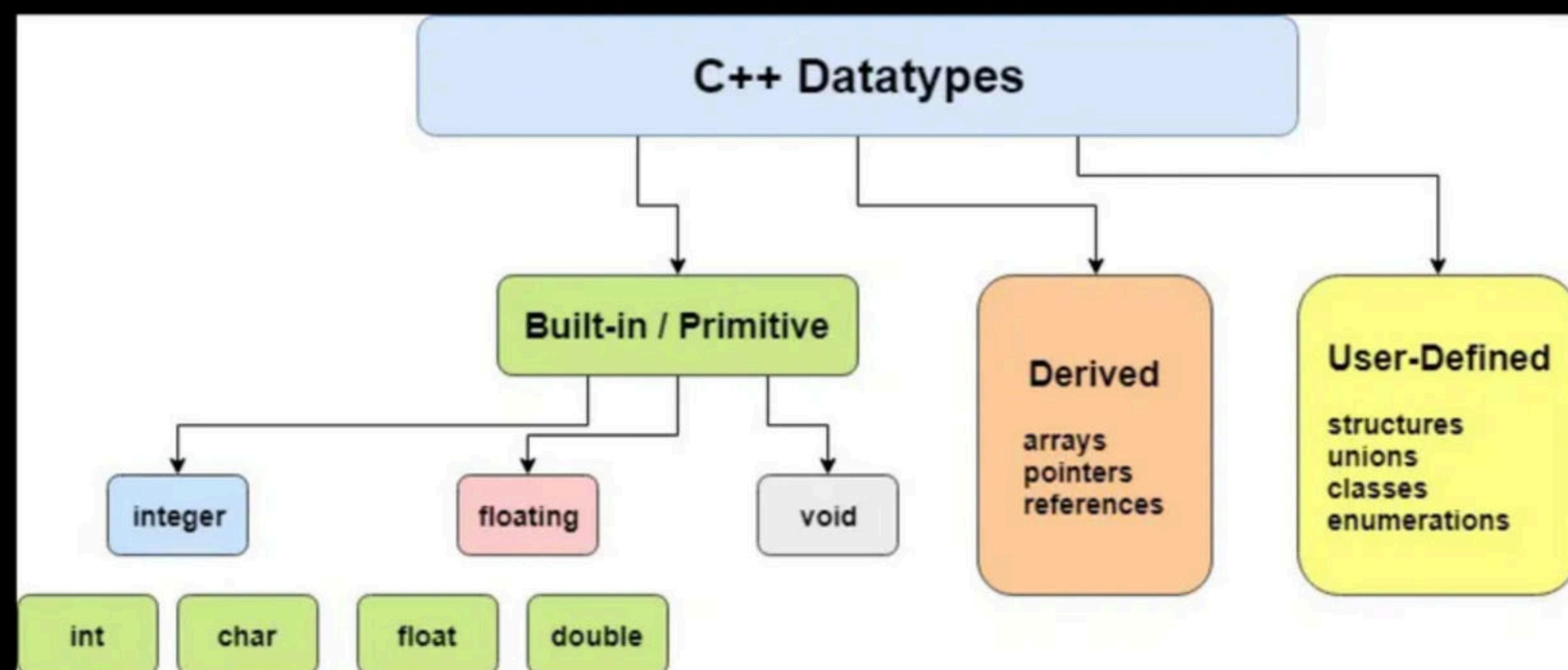


# Input/Output in C++



# Datatypes & Variables:

Variables in C++ is a name given to a memory location. It is the basic unit of storage in a program. The value stored in a variable can be changed during program execution. A variable is only a name given to a memory location, all the operations done on the variable effects that memory location.



# Datatypes:

C Basic Data Types	32-bit CPU		64-bit CPU	
	Size (bytes)	Range	Size (bytes)	Range
char	1	-128 to 127	1	-128 to 127
short	2	-32,768 to 32,767	2	-32,768 to 32,767
int	4	-2,147,483,648 to 2,147,483,647	4	-2,147,483,648 to 2,147,483,647
long	4	-2,147,483,648 to 2,147,483,647	8	9,223,372,036,854,775,808-9,223,372,036,854,775,807
long long	8	9,223,372,036,854,775,808-9,223,372,036,854,775,807	8	9,223,372,036,854,775,808-9,223,372,036,854,775,807
float	4	3.4E +/- 38	4	3.4E +/- 38
double	8	1.7E +/- 308	8	1.7E +/- 308

# Variable Naming Conventions

## Naming Conventions rules for Variables are:

- It should begin with an alphabet.
- There may be more than one alphabet, but without any spaces between them.
- Digits may be used but only after alphabet.
- No special symbol can be used except the underscore (\_) symbol. When multiple words are needed, an underscore should separate them.
- No keywords or command can be used as a variable name.
- All statements in C++ language are case sensitive. Thus a variable **A** (in uppercase) is considered different from a variable declared **a** (in lowercase).

# **How data is Stored ?**

**+ve or -ve integers ?**

# Brain Teaser #1:

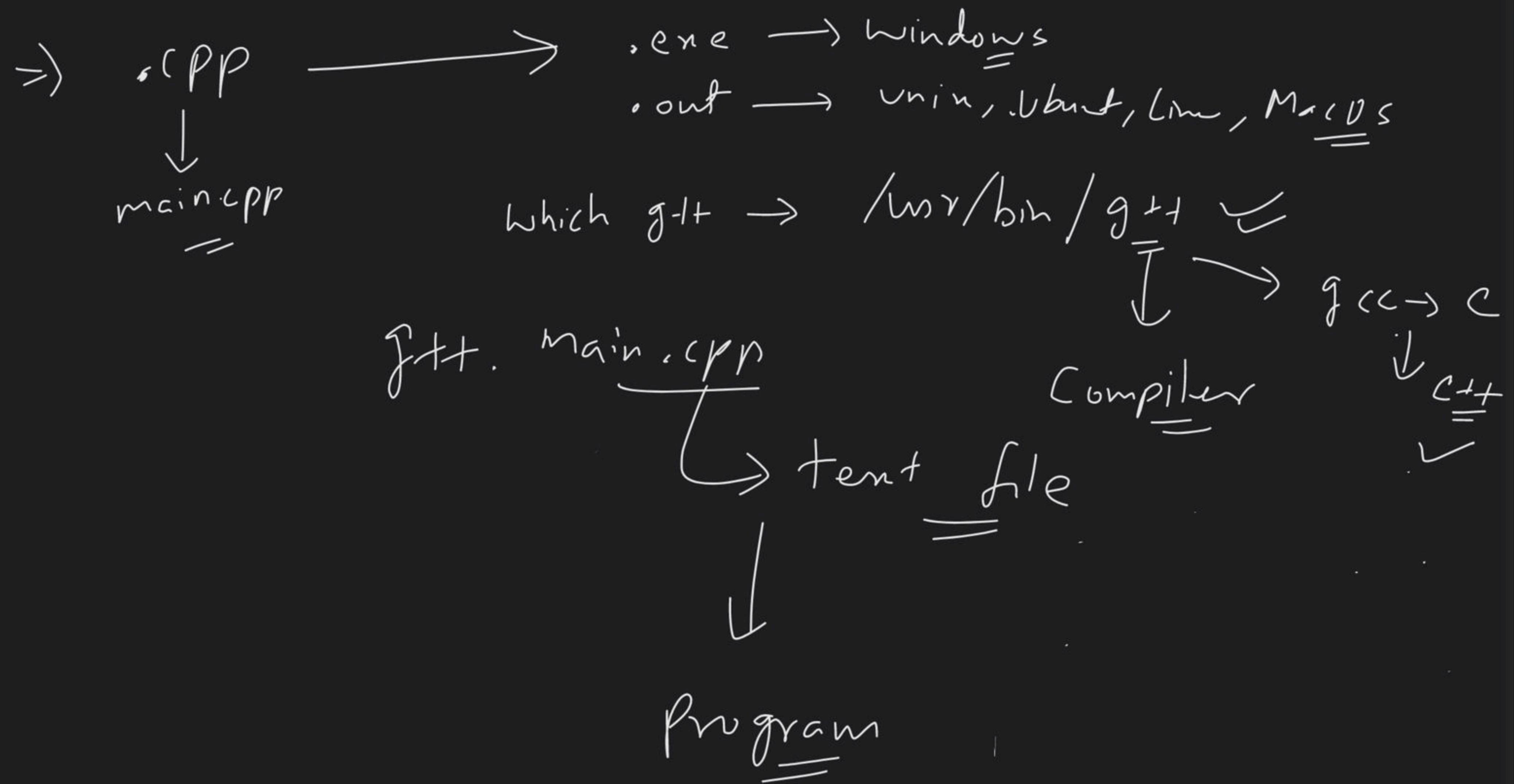
# Signed vs Unsigned data:

# Operators:

- Arithmetic
- Relational
- Assignment
- Logical
- Bitwise

# HomeWork:

- 32 bit vs 64 bit Architecture
- TypeCasting: Implicit vs Explicit
- Number System: Binary and Decimal



g++ looks at a header file  
g++ input → CPP file

- ① Preprocessing → ① include header files ✓  
② Macros expand ✓  
③ Remove comments ✓

↓  
.CPP → Change →

.CPP expanded

②

Compilation

Preprocessed code

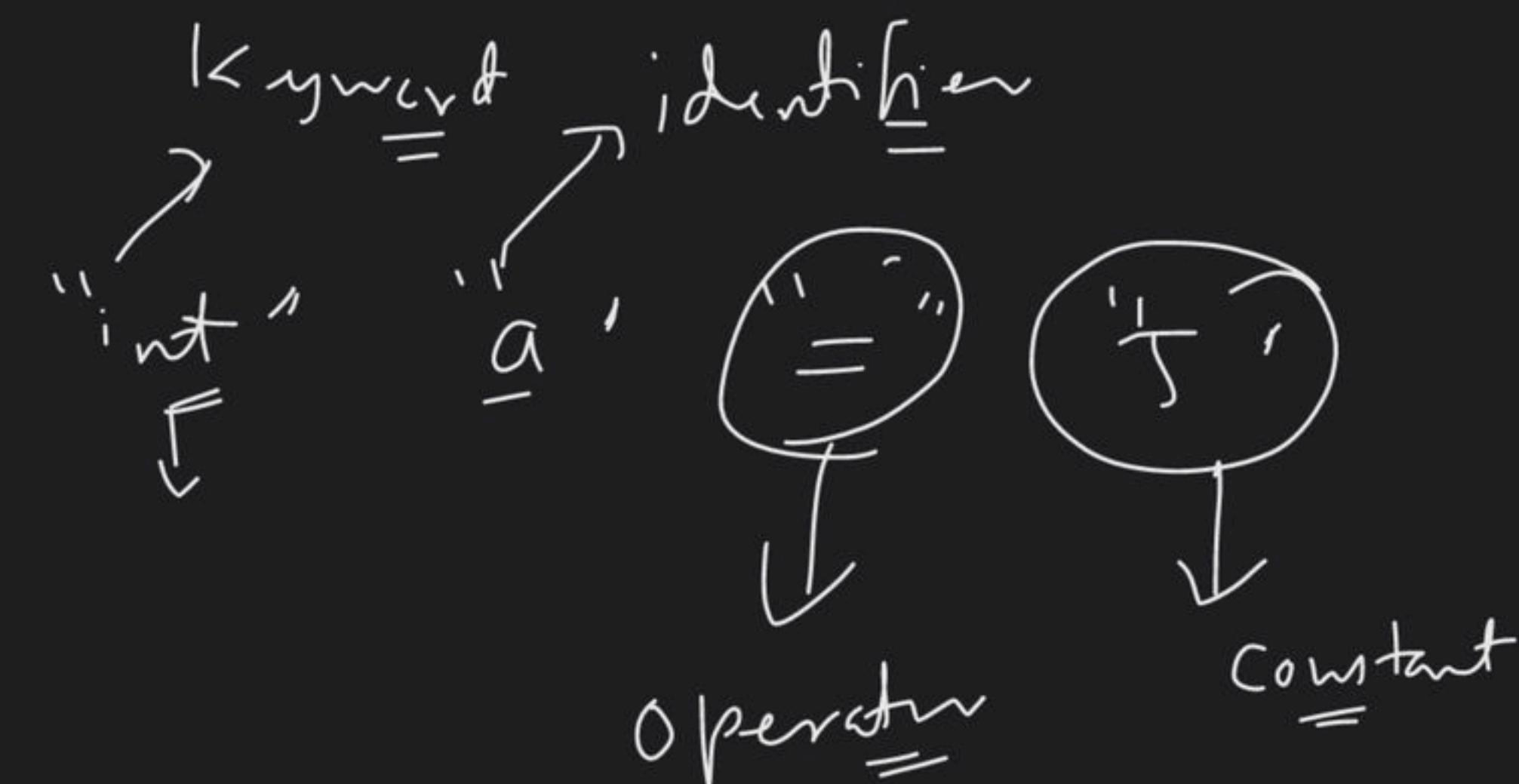
Machine code

① Lexical Analysis →

//

int a = 5;

a = a + 5;



②

Parsing  $\rightarrow$  Tokens  $\rightarrow$  Syntax Tree

Syntax error

~~int d = 5;~~

int s = a

a int = 5;



?

Semantic analysis →

meaning

meaningfulness ✓

type mismatch => ??

undeclared variable  
check

int a = 5;

cout << b << endl;

int a = "Lakshey";

✗

4

Intermediate Code gen

int a = 5;  
=

PAR a;

•  $\stackrel{\text{asm}}{=}$   $\Rightarrow$  assembly format

Var A;  
move 5 a;  
PRINT → A

M1, M7, I3  
Processor

dependent

5

## Optimization

→ remove dead code

```
{ int a = 5;  
  int b = 10; //  
  cout << a;  
 }  
 //
```

cout << a;

& then 0;

3

3

Object file = gen. ✓

void fun() ← 1.cpp  
= ↓  
2.cpp 3.cpp  
↓ ↓ ↓  
Complie

↓  
fun() symbol  
↓  
1.0 2.0 3.0 → win.  
← 1.0bj 2.0bj 3.0bj → win.  
↓ ↓  
Compiled C C



C++  
main.cpp



Compile



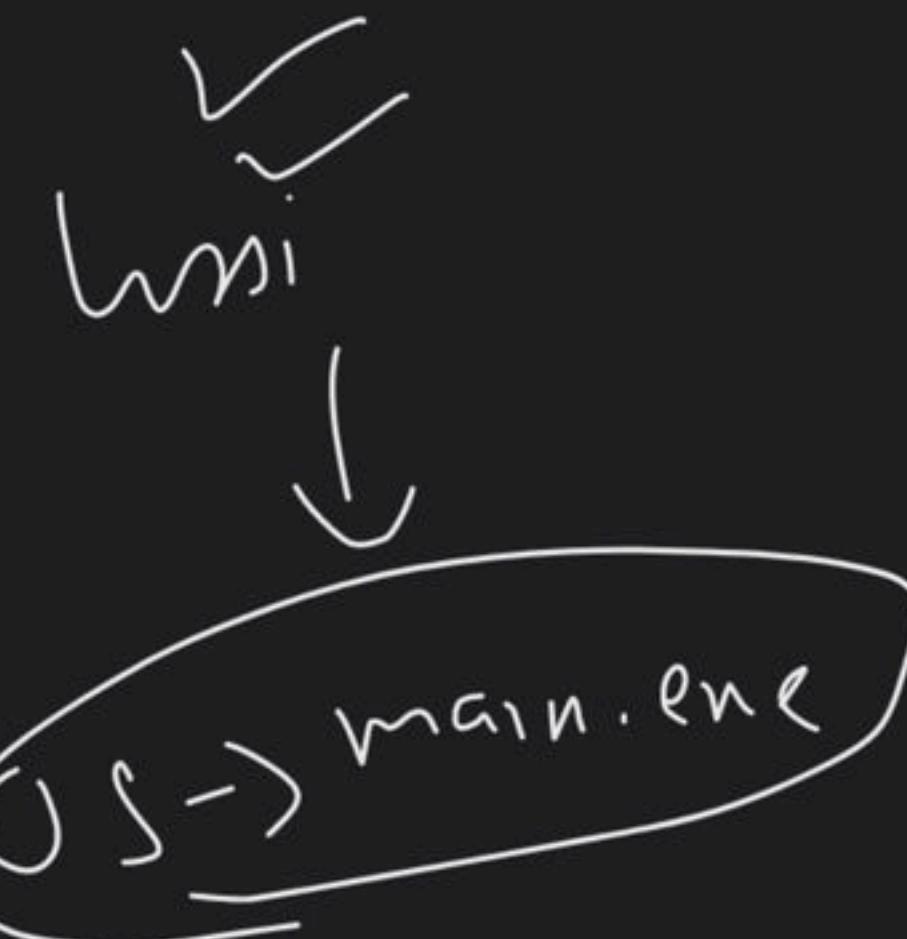
Object file



Link



→ exe



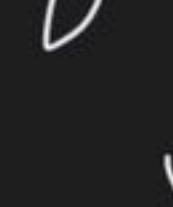
Java



main.java



Compile



Bytecode



Stop



OS → JVM → main.bytes

Mac

↓

machine indepen.

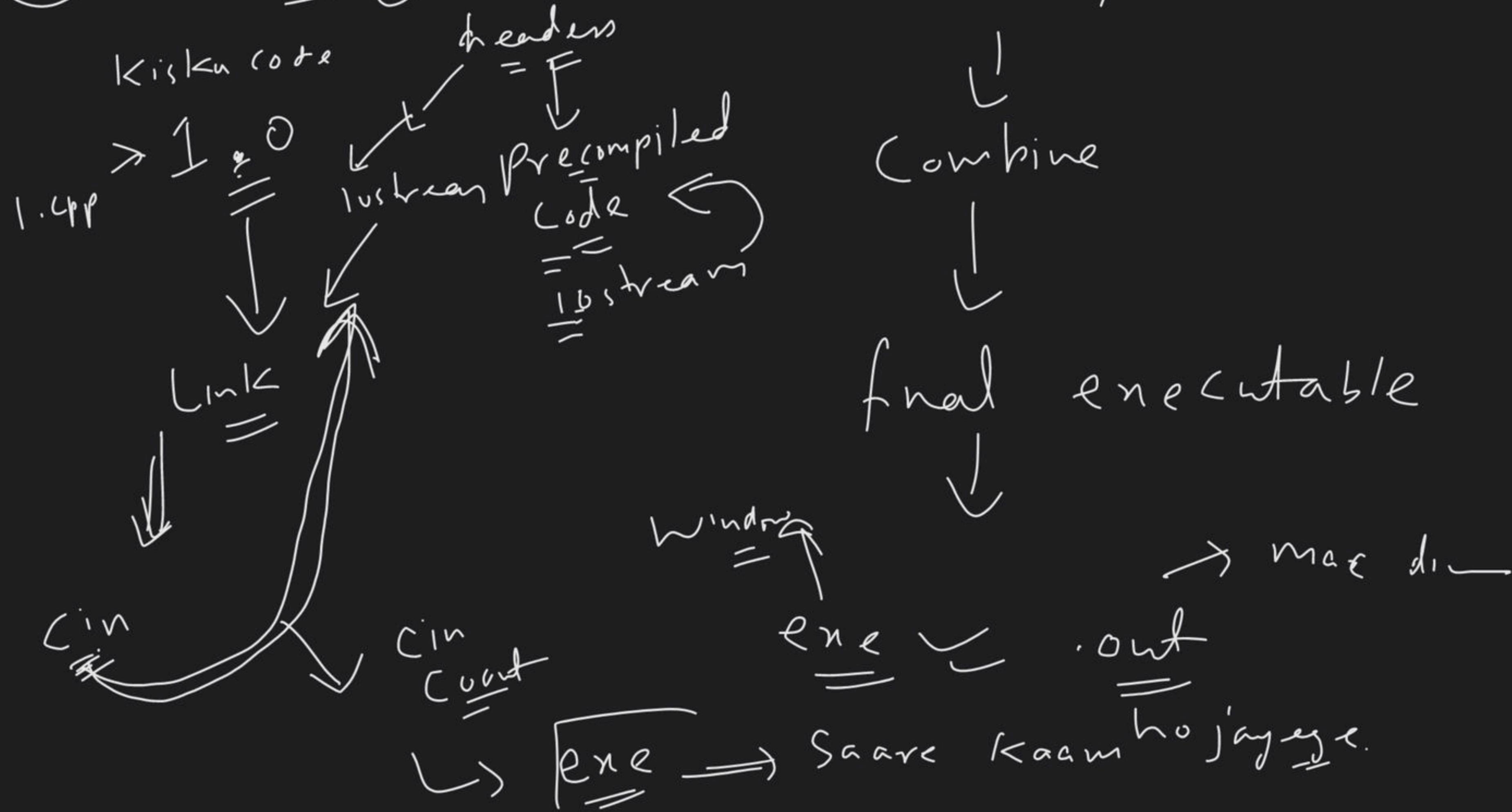
↓

main, By w

JVM

exe

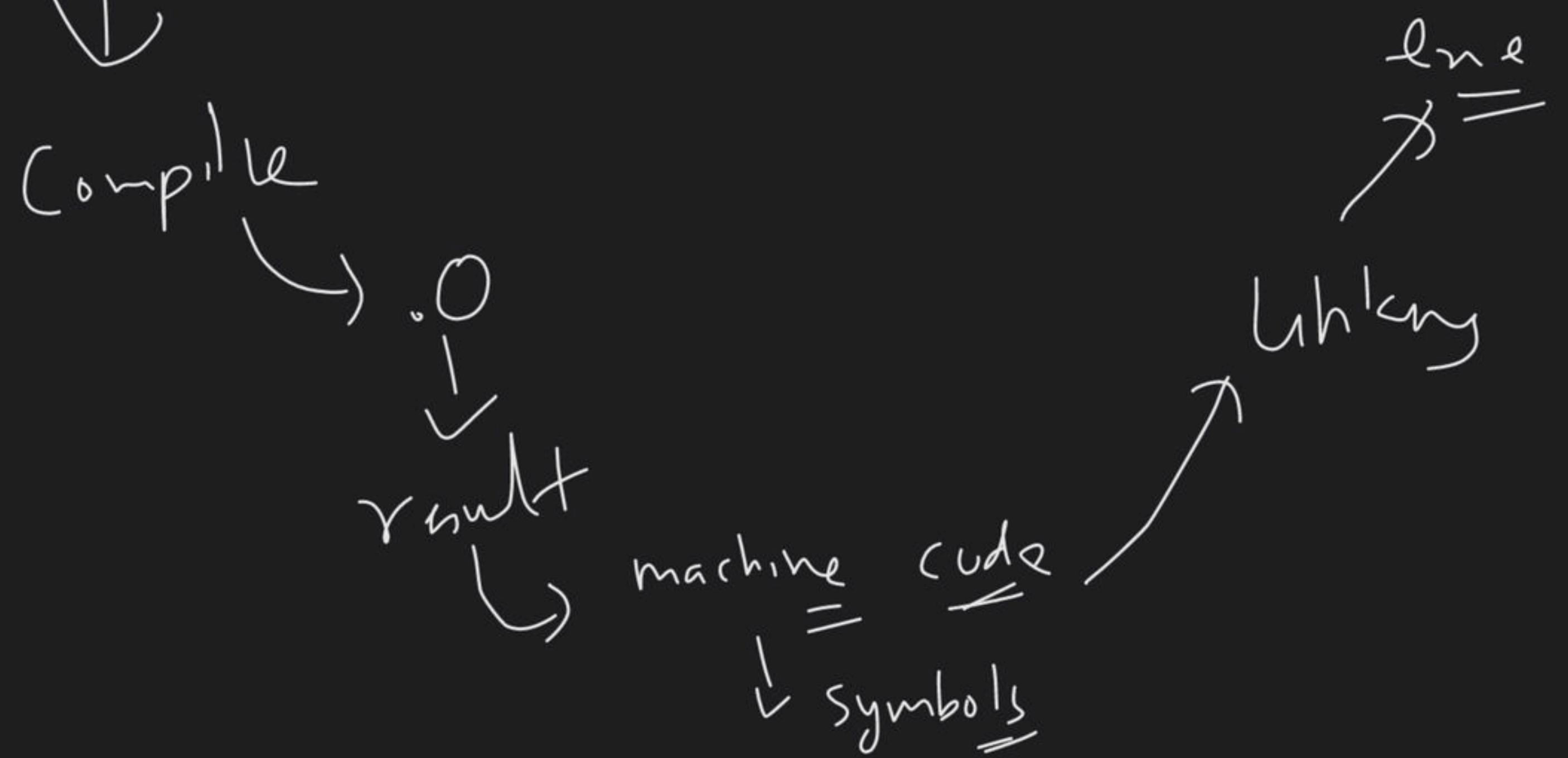
④ Linking → multiple objs / o's



1.cpp → cin, lost ==



main.cpp → → .o ??



Interpreter



executable

w/o compilation (No machine code)



Line By Line execution

Python  
==  
└── main.py

1. Print ("codehelp") → Translation

2. a = 5 → assignment  
=

3. print (a) →

Py interpreter  
==  
Py Libs  
machine code  
C++

→ assignment  
a = 5

Py Libs  
machine code  
a =

git → mac win ✓

→ git main.cpp

git → win → mac ✗

win

Mac

enc

out

⇒ C++ → develop hui → content → age developer  
↳ win, Mac, linuy

JS → web native

interviewer →

Developer → Google | Skills++