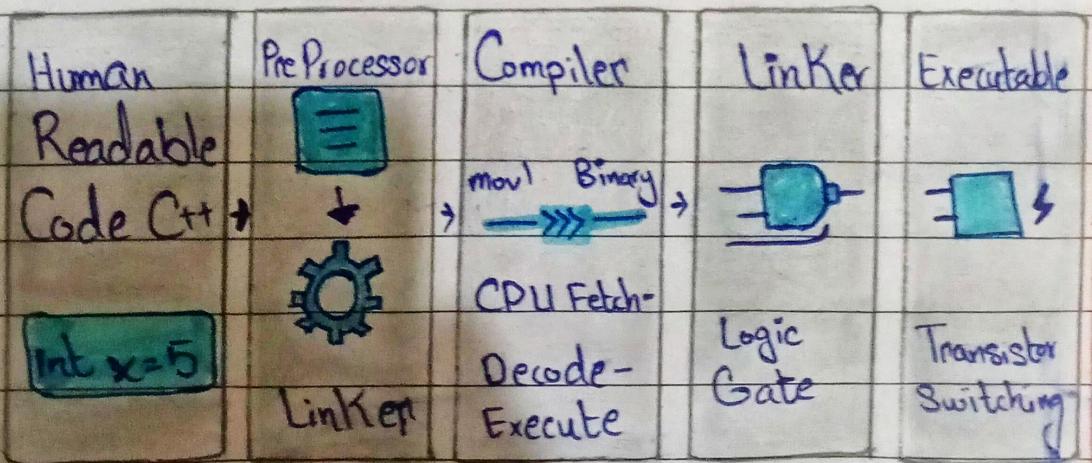


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C++

- ↳ C++ is a cross-platform language that can be used to create high-performance applications.
- ↳ C++ was developed by "Bjarne Stroustrup" as an extension to the C language.
- ↳ C++ gives programmers a high level of control over system resources and memory.



Preprocessor

- Preprocessor directives tell the compiler to do certain tasks before actual compilation starts.
- Always start with '#'
- Common directives
 - ↳ `#include` → adds library.
 - ↳ `#define` → define macros.
 - ↳ `#ifdef / #endif` → conditional compilation.

“ They prepare the program with libraries/macros before compilation ”

Namespace

A namespace avoids naming conflicts in large programs.

Standard C++ function & Objects like (`cout, cin`) live in `std` namespace.

“ Organizes code and prevents clashes between variable/function names. ”

```
#include <iostream>
using namespace std;

main(){
    cout << "Hammad";
}
```

```
#include <iostream>
// Without namespace

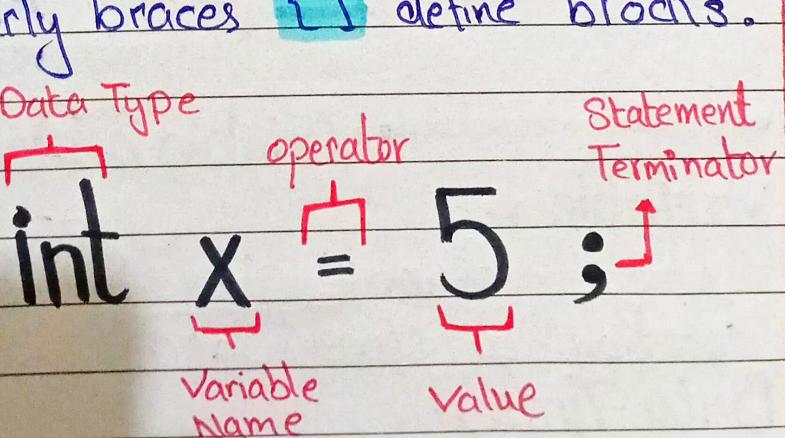
main(){
    std::cout << "Hammad";
}
```

C++ Syntax

- The set of rules that define how C++ code is written.

Every program has:

- ↳ Preprocessor directives.
- ↳ `main()` function.
- ↳ Statement end with ;
- ↳ Curly braces {} define blocks.



Syntax of variable declaration + initialization

Structure of C++

A C++ program has :

- Documentation section (comments).
- Preprocessor section (`#include`).
- Global declaration section.
- `main()` function.
- Body.

```
#include <iostream> // Library
using namespace std;
// Global variable before main()
int main() // Entry Point
{
    cout << "Hi"; // Body
    return 0; // exit Code
}
```

Variable & Data Type

Variable :-

A name given to memory location to store data.

Data Type :-

Define the type of data stored in variable.

Common Type :-

- int → Integer → int a = 1 ;
- float → decimals → float a = 1.1 ;
- char → Single character → char a = 'A' ;
- String → text → string a = "Levi" ;
- bool → true/false → bool a = true ;

Naming Rule

1. Can only use letters, digits and underscores.

✓ myName , my_name .

✗ my-name .

2. Must start with a letter or underscore (not a digit).

✓ age

✓ _age

✗ 1age (can't start with number)

3. Case sensitive.

Score and score } are different
Age and age

4. Can't use reserved Keywords.

if, int, for, class, return, else .

while, bool, string etc

Comments

- Used for notes/documentation in code.
- Compiler ignores them.

1. Single line → `// comment`
2. Multi Line → `/* comment */`

```
#include <iostream>
using namespace std;
```

```
int main(){
```

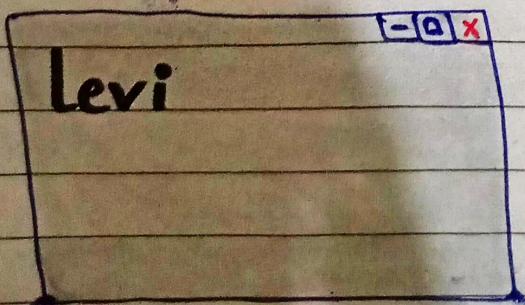
// This is Single Line Comment

```
/* cout << "Hinata";
   cout << "Mikasa"; */
   cout << "Levi";
```

```
return 0; }
```

x

Output



Cin / Cout

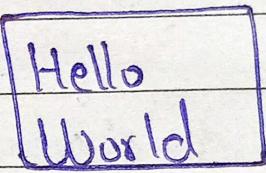
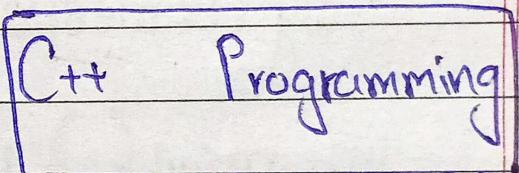
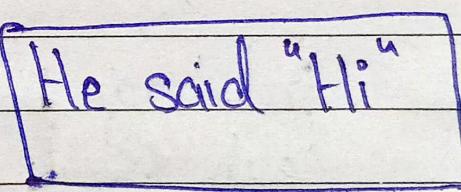
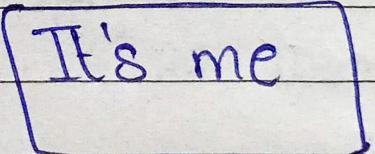
Cout stand for Console output.
→ Print data to Screen.

Cin stand for Console input.
→ Takes input from user.

```
#include <iostream>
using namespace std ;
int main() {
    int age ;
    cout << "Enter Age : " ;
    cin >> age ;
    cout << "Your age is : " << age ;
    return 0 ;
}
```

Escape Sequence

\n	→	New Line
\t	→	Tab Space
\\	→	Backslash
\"	→	Double Quote
'	→	Single Quote

- "Hello\nWorld" → 
- "C++\tProgramming" → 
- "He said \"Hi\"" → 
- "It\'s me" → 
- "True\\False" → 