Day 1

C++ by Abdul Bari

```
#include <iostream>
using namespace std;
int main()
{
cout << "Hello world";

return 0;
}
```

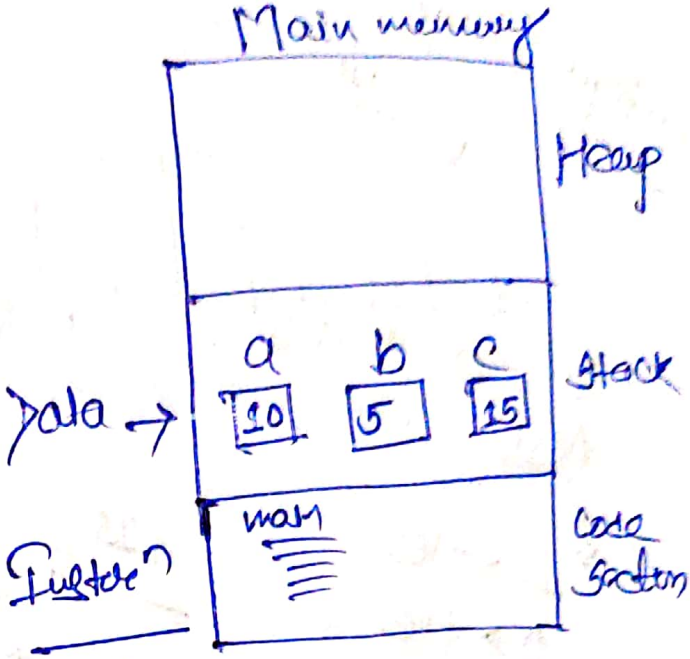
if you don't use using namespace std then

```
std::cout << "Hello World";
```

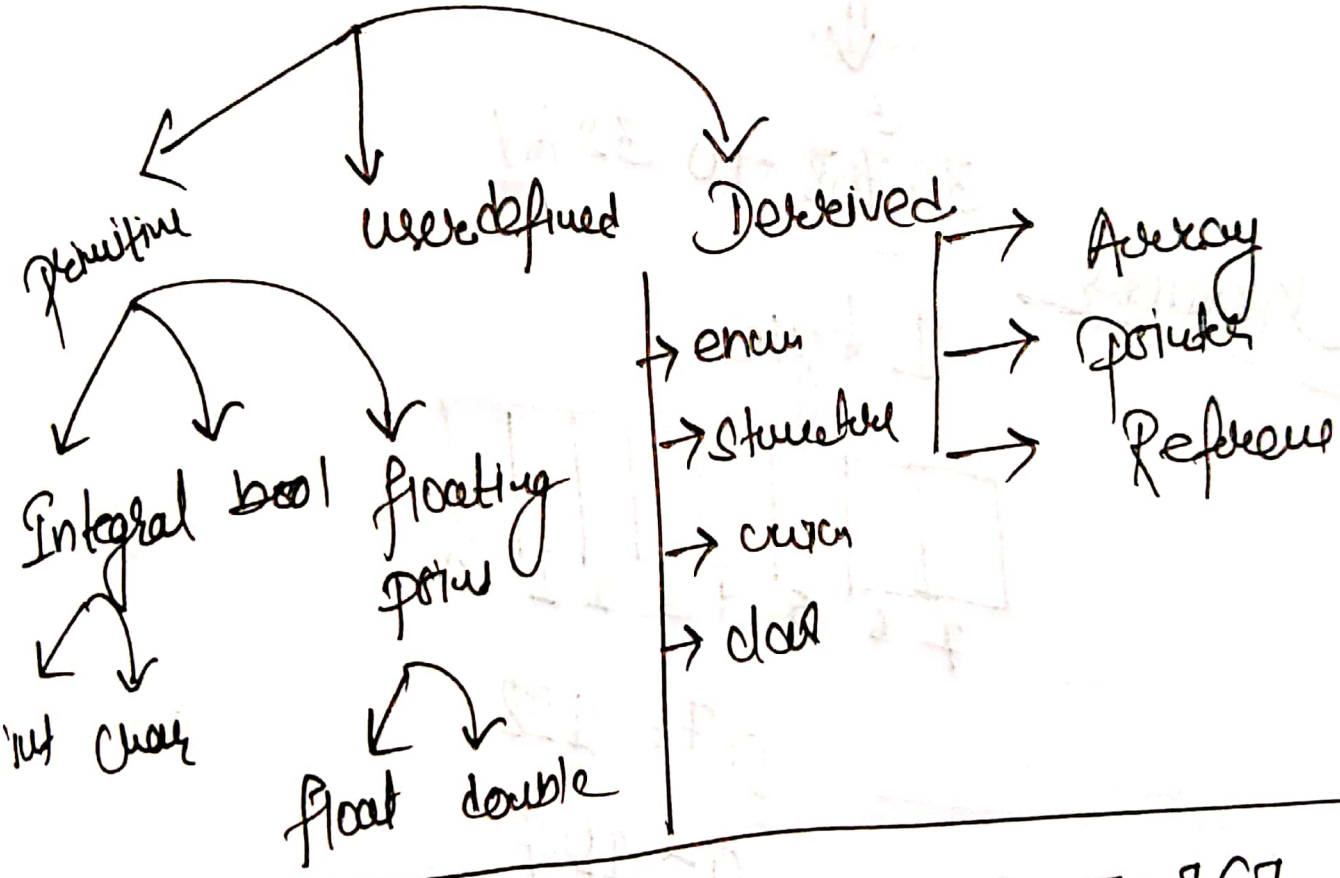
↑ scope resolution operator

* getline (cin, variable)
Print all the lines until you hit enter.

```
int a,b,c;
a = 10
b = 5
c = 15
```

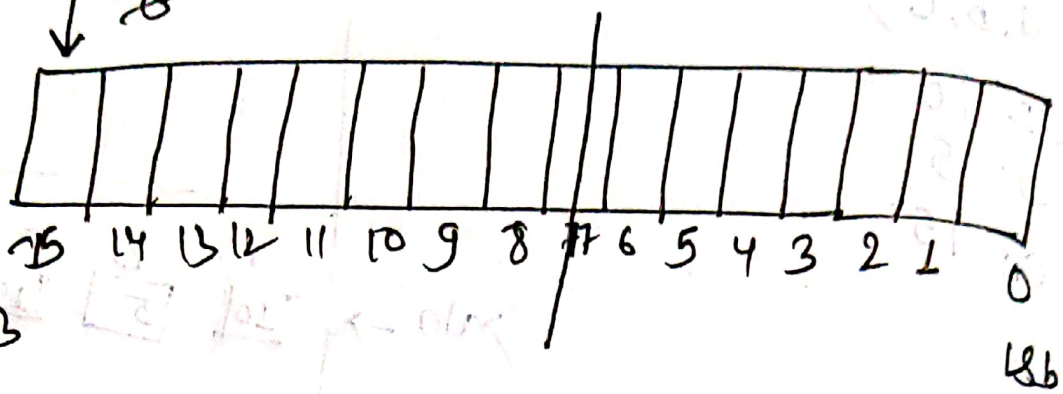


Datatypes



Integer	2 or 4	-32,768 to 32,767
float	4	-3.4×10^{38} to 3.4×10^{38}
double	8	-1.7×10^{308} to 1.7×10^{308}
bool	undefined	true / false

Integer Range



1 → -ve
0 → +ve

$2^{15} = 32768$

32767 0^- 0^+ −32767

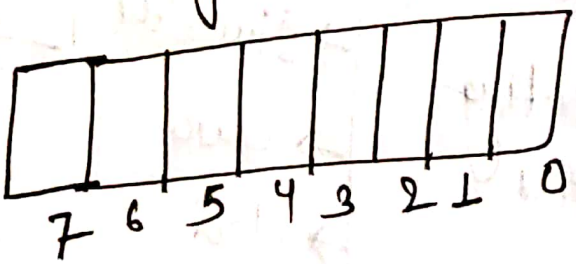
⇓

So

32768 to 32767

Character

= 1 byte



$2^7 = 128$

0 - 127

So −128 to 127

ASCII Codes

A → 65 Z → 90 a - 97

B → 66 b - 98

z → 122

0 → 48
1 → 49
⋮
9 → 57

Modifiers

Unsigned
long

unsigned int = +ve value

65535

Unsigned char

= 255

long int - 4 bytes / 8 bytes

long double - 10 bytes

Page Left for Miscellaneous Data types

Operator & Expression

U A B R L C A

1. Unary operator; +, -, ++, --, Size of()
   R → L
2. Arithmetic operator
   *, /, % L → R
   +, -
3. Bitwise
   ~
   <<, >> L → R
   &
   ^
   |
4. Relational
   <, >, <=, >=,
   ==, !=
   L → R

⑤ Logical : ! && || L → R

⑥ Conditional

test ? a : b R → L

⑦ Assignment : a = b;

⑧ post Increment Decrement } L → R

⑨ Comma operator

$x = (a + (b * c)) - (d / e)$

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Increment Decrement operator

```
int x=5, y;
y = ++x;
y = (x=x+1)
y = (5+1)
y=6
x=6
```

```
y = x++;
y is assigned first then x = x+1
so y=5, x=6
```

++x = pre increment
x++ post increment
--x pre decrement
x-- post decrement

i=5

J= (2 * (++i)) + (2 * (i++));

12 + (2 * 6)

= 12 + 12

= 24

Cout << i << J << endl;

i = 7

J = 24

i=5, J= 2 * i++ + 2 * i++;

Cout << i << J << endl;

J= 10 + 2 * 6

= 22

i = 7

3 3

Overflow (-ve number are Stored in 2's Complement format).

Char x= 127

++x;

Range of char

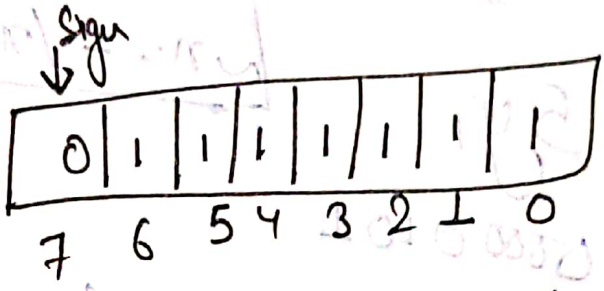
-128 to 127

If you decrease beyond -128 ~~or increase beyond 127 then it~~ above then it will go towards 127.

eg ~~++a = a~~.

char x = 127	char x = -128
++x;	++x;
= -127	= 127

$(127)_{10} = (01111111)_2$



$$\begin{array}{r} 01111111 \\ +\quad 1 \\ \hline 10000000 \end{array}$$

= 128

msb = 1
so no. is -ve

(-128)

So ++x = -128

Bitwise operator

These operation are performed on the bits of data, not on the whole data as a single unit

& and
| or
^ x-or
~ not

<< >>

XOR

0	0	0
1	0	1
0	1	1
1	1	0

$\sim x = -(x+1)$

Char x = 5;

x → 00000101

~x = 11111010

00000001
+ 1

00000110

= -6

<< (Left Swift)

x << i

x * 2^i

Right Swift >>

x >> i

= x / 2^i

Enum and Typedef

Departments
CS - 0
mech - 1
ECE - 2

menu file
new - 0
open - 1
save - 2
close.

Days
mon - 0
Tues - 1
wed - 2
.

enum day {mon, tues, wed, thurs, fri, sat, sun};
(1, 2, 3, 4, 5, 6)

datatype.
creates our own data type

```
int main()
{
  day d;
  d = mon;
  d = fri;
  .
```

enum dept {cs=1, ece, mech...};
(2)

Typedef