C++
Input & Operators

Lecture- 2

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Today's checklist

1) Taking Input
2) Operators
3) Typecasting
4) Hierarchy of operators
5) Char and ASCII

Taking input // Let us take a simple example

```
int x;

cout<<”Enter a number\n”;

cin>>x;  // user will give ‘x’ a value.

int y = x*x;

cout<<square of number that you gave is”<<y;
```

```cpp
#include<iostream>
using namespace std;
int main(){
    int x;
    cin>>x; // x ko ek value doonga
    cout<<x;
}
```

Output / Input

10

10

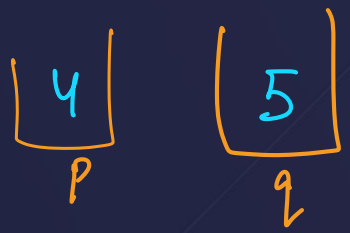
Taking input // SUM of 2 given numbers

```
int x;
cout<<Enter first number\n”;
cin>>x;  // user will give ‘x’ a value.
int y;
cout<<Enter second number\n”;
cin>>y;  // user will give ‘y’ a value.
int sum = x+y;
cout<<”sum of the numbers that you gave is”<<sum;
```

Taking Input

Predict the output :

```
main(){
   int p,q;
   cout<<"Enter values of p and q";
   cin>>p>>q;
   cout<<"p ="<<p<<" q ="<<q;
}
```



Output / Input

Enter values of p and q 4

5

p =4 q =5

Types of Operators

- Arithmetic Operators(already done in last lecture)
- Relational Operators
- Logical Operators (will be covered in IF-ELSE)
- Assignment Operators
- Bitwise Operators (will be covered in bit Manipulation)

C++ Relational Operators

`==` Is Equals to

`int x = 5;` Assignment

`x == 5` Comparison

`!=` Not Equals to

`>` Greater Than

```
int main(){
    int x = 3;
    cout<<(x=7);
}
```

Output

7

```
main(){
    int x = 3;
    x = 7;
    cout << x;
}
```

C++ Relational Operators

< Less than

≥ Greater than or equals to

≤ lesser than or equal to

C++ Assignment Operators

=

+=

```
int x = 7;
x += 8;  // x = x + 8;
```

-=

```
x -= 10;  // x = x - 10
```

/=

```
x /= 5; // x = x/5;
```

%=

Ques: What is the result of the following code fragment?

```
bool p = false;
bool q = false;
bool r = true;
cout<<(p == q == r);
```

Output

1

p == q == r

Left to Right

1 == r

1

char data type

```
char ch = 'a';
```

ASCII values

'#' → 35

```
char ch = 'a';
```

Each character has an ASCII value

'A' → 65
'B' → 66
'C' → 67
.
.
.
'Z' → 90

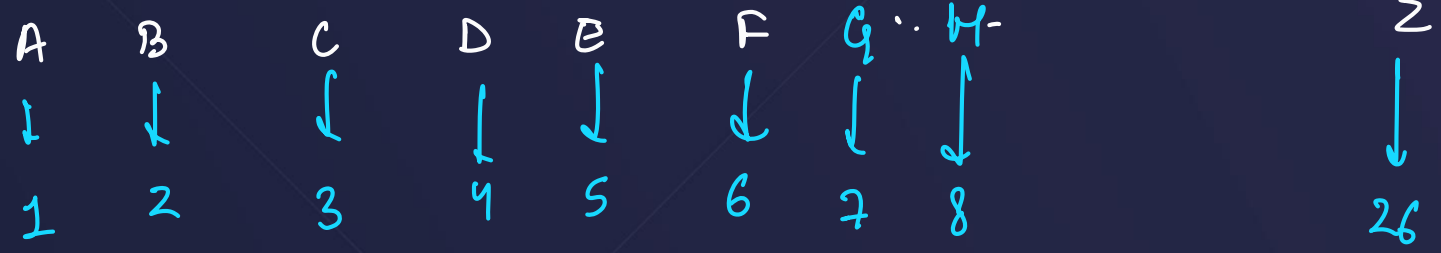
'a' → 97
'b' → 98
'c' → 99
.
.
.
'z' → 122

'0' → 48
'1' → 49
.
.
.
'9' → 57

ASCII values

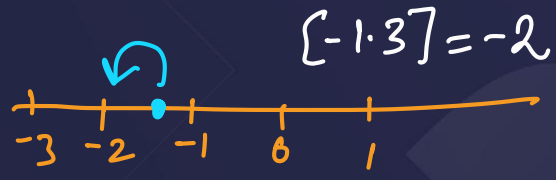
char ch = 'H';

```
char ch = 'a';
```



Typecasting

```
int x;
cin>>x;
```



Ques : Take integer as input and print half of the number.

Ques : Take float input and print the fractional part of the real number.

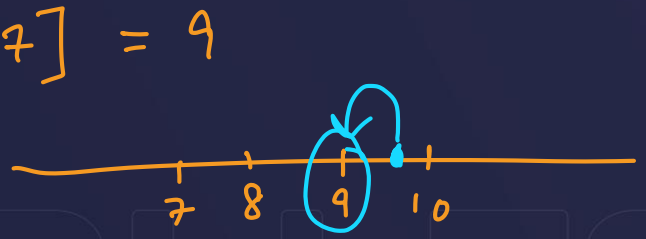
$x = 9.7 \rightarrow 0.7$

$x = 8.13 \rightarrow 0.13$

$x = -1.3 \rightarrow 0.3$ ✗

0.7

$\{x\} = x - [x]$



Hierarchy of operators

*, / > +, −

```
int i = 2 * 3 / 4 + 4 / 4 + 8 - 2 + 5 / 8 ;
cout<<i;
```

6/4 + 1 + 8 - 2 + 0

⇒ 1 + 1 + 8 - 2 + 0

2 + 8 - 2 + 0

10 - 2 + 0

8 + 0 = 8

2*3/4 = 6/4 = 1

2*3/4 = 2*0 = 0

diff.

Output

** Hierarchy of operators

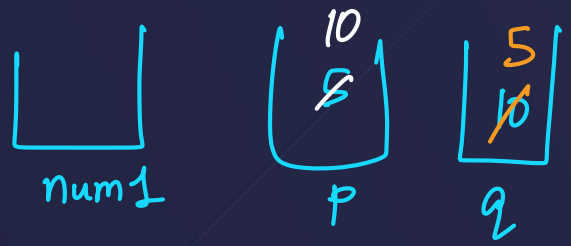
BODMAS

Category	Operator	Associativity
Postfix	() [] -> . ++ - -	Left to right
Unary	+ - ! ~ ++ - - (type)* &sizeof	Right to left
Multiplicative	* / %	Left to right
Additive	+ -	Left to right
Shift	<<>>	Left to right
Relational	<<= >>=	Left to right
Equality	== !=	Left to right
Bitwise AND	&	Left to right
Bitwise XOR	^	Left to right
Bitwise OR	|	Left to right
Logical AND	&&	Left to right

() > %, *, / > +, - > >, >=, <, <= > ==, !=

Ques: What is the result of the following code fragment?

```
int main()
{
    int num1;
    int p = 5, q = 10;
    p += q -= p;
    cout<<p<<" "<<q<<endl;
    return 0;
}
```



Output

10 5

$p = p + q$

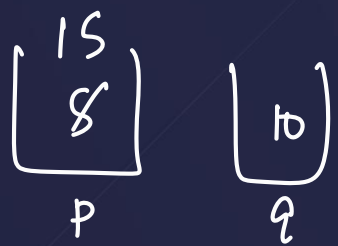
$p = 5 + 5 = 10$

$q -= p \rightarrow q = q - p$

$\Rightarrow q = 10 - 5 = 5$

Ques: What is the result of the following code fragment?

```
int main()
{
    int num1;
    int p = 5, q = 10;
    p += q -= p;
    cout<<p<<" "<<q<<endl;
    return 0;
}
```



p = p + q

p = 5 + 10 = 15

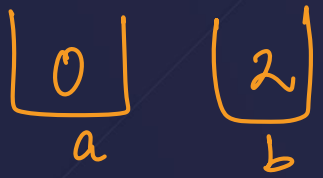
q = q - p

q = 10 - 15 = -5

Try This!

Predict the output :

```
int main(){
   int i = 2, j = 3, k, l;
   float a, b;
   k = i / j * j ;
   l = j / i * i;
   a = i / j * j ;
   b = j / i * i;
   cout<<k<<" "<<l<<" "<<a<<" "<<b;
}
```



$k = 2/3 * 3 = 0 * 3 = 0$

$l = 3/2 * 2 = 1 * 2 = 2$

0 2 0 2

MCQ Time !

MCQ 1

Which of the following is NOT a character constant

(1) 'Thank You'

(2) 'Enter values of P, N, R'

(3) '23.56E-03'

(4) All the above

MCQ 2

The expression, float a = 7 / 22 * (3.14 + 2) * 3 / 5 ; evaluates to

(1) 8.28

(2) 6.28

(3) 3.14

(4) 0

7/22 * 5.14 * 3/5

0 * 5.14 * 3/5

0 * 3/5

0/5 → 0

MCQ 3

The expression x = 4 + 2 % - 8 evaluates to

(1) -6

(2) 6

(3) 4

(4) None of the above

$x = 4 + 2 \% (-8)$

$x = 4 + (2 \% 8)$

$x = 4 + 2 = 6$

THANK YOU