Module-1 : Basic C++

How to Print in C++

- in **C header file** → **stdio.h** (work for input and output)
- in **C++ header file** → **iostream**

- in C **printf** for print output
- in C++ **cout** for print output

Print

```
#include<iostream>
int main()
{
    std::cout<<"Hello";
    return 0;
}

output: Hello
```

- for **new line** in C++ **std::cout<< variable <<"\n";**
- for **new line** in C++ **std::cout<< variable << std::endl;**
- for **space** in C++ **std::cout<< variable <<" ";**

```
#include<iostream>
int main()
{
    //std::cout<<"Hello";
    int a = 10;
    long long int b = 1000000000000;
    float c = 1.5;
    double d = 1.5638478;
    char e = 'T';
```

```
    std::cout<< a << " \n"<< b << c << d;
    return 0;
}

input: 10
       1000000000
       1.5
       1.5632
       T

output:10
       1000000000
       1.5
       1.5632
       T
```

- **in C printf("%d",a); have format specifier which is %d**
- **in C++ std::cout<<a; just give variable name for print**
- in C++ if we print like **My Favourite Number Is 10** the formet **std::cout<<"My Favourite Number Is "<<a;**

How to take input in C++, Typecasting

- in C we use **scanf(”%d”,&a)**; for **input**
- in C++ we use **cin>>;** for **input**

If we use **using namespace std;** after the header file then we don’t need to write **std::**

Input from the user in C++

```
#include<iostream>
using namespace std;
int main()
{
    int a,b; // data type declare
    cin >> a >> b; // scan value
    cout << a << " " << b << endl; // print value
```

```
    return 0;
}

input: 10 20
output: 10 20
```

in **C++**

- long long int → int
- char → int
- float/double → int

EOF and Set precision in C++

EOF C

```
#include<stdio.h>
int a,b;
    while (scanf("%d %d",&a,&b) != EOF)
    {
        printf("%d %d\n",a,b);
    }

input:  10 20
        30 40
        50 60
output: will be same
```

in C this program will end when our last input print

EOF C++

```
#include<iostream>
using namespace std;
int main()
{
    int a,b;
```

```
    while (cin >> a >> b)
    {
        cout << a <<" "<< b <<endl;
    }
    return 0;
}

input:10 20
      30 40
      50 60
      70 80

output: will be same
```

Setprecision

```
#include<iostream>
#include<iomanip> // output key manupulate korbo
using namespace std;
int main()
{
    double a;
    cin >> a; // input from user
    cout << fixed << setprecision(2) << a << endl;
    return 0;
}

input:  10.543299
output: 10.54
```

in C we use **%.2lf** for print **double value** but **C++** didn't have formet specifier that’s why first we add **#include<iomanip>** header file then we use in **cout << fixed << setprecision(2) << a << endl;** for print double-value .

If Else and Ternary Operator

- Ternary means Short Cut if else

- (condition)? true : false;

```
#include<iostream>
using namespace std;
int main()
{
    int n;
    cin >> n;

    if(n%2==0)
    {
        cout<<"Even";
    }
    else
    {
        cout<<"Odd";
    }
    return 0;
}
input: 1 - output: Odd
input: 0 - output: Even
```

Ternary

```
#include<iostream>
using namespace std;
int main()
{
    int n;
    cin >> n;

    (n%2==0)? cout<<"Even" <<endl : cout<<"Odd" <<endl;

    return 0;
}

input: 1 - output Odd
input: 0 - output Even
```

Switch Case

it’s work when ==

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

int main()
{
   int x = 5;
   switch(x)
   {

    case 1:
    cout << "One" << endl;
    break;

    case 2:
    cout << "Two" << endl;
    break;

    case 3:
    cout << "Three" << endl;
    break;

    case 4:
    cout << "Four" << endl;
    break;

    case 5:
    cout << "Five" << endl;
    break;

    default:
    cout << "No Match"; // if we input 5 up then output

   }

    return 0;
}
input: 5
output: Five
```

if we mod **x %2** then the answer should go **case :** then if the **value 1** then it will be **odd** otherwise **even**

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

int main()
{
   int x;
   cin >> x;

   switch(x%2)
   {
    case 0:
    cout << "Even" <<endl;

    case 1:
    cout << "Odd" <<endl;
   }
    return 0;
}

input: 1 - output: Odd
input: 0 - output: Even
```

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

int main()
{
   char x;
   cin >> x;

   switch(x)
   {
     case 'a':
     cout << "Vowel";
     break;

     case 'e':
     cout << "Vowel";
     break;

     case 'i':
     cout << "Vowel";
```

```
     break;

     case 'o':
     cout << "Vowel";
     break;

     case 'u':
     cout << "Vowel";
     break;

     default:
     cout << "Consonent";
   }
    return 0;
}

input: a - output: Vowel
input: z - output: Consonent
```

min(), max() and swap() Functions in C++

Max, Min value

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

int main()
{
   int a,b;
   cin >> a >> b;

   int c = min(a,b); // minimum value
   int d = max(a,b); // maximum value
   cout << c << " " << d << endl;
   return 0;
}
input: 20 1
output: 1 20
```

Here we use **#include<algorithm>** header file for

max, min operation.

Max, Min value

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

int main()
{
   int a,b,c,d;
   cin >> a >> b >> c >> d;

   int mn = min({a,b,c,d});
   int mx = max({a,b,c,d});
   cout << mn << " " << mx << endl;

    return 0;
}
input: 10 3 4 50
output: 3 50
```

Swap

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

int main()
{
    int a,b;
    cin >> a >> b;

    int tmp = a;
    a = b;
    b = tmp;
    cout << a << " " << b << endl;

    return 0;
}

input: 10 5
output: 5 10
```

Swap use function

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

void fun_swap(int *a, int *b)
{
   int tmp = *a; // temp = 10
    *a = *b;     // a= 5
    *b = tmp;    // b=10
}

int main()
{
    int a,b;
    cin >> a >> b;

    fun_swap(&a, &b);
    cout << a << " " << b << endl;

    return 0;
}

input: 10 5
output: 5 10
```

Again Swap with function

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

int main()
{
    int a,b;
    cin >> a >> b;

    swap(a,b); // function
    cout << a << " " << b << endl;
    return 0;
}
```

```
input: 10 5
output: 5 10
```

Here we use **#include<utility>** for Swap

String Input and Output in C++

Array

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

int main()
{
    int n;
    cin >> n; // user theky value input

    int ar[n]; // array initilize
    for(int i=0; i<n; i++)
    {
        cin >> ar[i]; // scan array
    }

    for(int i=0; i<n; i++)
    {
        cout << ar[i] << endl; // print array
    }

    return 0;
}
input: 5
       1 2 3 4 5

output: 1
        2
        3
        4
        5
```

String

```
#include<iostream>
#include<string.h>
```

```
using namespace std;

int main()
{
    char s[100];
    cin >> s;
    cout << s << endl;
    return 0;
}
input: tushar
output: tushar
```

Length

```
#include<iostream>
#include<string.h>
using namespace std;

int main()
{
    char s[100];
    cin >> s;
    cout << strlen(s) << endl;
    return 0;
}

input: tushar
output: 6
```

Getline

```
#include<iostream>
#include<string.h>
using namespace std;

int main()
{
    char s[100];
    cin.getline(s,100);
    cout << s << endl;
    return 0;
}
```

```
input: Ifath Rahman Tushar
output: Ifath Rahman Tushar
```

```
#include<iostream>
#include<string.h>
#include<string>
using namespace std;

int main()
{
    char s[100];

    int a;
    cin >> a;

    getchar();
    cin.getline(s,100);

    cout << a << endl;
    cout << s << endl;

    return 0;
}

input: 20
       Ifath Rahman Tushar

output: 20
        Ifath Rahman Tushar
```

Bits Header File

```
#include<iostream>
#include<string>
#include<iomainp>
#include<algorithm>
#include<utility>
#include<string.h>
#include<stdio.h>
using namespace std;
```

```
#include<bits/stdc++.h>
```

This header file **#include<bits/stdc++.h>** in future we use in our all program and any function.