Lecture (2)
" Programming Essentials in C++ "

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A simple C++ Program (Printing a Line of Text)

```
1)  #include <iostream>
2)  using namespace std;
•   int main()
•   {
•   cout << "Hello world!";
•       return 0;
•   }
```

```cpp
#include <iostream>

using namespace std;

int main()
{

    cout<<"Hello World";

    return 0;
}

```

input

```
Hello World

...Program finished with exit code 0
```

First Program in C++: Printing a tab or comment

- **How to write a Tab**

Write (\t)

cout << “Hello \t world”;s

- **How to begin a new line**

Write \n or write **<<endl;** -----

Cursor moves to beginning of next line on the screen

- **How to write a comment**

Write (//)

```
8  ********************************************************************************
9  #include <iostream>
10
11 using namespace std;
12
13 int main()
14 {
15     cout<<"Hello \t World";
16
17     return 0;
18 }
```

input

```
Hello    World

...Program finished with exit code 0
Press ENTER to exit console.
```

Display variables on the screen

```
8  ********************************************************************************
9  #include <iostream>
10
11 using namespace std;
12
13 int main()
14 {
15     int x=15;
16     cout<<"x is equal "<<x<<endl;
17
18     return 0;
19 }
```

input

```
x is equal 15
```

Example about Variables

```
#include <iostream>

using namespace std;

int main()
{
    int age=20;
    float gpa=2.3;
    string name="ahmed";
    char grade='B';
    bool sucess=true;
    cout<<"age is equal "<<age<<endl;
    cout<<"gpa is equal "<<gpa<<endl;
    cout<<"name is equal "<<name<<endl;
    cout<<"grade is equal "<<grade<<endl;
    cout<<"sucess is equal "<<sucess<<endl;
```

```
age is equal 20
gpa is equal 2.3
name is equal ahmed
grade is equal B
sucess is equal 1
```

Demand information from the user in C++ Program

```
#include <iostream>
using namespace std;
int main()
{
int x;
Cin >> x<<endl;
Cout<<“x is equal” << x<<endl;
 return 0;
}
```

```
8  ********************************************************************
9  #include <iostream>
10
11 using namespace std;
12
13 int main()
14 {
15     int x;
16     cin>>x;
17     cout<<"x is equal "<<x<<endl;
18     return 0;
19 }
```

```
300
x is equal 300
```

Example about demanding two Variables

```
7
8   ********************************************************************************/
9   #include <iostream>
10
11  using namespace std;
12
13  int main()
14  {
15      int x,y;
16      cout<<"enter two numbers\n";
17      cin>>x;
18      cin>>y;
19      cout<<"x is "<<x<<"y is "<<y;
20
21      return 0;
22  }
```

input

```
enter two numbers
20
30
x is 20y is 30
```

Example about demanding two Variables in the same lines

```
8  ********************************************************************************
9  #include <iostream>
10
11 using namespace std;
12
13 int main()
14 {
15     int x,y;
16     cout<<"enter two numbers\n";
17     cin>>x>>y;
18
19     cout<<"x is "<<x<<"y is "<<y;
20
21     return 0;
22 }
```

input

```
enter two numbers
10
15
x is 10y is 15
```

Insert data and show out the entered information

```
string name="unknown";
int age=0;
double gpa=0;
char letter='a';
bool success=true;
cout<<"enter your name\n";    cin>>name;
cout<<"enter your age\n";    cin>>age;
cout<<"enter your gpa\n";   cin>>gpa;
cout<<"enter your letter\n";   cin>>letter;
cout<<" Are you success\n";   cin>>success;
cout<<"your name is "<<name<<endl;
cout<<"your age is "<<age<<endl;
cout<<"your letter is "<<letter<<endl;
cout<<"your gpa is "<<gpa<<endl;
cout<<"if success=1 congratulations else never mind:: "<<success<<endl;
```

```
8  ********************************************************************************
9  #include <iostream>
10
11 using namespace std;
12
13 int main()
14 {
15     string name="unknown";
16       int age=0;
17 double gpa=0;
18 char letter='a';
19  bool success=true;
20 cout<<"enter your name\n";     cin>>name;
21 cout<<"enter your age\n";    cin>>age;
22  cout<<"enter your gpa\n";   cin>>gpa;
23   cout<<"enter your letter\n";   cin>>letter;
24 cout<<" Are you success\n";   cin>>success;
25 cout<<"your name is "<<name<<endl;
26 cout<<"your age is "<<age<<endl;
27 cout<<"your letter is "<<letter<<endl;
28 cout<<"your gpa is "<<gpa<<endl;
29 cout<<"if success=1 congratulations else never mind:: "<<success<<endl;
30
31     return 0;
32 }
```

input

```
enter your name
Nada
enter your age
22
enter your gpa
3.8
enter your letter
```

```cpp
int main()
{
    string name="unknown";
      int age=0;
double gpa=0;
char letter='a';
 bool success=true;
cout<<"enter your name\n";    cin>>name;
cout<<"enter your age\n";    cin>>age;
 cout<<"enter your gpa\n";   cin>>gpa;
  cout<<"enter your letter\n";   cin>>letter;
cout<<" Are you success\n";   cin>>success;
cout<<"your name is "<<name<<endl;
cout<<"your age is "<<age<<endl;
cout<<"your letter is "<<letter<<endl;
cout<<"your gpa is "<<gpa<<endl;
cout<<"if success=1 congratulations else never mind:: "<<success<<endl;

```

input

```
enter your name
Nada
enter your age
22
enter your gpa
3.8
enter your letter
a
 Are you success
1
your name is Nada
your age is 22
your letter is a
your gpa is 3.8
if success=1 congratulations else never mind:: 1
```

Arithmetic Operations

Symbol	Purpose
+ or -	Addition or Subtraction
-	Negative sign
* or /	Multiplication or Division
%	Modulus for the remainder of the division
=	Equality

Addition Example

```
8  ********************************************************************
9  #include <iostream>
10
11 using namespace std;
12
13 int main()
14 {
15  int x= 5;
16  int y=4;
17  cout<<x+y<<endl;
18     return 0;
19 }
```

```
9
```

Subtraction Example

```
8  ********************************************************************
9  #include <iostream>
10
11 using namespace std;
12
13 int main()
14 {
15  int x= 5;
16  int y=3;
17  int z=x-y;
18  cout<<z<<endl;
19     return 0;
20 }
```

```
2
```

Multiplication Example

```
8  ********************************************************************************
9  #include <iostream>
10
11 using namespace std;
12
13 int main()
14 {
15  int x= 5;
16  int y=3,z;
17  z=x*y;
18  cout<<z<<endl;
19     return 0;
20 }
```

```
15
```

Division Example

```
7
8  ********************************************************************
9  #include <iostream>
10
11 using namespace std;
12
13 int main()
14 {
15  int x= 5;
16  int y=3,z;
17  z=x/y;
18  cout<<z<<endl;
19     return 0;
20 }
```

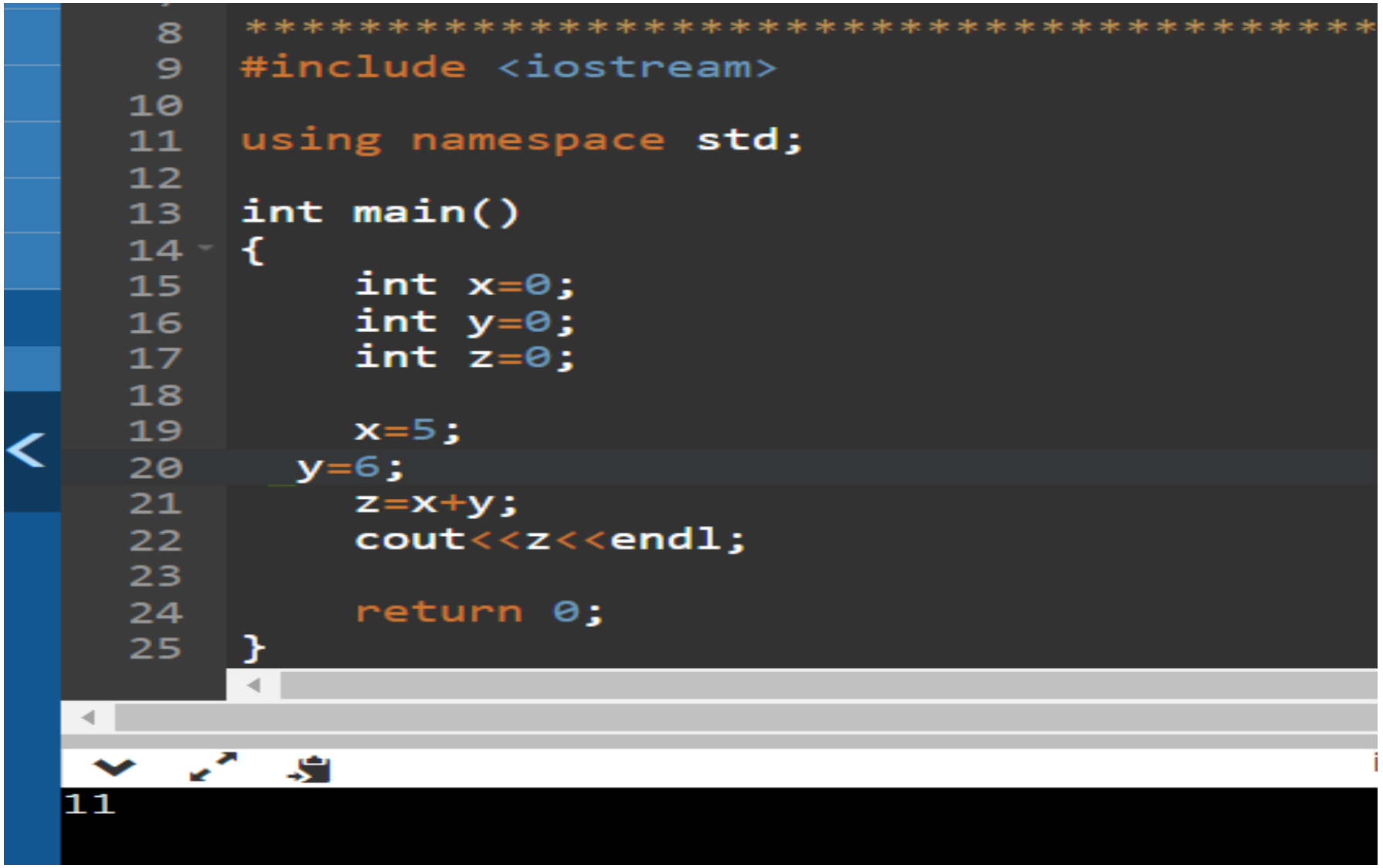
```
1
```

Division Example (Quotient &Remainder)

```
8  ********************************************************************************
9  #include <iostream>
10
11 using namespace std;
12
13 int main()
14 {
15 float x= 5;
16  float y=3,z;
17  z=x/y;
18  cout<<z<<endl;
19     return 0;
20 }
```

```
1.66667
```

Redeclaration variables Example

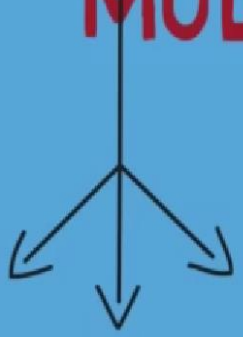


```
8   ********************************************
9   #include <iostream>
10
11  using namespace std;
12
13  int main()
14  {
15      int x=0;
16      int y=0;
17      int z=0;
18
19      x=5;
20    y=6;
21      z=x+y;
22      cout<<z<<endl;
23
24      return 0;
25  }
```

```
11
```

Calculation Modulus Example

MODULUS %



1 : number % same number = 0

5%5=0

6%6=0

7%7=0

Calculation Modulus Example

2 : small % big = small

4%5 = 4

Calculation Modulus Example

3 : big % small=??

7 % 6 = 1

12 % 7 = 5

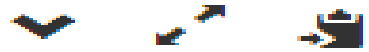
Calculation Modulus Example

$$15\%7 = 8 - 7 = 1$$

```
// 1 : Number % SameNumber = 0
// 2 : Small % Big = Small
// 3 : Big % Small = Small - Big
```

Calculation remainder Example

```
 8  **********************************************************
 9  #include <iostream>
10
11  using namespace std;
12
13  int main()
14  {
15
16    cout<<5%5<<endl;
17        return 0;
18  }
```



```
0
```

Calculation remainder Example

```
 9  #include <iostream>
10
11  using namespace std;
12
13  int main()
14  {
15
16   cout<<5%3<<endl;
17      return 0;
18  }
```

```
2
```


Thank
you