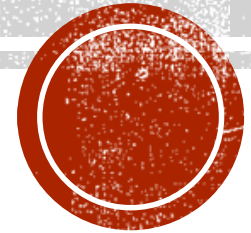
EXERCISES CIN, COUT

Introduction To Programming

2020-2021



Exercise 1:

Write a program that prints the value of the surface of a rectangle

- Inputs of the program?

  Data needed to calculate the surface?

  ➔ We need Length and width of the rectangle

  ➔ We need two variables de type float: one for length and one for width;

- Output of the program?

surface of the rectangle i.e. length multiplied by its width

SOLUTION- EXERCISE 1

```
1   #include <iostream>
2   using namespace std;
3   int main()
4   {
5       float width, length, surface;
6       cin>>length>>width;
7        surface=width*length;
8        cout<<"surface of the rectangle ="<<surface;
9   return 0;
10  }
```

Screen

```
5
3
surface of the rectangle =15
```

REMARK

- We can rewrite the program with declaration of 2 variables only (width, length).

```
1  #include <iostream>
2  using namespace std;
3  int main()
4  {
5     float width, length;
6     cin>>length>>width;
7      cout<<"surface of the rectangle ="<<length*width;
8  return 0;
9  }
```

```
5
3
surface of the rectangle =15
```

EXERCISE 2

Write a program that reads two real numbers and prints their sum, their multiplication, their division and their subtraction.

```
1   #include <iostream>
2   using namespace std;
3   int main()
4   {
5     float num1, num2;
6     cin >> num1 >> num2;
7
8      cout<<"sum = " << num1 + num2 << " \n multiplication =" << num1 * num2 << "\n subtraction = ";
9      cout << num1-num2 << "\n division = "<< num1/num2;
10  return 0;
11  }
```

```
14
3
sum  = 17
 multiplication =42
 subtraction  = 11
 division  = 4.66667
```

Execution of the program (case of num1=15.7 and num2=9.64)

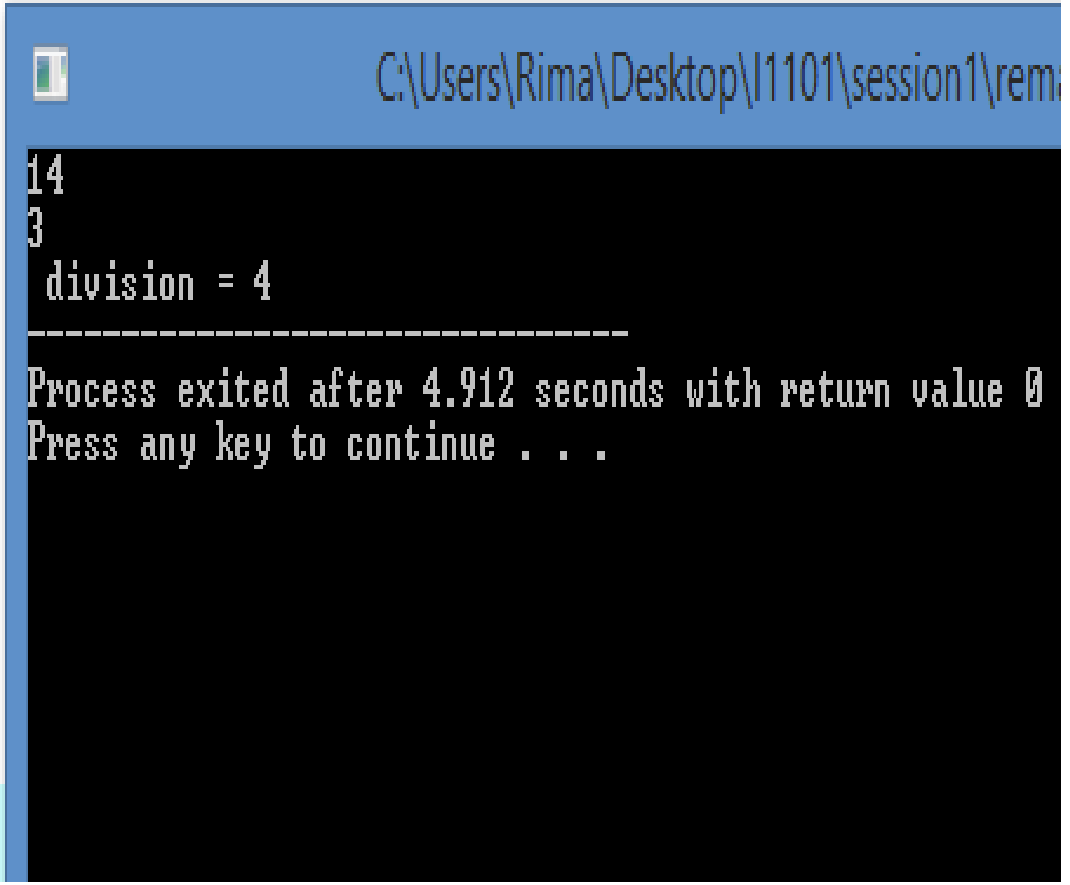
```
1   #include <iostream>
2   using namespace std;
3   int main()
4   {
5     float num1, num2;
6     cin >> num1 >> num2;
7
8      cout<<"sum = " << num1 + num2 << " \n multiplication =" << num1 * num2 << "\n subtraction = ";
9      cout << num1-num2 << "\n division = "<< num1/num2;
10  return 0;
11  }
```

```
15.7
9.64
sum  = 25.34
 multiplication  =151.348
 subtraction  = 6.06
 division  = 1.62863
```

REMARK

- If num1 et num2 are of type integer (int), and we want to get the value of num1/num2.

```
1  #include <iostream>
2  using namespace std;
3  int main()
4  {
5    int num1, num2;
6    cin >> num1 >> num2;
7     cout << " division = "<< num1/num2;
8  return 0;
9  }
```



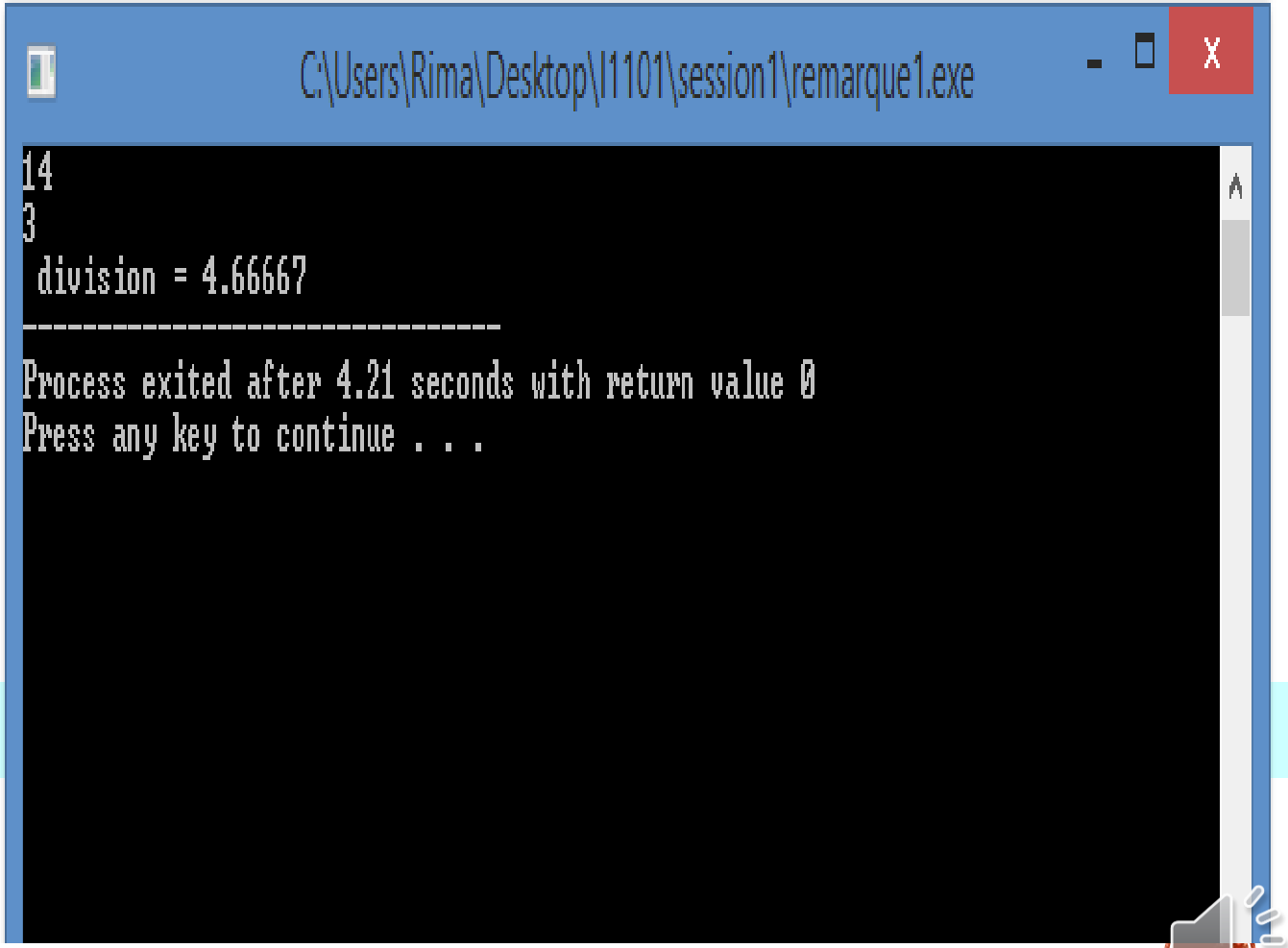
EXPLANATION

1) You remarked that the result of num1/num2 displayed on the screen output (displayed by cout<<) is equal to à 4 instead of 4.666667.
2) If the operands of the operator / are integers, then the result of / is integer. The operator / will give a float value if and only if one of its operand is of type float.
3) Therefore, we need to convert one of the operand to float, this can be done by: (float) num1 (see next slide)
4) **Conclusion:** if we have two integer variables and we want to get their division (with float value) we need to convert at least one of them to float type.

EXPLANATION

remarque1.cpp

```cpp
#include <iostream>
using namespace std;
int main()
{
  int num1, num2;
  cin >> num1 >> num2;
   cout << " division = "<< (float)num1/num2;
return 0;
}
```



EXERCISE 3

- Write a program that reads an integer number and prints its opposite

Solution 1

```cpp
#include <iostream>
using namespace std;
int main()
{
  int num, x;
  cin >> num;
  x=-num;
   cout << " opposite of "<< num << " is equal to " << x;
return 0;
}
```

```
10
 opposite of 10 is equal to -10
```

Solution 2

```cpp
#include <iostream>
using namespace std;
int main()
{
  int num;
  cin >> num;
   cout << " opposite of "<< num << " is equal to " << -num;
return 0;
}
```