Metropolia
C++ Programming
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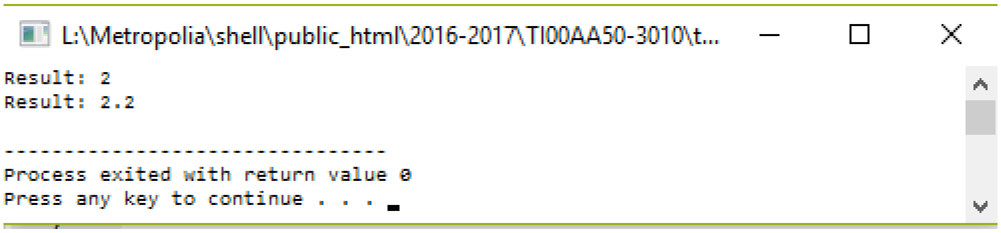
Exercise 4
Overloading

1. **Function call operator () overloading in C++**. Write a program where you overload function **timesTwo**. This function **timesTwo** gets one parameter which type is **int** and **double**. You have to write two different implementation of function **timesTwo**. In main function you call this function with value 2 and 2.2. In function **timesTwo** you have to print the value. Sample print is in figure 1.

   Hint: https://www.tutorialspoint.com/cplusplus/function_call_operator_overloading.htm

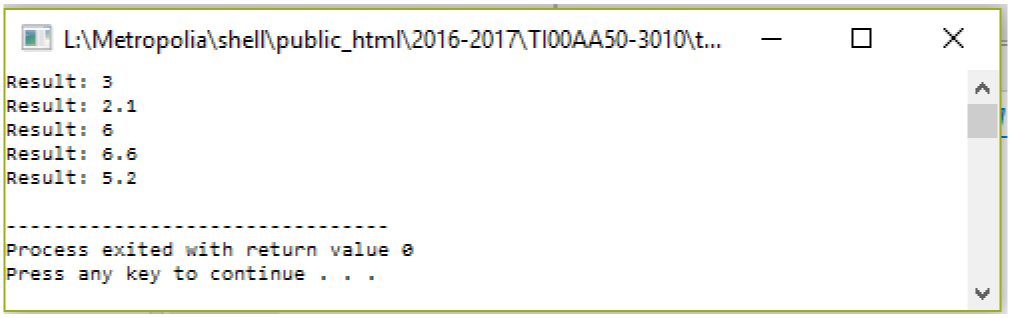

L:\Metropolia\shell\public_html\2016-2017\TI00AA50-3010\t...

```
Result: 2
Result: 2.2

--------------------------------
Process exited with return value 0
Press any key to continue . . .
```

Figure 1. Sample print in Dev C++ -program

2. Write a program where you overload function **add**. In main function are next calls add(A, B), add(A, D), add(A, B, C), add(D, E, F), add(A, E, B) where values of variables are A = 1, B = 2, C = 3, D = 1.1, E = 2.2 and F = 3.3. Variables A, B and C are integer and D, E and F are double. Sample print is in figure 1.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```
Result: 3
Result: 2.1
Result: 6
Result: 6.6
Result: 5.2

--------------------------------
Process exited with return value 0
Press any key to continue . . .
```

Figure 2. Sample print in Dev C++ -program

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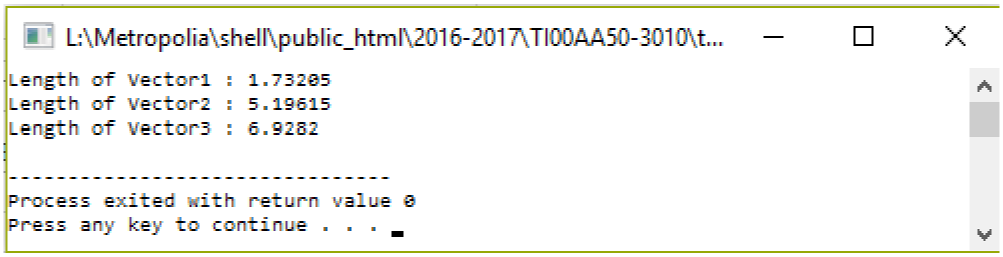
3. **Binary operators overloading in C++**. Define class **Vector** which have double types attributes x, y and z. Implement a program where you overload binary operator **+**. Implement **getLength** which return the length of vector. Furthermore implement **setX**, **setY** and **setX** which sets the coordinates of vector (x,y,z). Further overload + operator to add two Vector objects. In main program define three Vector objects A, B and C. Further set coordinates to vectors A = (1, 1, 1) and B = (3, 3, 3). Then print lengths of vectors A and B. Further use + operator and add two objects A and B and set the result to C. At the end print length of vector C. Sample print is in figure 3.

   Reference: https://www.tutorialspoint.com/cplusplus/binary_operators_overloading.htm

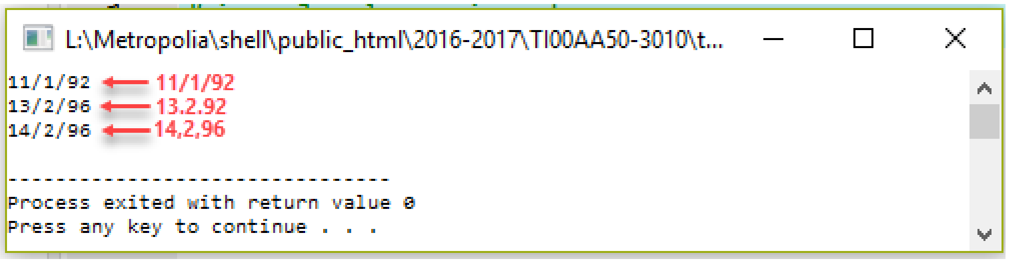
   Note! The right-hand operand is passed as an argument.


L:\Metropolia\shell\public_html\2016-2017\TI00AA50-3010\t...

```
Length of Vector1 : 1.73205
Length of Vector2 : 5.19615
Length of Vector3 : 6.9282

--------------------------------
Process exited with return value 0
Press any key to continue . . .
```

Figure 3. Sample print in Dev C++ -program

4. **Constructor overloading**. Implement the class **dateT** in which constructor accepts date as a **string** in format **pp/k/vv** and **pp.kk.vv** or as three **integer** in order day, month and year. Implement method show, which shows the date in right format. Sample print is in figure 4. Red dates are parameters of the constructor.


L:\Metropolia\shell\public_html\2016-2017\TI00AA50-3010\t...
11/1/92
13.2.92
14,2,96

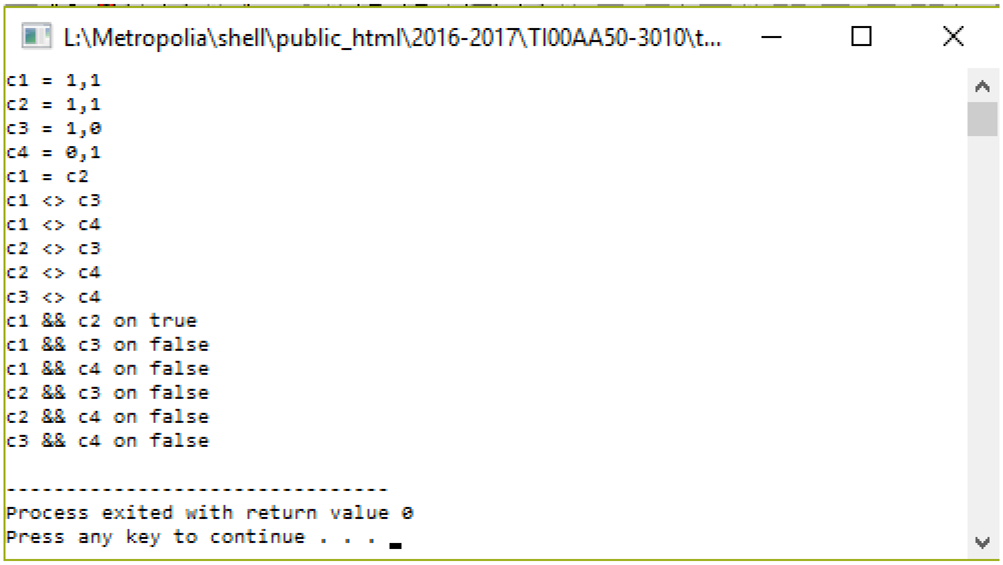
```
11/1/92
13/2/96
14/2/96

--------------------------------
Process exited with return value 0
Press any key to continue . . .
```

Figure 4. Sample print in Dev C++ -program

< continued >

5. **Logical operators overloading**. Implement the class **coordinate** in which are two integer type attributes x and y. In this class is non parametric constructor and two parametric constructor. Furthermore in this class is method **get_xy**. Next you have to overload operators == and &&. In main function you have to create 4 objects with clause **coordinate c1(1, 1), c2(1, 1), c3(1, 0), c4(0, 1);**. After that you have to print coordinate values **c1**, **c2**, **c3** and **c4** (figure 6). You have to make comparisons if (c1 == c2), if (c1 == c3), if (c1 == c4), if (c2 == c3), if (c2 == c4), if (c3 == c4), if (c1 && c2), if (c1 && c3), if (c1 && c4), if (c2 && c3), if (c2 && c4) and if (c3 && c4). Sample print is in figure 5.

   Note! The right-hand operand is passed as an argument.


L:\Metropolia\shell\public_html\2016-2017\TI00AA50-3010\t...

```
c1 = 1,1
c2 = 1,1
c3 = 1,0
c4 = 0,1
c1 = c2
c1 <> c3
c1 <> c4
c2 <> c3
c2 <> c4
c3 <> c4
c1 && c2 on true
c1 && c3 on false
c1 && c4 on false
c2 && c3 on false
c2 && c4 on false
c3 && c4 on false

--------------------------------
Process exited with return value 0
Press any key to continue . . .
```

Figure 5. Sample print in Dev C++ -program