

# CSCI204/MCS9204

## Object and Generic Programming in C++

### Laboratory Exercise 10 (Week 12)

#### Task: vector and template functions (1.0)

The program **vectorProc.cpp** intends to implement and test a template function:

```
template<class T>
```

```
bool same_elements(const vector<T> &val1, const vector<T> &val2);
```

that checks whether two vector containers have the same elements with the same multiplicities. For example,

“1 4 9 16 9 7 4 9 11” and “11 1 4 9 16 9 7 4 9” would be considered identical, but “1 4 9 16 9 7 4 9 11” and “11 11 7 9 16 4 1” would not be the same.

Define a template function that removes duplicates from a vector container:

```
template<class T>
```

```
void remove_duplicates(vector<T> &val);
```

Complete the implementation of these two functions. You will probably need one or more helper (template) functions for the implementation. Place the helper functions in the file **vectorProc.cpp**. Complete the **main()** function and test your implementation.

You can download test files **input1.txt**, **input2.txt** and **input3.txt** from the web site to test your program.

#### Testing:

You can compile your program

```
CC -o task vectorProc.cpp
```

Then run the program

```
./task < input1.txt
```

Input number of elements for integer v1: 9

Input data: 1

Input data: 4

Input data: 9

Input data: 16

Input data: 9

Input data: 7

Input data: 4

Input data: 9

Input data: 11

Input number of elements for integer v2: 9

Input data: 11

Input data: 1

Input data: 4

Input data: 9

Input data: 16

Input data: 9

Input data: 7

Input data: 4

Input data: 9

v1 and v2 contain same elements.

After remove duplicates from v1, now it contains:

1 4 9 16 7 11

After remove duplicates from v2, now it contains:

11 1 4 9 16 7

Input number of elements for double v1: 5

Input data: 1.5

Input data: 4.3

Input data: 9.6

Input data: 16.2

Input data: 9.6

Input number of elements for double v2: 5

Input data: 9.6

Input data: 16.2

Input data: 1.5

Input data: 9.6

Input data: 4.3

v1 and v2 contain same elements.

After remove duplicates from v1, now it contains:

1.5 4.3 9.6 16.2

After remove duplicates from v2, now it contains:

9.6 16.2 1.5 4.3

### Submission:

You should submit the file of the task to the banshee server by 11:59 PM on Friday, 23 October 2015 via command:

```
submit -u your-user-name -c CSCI204 -a L10 vectorProc.cpp
```

and input your password.

**Make sure that you use the correct file names. The UNIX system is case sensitive. You must submit all files in one *submit* command line.**

After submit your assignment successfully, please check your email of confirmation. You should keep this email for the reference.

**You would receive ZERO of the marks if your program codes could not be compiled correctly.**

**Later submission will not be accepted. Submission via e-mail is NOT acceptable.**

**End of Specification**