# COMP3512 - Lab Exercise 5 (Oct 30 - Nov 3, 2017)

This is an exercise that you need to do on a computer. You'll need to commit and push your code to your GitLab repo, and submit for automated marking via Slack.

For this exercise, you will need to write a C++ utility methods for std::vector that will be used to perform various vector operations.

## 1. Project Setup

1. Open Lab5.sln in Visual Studio 2017
2. Add Lab5.h file to your project. (refer to Lab 1 if you don't know how)
3. Add the following content in the header file.

#pragma once

#include <vector>

namespace lab5

{

int Sum(const std::vector<int>& v);

int Min(const std::vector<int>& v);

int Max(const std::vector<int>& v);

float Average(const std::vector<int>& v);

int NumberWithMaxOccurence(const std::vector<int>& v);

}

1. Add Lab5.cpp file to your project.
2. Add the following empty implementations in the cpp file.

#include "Lab5.h"

namespace lab5

{

int Sum(const std::vector<int>& v)

{

return 0; // implement Sum

}

int Min(const std::vector<int>& v)

{

return 0; // implement Min

}

int Max(const std::vector<int>& v)

{

return 0; // implement Max

}

float Average(const std::vector<int>& v)

{

return 0.0f; // implement Average

}

int NumberWithMaxOccurence(const std::vector<int>& v)

{

return 0; // implement NumberWithMaxOccrance

}

}

1. You can create main.cpp file with the following contents to test your code locally.

#include "Lab5.h"

int main()

{

std::vector<int> v;

v.push\_back(1);

v.push\_back(2);

v.push\_back(2);

v.push\_back(4);

v.push\_back(4);

int sum = lab5::Sum(v);

int min = lab5::Min(v);

int max = lab5::Max(v);

float average = lab5::Average(v);

int maxOccurence = lab5::NumberWithMaxOccurence(v);

return 0;

}

### Expected Behavior of methods in this class

* Sum method should return the sum of all integer elements inside a vector. If vector is empty, return 0.
* Max method should return the maximum of all integer elements of a vector. For example, a vector with { 1, 3, 2, 4, 5 } should return 5 as the max. If vector is empty, return 0.
* Min method should return the minimum of all integer elements of a vector. For example, a vector with { 3, 2, 1, 6, 8 } should return 1 as the min. If vector is empty, return 0.
* Average should return the average of all integer elements of a vector. For example, a vector with { 1, 2, 3, 5 } should return 5.5 as the average. If vector is empty, return 0.
* NumberWithMaxOccurence should determine which integer inside a vector occurs most frequently. For example, a vector with { 1, 3, 3, 5, 7, 3, -10 } should return 3. If multiple numbers has the same occurrence, then return any of that number. For example, { 1, 1, 3, 3, 2, 6, -1 } should return either 1 or 3.

## 2. Commit, Push and Ask for a Build

You know the drill :)

# 