MIDDLE EAST TECHNICAL UNIVERSITY, NORTHERN CYPRUS CAMPUS

CNG242 Programming Language Concepts – Lab 6: C++

Introduction to C++ Classes:

You can find an example implementation of Time class below using C++ Classes.

time.h

```
#ifndef TIME_H
#define TIME_H

class Time {
private:
        int hour;
        int minute;
        int second;
public:
        Time();
        void setTime(int, int, int);
        void printTime(void);
};
#endif
```

time.cpp

```
#include <iostream>
#include "time.h"
using namespace std;

Time::Time() {
        hour = 0;
        minute = 0;
        second = 0;
}

void Time::setTime(int h, int m, int s) {
        hour = h;
        minute = m;
        second = s;
}

void Time::printTime(void){
        cout << ((hour < 10) ? "0" : "") << hour << ":";
        cout << ((minute < 10) ? "0" : "") << minute << ":";
        cout << ((second < 10) ? "0" : "") << second << endl;
}
```

main.cpp

```
#include <iostream>
#include "time.h"
using namespace std;

int main()
{
      Time mytime1;
      mytime1.setTime(13, 15, 00);
      mytime1.printTime();

      Time *mytime2 = new Time();
      mytime2->setTime(13, 15, 00);
      mytime2->printTime();
      delete mytime2;

      system("PAUSE");
      return 0;
}
```

Output

```
13:15:00
13:15:00
```

Practical Exercises on C++ Classes

a. Create a class `Rectangle`. The class has attributes `length` and `width`, each of which defaults to 1. It has member functions that calculate the perimeter and the area of the rectangle. It has set and get functions for both length and width. The set function should verify that length and width are each floating point numbers larger than 0.0 and lower than 20.0.

b. Modify the `Rectangle` class implemented in Part (a) to include **draw** function that displays the rectangle. However, you first need to include the following member functions:
   - `setFillCharacter` function to specify the character (such as -) that will be used to fill the body of the rectangle.
   - `setPerimeterCharacter` function to specify the character (such as *) that will be used to draw the border of the rectangle.

```
***************
*-------------*
*-------------*
*-------------*
***************
```

c. Create a class `Line` which consists of start and end coordinates, and line type. The default values should be as follows: start coordinate is (0, 0), end coordinate is (0, 0). This class should support two types of lines which are vertical (v) and horizontal (h). The default value for line type should be vertical. This class has `set` function which is used to set the start and end coordinates, and line type. This function should verify that the line can be drawn using the start and end coordinates based on the line type. This class also has `draw` function which draws a line.

First of all, you need to implement a class `Coordinate`. Hint: You need to calculate the length of the line in order to draw.

```
     Horizontal Line                 Vertical Line
                                           *
   * * * * * * * * * *                     *
                                           *
                                           *
                                           *
                                           *
                                           *
                                           *
                                           *
                                           *
```

References:

1. H. M. Deitel and P. J. Deitel (2000) C How to Program. Third Edition. Prentice Hall: New Jersey