CS250 Assignment 7
SDL Moving Circle

Date assigned: Wednesday, April 5, 2017
Date due: Friday, April 14, 2017
Points: 35

Goals for this assignment

1. Read and use existing code
2 Write an object-oriented program using multiple classes.
3. Use composition, inheritance, friends, and operator overloading.
4. Implement the MovingCircle class.
5. Practice with basic 2D graphics in SDL.

Create a new project in your assignment solutions folder named **07MovingCircleTest**. You must link this project with the SDL libraries (see your notes from class) and 06Graphics2D. You will also add new code to 06Graphics2D

You must implement the MovingCircle class we discuss in class which will be placed on grace. You must use the Direction2D class presented in class which can also be found on grace.

Your **driver** (07MovingCircleTestDriver.cpp) must:

1. Create an instance of the SDLManager called rcSDLManager
2. Create a window of size 640 x 640 at position (300, 300) on the screen with title Moving Graphics
3. Initialize the world correctly. The background is TEAL.
4. Read the data file **movingcircles.txt** which will contain at most 10 moving circles into an array of MovingCircles.
5. Place each moving circle read on the screen. You are to have all moving circles displayed inside an animation loop that continues until the user selects the close box (i.e. the X in the upper right of the window). Each moving circle must:
   a) be initialized correctly from the data file using the overloaded constructor
   b) initially placed correctly on the display animating in the proper direction and at the proper speed
   c) bounce off the edge of the screen reflecting correctly after the bounce. For instance, a moving circle moving NW and reflecting off the left wall will be moving NE, and so on.

Here is how to proceed:

1. change the data type of mXCenter, mYCenter, and mRadius in Circle.h from Uint32 to int
2. change the access modifier of the data members of Circle.h from private to protected
3. add Direction2D.h and Direction2D.cpp from grace to 06Graphics2D
4. copy MovingCircle.h from grace placing this file in the same directory as Circle.h
5. implement and test each function of MovingCircle.h one function at a time
6. create a driver that animates each circle read from the file movingcircles.txt inside of the SDL animation loop until the window is closed

Notes on Design

You will be using composition in this project as a MovingCircle has-a Direction2D. You must also use Inheritance: a MovingCirlce is-a Circle. Your driver must contain an array of MovingCircles.

Error Handling

The data file will not contain any errors and will always contain at most 10 circles.

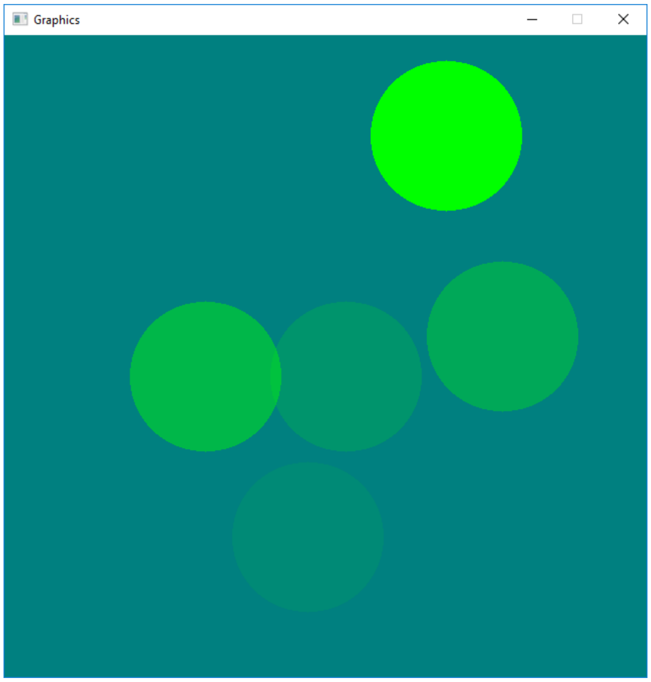
Sample File: The file will end with a blank line

```
100 100 75 0 255 0 255 E 1
200 200 75 0 255 0 110 S 1
300 300 75 0 255 0 80 E 2
400 400 75 0 255 0 40 NW 1
500 500 75 0 255 0 20 E 3
```

The values in the file are:

```
xposition yposition radius colorR colorG colorB colorA direction speed
```

Sample Output after a certain amount of animation



To complete this assignment you must submit the following:

1. An electronic copy of your program on Grace

a) Add a project named **07MovingCircleTest** to your assignment solutions folder. It is vital that you name your solution and your project correctly!
b) Type your program (fully documented/commented) into the project. You need to follow the coding standards from the CS250 Web page. These coding standards have been modified to include additional C++ language features introduced in CS250, so please be sure to read the new coding standards. Make sure that you include the hours you worked on the assignment in your header comments.
c) Pay attention to the example output. Your program's output must look **exactly** like the sample output.
d) Make sure that your program builds without errors & warnings and runs correctly. If you get any errors or warnings, double check that you typed everything correctly. Be aware that C++ is case-sensitive. You will lose 10% if there are any warnings and 40% if your program does not build successfully.
e) Once you are sure that the program works, it is time to submit your program. You do this by logging on to Grace and placing your complete solution folder in the **CS250-0X Drop** folder.
f) The solution must be in the drop folder by the time class starts on the day the assignment is due. Anything submitted after that will be considered late.

2. A hard copy of your program

a) The hard copy must be placed on the instructor's desk by the time class starts on the day that it is due.
b) You must print: 07MovingCircleTestDriver.cpp , MovingCircle.h, and MovingCircle.cpp.
c) **The hard copy must be printed in color, double-sided, and stapled in the upper left corner if your solution contains multiple pages**. Failure to print properly will result in loss of 4 points (10%)
d) Your tab size must be set to 2 and you must not go past column 80 in your output.

Remember, if you have any problems, come to me straight away

with your project on Grace. Good Luck!!!! :)