

CS250 Assignment 6  
SDL Moving Circle

Date assigned: Wednesday, April 6, 2016

Date due: Friday, April 15, 2016

Points: 45

**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 06\_MovingCircleTest. You must link this project with the SDL libraries (see your notes from class) and 05\_Graphics2D. You will also add new code to 05\_Graphics2D

You must add the following code from Grace to 05\_Graphics2D:

- Direction2D.h and Direction2D.cpp
- Finding a true bug in Direction2D will result in +1 bonus point (per bug).

You must implement the MovingCircle class we discussed in class (MovingCircle.h and MovingCircle.cpp in 05\_Graphics2D). You must use the Direction2D class presented in class.

Your **driver** (06\_MovingCircleTestDriver.cpp) must:

1. Initialize SDL
2. Build an SDL\_Window of size 640 x 640 at position (100,100) on the screen.
3. Build an SDL\_Renderer
4. Set the size of the SDL\_Renderer to the size of the SDL\_Window
5. Set the background color of the SDL\_Renderer to {0, 128, 128, 255}
6. Read the file **MovingCircles.txt** which will contain 5 circles into an array of Circles.
7. Places those circles on the screen and animate them until the user closes the window.
  1. The circles must bounce off the edges of the screen.
8. Allow the user to close the window using the x icon in the top right of the window.
9. Destroy all the SDL objects created above

## Notes on Design

You will be using composition in this project as a MovingCircle contains a Direction2D. You must also use Inheritance: a MovingCircle 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 5 circles.

**Sample File:** The file will end with a blank line

```
100 150 20 255 0 0 255 SOUTH 2
100 100 20 0 255 0 255 NORTH 3
200 200 5 3 0 0 255 255 NORTHEAST 3
300 300 10 100 11 0 255 NORTHWEST 3
400 400 15 11 7 100 255 WEST 1
```

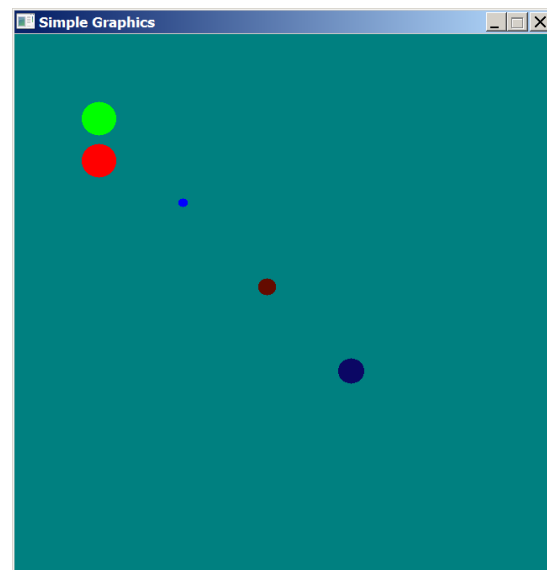
**The values in the file are:**

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

**NOTE:** the members of SDL\_Color are **unsigned char**, so you cannot read the rgba values directly from the file. You must read each individual value into an **int** and then assign that **int** to the correct r,g,b,a member in SDL\_Color

## Sample Output

**Initial placement of the circles:**



**Bonus (+4 pts):**

Create a Speed class that will allow Circle to move at a different speed for each the x and y coordinates. **In order to get any bonus points, your assignment must be on time.**

The file for the bonus will have the form:

```
xposition yposition radius colorR colorG colorB colorA direction xspeed yspeed
```

**To complete this assignment you must submit the following:**

**1. An electronic copy of your program on Grace**

- a) Add a project named **06\_MovingCircleTest** 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 70% 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: MovingCircle.h, MovingCircle.cpp, and 06\_MovingCircleTestDriver.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!!!! :)**