OOP Project – Fall 2019

Part 1

Description

You are required to create desktop screen saver having moving shapes (like Circle, Rectangle, Square or even Triangle, whereas other shapes can be found using below URL). Shapes should have

- different size (height,width/radius)
- different colors
- different starting location
- different direction of movement
- different speed of movement

→A shape should reflect after striking with the boundary/wall if the boundary/wall is touched by it.
→Two shapes of different colors should change their direction if they collide with each other.
→When two same shapes of same color (like two circles with red color) collide with each other, they should result in 1 shape/output (i.e. one of them is deleted/dropped)

Libraries

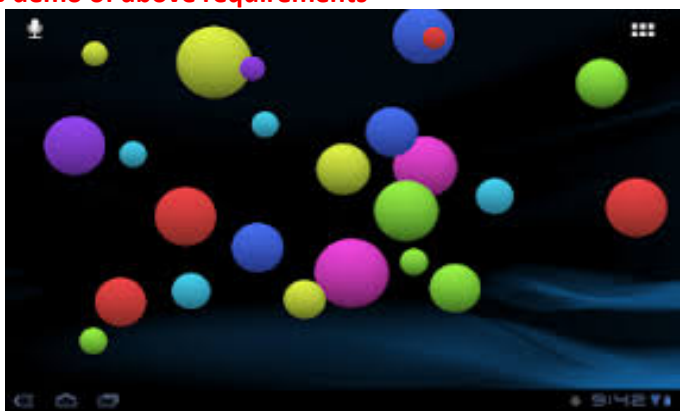
- Used graphics library: graphics.h: https://www.programmingsimplified.com/c/graphics.h
- Available in Turbo C++ compiler: https://developerinsider.co/download-turbo-c-for-windows-7-8-8-1-and-windows-10-32-64-bit-full-screen/
- Dev C++ compiler can also be used with some additional package. See the bottom of: https://www.programmingsimplified.com/c/graphics.h
- Other compiler can also be used with different library for graphics
- You can also use other libraries of your choice.

URL for various shapes: https://www.programmingsimplified.com/c/graphics.h

Expected output

Video – not 100% demo of above requirements
https://www.youtube.com/watch?v=Z-jnRBCqKdg
https://www.youtube.com/watch?v=L8Mcg1BO5yw&disable_polymer=true

Image – not 100% demo of above requirements



Part 2

Turning above task into a Game

User selects any one color by taking input (may be at the start of the program), the task is to touch the balloons of this very color only to get points. If user clicks a shape of any other color then points are decremented. You can set a time for this game, where total points are displayed at the end of the game. Below diagram may provide you some help (do not get confused with shape of hand, you can use mouse- **not 100% demo of above requirements.**)

→ If user drags a shape and make it collide it with another same shape of same color, then the resulting output should be same shape of bigger size.

Bonus: If certain shape of same color, reaches a certain size (i.e. by merging/grouping more than 3 shapes) then it should split back into 3 same shape of original sizes.

Libraries

Skeleton code is attached. You can discuss with your seniors about how to use this skeleton code.

Deliverables

1. Pictorial design of the classes, their members (data, functions, types of functions), and their relationships, some explanation of your logic and functionalities etc, in MS Word document.
2. Programming code
3. The code and the report must be submitted as a single zip file.

Demo

1. A power point presentation to discuss each functionality/logic
2. Working/running code on your laptop to view the functionality of the product

Submission and Deadline

Submission on Slate only. Deadline is 6th of December (Friday 9:30 AM). This is an individual task, group work is not allowed.

Hints for Implementation

- **Shape -> Abstract class**
  - setInitialLocation(x,y)
  - setSize(width/radius, height)
  - setColor(c)
  - setSpeedAndInitialDirection(dx, dy)
  - draw() -> Draws the shape
  - move()
    - Changes polarity of dx or dy if boundary is touched
    - Updates x and y of a shape
  - Think about others if required
- **Circle/Rectangle/.. -> Polymorphic classes** that inherit virtual functions of Abstract class
- **main()**
  - Initialize graphics
  - Declares different shapes and initializes them
  - Calls clear(), draw(), move() of all shapes inside a loop. In each iteration use sleep() to delay
  - Think about others if required