Assignment 4 - Drawing Circles
Due Nov 1 23:59

Goals

Handle touch events
Use 2D graphics
Menus
Animation
Use the accelerometer

App description

This assignment is to develop a simple drawing app. The user can draw colored circles. The app will have three modes of operation: drawing, deleting and moving. The three modes are described below. The app can only be in one mode at a time. So in the drawing mode circles are not moving.

Drawing Mode

The drawing area for the circles will be the entire screen except for the title bar. When the user places one finger on the screen a circle is drawn on the screen. The center of the circle is placed where the user touched the screen. The user moves their finger to increase the radius of the circle. While the user is moving their finger the circle is drawn, with the edge of the circle under the users finger. So as the user moves their finger farther from the center of the circle the circle gets larger in real time. When the user lifts their finger the size of the circle is fixed. The user can put multiple circles on the screen by touching it multiple times. You should be able to support unlimited number of circles (or as many as memory will allow).

While in drawing mode the user can select via a menu which color the circle should be when drawn. The user can select the colors blue, red, green and black. The default color it is black. This is the color of the circles drawn while the color selected. So the user could draw several black circles, then change the color to blue and then draw some blue circles. The first black circles remain black.

Delete Mode

While in delete mode the user can delete circles. When the user touches inside a circle the circle is removed and not drawn again. If the spot where the user touches the screen is inside multiple circles at the same time they are all deleted. Circles do not move when the app is in delete mode.

Moving Mode

In this mode the user can put the circles in motion. The user sets a circle in motion by placing a finger in a circle and swiping in any direction. The circles will start moving in direction and velocity indicated by the swipe. Different circles can be moving in different directions with different speeds. When a circle reaches the edge of the screen it will bounce off the edge properly. That is it will lose some velocity and take into account the angle it strikes the edge. For example if the circle hits the edge at 90 degree angle it will bounce straight back. If it strikes the edge at a 45 degree angle it will bounce off at a 135 degree angle.

Selecting the Mode

You need to have a way for the user to select which mode the app is in and show the user which mode the app is currently in.

Challenge Features

1. Have the circles bounce off each other in a reasonable way when they collide. This will require some physics as how two circle will react when they collide depends on angle of their intersection, their velocities and their masses.

2. When circles are moving use the accelerometer to modify the direction and velocity of a circle. As the user tilts or moves the phone the circles in motion need to respond to changes in the accelerometer. Keep in mind that the accelerometer give you acceleration not velocity. The circle will be accelerated in the direction of the lower part of the device. If we tilt the top of the device down the circle will accelerate toward the top of the device. If the tilt is slight the acceleration is slight. If the circle is moving toward the bottom of the device when the device is tilted so the top is lower than the bottom the circle does not immediately start moving toward the top of the device. The emulator does allow you to simulate the accelerometer.

Target Device

iPhone 13

What to Turn in

Create a Xcode project for the assignment. Xcode places the project in its own directory. Place the directory (and all its contents) into a zip file. Turn in the zip file. Turn in your assignment at: http://bismarck.sdsu.edu/CoursePortal.

Grading

The assignment will be graded as follows:

Item	Points
Handle one circle	10
Handle multiple circles	10
Circles grow	15
Multiple colors	15
Deleting circles	15
Moving circles	15
Mode selection & proper indicating of current mode	10
Circles collide with edges correctly	10