CISC106 Fall 2009 Project 1 Part 2

Dates

Oct 28

Single team submission of project 1 part 1 (all functions and all tests) due on Sakai before 11:59 pm.

Fri Nov 6

All teams will meet with a TA to demonstrate their project. Teams must have *scheduled* next week's 10 minute demo with the TA of the team leader by 5 pm.

Sun Nov 8

Single team submission of project 1, all functions and all tests due on Sakai before 11:59 pm. This is the final submission.

Mon Nov 9 - Tue Nov 10

Demos with TA

Wed Nov 10

Second midterm exam, including questions on the project material.

Fri Nov 12

Team evaluations

Project Part 2 Overview

Part 1 of the project will be 50% of the total project points.

In part 2, you will add some realism to your simulation. Every group must extend their part 1 solution to include gravity and friction. There are then three optional parts. Implementing 1 of the options is worth 20 points, 2 is worth 25 points, and 3 is 30 points. Your group may also propose a different option than the 3 listed (see details below):

- (10 points) Gravity Add a new function, updateCircleGravity, that takes a circle and increases its downward velocity (or decreases its upwards velocity) each simulation cycle according to a given gravity constant.
- (10 points) Friction Add a new function, updateCircleFriction, that takes a circle and decreases its x and y velocities. This uses the concept of Stokes' drag (http://en.wikipedia.org/wiki/Drag_(physics)) for small spherical objects. The formula for this drag is $F_d = -(c\pi r)v$ where c is a constant representing the viscosity of the fluid (could be air, water, oil, etc), r is the radius of the circle, and v is the current velocity magnitude.

- (option) Motion Trails Changes the handles vector to be a two-dimensional matrix, and only deletes the handles that are in the last column of the matrix during each cycle. During each cycle the new handles that result from drawing circles are placed in the first column of the matrix. Trail depth can be specified by a parameter.
- (option) Splitting Splits each circle into two circles if it is at the bottom edge. The new circles both have radius = (2 * oldRadius)/pi. If a circle with radius < 1 reaches the bottom edge it is removed completely from the set of circles and handles.
- (option) Collisions Detects when circles collide with one another and updates the x and y velocities of each circle using the elastic collision model. See additional document on 2dcollisions.
- (option) Your Approved Idea Do you have an exciting feature you'd like to add to your project? Think it out, write it up in a clear descriptive paragraph, including how you think you'd implement it, and get it approved by your professor during office hours.

Each of these extensions has corresponding functions listed in functions2.txt.

Questions

Please be sure to check the online FAQ before you send a question to the TA or your professor.

Email

Any email about the project to the professor or your TA must include "106 PROJECT *yourteamname*" in the subject line. Emails without this may be ignored and/or discarded¹.

Communication

Work on the project within your team only. Seek help and explanations from your team members, not from members of other teams. In particular, DO NOT communicate with another team or outside person about how they wrote a particular function or test. Feel free to send your code or thoughts to other members of your team, but not outside the team. Violations of this policy will be considered academic dishonesty (see the class web page).

All team-related emails² to another member of the team must be cc'ed to every team member. This means that everyone will need to be especially careful when choosing their words to comment on someone else's code, timeliness, new shoes, etc.

¹Adding this information to your subject line allows us to categorize emails automatically. Help us help you!

²This rule applies to any written words, including text messaging, paper, etc.