Assignment 3 – Moving Discs

ES 103

Term I, 2015-16

We would like to build a simple game system. This involves a set of circular discs moving randomly in the plane.

The user has to add discs to this set without hitting any of the existing discs. If successful, the new disc is added to the set of moving discs. If it hits any of the existing discs, the game is over and needs to be re-started. Since these are discs, there should be no overlap between the new disc and the existing discs. Existing discs can themselves overlap with each other.

After each attempt to add a new disc, the score is printed (the number of discs currently in the game).

Before each attempt by the user, each existing disc randomly moves and/or changes its radius by a small amount. A small fraction of them (approx. 1 in 10) also "clone" themselves. (You will need to implement the code to move the discs and/or change their radius, and/or clone them.)

In this version, there is no graphical display. After each attempt, the position and radius of each disc is printed.

Your program should model the user, the disc, the "game" (the set of discs and the score), and positions (i.e. x,y coord pairs) as classes.

The game starts with an empty rectangular region. The user types in 3 values – x and y values of the center, and the radius – of the disc that is to be added to the game. A set of 3 zeroes as input is a signal to gracefully end the game (if it is not already over!)

Assume the rectangular region is 500x500 units, and that the centers of the discs should stay within these bounds. Further, discs can vary only between 10 and 50 units.