CS 490.001: GAME DESIGN, DEVELOPMENT, AND TECHNOLOGY

PROGRAMMING ASSIGNMENT #2: TEXTURES, QUADRICS, AND OBSTACLES

DUE DATE: THURSDAY, MARCH 20, 2008, 10:30 AM

In this programming assignment, you will expand an existing program to set up a grid-based, texture-mapped environment that you will use in your third assignment. The code for the existing program is on the course Web site:


The existing program sets up four objects in a layered fashion, with keyboard controls for changing the viewing perspective. The four objects are:

- A texture-mapped rectangle, representing a basic playing field.
- A texture-mapped disk hovering above the playing field, representing a game obstacle.
- A segment-based circle, hovering above the texture-mapped disk.
- A non-texture-mapped disk, hovering above the circle.

These objects illustrate the basic types of objects that you will need for your assignment. There are four basic alterations you will need to make to this program:

- Replace the texture-mapped disk with three such disks, randomly placed just above the surface of the playing field. These disks should have no overlap with each other, and should be completely contained within the playing field.
- Insert a “R”-based keyboard control that will reposition the three obstacle disks in three new positions. Once again, there should be no overlap between the three disks.
- Set up a 25×25 grid structure covering the playing field. Use a recursive flood fill algorithm to determine which grid points and which horizontal, vertical, and diagonal grid edges are not covered by any of the three obstacle disks. Essentially, start with a “seed” point (i.e., a grid point that doesn’t cover one of the obstacle disks) and examine its neighbors to determine which ones are similarly unobstructed; those points and the corresponding edges are thus validated and the process continues with recursive calls for each validated grid point. The first few steps of this recursion are illustrated below.

- Insert a “G”-based keyboard control that will toggle the display of the unobstructed portions of the grid (as illustrated at right). Use segments similar to those used in the original program’s circle to render the grid edges, and disks similar to those used in the original program’s non-texture-mapped disk to render the grid points. Remember to elevate these components slightly so they will be not conflict with the display of the texture-mapped objects.

All of your code should be modular and well-documented, with clear comments indicating your additions or alterations to the original program and reflecting the purpose of every major programming component. Constants should be declared in the provided header file and undeclared constants should never be used.

Zip-compress your entire project file and copy it to your drop-box by 10:30 AM on March 20, 2008. Late assignments are not accepted without verifiable medical documentation. You must write your own code, and no one but the instructor may see your code.