Lab 1 – CSC 572
Due 10/2/08 to be demoed in lab

This project is to be worked on in pairs.

Objective: Exposure to implicit functions, volumes, marching cubes

1) Create a program, which generates and visualizes volume data. You will procedurally generate the volume by using the implicit equation of a sphere. Create a volume that is 128x128 with the sphere centered at the middle of the volume. Carefully compute the values for each grid node in the volume such that your sphere's radius is of reasonable size (i.e. it fits within your volume). Once you have generated the volume data, you will need to visualize your sphere by rendering a simple primitive for every voxel that contains a zero crossing. I strongly encourage you to use a small oriented polygon that faces forward and has the correct normal.

2) Next, using the code provided in the below link – finalize the program to create a triangulation of various isosurfaces of the volume. You will only need to demonstrate the zero-set. Your output may be triangle soup. Your program should display the shaded triangulated model.

   See: http://www.ia.hiof.no/~borres/cgraph/explain/marching/p-march.html for source code for a marching cubes implementation. Most useful to you will be the table and edge generation. Note the above code is not a perfect match for this assignment, i.e. it is for meta-balls, but it has all the necessary cube table generation to assist in your implementation.