

Homework 5: Sceneview

Due: Friday, April 3 (9:30 AM)

Question 1 *Define the classes you will use to represent a single subgraph in the scene file. These classes should include: how to store matrices, object attributes, the objects (cones, spheres, etc) themselves, and tree structure information. Remember that a subgraph can have a list of trans nodes, a trans node can have a trans node in it, and that there can be any number of matrices listed in a trans node. The next question will deal with named subgraphs and linking them into an existing subgraph. Write these out as you would a class header file, and include comments. Also include the methods you need on the classes (you do not need to write out the source code for the method, just the declaration).*

Question 2 *For the following scenefile code, draw the class instances that will be created and how they will be linked together (this should be some form of a tree or graph structure). Your arrows must be labeled with the member variable names. Include where the tessellated objects are stored, and the appropriate pointers to them.*

```
subgraph root [  
  trans [  
    rotate 0 1 0 30  
    scale 1 1 2  
    object cone [  
      diffuse 1 0 0  
    ]  
  ]  
  trans [  
    scale 2 2 2  
  
    object sphere [  
      specular 0 1 0  
    ]  
  ]  
]
```

Question 3 *Describe the parsing algorithm you will use for the scenegraph in question 1.*

Question 4 *Add a named subgraph to your scenefile in question 2. (Just show the new pieces and clearly indicate where they go in the original scenegraph.)*

Question 5 *Describe the data structures and algorithm you will use to parse and store a named subgraph.*