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Report for Homework 1.

## Problem Description

The assignment requires us to replicate images given to us using knowledge from openGL. And also use the skill from openGL to create an open-ended scene that utilizes the glPushMatrix function within another glPushMatrix function to transform an image. It also requires the use of at least one triangle to render an scene.

## Problem #1

This problem required us to replicate a scene that uses openGl's "teapot" object to replicate a circle with 10 teapots as 10 points on the circle and each teapot rotated at a certain angle where the handle is pointing towards the center of the circle.

Upon Looking at the image I realized that I would have to utilize the equation of a circle and how it works to build a circle. The radius of my circle was 1.0 and I used the glTranslate() function and gave the x axis parameter the argument of 1.0 which translates the teapot from the point of the origin 1.0 away to the x-axis. I used that as my anchor point and calculated the distance based on the unit circle and the equation $x^2 + y^2 = 1$. I plotted the remaining values and used them as corresponding x and y values for the glTranslate() function and I used the

glRotate() function to rotate the objects around angles relative to their position on the circle so as to fit the description of the scene provided in the assignment description.

Problem #2

This problem involves an image created by openGl's cube object to create a step-like image. I implemented it using an algorithm with a loop that increments the height of each successive cube using the glScale() function and creates another cube at every iteration of the loop. I use variables and increase them by specific values at each iteration of the loop and those values are used as arguments to my glTranslate() function and glScale() functions.

Problem #3

This problem was very interesting for me because it reminded me of the format of the pascals triangle. Teapots positioned in a triangle shape increasing in number from top to bottom. I utilized a nested for loop where the first for loop iterates for each row of teapots and the inner for-loop iterates to create each teapot in a row. The inner for-loop iterates up until the variable counter of the first for loop. I created three variable counters which I set their initial values and incremented them at appropriate points in the for-loops which gives each iteration a different argument which I passed into the gLTranslate functions for the X and Y values. And with this algorithm I was able to create the image in the homework.