# CS 432 – Interactive Computer Graphics

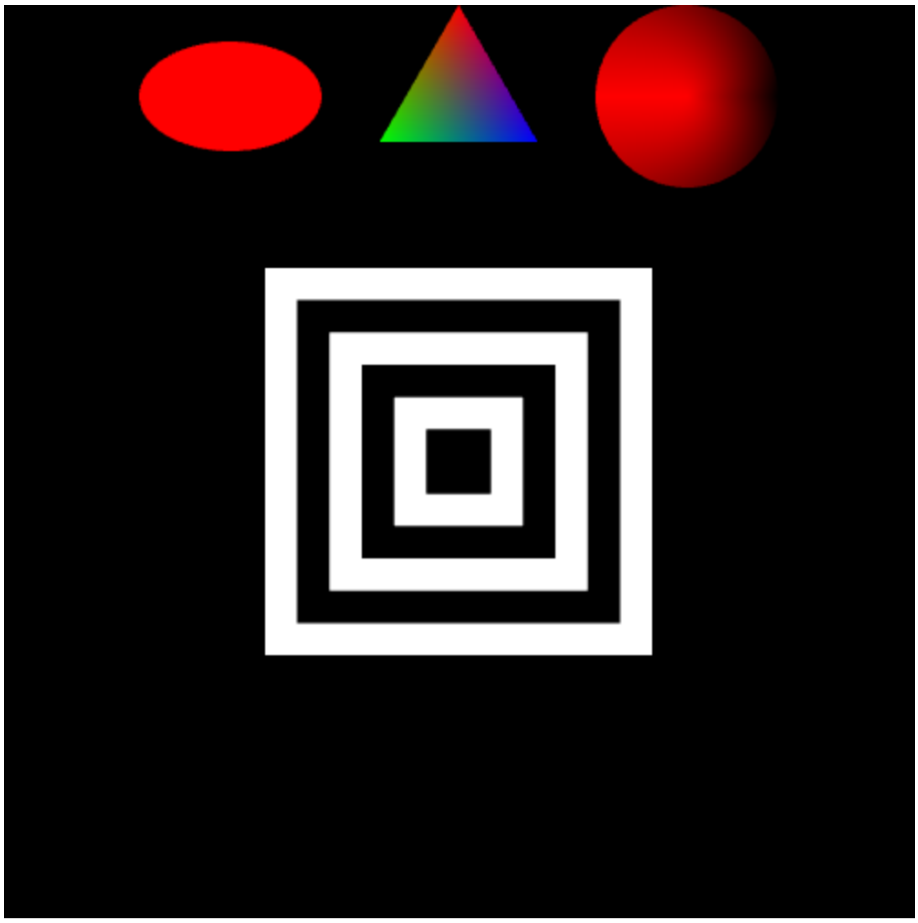
*Assignment 3 – More 2D Graphics*

## Objectives:

1. Define additional polygon shapes.
2. Create addition coloring effects via shader programs.

## Assignment

The goal of this assignment is simple, write code to create the picture below. This is a 500x500 pixel canvas with the viewport utilizing the entire canvas.



One the next page are some notes/hints on drawing the objects.

***The Circle***

Vertices for the circle are most easily defined using the parametric equation of a circle. Varying $0 \leq \theta \leq 2\pi$, points on a circle centered at $(x_c, y_c)$ and with radius $r$ are computed as:

$$x = rcos(\theta) + x_c$$

$$y = rsin(\theta) + y_c$$

Additional notes:

- To achieve the red color effect, vary its vertices amount of red as a function of the angle.
- To draw the circle using the vertex positions, you should use a triangle fan.

***The Ellipse***

You can use the same parametric equation for the circle, but scale down the y component by 60%:

$$x = rcos(\theta) + x_c$$

$$y = \left(\frac{6}{10}\right) rsin(\theta) + y_c$$

The ellipse is pure red.

***The Triangle***

Hopefully, this is pretty straightforward.

That being said, to have easy control over changing the location and size of the triangle you may want to compute its vertices using angles (somewhat like you did with the circle and ellipse).

***The Square(s)***

This shape is created by placing several squares on top of one another, varying the colors of the squares between black and white.

## What to submit?

Submit a single zip file containing all the files needed to run your code.

We should be able to extract your file, navigate to your directory, run an http server there and run your code in a browser.

## Grading:

1. Basic display function (stuff displays): 2 points.
2. Polygon shapes: 4 points.
3. Polygon colors:  4 points.