COSC686: Computer Graphics
Spring 2016, Assignment 1
(Total points: 100)
Due date: March 2nd, 2016 (before midnight)

Submission Instructions

1. Compress your programs by using WinZip or sending the folder to a compressed (Zip) file in Windows.
2. Rename the Zip file following this notation:
   FirstnameLastnameHW1.zip
   Do not use a space in the filename.
3. Upload and submit the zip file through Blackboard.
4. NO late submission is accepted.

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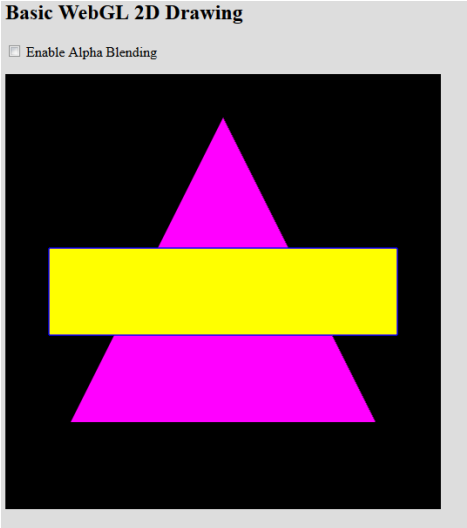
1. The file simpledraw.html draws the following images using WebGL.



It uses the default WebGL coordinate system, in which *x* extends from −1 on the left to 1 on the right, and *y* extends from −1 at the bottom to 1 at the top. It draws three primitives: a triangle drawn using `gl.TRIANGLES`, a rectangle drawn using `gl.TRIANGLE_FAN`, and the outline of the rectangle drawn using `gl.LINE_LOOP` with line width set equal to 3 pixels. Recall that the remaining primitives are `gl.TRIANGLE_STRIP`, `gl.LINES`, `gl.LINE_STRIP`, and `gl.POINTS`.

This example uses the minimal shader program, which allows primitives to be drawn in two dimensions using a uniform color for each primitive. For demonstration purposes, it also uses alpha blending and has a checkbox to enable/disable that feature. It defines a function

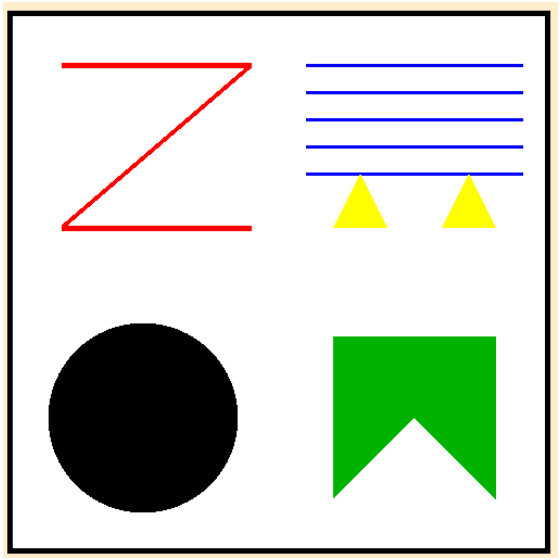
```
function drawPrimitive( primitiveType, color, vertices )
```

for drawing individual primitives. WebGL has no primitives for drawing circles, but a circle can be approximated by a regular polygon with a large enough number of vertices. The sample file defines but does not use the function

```
function makeCircleVertices( centerX, centerY, radius,
vertexCount )
```

which creates an array of vertex coordinates for points evenly spaced along a given circle. The number of vertices that you need to approximate a circle depends on the size of the circle, but 64 vertices should be adequate. (The comments on the definitions of these functions give complete explanations of the parameters)

Your assignment is to replace the body of the `draw()` method in simpledraw.html with code that will draw the following picture, including the black border:



Draw the picture using *each* of the seven kinds of primitive *except* `gl.POINTS` exactly *once*. (Points are a little harder to work with. You'll encounter them in a later lab.) Use six calls to the *drawPrimitive*() function. (You have to use `gl.TRINAGLE_STRIP` for one of the shapes, even though `gl.TRIANGLE_FAN` would probably be easier.) Note that you will also have to use *gl.lineWidth*() and *makeCircleVertices*(). The border of the picture is one of the primitives. The background color of your picture should be white. (You don't need to use alpha blending for this exercise.)