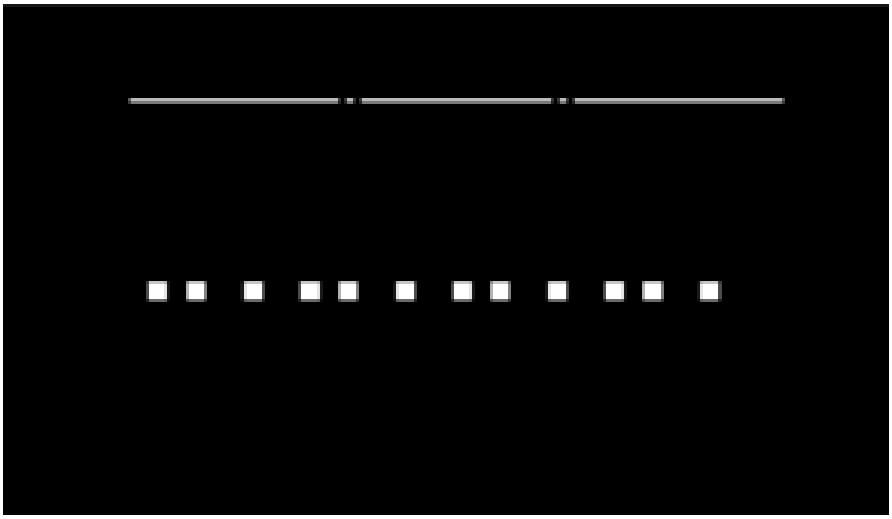
CSE 4200 Lab 4 - Spencer Wallace

*For the code only able the lines that I changed are included

Summary: (Please see photos and code below)

All parts completed, to my knowledge, successfully because of this I am giving myself full credit – 30/30. ***Lines discussed below.** For the polygons I struggled a while with the 9 sided polygon, I could not get it to draw all of the vertices, I think because I was accidentally drawing a convex polygon. I was able to fix this and produce a 12 sided polygon which I then scaled down to 9 sides as seen below. For the cube I estimated some points using some guesses from what I know about how a cube looks, and for the dotted lines I used 0x9999 to draw constantly alternating points. I think it looks pretty good. This same method for the cube was used for the hut, but doubled in scale – and it was also used for the chimney as well as the door. For the window I used the circle algorithm from our previous lab and drew circles with a decreasing radius but same central point until it was filled. For the roof I used four triangles which I again estimated for location and size, and I also think these turned out pretty good and that the hut was pretty colorful.

Lines.cpp



For the top lines I used 0xFFFF to draw a solid line, and then 0xF99F for the dot in between since this is able to connect with the other lines but still represent a dot.

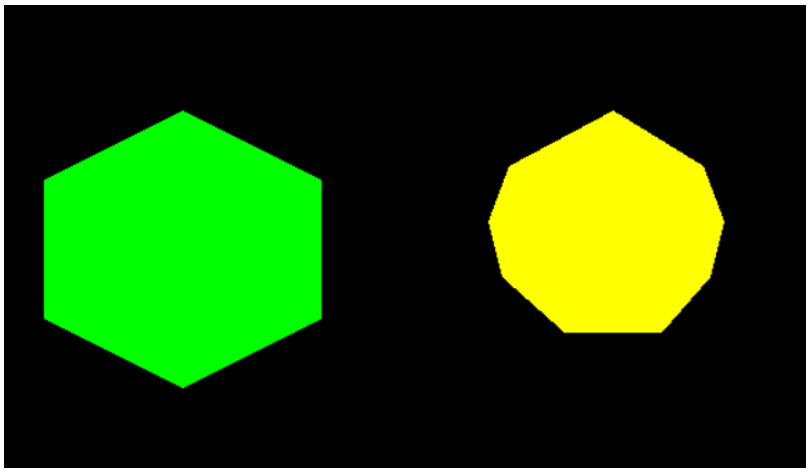
1111 1111 1111 1111 1111 1001 1001 1111 1111 1111 1111 1111

For the bottom I used 0x4A4A as this gives exactly two spaces between the second of the group closed together and the distant dot, and then two spaces between the distant dot and the beginning of the next group.

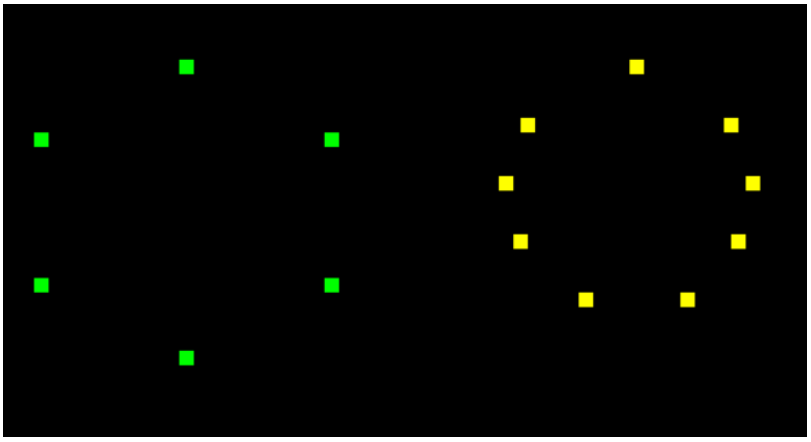
Code for lines.cpp

```
  glColor3f (1.0, 1.0, 1.0);
  glEnable (GL_LINE_STIPPLE);
    glLineStipple (1, 0xFFFF);  //  dash
    drawOneLine (50.0, 125.0, 100.0, 125.0);
    glLineStipple (1, 0xF99F);  //  dot
    drawOneLine (100.0, 125.0, 116.0, 125.0);
    glLineStipple (1, 0xFFFF);  //  dash
    drawOneLine (116.0, 125.0, 156.0, 125.0);
    glLineStipple (1, 0xF99F);  //  dot
    drawOneLine (156.0, 125.0, 172.0, 125.0);
    glLineStipple (1, 0xFFFF);  //  dash
    drawOneLine (172.0, 125.0, 222.0, 125.0);

    glLineWidth(5.0);
    glLineStipple (5, 0x4A4A);  //  close then distant
    drawOneLine (50.0, 75.0, 210, 75.0);
```

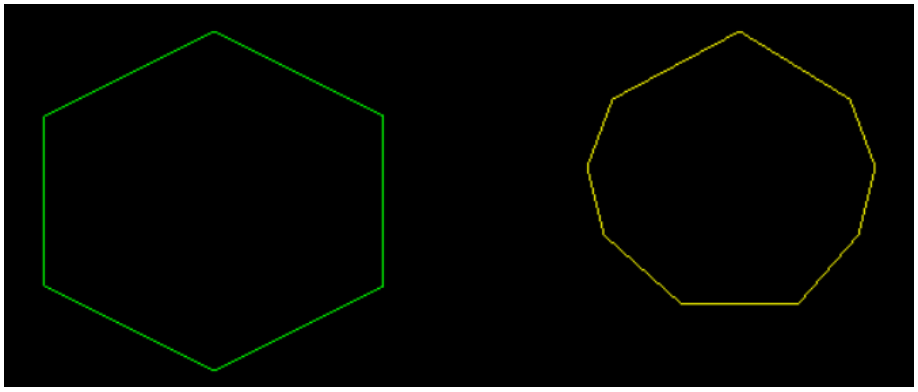
Polygon.cpp



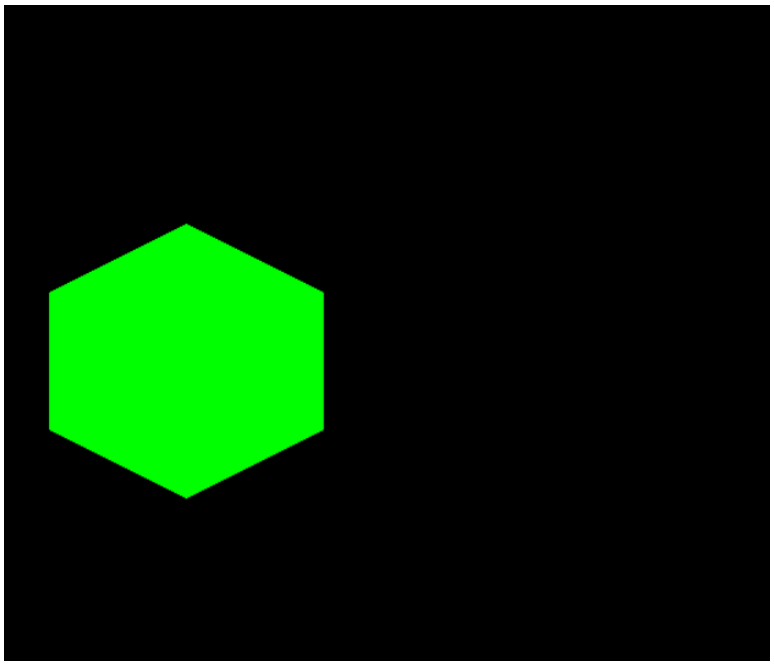
Draw Mode with fill



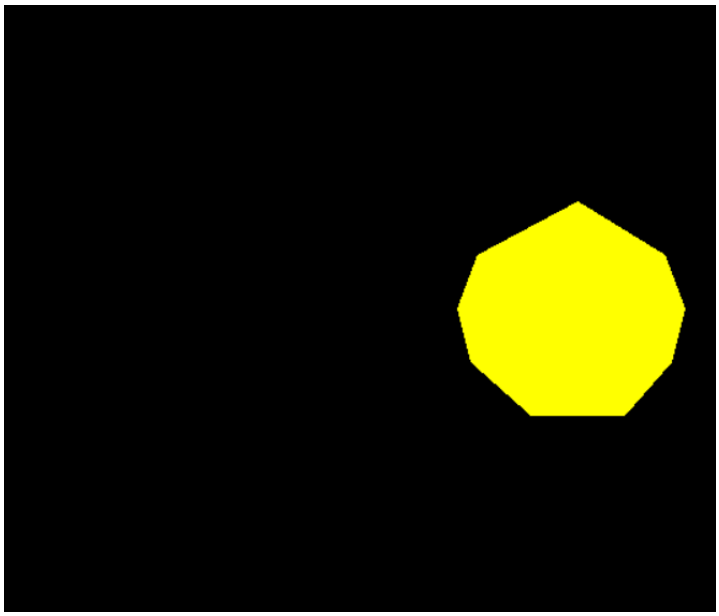
Draw Mode with point



Draw Mode with lines



Green polygon is drawn clockwise, set to cull front



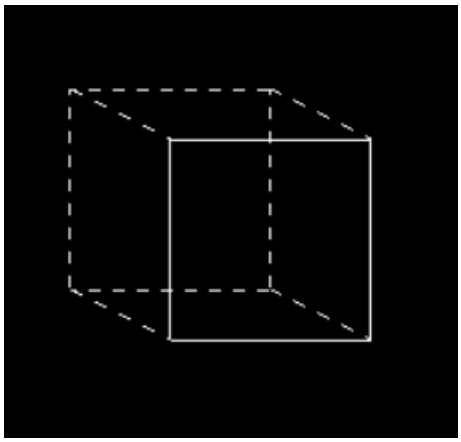
Yellow polygon is drawn counter clockwise, set to cull back

Code

```
  glClear (GL_COLOR_BUFFER_BIT);
  glEnable(GL_CULL_FACE);
  glCullFace(GL_BACK);

  glPointSize(10.0);
//green poly
  glColor3f (0.0, 1.0, 0.0);
  glPolygonMode(GL_FRONT, GL_FILL);
 // glFrontFace(GL_CW);
  glBegin( GL_POLYGON );
      glVertex2i( 140, 400 );
      glVertex2i( 240, 350 );
      glVertex2i( 240, 250 );
      glVertex2i( 140, 200 );
      glVertex2i( 40, 250 );
      glVertex2i( 40, 350 );
glEnd();

//yellow poly
  glColor3f (1.0, 1.0, 0.0);
  glPolygonMode(GL_FRONT, GL_FILL);
//   glFrontFace(GL_CCW);
  glBegin( GL_POLYGON );
      glVertex2i( 450, 400 );
      glVertex2i( 375, 360 );
      glVertex2i( 360, 320 );
```

```
    glVertex2i( 370, 280 );
    glVertex2i( 415, 240 );
    glVertex2i( 485, 240 );
    glVertex2i( 520, 280 );
    glVertex2i( 530, 320 );
    glVertex2i( 515, 360 );
    glEnd();

glFlush ();
```

cube.cpp

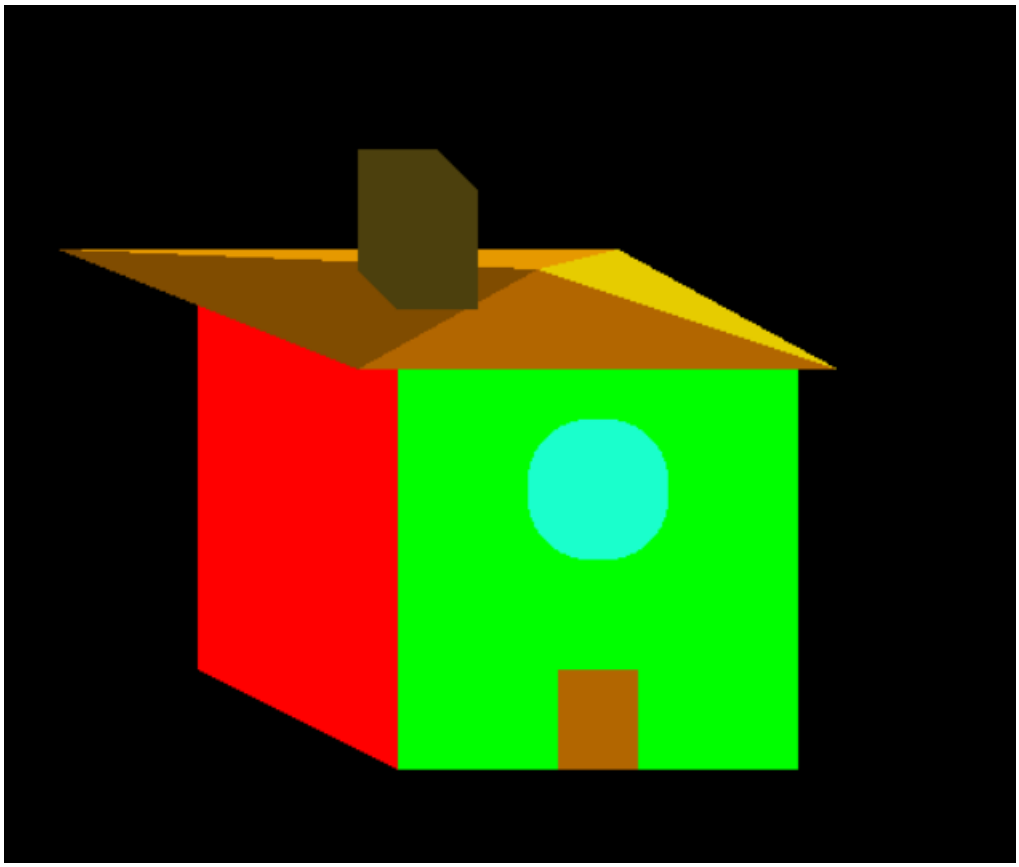


Code

```
glColor3f (1.0, 1.0, 1.0);
glEnable (GL_LINE_STIPPLE);
  //bottom back
  glLineStipple (3, 0x9999);
  drawOneLine (100.0, 50.0, 50.0, 75.0);
  glLineStipple (3, 0x9999);
  drawOneLine (50.0, 75.0, 150, 75.0);
  glLineStipple (3, 0x9999);
  drawOneLine (200.0, 50.0, 150.0, 75.0);

  //front
  glLineStipple (1, 0xFFFF);
  drawOneLine (100.0, 50.0, 200.0, 50.0);
  glLineStipple (1, 0xFFFF);
  drawOneLine (100.0, 150.0, 200.0, 150.0);
  glLineStipple (1, 0xFFFF);
  drawOneLine (100.0, 150.0, 100.0, 50.0);
  glLineStipple (1, 0xFFFF);
```

```
drawOneLine (200.0, 150.0, 200.0, 50.0);
//top back
glLineStipple (3, 0x9999);
drawOneLine (100.0, 150.0, 50.0, 175.0);
glLineStipple (3, 0x9999);
drawOneLine (50.0, 175.0, 150, 175.0);
glLineStipple (3, 0x9999);
drawOneLine (200.0, 150.0, 150.0, 175.0);

//back sides
glLineStipple (3, 0x9999);
drawOneLine (50.0, 175.0, 50, 75.0);
glLineStipple (3, 0x9999);
drawOneLine (150.0, 175.0, 150.0, 75.0);

glFlush ();
```

hut.cpp



Code

```
  glPointSize(10.0);
  glColor3f (0.0, 1.0, 0.0);
  glPolygonMode(GL_FRONT, GL_FILL);
 // front
  glBegin( GL_POLYGON );
  glVertex2i(200, 50);
  glVertex2i(400, 50);
  glVertex2i(400, 250);
  glVertex2i(200, 250);
  glEnd();
```

```
  //left
   glColor3f (1.0, 0.0, 0.0);
   glBegin( GL_POLYGON );
   glVertex2i(200, 50);
   glVertex2i(100, 100);
   glVertex2i(100, 300);
   glVertex2i(200, 250);
   glEnd();
   //top
   glColor3f (0.0, 0.8, 0.9);
   glBegin( GL_POLYGON );
   glVertex2i(100, 300);
   glVertex2i(200, 250);
   glVertex2i(400, 250);
   glVertex2i(300, 300);
   glEnd();
   //door
   glColor3f (0.7, 0.4, 0.0);
   glBegin( GL_POLYGON );
   glVertex2i(280, 100);
   glVertex2i(280, 50);
   glVertex2i(320, 50);
   glVertex2i(320, 100);
   glEnd();
 //roof
 ////front
   glBegin( GL_POLYGON );
```

```
glVertex2i(270, 300);
glVertex2i(180, 250);
glVertex2i(420, 250);
glEnd();
//left
glColor3f(0.5, 0.3, 0.0);
 glBegin( GL_POLYGON );
glVertex2i(30, 310);
glVertex2i(180, 250);
glVertex2i(270, 300);
glEnd();
//back
glColor3f(0.9, 0.6, 0.0);
glBegin( GL_POLYGON );
glVertex2i(30, 310);
glVertex2i(310, 310);
glVertex2i(270, 300);
glEnd();
//right
glColor3f(0.9, 0.8, 0.0);
glBegin( GL_POLYGON );
glVertex2i(420, 250);
glVertex2i(310, 310);
glVertex2i(270, 300);
glEnd();
```

```
 //chimney
 glColor3f( 0.3, 0.25, 0.05 );
// front
 glBegin( GL_POLYGON );
 glVertex2i(200, 280);
 glVertex2i(240, 280);
 glVertex2i(240, 340);
 glVertex2i(200, 340);
 glEnd();
//left
 glBegin( GL_POLYGON );
 glVertex2i(180, 300);
 glVertex2i(200, 280);
 glVertex2i(200, 340);
 glVertex2i(180, 360);
 glEnd();
 //top
 glBegin( GL_POLYGON );
 glVertex2i(180, 360);
 glVertex2i(200, 340);
 glVertex2i(240, 340);
 glVertex2i(220, 360);
 glEnd();

 //window
 glColor3f (0.1, 1.0, 0.8);
```

```
Circle(300, 190, 30);

Circle(300, 190, 25);

Circle(300, 190, 20);

Circle(300, 190, 15);

Circle(300, 190, 10);

Circle(300, 190, 5);


glFlush ();
```