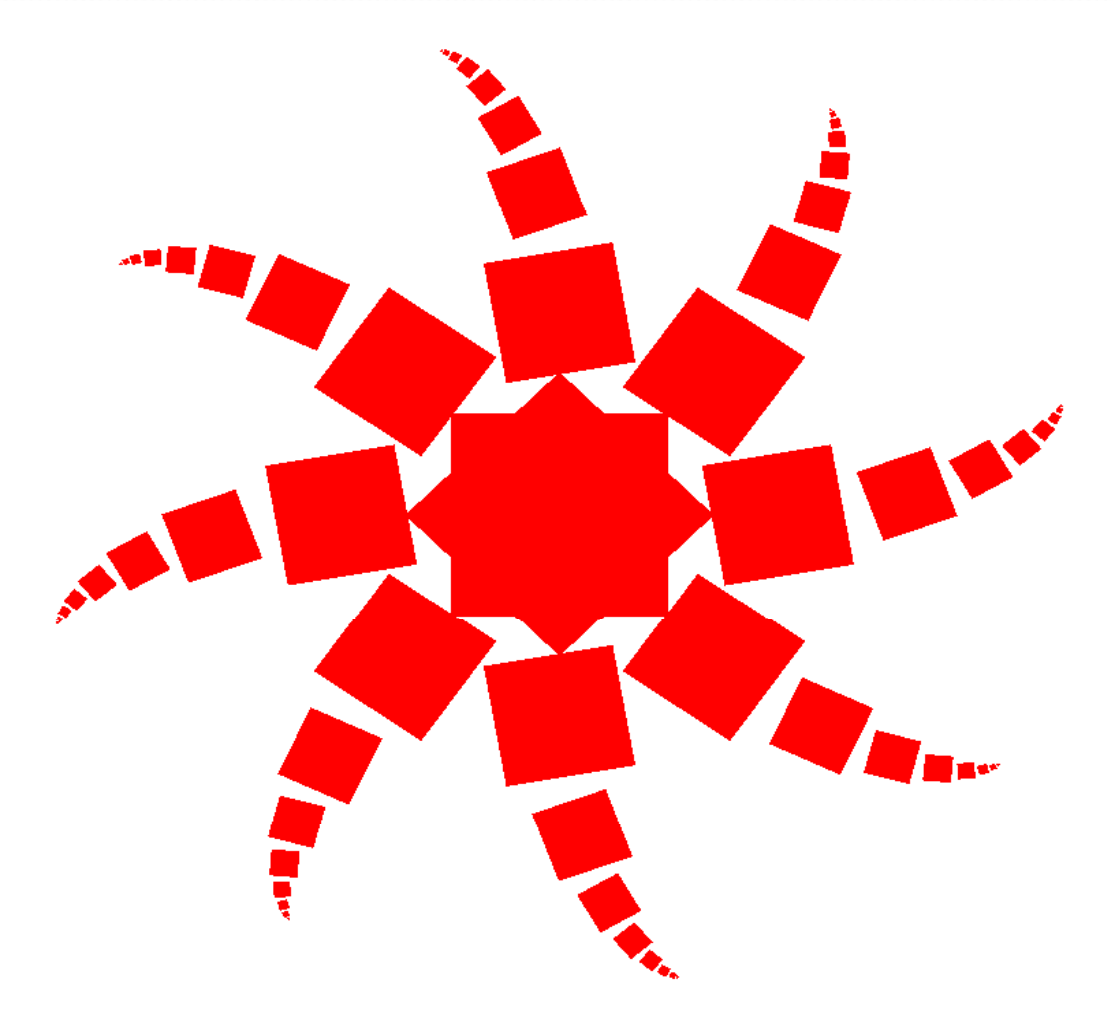
Question 1

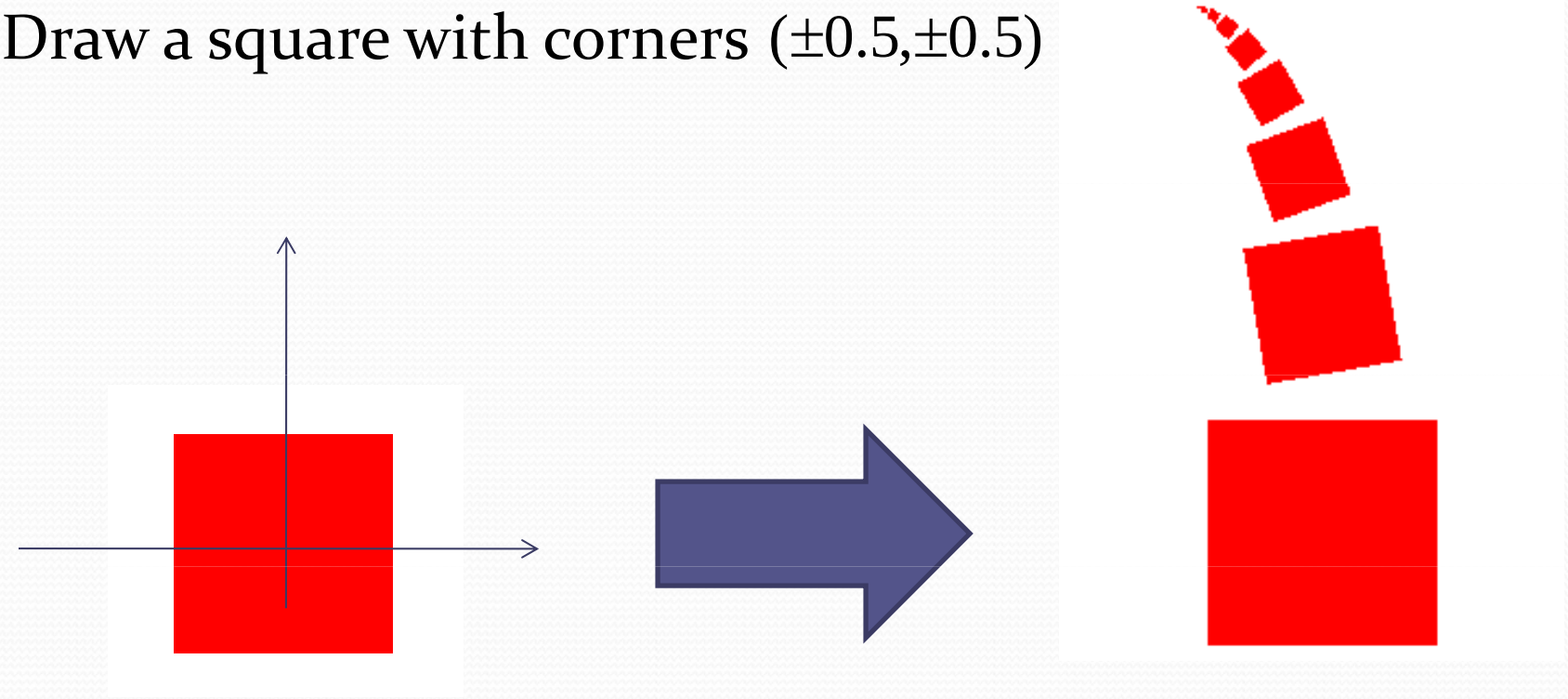
CS3241 Computer Graphics

Drawing a Sun



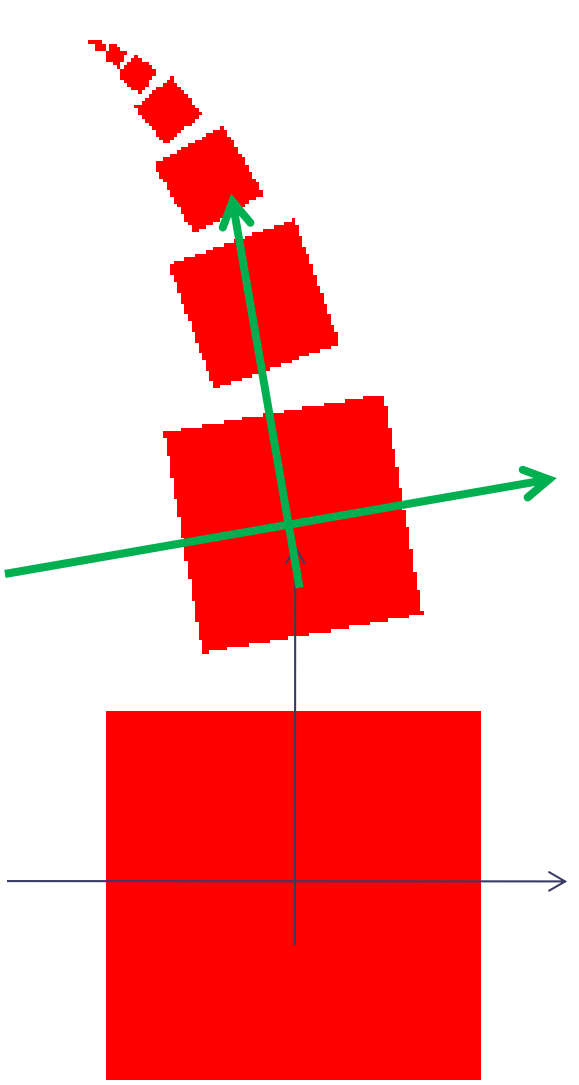
drawAUnitSquare()

- Draw a square with corners (±0.5,±0.5)



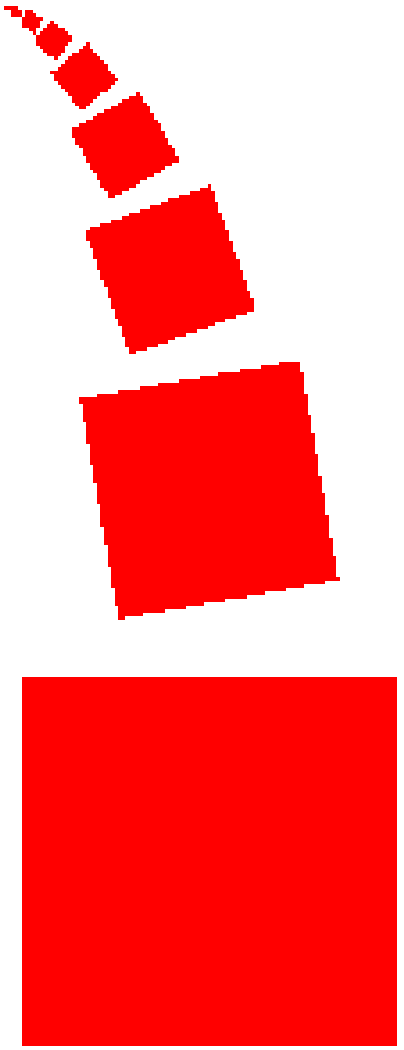
drawStroke()

- Translate
- Rotate
- Scale

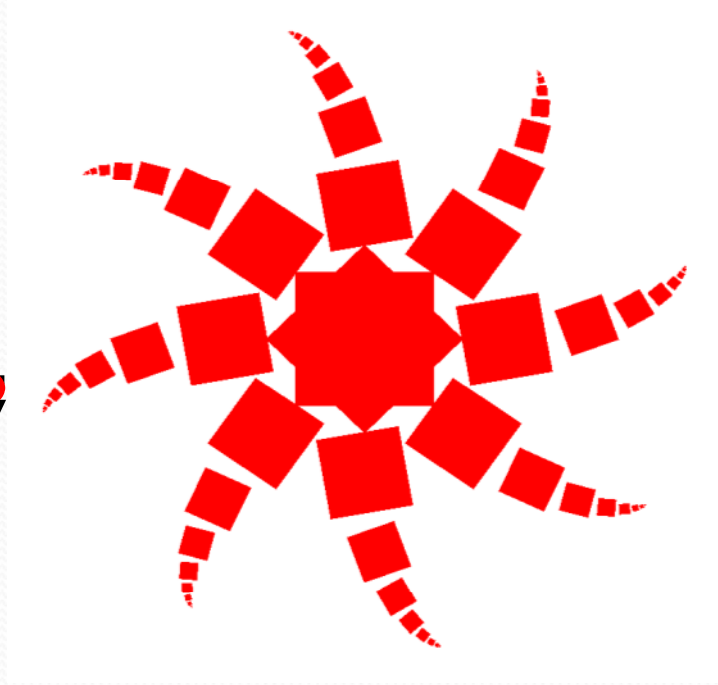


drawStroke()

```
void drawStroke(int n)
{
  glPushMatrix();
       if(n)
       {
              drawUnitSquare();
              glTranslatef(0,1,0);
              glScalef(0.6,0.6,0.6);
              glRotatef(10,0,0,1);
              drawStroke(n-1);
       } else
              drawTri();

  glPopMatrix();
}
```

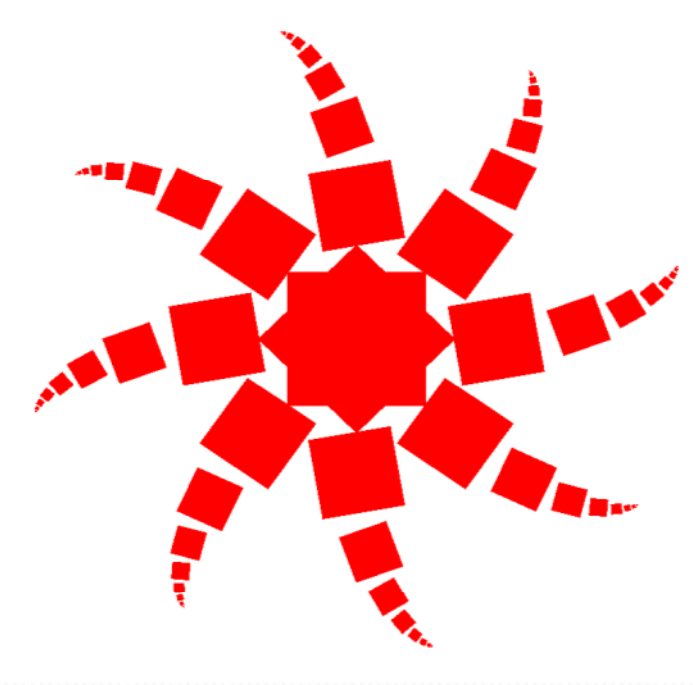


```
void drawSun()
{
  glPushMatrix();
    for(int i=0;i<8;i++)
    {
      glRotatef(360/8,0,0,1);
      drawStroke(8);
    }
  glPopMatrix();

}
```



What if?

```
void drawSun()
{
  glPushMatrix();
    for(int i=0;i<8;i++)
    {
      glPushMatrix();
      glRotatef(360/8,0,0,1);
      drawStroke(8);
      glPopMatrix();
    }
  glPopMatrix();

}
```

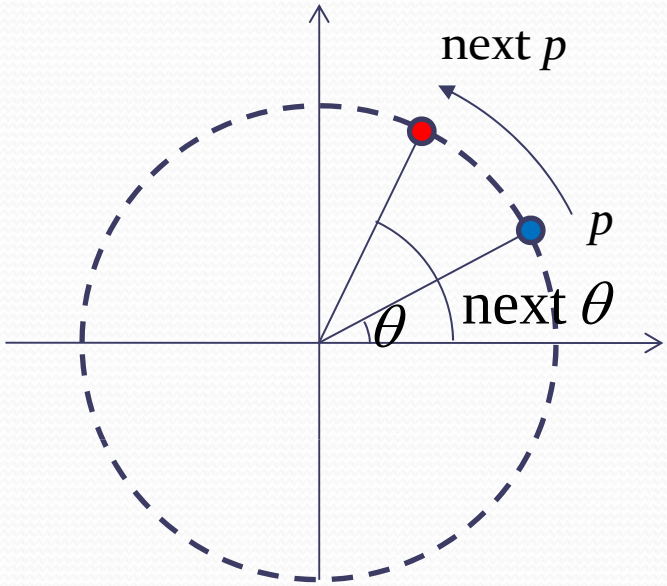


Thoughts…

- What happen if we remove any pairs of the push/pop matrix calls?
  - Remove the pair in drawStroke()?
  - Remove the pair in drawSun()?

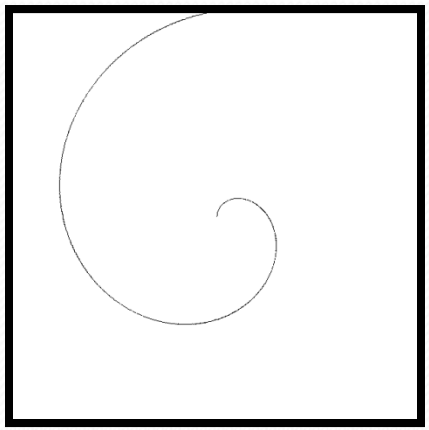
Question 2

To Draw a Circle?




```
void drawCircle()
{
   int i;
   double theta, nextTheta;
   double x1,y1;
   double x2,y2;
   glColor3f(0,0,0); // black color
   glBegin(GL_LINE_STRIP);
   for(i=0;i<360;i++) // angle in degree
   {
                theta = (3.141592654/180)*i;  //  converting degree to radian
                nextTheta = (3.141592654/180)*(i+1);
                x1 = sin(theta);     y1 = cos(theta);
                x2 = sin(nextTheta); y2 = cos(nextTheta);
                glVertex2f(x1,y1);
                glVertex2f(x2,y2);
   }
   glEnd();
}
```

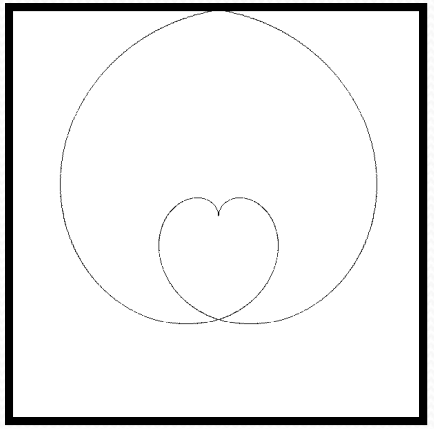
Draw a Spiral?



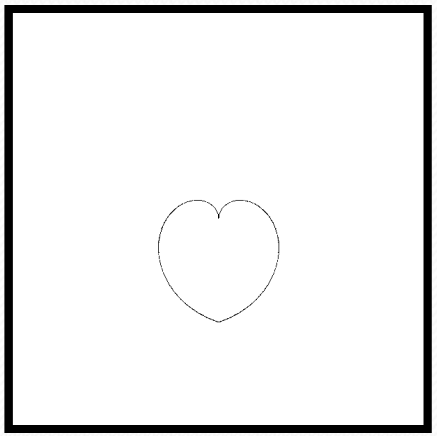
```
void drawSpiral()
{
   int i;
   double theta, nextTheta;
   double x1,y1;
   double x2,y2;
   glColor3f(0,0,0); // black color
   glBegin(GL_LINE_STRIP);
   for(i=0;i<360;i++) // angle in degree
   {
                theta = (3.141592654/180)*i;  // convert  degree to radian
                nextTheta = (3.141592654/180)*(i+1);
                x1 = sin(theta); y1 = cos(theta);
                x2 = sin(nextTheta); y2 = cos(nextTheta);

                glVertex2f((i/360.0)*x1,(i/360.0)*y1);
                glVertex2f(((i+1)/360.0)*x2,((i+1)/360.0)*y2);
   }
   glEnd();
}
```

Two Spirals?

```
drawSpiral();
glScalef(-1,1,1);
drawSpiral();
```



Heart Shape?



```
void drawSpiral()
{
   int i;
   double theta, nextTheta;
   double x1,y1;
   double x2,y2;
   glColor3f(0,0,0); // black color
   glBegin(GL_LINE_STRIP);
   for(i=0;i<180;i++) // angle in degree
   {
                theta = (3.141592654/180)*i;  // convert  degree to radian
                nextTheta = (3.141592654/180)*(i+1);
                x1 = sin(theta); y1 = cos(theta);
                x2 = sin(nextTheta); y2 = cos(nextTheta);

                glVertex2f((i/360.0)*x1,(i/360.0)*y1);
                glVertex2f(((i+1)/360.0)*x2,((i+1)/360.0)*y2);
   }
   glEnd();
}
```