INSTRUCTION:

1) Draw all output of a particular question on the same graph paper (space).
2) Label intermediate outputs as 1, 2, 3…. Use colored Pencils for better visualization.

Draw the output of the given OpenGL using CS transformation i.e. from top to bottom.

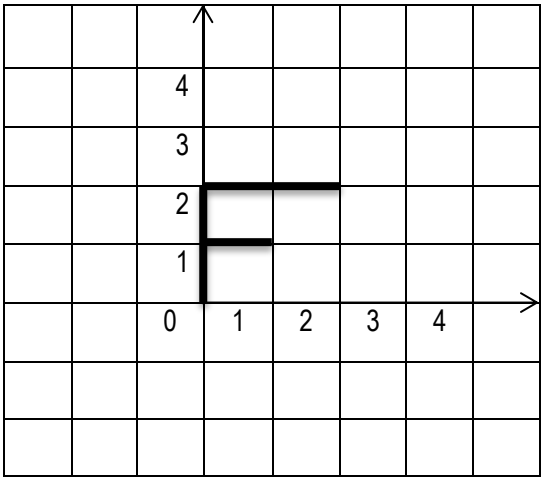
```
Display()
{
glMatrixMode(GL_MODELVIEW);
glLoad Identity();
glPushMatrix();

  glTranslatef(2,-1 , 0);
  DrawF();     //1

glPushMatrix();
   glRotatef(-90,0,0,1);
   drawF();     //2
   glTranslatef(-4,-3,0);
   drawF();   //3
glPopMatrix();

glPushMatrix();
 glTranslatef(-4,0,0);
 drawF();  //4
 glScalef(-0.5, 0.5,0.5);
 drawF();    //5
 glTranslatef(-2,-2,0);
 drawF();    //6
glPopMatrix();

glPopMatrix();
}
```

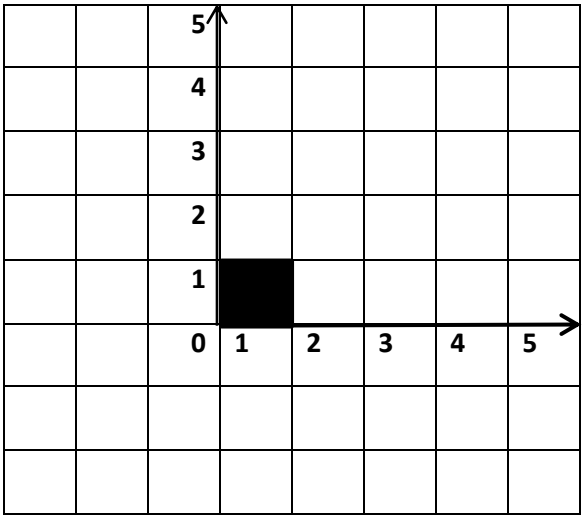


CS Transformation Practice Worksheet 2019

What is draw on the screen after a call to the function *draw ()* below via CS transformation. Draw all output on a single graph.

```
draw()
{
drawSquare()  //square
glColor(1,0,0)
glPushMatrix()
glTranslate(1,2,0)
glScale(2,1,1)
glRotate(90,0,0,1)
glPushMatrix()
glTranslate(3,0,0)
drawSquare()   //square 4
glColor(0,1,0)
glPopMatrix()
glRotate(180,0,0,-1)
glPushMatrix()
glTranslate(4,0,0)
glPopMatrix()
drawSquare()   //square 3
 }
```

```
drawSquare()
{
glBegin(GL_QUADS)
        glvertex(0,0,0)
        glvertex(0,1,0)
        glvertex(1,1,0)
        glvertex(1,0,0)
glEnd()
}
```



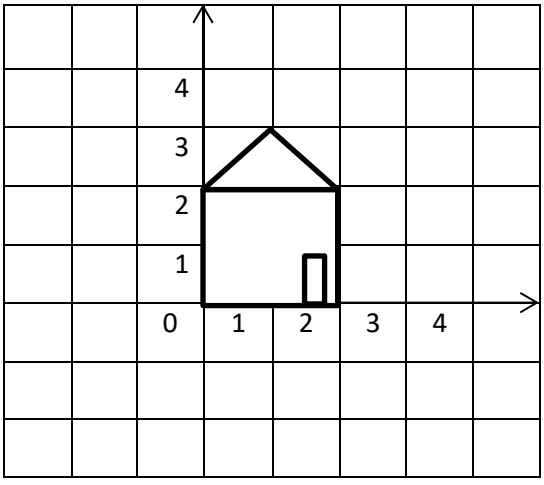
Draw in the space provided house A house B house C and house D transformed by the appropriate OpenGL commands via both CS transformation and object transformation.

```
glLoadIdentity();
glPushMatrix();
glScale(1,0.5,1);
glTranslate(-4,-2,0);
drawHouseA();

glPushMatrix();
glRotate(180,0,0,1);
glTranslate(0,2,0);
drawHouseB();
```

```
glPopMatrix();
glTranslate(0,2,0);
drawHouseC();

glPopMatrix();
glRotate(180,0,0,1);
drawHouseD();
```



CS Transformation Practice Worksheet 2019

Draw shapes 2, 3, 4, and 5 transformed by the appropriate openGL commands in the left column below. The draw() shape code is shown in the middle column, and the result of the first call is shown in the right column. (Be careful with PushMatrix() and PopMatrix()).

glIdentity();
drawShape(); // shape 1
glTranslate(2,-3,0);
drawShape(); // shape 2
glRotate(90,0,0,1);
drawShape(); // shape 3
glPushMatrix();
glTranslate(1,0,0);
drawShape(); // shape 4
glTranslate(0,2,0);
glScale(2,1,1);
glRotate(90,0,0,1);
glTranslate(-1,0,0);
glPopMatrix();
glScale(1,0.5,1);
glTranslate(0,-2,0);
drawShape(); // shape 5
	drawShape()
	{
	glBegin(GL_POLYGON);
	glVertex(0,0,0,1);
	glVertex(2,0,0,1);
	glVertex(2,1,0,1);
	glVertex(1,1,0,1);
	glVertex(1,3,0,1);
	glVertex(0,3,0,1);
	glEnd(GL_POLYGON);
	}