FCIT-LOGO

CPCS-391 PROJECT

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Contents

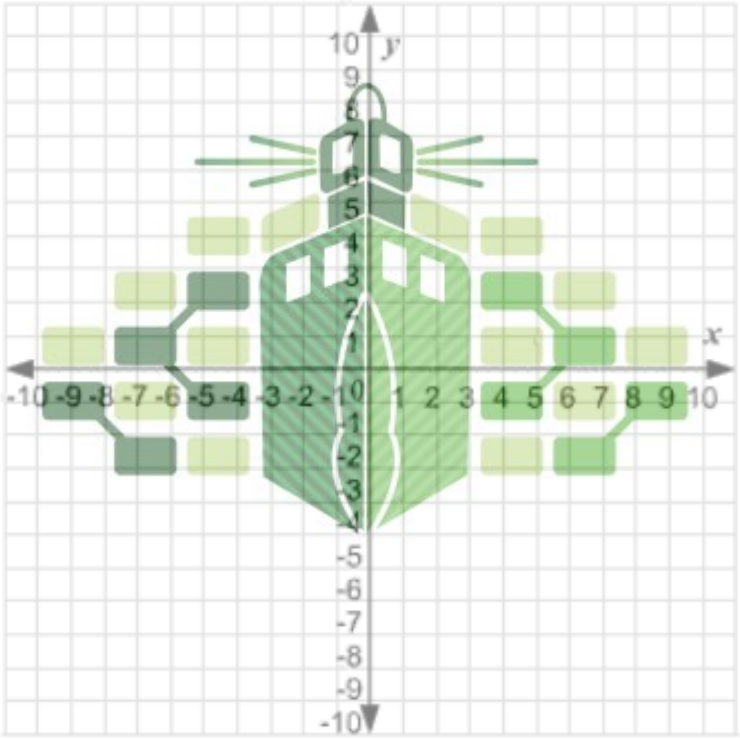
Introduction

FCIT started as a section in the math department that belongs to the faculty of science, after that it became its own section in the faculty of science and was known as the Computer Science department, and now it proudly became its own Faculty known today as the Faculty of Computing & Information Technology.

And now we as computer science students, are honored to design the FCIT Logo using JOGL Library in Java.

Drawing with JOGL

Since we are computer science students, we might lack the necessary skills to draw a shape like this on paper, but we can make points for each shape and use those points to draw using Java.



And as shown above we can divide that shape to several main shapes:

- Smooth Squares.
- Lines (connecting some of the squares).
- House.
- Feather.
- Windows Inside the House.
- Light House Windows.
- Light Bulb Above the Lighthouse.
- Light Rays
- Curved Squares above the house.

Drawing Smooth Squares

It was tricky to draw such a shape, as we know JOGL does not draw such shapes immediately.

So, our idea was to draw two rectangles and at their height and width's point of intersection we draw part of the circle as follows:

```
GL gl = drawable.getGL();

gl.glBegin(GL.GL_QUADS);
gl.glColor3d(0.760784f, 0.937255f, 0.560784f);
gl.glVertex3f(-2.0f, 1.4f, 0.0f);  // Top Left
gl.glVertex3f(2.0f, 1.4f, 0.0f);   // Top Right
gl.glVertex3f(2.0f, -1.4f, 0.0f);  // Bottom Right
gl.glVertex3f(-2.0f, -1.4f, 0.0f); // Bottom Left

gl.glEnd();

gl.glBegin(GL.GL_QUADS);
gl.glColor3d(0.760784f, 0.937255f, 0.560784f);
gl.glVertex3f(-2.6f, 0.8f, 0.0f);  // Top Left
gl.glVertex3f(2.6f, 0.8f, 0.0f);   // Top Right
gl.glVertex3f(2.6f, -0.8f, 0.0f);  // Bottom Right
gl.glVertex3f(-2.6f, -0.8f, 0.0f); // Bottom Left

gl.glEnd();

DrawPartOfCircle(2.0f, 0.8f, 0.60f, 0.25f, gl);
gl.glTranslatef(-2.0f, 0.8f, 0.0f);
gl.glRotatef(90, 0, 0, 1);
DrawPartOfCircle(-0.8f, 2.0f, 0.60f, 0.25f, gl);

gl.glRotatef(90, 0, 0, 1);
gl.glTranslatef(2.0f, -0.8f, 0.0f);
DrawPartOfCircle(-2.0f, 2.4f, 0.60f, 0.25f, gl);
gl.glRotatef(90, 0, 0, 1);
DrawPartOfCircle(-0.0f, 4.0f, 0.60f, 0.25f, gl);
gl.glLoadIdentity();
```

Figure 1. Smooth Square Code

```
gl.glTranslatef(xc, yc, 0.0f);
gl.glBegin(GL.GL_POLYGON);
gl.glVertex2d(0, 0);
for (float theta = 0; theta <= part * 2 * PI; theta += 1.0f / 300 * r) {
    float x = r * (float) cos(theta);
    float y = r * (float) sin(theta);
    gl.glVertex2f(x, y);
}
gl.glEnd();
```

Figure 2. Part Of Circle Code

Figure 3. Smooth Square

And the rest is easy, we just make different Translations for all the squares.

Drawing Lines

```
GL gl = drawable.getGL();
gl.glBegin(GL.GL_QUADS);
gl.glColor3f(0.32f, 0.49f, 0.46f);
gl.glVertex3f(0.0f, 0.0f, 0.0f);
gl.glVertex3f(5.0f, 0.0f, 0.0f);
gl.glVertex3f(5.0f, 0.6f, 0.0f);
gl.glVertex3f(0.0f, 0.6f, 0.0f);

gl.glEnd();
gl.glLoadIdentity();
```

Figure 4. Lines Code

After Drawing the lines all we need to do is rotate them and translate each one of them to change their place accordingly.

And after drawing the smooth squares and the lines we are left with this:

Figure 5. Smooth Squares

Drawing House & Feather.

```
GL gl = drawable.getGL();
gl.glBegin(GL.GL_QUADS);
gl.glColor3f(0.32f, 0.49f, 0.46f);
gl.glVertex3f(-3.0f, 1.3f, 0.0f);
gl.glVertex3f(4.5f, -0.8f, 0.0f);
gl.glVertex3f(4.5f, -17.8f, 0.0f);
gl.glVertex3f(-3.0f, -20.6f, 0.0f);

gl.glEnd();
gl.glLoadIdentity();
```

Figure 6. House Code

```
GL gl = drawable.getGL();
gl.glBegin(GL.GL_QUADS);
gl.glColor3f(1.0f, 1.0f, 1.0f);
gl.glVertex3f(-1.8f, -2.0f, 0.0f);
gl.glVertex3f(-1.8f,  0.0f, 0.0f);
gl.glVertex3f(0.0f,  -0.5f, 0.0f);
gl.glVertex3f(0.0f,  -2.5f, 0.0f);

gl.glEnd();
gl.glLoadIdentity();
```

Figure 7.House Window

```
GL gl = drawable.getGL();
gl.glLineWidth(4.5f);
gl.glBegin(GL.GL_LINE_STRIP);
gl.glColor3f(1.0f, 1.0f, 1.0f);
gl.glVertex3f(-3.0f, -3.3f, 0.0f);
gl.glVertex3f(-1.0f, -6.8f, 0.0f);
gl.glVertex3f(-0.5f, -8.8f, 0.0f);
gl.glVertex3f(-0.5f, -10.8f, 0.0f);
gl.glVertex3f(-0.5f, -12.8f, 0.0f);
gl.glVertex3f(-1.0f, -14.8f, 0.0f);
gl.glVertex3f(-0.5f, -15.8f, 0.0f);
gl.glVertex3f(-0.3f, -16.3f, 0.0f);
gl.glVertex3f(-0.5f, -16.8f, 0.0f);
gl.glVertex3f(-0.7f, -17.0f, 0.0f);
gl.glVertex3f(-1.5f, -18.8f, 0.0f);
gl.glVertex3f(-3.0f, -20.6f, 0.0f);

gl.glEnd();
gl.glLoadIdentity();
```

Figure 8. Feather Code

Figure 9. House Drawing

Light House & Light Rays

```
GL gl = drawable.getGL();
gl.glBegin(GL.GL_QUADS);
gl.glColor3f(0.184314f, 0.309804f, 0.184314f);
gl.glVertex3f(-3.0f, 4.2f, 0.0f);
gl.glVertex3f(-3.0f, 8.0f, 0.0f);
gl.glVertex3f(0.2f,  7.0f, 0.0f);
gl.glVertex3f(0.2f,  3.2f, 0.0f);

gl.glEnd();
gl.glLoadIdentity();
```

Figure 10. Light House Window Code

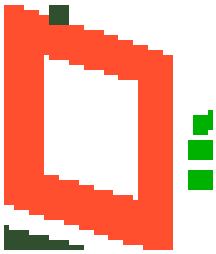


Figure 11. Light house Window

```
GL gl = drawable.getGL();
gl.glBegin(GL.GL_QUADS);
gl.glColor3f(1.0f, 1.0f, 1.0f);
gl.glVertex3f(-2.3f, 4.8f, 0.0f);
gl.glVertex3f(-2.3f, 7.0f, 0.0f);
gl.glVertex3f(-0.5f, 6.5f, 0.0f);
gl.glVertex3f(-0.5f, 4.3f, 0.0f);
```

Figure 12. Light House Window Glass Code

Figure 13. Light House Window Glass

```
GL gl = drawable.getGL();
gl.glBegin(GL.GL_LINE_STRIP);
gl.glColor3f(0.184314f, 0.309804f, 0.184314f);
gl.glVertex3f(-2.5f, 7.6f, 0.0f);
gl.glVertex3f(-2.5f, 7.9f, 0.0f);
gl.glVertex3f(-2.5f, 8.2f, 0.0f);
gl.glVertex3f(-2.6f, 8.5f, 0.0f);
gl.glVertex3f(-2.7f, 8.8f, 0.0f);
gl.glVertex3f(-2.9f, 9.1f, 0.0f);
gl.glVertex3f(-3.1f, 9.4f, 0.0f);
gl.glVertex3f(-3.3f, 9.7f, 0.0f);
gl.glVertex3f(-3.45f, 9.8f, 0.0f);
gl.glVertex3f(-3.65f, 9.8f, 0.0f);

gl.glEnd();
gl.glLoadIdentity();
```

Figure 14. Light Bulb Code

Figure 15. Light Bulb

```
GL gl = drawable.getGL();
gl.glBegin(GL.GL_LINE_STRIP);

gl.glColor3f(0.0f, 0.70f, 0.0f);
gl.glVertex3f(-0.5f, 5.7f, 0.0f);
gl.glVertex3f(2.55f, 6.15f, 0.0f);
//
gl.glColor3f(0.32f, 0.49f, 0.46f);
gl.glVertex3f(2.55f, 6.15f, 0.0f);
gl.glVertex3f(5.6f, 6.6f, 0.0f);

gl.glEnd();
gl.glLoadIdentity();
```

Figure 16. Light Ray 1 Code

```
GL gl = drawable.getGL();
gl.glBegin(GL.GL_LINE_STRIP);

gl.glColor3f(0.0f, 0.70f, 0.0f);
gl.glVertex3f(-0.5f, 5.2f, 0.0f);
gl.glVertex3f(4.6f, 5.2f, 0.0f);
//
gl.glColor3f(0.32f, 0.49f, 0.46f);
gl.glVertex3f(4.6f, 5.2f, 0.0f);
gl.glVertex3f(9.6f, 5.2f, 0.0f);

gl.glEnd();
gl.glLoadIdentity();
```

Figure 17. Light Ray 2 Code

```
GL gl = drawable.getGL();
gl.glBegin(GL.GL_LINE_STRIP);

gl.glColor3f(0.0f, 0.70f, 0.0f);
gl.glVertex3f(-0.5f, 4.7f, 0.0f);
gl.glVertex3f(2.55f, 4.25f, 0.0f);
//
gl.glColor3f(0.32f, 0.49f, 0.46f);
gl.glVertex3f(2.55f, 4.25f, 0.0f);
gl.glVertex3f(5.6f, 3.8f, 0.0f);

gl.glEnd();
```

Figure 18. Light Ray 3 Code

Figure 19. Light Ray

Curved Squares Above the House & Small Window

```
GL gl = drawable.getGL();
gl.glBegin(GL.GL_QUADS);
gl.glColor3d(0.760784f, 0.937255f, 0.560784f);    /
gl.glVertex3f(0.4f, 0.4f, 0.0f);  //bottom left
gl.glVertex3f(0.5f, 3.3f, 0.0f);  //top left
gl.glVertex3f(4.0f, 2.3f, 0.0f); //top right
gl.glVertex3f(4.0f, -0.6f, 0.0f);   //bottom right

gl.glBegin(GL.GL_QUADS);
gl.glColor3d(0.760784f, 0.937255f, 0.560784f);    /
gl.glVertex3f(-0.1f, 1.2f, 0.0f);  //bottom left
gl.glVertex3f(-0.1f, 2.8f, 0.0f);  //top left
gl.glVertex3f(4.5f, 1.5f, 0.0f); //top right
gl.glVertex3f(4.5f, -0.2f, 0.0f);   //bottom right

gl.glEnd();
gl.glRotatef(-8, 0, 0, 1);
DrawPartOfCircle(3.6f, 2.11f, 0.67f, 0.25f, gl);
gl.glRotatef(89, 0, 0, 1);
DrawPartOfCircle(0.5f, 3.4f, 0.67f, 0.25f, gl);
gl.glRotatef(89, 0, 0, 1);
DrawPartOfCircle(-0.25f, 1.5f, 0.67f, 0.25f, gl);
gl.glRotatef(98, 0, 0, 1);
DrawPartOfCircle(1.0f, 3.37f, 0.6f, 0.25f, gl);
gl.glLoadIdentity();
```

Figure 20. Curved Windows Code

Figure 21. Curved Window

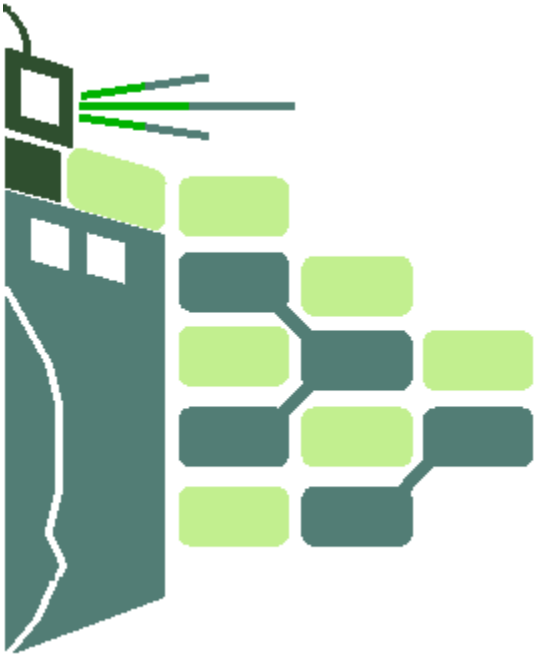
```
GL gl = drawable.getGL();
gl.glBegin(GL.GL_QUADS);
gl.glColor3f(0.184314f, 0.309804f, 0.184314f);
gl.glVertex3f(-3.0f, 1.4f, 0.0f);
gl.glVertex3f(-3.0f, 3.8f, 0.0f);
gl.glVertex3f(-0.4f, 3.1f, 0.0f);
gl.glVertex3f(-0.4f, 0.7f, 0.0f);

gl.glEnd();
gl.glLoadIdentity();
```

Figure 22. Small Window Code

Figure 23. Small Window

Reflections

After all that drawing, we now have half of the shape:



All we need to do now is reflect the shape.

```
GL gl = drawable.getGL();
gl.glBegin(GL.GL_QUADS);
gl.glColor3d(0.760784f, 0.937255f, 0.560784f);   //
gl.glVertex3f(0.0f, 0.4f, 0.0f);  //Bottom Right
gl.glVertex3f(0.0f, 3.15f, 0.0f);  //Top Right
gl.glVertex3f(-3.5f, 2.2f, 0.0f); //Top Left
gl.glVertex3f(-3.5f, -0.6f, 0.0f);   //Bottom Left

gl.glEnd();

gl.glBegin(GL.GL_QUADS);
gl.glColor3d(0.760784f, 0.937255f, 0.560784f);   //
gl.glVertex3f(0.5f, 1.2f, 0.0f);  //Bottom Right
gl.glVertex3f(0.5f, 2.8f, 0.0f);  //Top Right
gl.glVertex3f(-4.0f, 1.6f, 0.0f); //Top Left
gl.glVertex3f(-4.0f, -0.1f, 0.0f);   //Bottom Left

gl.glEnd();

gl.glRotatef(9, 0, 0, 1);
DrawPartOfCircle(0.34f, 2.5f, 0.6f, 0.25f, gl);
gl.glRotatef(90, 0, 0, 1);
DrawPartOfCircle(-0.34f, 3.4f, 0.6f, 0.25f, gl);
gl.glRotatef(90, 0, 0, 1);
DrawPartOfCircle(0.31f, 1.58f, 0.61f, 0.25f, gl);
gl.glRotatef(94, 0, 0, 1);
DrawPartOfCircle(-0.26f, 3.4f, 0.65f, 0.25f, gl);
gl.glLoadIdentity();
```

Figure 24. Curved Window Reflection

```
GL gl = drawable.getGL();
gl.glBegin(GL.GL_QUADS);
gl.glColor3f(0.184314f, 0.309804f, 0.184314f);
gl.glVertex3f(2.5f, 1.4f, 0.0f);  //73
gl.glVertex3f(2.5f, 3.8f, 0.0f);  //72
gl.glVertex3f(-0.1f, 3.1f, 0.0f); //95
gl.glVertex3f(-0.1f, 0.7f, 0.0f);   //98

gl.glEnd();
gl.glLoadIdentity();
```

Figure 25. Small Window Reflection

```
GL gl = drawable.getGL();
gl.glBegin(GL.GL_QUADS);
gl.glColor3f(0.184314f, 0.309804f, 0.184314f);
gl.glVertex3f(3.0f, 4.2f, 0.0f);
gl.glVertex3f(3.0f, 8.0f, 0.0f);
gl.glVertex3f(-0.2f, 7.0f, 0.0f);
gl.glVertex3f(-0.2f, 3.2f, 0.0f);

gl.glEnd();
gl.glLoadIdentity();
```

Figure 26. Light House Window Reflection

```
GL gl = drawable.getGL();
gl.glBegin(GL.GL_QUADS);
gl.glColor3f(1.0f, 1.0f, 1.0f);
gl.glVertex3f(2.3f, 4.8f, 0.0f);
gl.glVertex3f(2.3f, 7.0f, 0.0f);
gl.glVertex3f(0.5f, 6.5f, 0.0f);
gl.glVertex3f(0.5f, 4.3f, 0.0f);

gl.glEnd();
gl.glLoadIdentity();
```

Figure 27. Light House Window Glass Reflection.

```
GL gl = drawable.getGL();
gl.glBegin(GL.GL_LINE_STRIP);
gl.glColor3f(0.184314f, 0.309804f, 0.184314f);
gl.glVertex3f(2.5f, 7.6f, 0.0f);
gl.glVertex3f(2.5f, 7.9f, 0.0f);
gl.glVertex3f(2.5f, 8.2f, 0.0f);
gl.glVertex3f(2.6f, 8.5f, 0.0f);
gl.glVertex3f(2.7f, 8.8f, 0.0f);
gl.glVertex3f(2.9f, 9.1f, 0.0f);
gl.glVertex3f(3.1f, 9.4f, 0.0f);
gl.glVertex3f(3.3f, 9.7f, 0.0f);
gl.glVertex3f(3.45f, 9.8f, 0.0f);
gl.glVertex3f(3.65f, 9.8f, 0.0f);

gl.glEnd();
gl.glLoadIdentity();
```

Figure 28. Light Bulb Reflection.

```
GL gl = drawable.getGL();
gl.glBegin(GL.GL_LINE_STRIP);

gl.glColor3f(0.0f, 0.70f, 0.0f);
gl.glVertex3f(0.5f, 5.7f, 0.0f);  /
gl.glVertex3f(-2.55f, 6.15f, 0.0f);
//
gl.glColor3f(0.32f, 0.49f, 0.46f);
gl.glVertex3f(-2.55f, 6.15f, 0.0f);
gl.glVertex3f(-5.6f, 6.6f, 0.0f);

gl.glEnd();
gl.glLoadIdentity();
```

Figure 29. Light Ray 1 Reflection

```
GL gl = drawable.getGL();
gl.glBegin(GL.GL_LINE_STRIP);

gl.glColor3f(0.0f, 0.70f, 0.0f);
gl.glVertex3f(0.5f, 5.2f, 0.0f);  /
gl.glVertex3f(-4.6f, 5.2f, 0.0f);
//
gl.glColor3f(0.32f, 0.49f, 0.46f);
gl.glVertex3f(-4.6f, 5.2f, 0.0f);
gl.glVertex3f(-9.6f, 5.2f, 0.0f);

gl.glEnd();
gl.glLoadIdentity();
```

Figure 30. Light Ray 2 Reflection

```
GL gl = drawable.getGL();
gl.glBegin(GL.GL_LINE_STRIP);

gl.glColor3f(0.0f, 0.70f, 0.0f);
gl.glVertex3f(0.5f, 4.7f, 0.0f);  /
gl.glVertex3f(-2.55f, 4.25f, 0.0f);
//
gl.glColor3f(0.32f, 0.49f, 0.46f);
gl.glVertex3f(-2.55f, 4.25f, 0.0f);
gl.glVertex3f(-5.6f, 3.8f, 0.0f);

gl.glEnd();
gl.glLoadIdentity();
```

Figure 31. Light Ray 3 Reflection

```
GL gl = drawable.getGL();
gl.glBegin(GL.GL_QUADS);
gl.glColor3f(0.184314f, 0.309804f, 0.184314f);
gl.glVertex3f(3.0f, 1.3f, 0.0f);
gl.glVertex3f(-4.5f, -0.8f, 0.0f);
gl.glVertex3f(-4.5f, -17.8f, 0.0f);
gl.glVertex3f(3.0f, -20.6f, 0.0f);

gl.glEnd();
gl.glLoadIdentity();
```

Figure 32. House Reflection

```
GL gl = drawable.getGL();
gl.glBegin(GL.GL_QUADS);
gl.glColor3f(1.0f, 1.0f, 1.0f);
gl.glVertex3f(1.8f, -2.0f, 0.0f);
gl.glVertex3f(1.8f, 0.0f, 0.0f);
gl.glVertex3f(0.0f, -0.5f, 0.0f);
gl.glVertex3f(0.0f, -2.5f, 0.0f);

gl.glEnd();
gl.glLoadIdentity();
```

Figure 33. House Window Reflection

```
GL gl = drawable.getGL();
gl.glLineWidth(4.5f);
gl.glBegin(GL.GL_LINE_STRIP);
gl.glColor3f(1.0f, 1.0f, 1.0f);
gl.glVertex3f(-3.0f, -3.3f, 0.0f);
gl.glVertex3f(-1.0f, -6.8f, 0.0f);
gl.glVertex3f(-0.5f, -8.8f, 0.0f);
gl.glVertex3f(-0.5f, -10.8f, 0.0f);
gl.glVertex3f(-0.5f, -12.8f, 0.0f);
gl.glVertex3f(-1.0f, -14.8f, 0.0f);
gl.glVertex3f(-0.5f, -15.8f, 0.0f);
gl.glVertex3f(-0.3f, -16.3f, 0.0f);
gl.glVertex3f(-0.5f, -16.8f, 0.0f);
gl.glVertex3f(-0.7f, -17.0f, 0.0f);
gl.glVertex3f(-1.5f, -18.8f, 0.0f);
gl.glVertex3f(-3.0f, -20.6f, 0.0f);

gl.glEnd();
gl.glLoadIdentity();
```

Figure 34. Feather Reflection

Figure 35. FCIT Final Shape

Animation 1

For our first animation we made the shape move like a Newton’s Cradles

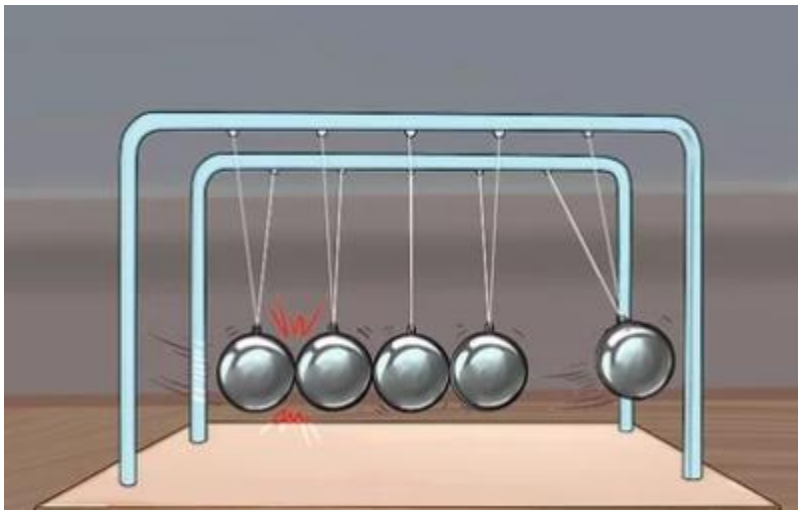


Figure 36. Newton's Cradle

Figure 37. FCIT Cradle Movement 1

Figure 38. FCIT Cradle Movement 2

Animation 2

Our Second Animation we made a magnet movement.

Most of the shapes are not in place, and then they are drawn into place by a magnet that turns on when it changes colors.

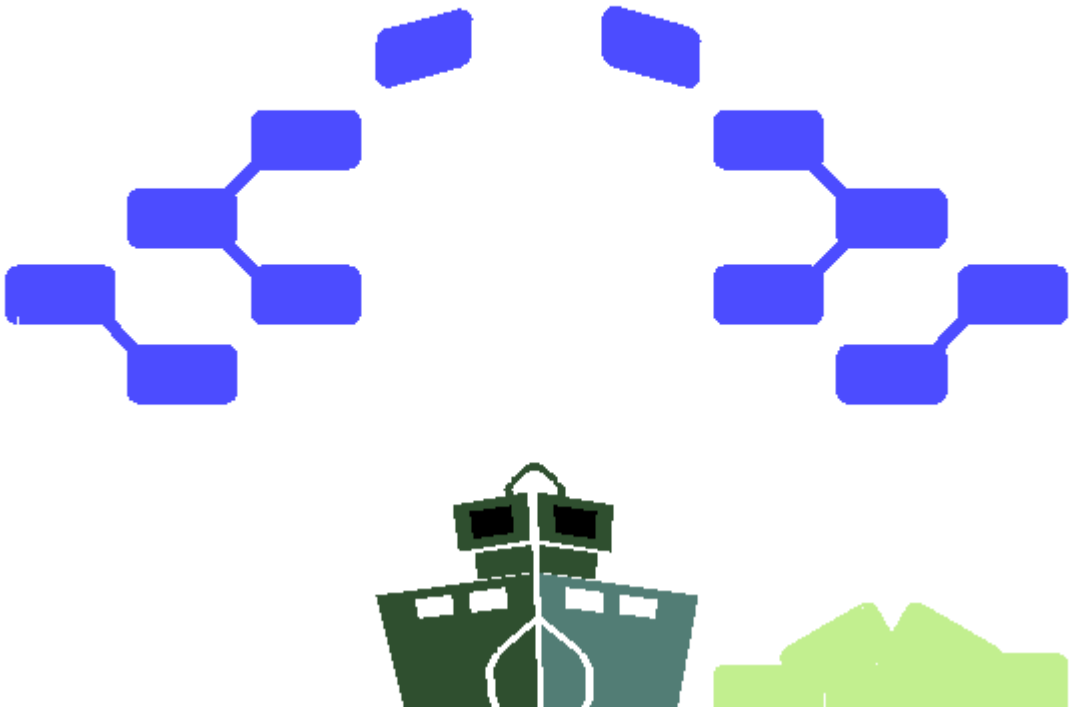


Figure 39. FCIT Magnet1

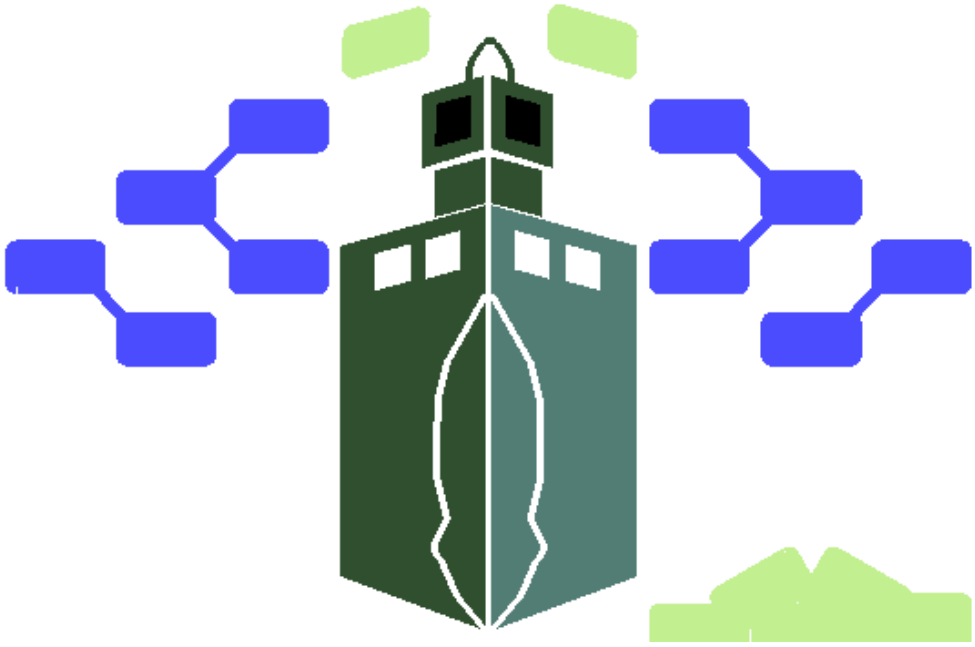


Figure 40.FCIT Magnet 2

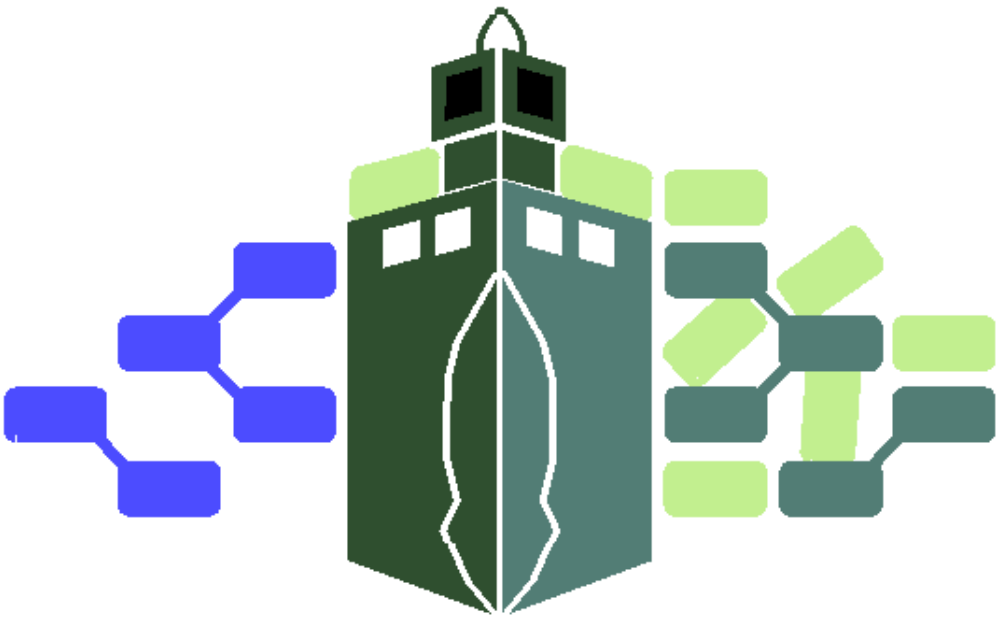


Figure 41. FCIT Magnet 3

Figure 42. FCIT Magnet 4

Animation 3

Our Third Animation we made a ticking bomb, the squares all start activating sequentially and then after a few seconds…BOOM! , the shape collapses.

Figure 43. FCIT Ticking Bomb 1

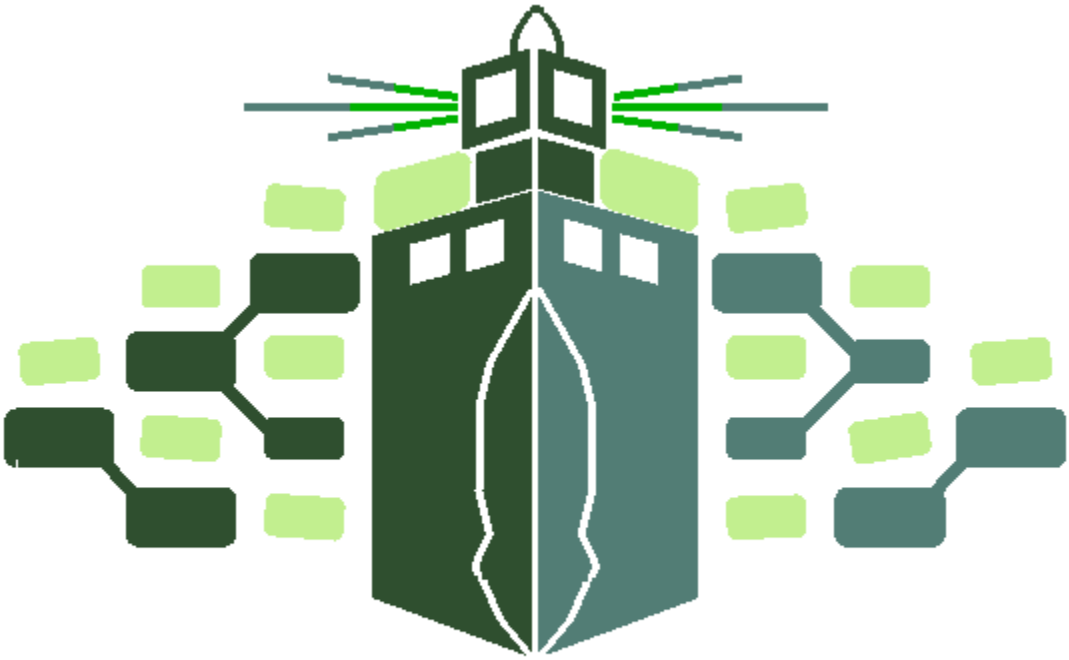


Figure 44. FCIT Ticking Bomb 2

Figure 45. FCIT Ticking Bomb 3

Roles

- Draft Paper- Hamed and Mansour.
- Drawing – Amin , Ebrahim, Sultan.
- Animation 1 – Sultan and Hamed.
- Animation 2 – Ebrahim and Mansour.
- Animation 3 – Amin.

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