Lab Taks-2

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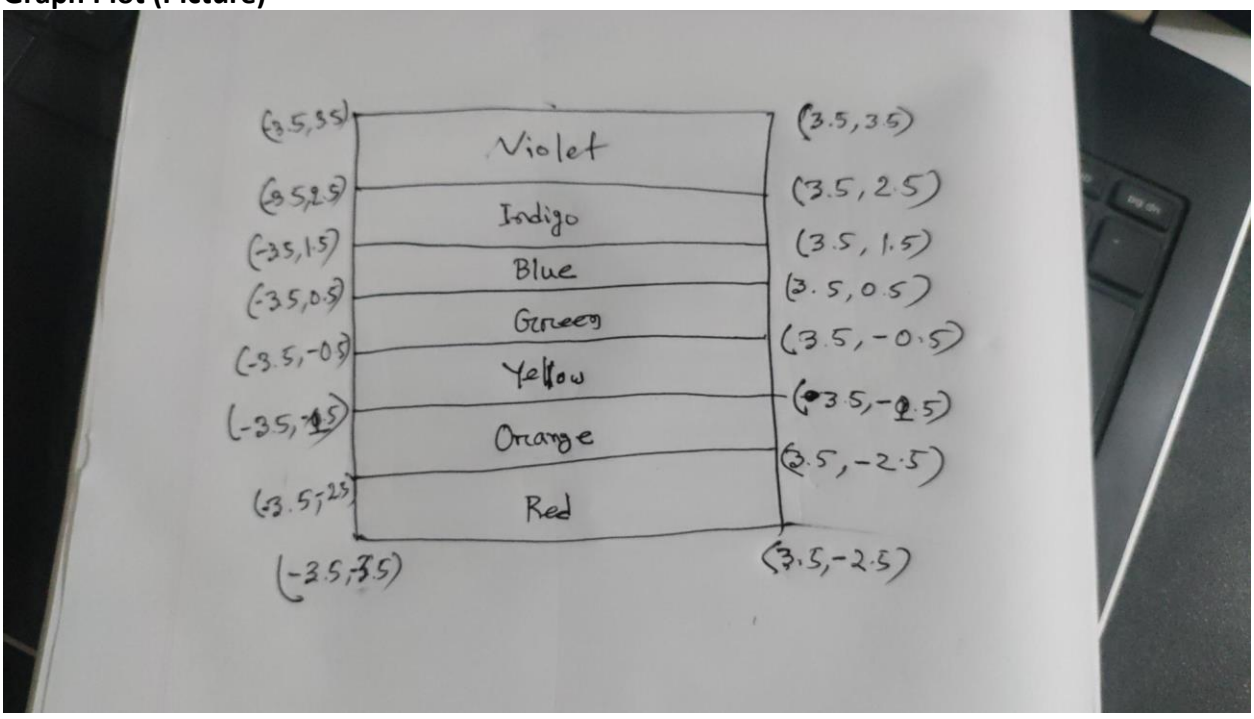
COURSE: COMPUTER GRAPHICS [F]

Question- 1

Draw a Rainbow Flag

Graph Plot (Picture)-



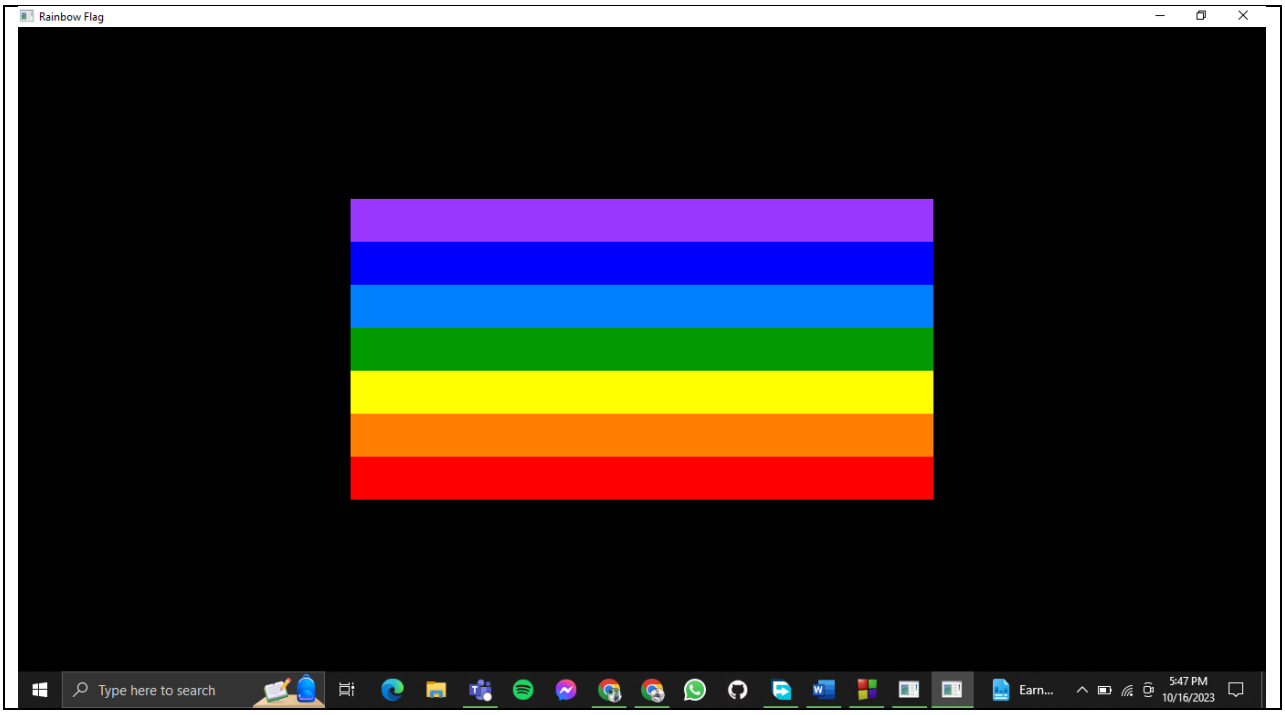
Code-

```
#include <windows.h>
```

```
#include <GL/glut.h>

void initGL() {
   glClearColor(0.0f, 0.0f, 0.0f, 1.0f);
}

void display() {
   glClear(GL_COLOR_BUFFER_BIT);

   glBegin(GL_POLYGON);
   glColor3ub(255, 0, 0);
   glVertex2f(-3.5f, -3.5f);
   glVertex2f(3.5f, -3.5f);
   glVertex2f(3.5f, -2.5f);
   glVertex2f(-3.5f, -2.5f);
   glEnd();

   glBegin(GL_POLYGON);
   glColor3ub(255, 128, 0);
   glVertex2f(-3.5f, -2.5f);
   glVertex2f(3.5f, -2.5f);
   glVertex2f(3.5f, -1.5f);
   glVertex2f(-3.5f, -1.5f);
   glEnd();

   glBegin(GL_POLYGON);
   glColor3ub(255, 255, 0);
   glVertex2f(-3.5f, -1.5f);
   glVertex2f(3.5f, -1.5f);
   glVertex2f(3.5f, -0.5f);
   glVertex2f(-3.5f, -0.5f);
   glEnd();

   glBegin(GL_POLYGON);
   glColor3ub(0, 153, 0);
   glVertex2f(-3.5f, -0.5f);
   glVertex2f(3.5f, -0.5f);
   glVertex2f(3.5f, 0.5f);
   glVertex2f(-3.5f, 0.5f);
   glEnd();

   glBegin(GL_POLYGON);
   glColor3ub(0, 128, 255);
   glVertex2f(-3.5f, 0.5f);
```

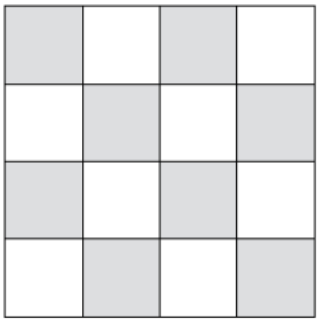
```
    glVertex2f(3.5f, 0.5f);
    glVertex2f(3.5f, 1.5f);
    glVertex2f(-3.5f, 1.5f);
    glEnd();

    glBegin(GL_POLYGON);
    glColor3ub(0, 0, 255);
    glVertex2f(-3.5f, 1.5f);
    glVertex2f(3.5f, 1.5f);
    glVertex2f(3.5f, 2.5f);
    glVertex2f(-3.5f, 2.5f);
    glEnd();

    glBegin(GL_POLYGON);
    glColor3ub(153, 55, 255);
    glVertex2f(-3.5f, 2.5f);
    glVertex2f(3.5f, 2.5f);
    glVertex2f(3.5f, 3.5f);
    glVertex2f(-3.5f, 3.5f);
    glEnd();

    glFlush();
}

int main(int argc, char** argv) {
    glutInit(&argc, argv);
    glutCreateWindow("Rainbow Flag");
    glutInitWindowSize(600, 600);
    gluOrtho2D(-7.5, 7.5, -7.5, 7.5);
    glutInitWindowPosition(50, 50);
    glutDisplayFunc(display);
    initGL();
    glutMainLoop();
    return 0;
}
```

Output Screenshot (Full Screen)-

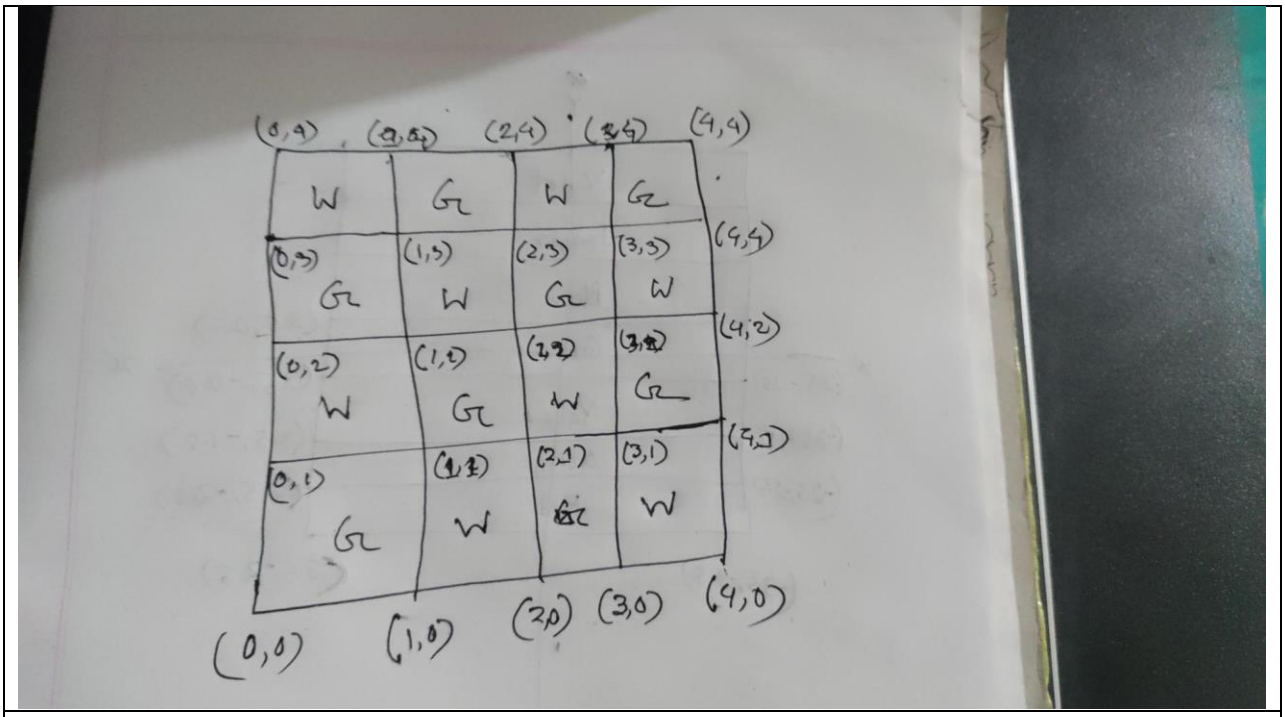


Question- 2

Draw 4X4 Chess Board



Graph Plot (Picture)-

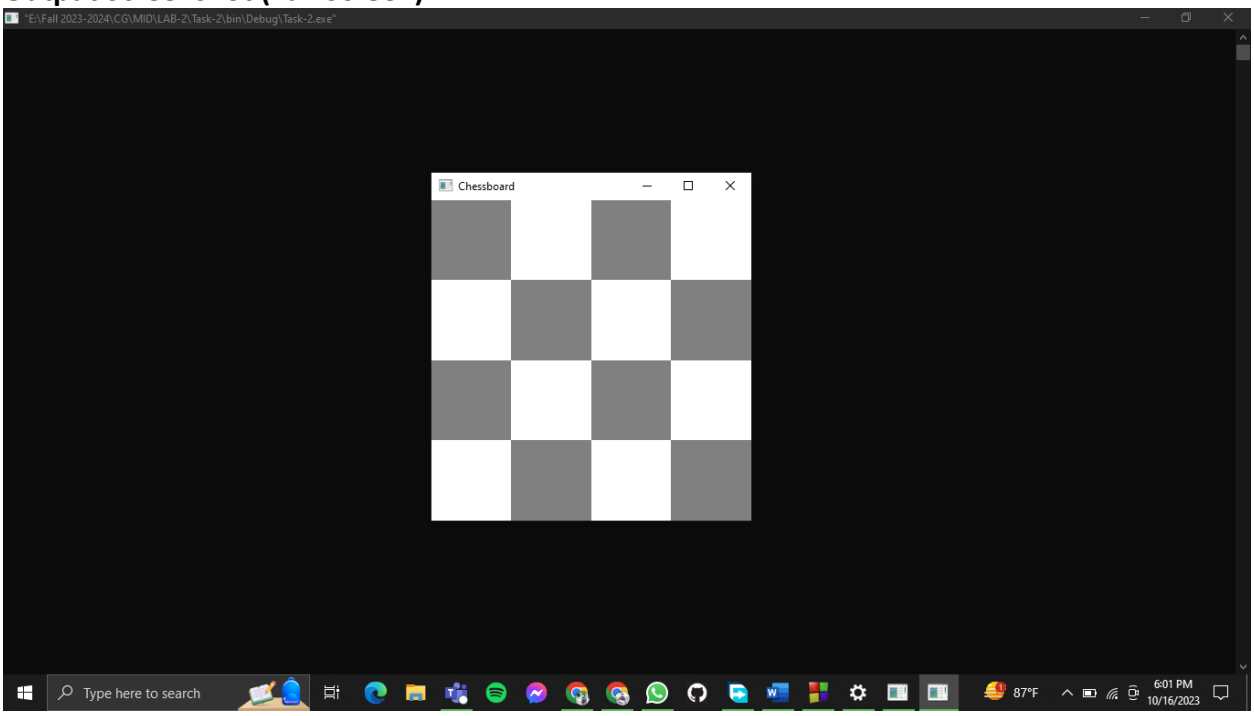


Code-

```
#include <windows.h>
#include <GL/glut.h>

void drawChessboard() {
   int i, j;
   for (i = 0; i < 4; i++) {
      for (j = 0; j < 4; j++) {
         if ((i + j) % 2 == 0) {
            glColor3f(1.0, 1.0, 1.0); // White square
         } else {
            glColor3f(0.5f, 0.5f, 0.5f); // Gray square
         }
         glBegin(GL_QUADS);
         glVertex2f(i, j);
         glVertex2f(i + 1, j);
         glVertex2f(i + 1, j + 1);
         glVertex2f(i, j + 1);
         glEnd();
      }
   }
}

void display() {
   glClear(GL_COLOR_BUFFER_BIT);
```

```
    drawChessboard();
    glFlush();
}

int main(int argc, char** argv) {
    glutInit(&argc, argv);
    glutInitDisplayMode(GLUT_SINGLE | GLUT_RGB);
    glutInitWindowSize(350, 350);
    glutCreateWindow("Chessboard");
    glClearColor(0.0, 0.0, 0.0, 1.0);
    gluOrtho2D(0, 4, 0, 4);
    glutDisplayFunc(display);
    glutMainLoop();
    return 0;
}
```

Output Screenshot (Full Screen)-



Question- 3

Create the batman logo given below-

Graph Plot (Picture)-

(Not Needed)

Code-

```
#include <windows.h>
#include <GL/glut.h>

void initGL() {

glClearColor(0.0f, 0.0f, 0.0f, 1.0f);
}

void display() {
glClear(GL_COLOR_BUFFER_BIT);
glBegin(GL_POLYGON);
glColor3f(0.0f, 0.0f, 0.0f);

glVertex2f(0.0f, 0.6f);
glVertex2f(-0.55f, 0.6f);
glVertex2f(-0.55f, 0.55f);
glVertex2f(-0.6f, 0.55f);
glVertex2f(-0.6f, 0.5f);
glVertex2f(-0.65f, 0.5f);
glVertex2f(-0.65f, 0.45f);
glVertex2f(-0.7f, 0.45f);
glVertex2f(-0.7f, 0.4f);
glVertex2f(-0.75f, 0.4f);
glVertex2f(-0.75f, 0.35f);
glVertex2f(-0.8f, 0.35f);
glVertex2f(-0.8f, 0.3f);
glVertex2f(-0.85f, 0.3f);
glVertex2f(-0.85f, 0.25f);
glVertex2f(-0.9f, 0.25f);
glVertex2f(-0.9f, 0.2f);
glVertex2f(-0.95f, 0.2f);
glVertex2f(-0.95f, -0.2f);
glVertex2f(-0.9f, -0.2f);
glVertex2f(-0.9f, -0.25f);
glVertex2f(-0.85f, -0.25f);
```

```
glVertex2f(-0.85f, -0.3f);
glVertex2f(-0.8f, -0.3f);
glVertex2f(-0.8f, -0.35f);
glVertex2f(-0.75f, -0.35f);
glVertex2f(-0.75f, -0.4f);
glVertex2f(-0.7f, -0.4f);
glVertex2f(-0.7f, -0.45f);
glVertex2f(-0.65f, -0.45f);
glVertex2f(-0.65f, -0.5f);
glVertex2f(-0.6f, -0.5f);
glVertex2f(-0.6f, -0.55f);
glVertex2f(-0.55f, -0.55f);
glVertex2f(-0.55f, -0.6f);
glVertex2f(0.55f, -0.6f);
glVertex2f(0.55f, -0.55f);
glVertex2f(0.6f, -0.55f);
glVertex2f(0.6f, -0.5f);
glVertex2f(0.65f, -0.5f);
glVertex2f(0.65f, -0.45f);
glVertex2f(0.7f, -0.45f);
glVertex2f(0.7f, -0.4f);
glVertex2f(0.75f, -0.4f);
glVertex2f(0.75f, -0.35f);
glVertex2f(0.8f, -0.35f);
glVertex2f(0.8f, -0.3f);
glVertex2f(0.85f, -0.3f);
glVertex2f(0.85f, -0.25f);
glVertex2f(0.9f, -0.25f);
glVertex2f(0.9f, -0.2f);
glVertex2f(0.95f, -0.2f);
glVertex2f(0.95f, 0.2f);
glVertex2f(0.9f, 0.2f);
glVertex2f(0.9f, 0.25f);
glVertex2f(0.85f, 0.25f);
glVertex2f(0.85f, 0.3f);
glVertex2f(0.8f, 0.3f);
glVertex2f(0.8f, 0.35f);
glVertex2f(0.75f, 0.35f);
glVertex2f(0.75f, 0.4f);
glVertex2f(0.7f, 0.4f);
glVertex2f(0.7f, 0.45f);
glVertex2f(0.65f, 0.45f);
glVertex2f(0.65f, 0.5f);
glVertex2f(0.6f, 0.55f);
```

```
glVertex2f(0.55f, 0.55f);
glVertex2f(0.55f, 0.6f);
glVertex2f(0.0f, 0.6f);

glEnd();


glBegin(GL_POLYGON);
glColor3f(1.0f, 1.0f, 0.0f);

glVertex2f(0.0f, 0.55f);
glVertex2f(-0.55f, 0.55f);
glVertex2f(-0.55f, 0.5f);
glVertex2f(-0.6f, 0.5f);
glVertex2f(-0.6f, 0.45f);
glVertex2f(-0.65f, 0.45f);
glVertex2f(-0.65f, 0.4f);
glVertex2f(-0.7f, 0.4f);
glVertex2f(-0.7f, 0.35f);
glVertex2f(-0.75f, 0.35f);
glVertex2f(-0.75f, 0.3f);
glVertex2f(-0.8f, 0.3f);
glVertex2f(-0.8f, 0.25f);
glVertex2f(-0.85f, 0.25f);
glVertex2f(-0.85f, 0.2f);
glVertex2f(-0.9f, 0.2f);
glVertex2f(-0.9f, -0.2f);
glVertex2f(-0.85f, -0.2f);
glVertex2f(-0.85f, -0.25f);
glVertex2f(-0.8f, -0.25f);
glVertex2f(-0.8f, -0.3f);
glVertex2f(-0.75f, -0.3f);
glVertex2f(-0.75f, -0.35f);
glVertex2f(-0.7f, -0.35f);
glVertex2f(-0.7f, -0.4f);
glVertex2f(-0.65f, -0.4f);
glVertex2f(-0.65f, -0.45f);
glVertex2f(-0.6f, -0.45f);
glVertex2f(-0.6f, -0.5f);
glVertex2f(-0.55f, -0.5f);
glVertex2f(-0.55f, -0.55f);
glVertex2f(-0.5f, -0.55f);
glVertex2f(0.55f, -0.55f);
glVertex2f(0.55f, -0.5f);
```

```
glVertex2f(0.6f, -0.5f);
glVertex2f(0.6f, -0.45f);
glVertex2f(0.65f, -0.45f);
glVertex2f(0.65f, -0.4f);
glVertex2f(0.7f, -0.4f);
glVertex2f(0.7f, -0.35f);
glVertex2f(0.75f, -0.35f);
glVertex2f(0.75f, -0.3f);
glVertex2f(0.8f, -0.3f);
glVertex2f(0.8f, -0.25f);
glVertex2f(0.85f, -0.25f);
glVertex2f(0.85f, -0.2f);
glVertex2f(0.9f, -0.2f);
glVertex2f(0.9f, 0.2f);
glVertex2f(0.85f, 0.2f);
glVertex2f(0.85f, 0.25f);
glVertex2f(0.8f, 0.25f);
glVertex2f(0.8f, 0.3f);
glVertex2f(0.75f, 0.3f);
glVertex2f(0.75f, 0.35f);
glVertex2f(0.7f, 0.35f);
glVertex2f(0.7f, 0.4f);
glVertex2f(0.65f, 0.4f);
glVertex2f(0.65f, 0.45f);
glVertex2f(0.6f, 0.45f);
glVertex2f(0.6f, 0.5f);
glVertex2f(0.55f, 0.5f);
glVertex2f(0.55f, 0.55f);
glVertex2f(0.0f, 0.55f);

glEnd();

glBegin(GL_POLYGON);
glColor3f(0.0f, 0.0f, 0.0f);

glVertex2f(-0.4f, 0.45f);
glVertex2f(-0.55f, 0.45f);
glVertex2f(-0.55f, 0.4f);

glVertex2f(-0.6f, 0.4f);
glVertex2f(-0.6f, 0.35f);

glVertex2f(-0.65f, 0.35f);
glVertex2f(-0.65f, 0.3f);
```

```
glVertex2f(-0.7f, 0.3f);
glVertex2f(-0.7f, 0.25f);

glVertex2f(-0.75f, 0.25f);
glVertex2f(-0.75f, 0.2f);

glVertex2f(-0.8f, 0.2f);
glVertex2f(-0.8f, 0.15f);

glVertex2f(-0.85f, 0.15f);
glVertex2f(-0.85f, -0.15f);

glVertex2f(-0.8f, -0.15f);
glVertex2f(-0.8f, -0.2f);

glVertex2f(-0.75f, -0.2f);
glVertex2f(-0.75f, -0.25f);

glVertex2f(-0.7f, -0.25f);
glVertex2f(-0.7f, -0.3f);

glVertex2f(-0.65f, -0.3f);
glVertex2f(-0.65f, -0.35f);

glVertex2f(-0.6f, -0.35f);
glVertex2f(-0.6f, -0.4f);

glVertex2f(-0.55f, -0.4f);
glVertex2f(-0.55f, -0.45f);

glVertex2f(-0.4f, -0.45f);
glVertex2f(-0.4f, -0.5f);


glVertex2f(0.4f, -0.5f);

glVertex2f(0.4f, -0.45f);
glVertex2f(0.55f, -0.45f);

glVertex2f(0.55f, -0.4f);
glVertex2f(0.6f, -0.4f);

glVertex2f(0.6f, -0.35f);
```

```
glVertex2f(0.65f, -0.35f);

glVertex2f(0.65f, -0.3f);
glVertex2f(0.7f, -0.3f);

glVertex2f(0.7f, -0.25f);
glVertex2f(0.75f, -0.25f);

glVertex2f(0.75f, -0.2f);
glVertex2f(0.8f, -0.2f);

glVertex2f(0.8f, -0.15f);
glVertex2f(0.85f, -0.15f);

glVertex2f(0.85f, 0.15f);
glVertex2f(0.8f, 0.15f);

glVertex2f(0.8f, 0.2f);
glVertex2f(0.75f, 0.2f);

glVertex2f(0.75f, 0.25f);
glVertex2f(0.7f, 0.25f);

glVertex2f(0.7f, 0.3f);
glVertex2f(0.65f, 0.3f);

glVertex2f(0.65f, 0.35f);
glVertex2f(0.6f, 0.35f);

glVertex2f(0.6f, 0.4f);
glVertex2f(0.55f, 0.4f);

glVertex2f(0.55f, 0.45f);
glVertex2f(0.4f, 0.45f);



glEnd();


glBegin(GL_POLYGON);
glColor3f(1.0f, 1.0f, 0.0f);

glVertex2f(-0.4f, 0.45f);
```

```
glVertex2f(-0.4f, 0.15f);
glVertex2f(-0.2f, 0.15f);
glVertex2f(-0.2f, 0.2f);
glVertex2f(-0.15f, 0.2f);
glVertex2f(-0.15f, 0.45f);


glEnd();


glBegin(GL_POLYGON);

glColor3f(1.0f, 1.0f, 0.0f);

glVertex2f(-0.4f, 0.4f);
glVertex2f(-0.45f, 0.4f);

glVertex2f(-0.45f, 0.2f);
glVertex2f(-0.4f, 0.2f);

glEnd();


glBegin(GL_POLYGON);

glColor3f(0.0f, 0.0f, 0.0f);

glVertex2f(-0.15f, 0.5f);// ear (left)
glVertex2f(-0.15f, 0.45f);

glVertex2f(-0.1f, 0.45f);
glVertex2f(-0.1f, 0.5f);

glEnd();

glBegin(GL_POLYGON);

glColor3f(0.0f, 0.0f, 0.0f);

glVertex2f(0.1f, 0.5f);// ear (right)
glVertex2f(0.1f, 0.45f);

glVertex2f(0.15f, 0.45f);
glVertex2f(0.15f, 0.5f);
```

```
glEnd();

glBegin(GL_POLYGON);
glColor3f(1.0f, 1.0f, 0.0f);

glVertex2f(0.15f, 0.45f);
glVertex2f(0.15f, 0.2f);

glVertex2f(0.4f, 0.2f);
glVertex2f(0.4f, 0.45f);


glEnd();

glBegin(GL_POLYGON);
glColor3f(1.0f, 1.0f, 0.0f);

glVertex2f(0.2f, 0.2f);
glVertex2f(0.2f, 0.15f);

glVertex2f(0.4f, 0.15f);
glVertex2f(0.4f, 0.2f);

glEnd();

glBegin(GL_POLYGON);
glColor3f(1.0f, 1.0f, 0.0f);

glVertex2f(0.4f, 0.4f);
glVertex2f(0.4f, 0.2f);

glVertex2f(0.45f, 0.2f);
glVertex2f(0.45f, 0.4f);

glEnd();

glBegin(GL_POLYGON);
glColor3f(1.0f, 1.0f, 0.0f);

glVertex2f(0.03f, -0.45f);
glVertex2f(0.03f, -0.5f);

glVertex2f(0.3f, -0.5f);
```

```
glVertex2f(0.3f, -0.45f);

glEnd();

glBegin(GL_POLYGON);
glColor3f(1.0f, 1.0f, 0.0f);

glVertex2f(0.1f, -0.4f);
glVertex2f(0.1f, -0.45f);

glVertex2f(0.3f, -0.45f);
glVertex2f(0.3f, -0.4f);

glEnd();

glBegin(GL_POLYGON);
glColor3f(1.0f, 1.0f, 0.0f);

glVertex2f(0.1f, -0.35f);
glVertex2f(0.1f, -0.4f);

glVertex2f(0.25f, -0.4f);
glVertex2f(0.25f, -0.35f);

glEnd();

glBegin(GL_POLYGON);
glColor3f(1.0f, 1.0f, 0.0f);

glVertex2f(0.15f, -0.3f);
glVertex2f(0.15f, -0.35f);

glVertex2f(0.2f, -0.35f);
glVertex2f(0.2f, -0.3f);

glEnd();

glBegin(GL_POLYGON);
glColor3f(1.0f, 1.0f, 0.0f);

glVertex2f(-0.3f, -0.45f);
glVertex2f(-0.3f, -0.5f);

glVertex2f(-0.03f, -0.5f);
```

```
glVertex2f(-0.03f, -0.45f);

glEnd();

glBegin(GL_POLYGON);

glColor3f(1.0f, 1.0f, 0.0f);

glVertex2f(-0.3f, -0.4f);
glVertex2f(-0.3f, -0.45f);

glVertex2f(-0.1f, -0.45f);
glVertex2f(-0.1f, -0.4f);

glEnd();

glBegin(GL_POLYGON);
glColor3f(1.0f, 1.0f, 0.0f);

glVertex2f(-0.25f, -0.35f);
glVertex2f(-0.25f, -0.4f);

glVertex2f(-0.1f, -0.4f);
glVertex2f(-0.1f, -0.35f);

glEnd();

glBegin(GL_POLYGON);
glColor3f(1.0f, 1.0f, 0.0f);

glVertex2f(-0.2f, -0.3f);
glVertex2f(-0.2f, -0.35f);
glVertex2f(-0.15f, -0.35f);
glVertex2f(-0.15f, -0.3f);

glEnd();

glFlush();
}

int main(int argc, char** argv) {
glutInit(&argc, argv);
glutCreateWindow("Batman logo");
glutInitWindowSize(1000, 1000);
```

```
glutDisplayFunc(display);
initGL();
glutMainLoop();
return 0;
}
```

Output Screenshot (Full Screen)-