Tugas Modul 2 : Ovaldy | 161111062

```
1.  #include <windows.h>
2.  #include "GL/glut.h"
3.  #include "math.h"
4.  #define PI 3.14159265
5.
6.  void initGL()
7.  {
8.    glClearColor(1.0f, 1.0f, 1.0f, 1.0f);
9.    glClearDepth(1.0f);
10.   glEnable(GL_DEPTH_TEST);
11.   glDepthFunc(GL_LEQUAL);
12.   glShadeModel(GL_SMOOTH);
13.   glHint(GL_PERSPECTIVE_CORRECTION_HINT, GL_NICEST);
14. }
15.
16. void timer(int value)
17. {
18.   glutPostRedisplay();
19.   glutTimerFunc(15, timer, 0);
20. }
21.
22.
23. void reshape(GLsizei width, GLsizei height)
24. {
25.   if (height == 0)
26.     height = 1;
27.   GLfloat aspect = (GLfloat)width / (GLfloat)height;
28.   glViewport(0, 0, width, height);
29.   glMatrixMode(GL_PROJECTION);
30.   glLoadIdentity();
31.   gluPerspective(45.0f, aspect, 0.1f, 100.0f);
32. }
33.
34. float degreeToRadian(float degree) {
35.   // 360 degree = 2 pi radian
36.   //   1 degree = 2 pi / 360 radian
37.   //   1 degree = pi / 180 radian
38.   return (degree * PI) / 180.0;
39. }
40.
41. void segiBeraturan(float xPusat, float yPusat, float r, int segi, float sudutAwal, floa
    t sudutAkhir) {
42.   float besarSudutRad = degreeToRadian(360.0/segi);
43.   float sudutAwalRad = degreeToRadian(sudutAwal);
44.   float sudutAkhirRad = degreeToRadian(sudutAkhir);
45.   glBegin(GL_LINES);
46.   for (int titikKe = 0; titikKe < segi; titikKe ++) {
47.     float sudut1 = besarSudutRad * titikKe + sudutAwalRad;
48.     float sudut2 = besarSudutRad * (titikKe + 1) + sudutAwalRad;
49.     float x1 = cos(sudut1) * r + xPusat;
50.     float x2 = cos(sudut2) * r + xPusat;
51.     float y1 = sin(sudut1) * r + yPusat;
52.     float y2 = sin(sudut2) * r + yPusat;
53.     glVertex3f(x1, y1, 0);
54.     glVertex3f(x2, y2, 0);
55.     if (sudut2 >= sudutAkhirRad) {
56.       break;
57.     }
```

```
  }
  glEnd();
}
void linesXY(){
    glBegin(GL_LINES);
        glVertex3f(-1.414, 0, 0);
        glVertex3f(0, -1.414, 0);
        glVertex3f(0, -1.414, 0);
        glVertex3f(1.414, 0, 0);
    glEnd();
}
void segi3(){
    glBegin(GL_TRIANGLES);
        glColor3f(1.0f, 0.0f, 0.0f);
        glVertex3f(0.0f, 0.5f, 0.0f);
        glColor3f(1.0f, 0.0f, 1.0f);
        glVertex3f(-0.5f, -0.5f, 0.0f);
        glColor3f(1.0f, 1.0f, 0.0f);
        glVertex3f(0.5f, -0.5f, 0.0f);
        glVertex3f(1.0f, -0.5f, 0.0f);
        glVertex3f(0.5f, -0.5f, 1.0f);
        glVertex3f(0.5f, -1.5f, 0.0f);

    glEnd();
}

void strip_segi3(){
    glBegin(GL_TRIANGLE_STRIP);
        glVertex3f(0, 0.25f,0);
        glVertex3f(-0.25f, -0.375f, 0);
        glVertex3f(0.14f, 0.03f, 0);
        glColor3f(1,0,0);
        glVertex3f(0.35f, 0.25f, 0);
        glVertex3f(0.85f, -0.35f, 0);
    glEnd();
}
void quads(){
    glBegin(GL_QUADS);
        glVertex3f(0,0.75f,0);
        glVertex3f(-0.75f,0,0);
        glVertex3f(0,-0.75f,0);
        glVertex3f(0.75f,0,0);
           glEnd();
       }
       void poligami(){
           glBegin(GL_POLYGON);
               glVertex3f(0,0.5f,0);
               glVertex3f(-0.5f,0.2f,0);
               glVertex3f(-0.5f,-0.2f,0);
               glVertex3f(0,-0.5f,0);
               glVertex3f(0,0.5f,0);
               glVertex3f(0.5f,0.2f,0);
               glVertex3f(0.5f,-0.2f,0);
               glVertex3f(0,-0.5f,0);
           glEnd();

       }
       void hurufT(){
           glBegin(GL_POLYGON);
               glVertex3f(0.1f,0.2f,0);
               glVertex3f(0.1f,-0.2f,0);
```

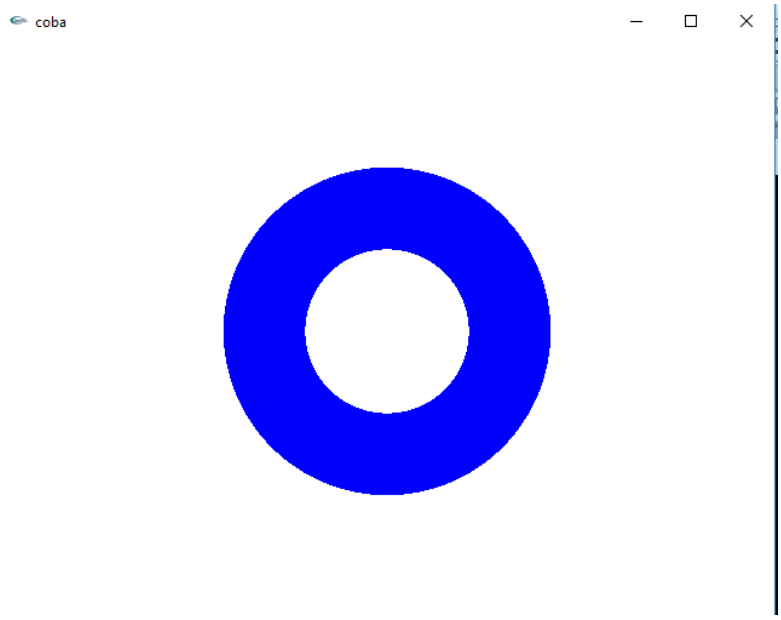
```
            glVertex3f(-0.1f,-0.2f,0);
            glVertex3f(-0.1f,0.2f,0);
            glVertex3f(-0.3f,0.2f,0);
            glVertex3f(-0.3f,0.4f,0);
            glVertex3f(0.3f,0.4f,0);
            glVertex3f(0.3f,0.2f,0);
        glEnd();

    }
    void bintang(){
        glBegin(GL_POLYGON);
         glColor3f(1.0f, 0.0f, 0.0f);
         glVertex3f(0.2f,-0.1f,0);
         glVertex3f(0.3f,-0.5f,0);;
         glVertex3f(0.0f,-0.2f,0);
         glColor3f(1.0f, 0.0f, 0.0f);
         glVertex3f(-0.2f,-0.5f,0);
         glColor3f(1.0f, 1.0f, 0.0f);
         glVertex3f(-0.1f,-0.1f,0);;
         glVertex3f(-0.5f,0.0f,0);;
         glVertex3f(-0.05f,0.1f,0);
         glVertex3f(0.05f,0.5f,0);
         glVertex3f(0.1f,0.1f,0);
         glVertex3f(0.5f,0.0f,0);

         glEnd();

    }
    void gambarHati(){
        glBegin(GL_LINES);
            glVertex3f(-1.414, 0, 0);
            glVertex3f(0, -1.414, 0);
            glVertex3f(0, -1.414, 0);
            glVertex3f(1.414, 0, 0);
        glEnd();
        segiBeraturan( 0.707, 0.707, 1, 30, -45, 135);
        segiBeraturan(-0.707, 0.707, 1, 30, 45, 225);
    }
    float sudut = 0;
    void lingkaran1(){
        int i,radius,jumlah_titik,x_tengah,y_tengah;
        radius = 70;
        jumlah_titik = 360;
        x_tengah = 50;
        y_tengah = 50;
        glBegin(GL_POLYGON);
            for (i=0;i<jumlah_titik; i++){
            //float sudut;
            sudut = (float) (i*(2*PI/jumlah_titik));
            float x = (float) (x_tengah+radius * cos(sudut));
            float y = (float) (y_tengah+radius * sin(sudut));
            glVertex2f(x/100, y/100);
            }
        glEnd();
    }
    void lingkaran2(){
        int i,radius,jumlah_titik,x_tengah,y_tengah;
        radius = 35;
        jumlah_titik = 360;
        x_tengah = 50;
        y_tengah = 50;
```

```
180.            glBegin(GL_POLYGON);
181.                for (i=0;i<jumlah_titik; i++){
182.                //float sudut;
183.                sudut = (float) (i*(2*PI/jumlah_titik));
184.                float x = (float) (x_tengah+radius * cos(sudut));
185.                float y = (float) (y_tengah+radius * sin(sudut));
186.                glVertex2f(x/100, y/100);
187.                }
188.            glEnd();
189.        }
190.
191.        void display()
192.        {
193.          glClear(GL_COLOR_BUFFER_BIT | GL_DEPTH_BUFFER_BIT);
194.          glMatrixMode(GL_MODELVIEW);
195.          glLoadIdentity();
196.
197.          glTranslatef(-0.5, -0.5, -3.0);
198.          //glRotatef(sudut, 0,0,1);
199.          glColor3f(0,0,1);
200.          lingkaran1();
201.          glTranslatef(0, 0, 0);
202.          glColor3f(1,1,1);
203.          lingkaran2();
204.
205.          sudut++;
206.
207.          glFlush();
208.          glutSwapBuffers();
209.        }
210.
211.        int main(int argc, char **argv)
212.        {
213.          glutInit(&argc, argv);
214.          glutInitDisplayMode(GLUT_DOUBLE | GLUT_DEPTH);
215.          glutInitWindowSize(640, 480);
216.          glutInitWindowPosition(50, 50);
217.          glutCreateWindow("coba");
218.          glutDisplayFunc(display);
219.          glutReshapeFunc(reshape);
220.          initGL();
221.          glutTimerFunc(0, timer, 0);
222.          glutMainLoop();
223.          return 0;
224.        }
```




```c
#include <windows.h>
#include "GL/glut.h"
#include "math.h"
#define PI 3.14159265

void initGL()
{
  glClearColor(1.0f, 1.0f, 1.0f, 1.0f);
  glClearDepth(1.0f);
  glEnable(GL_DEPTH_TEST);
  glDepthFunc(GL_LEQUAL);
  glShadeModel(GL_SMOOTH);
  glHint(GL_PERSPECTIVE_CORRECTION_HINT, GL_NICEST);
}

void timer(int value)
{
  glutPostRedisplay();
  glutTimerFunc(15, timer, 0);
}


void reshape(GLsizei width, GLsizei height)
{
  if (height == 0)
    height = 1;
  GLfloat aspect = (GLfloat)width / (GLfloat)height;
  glViewport(0, 0, width, height);
  glMatrixMode(GL_PROJECTION);
  glLoadIdentity();
  gluPerspective(45.0f, aspect, 0.1f, 100.0f);
}

float degreeToRadian(float degree) {
  // 360 degree = 2 pi radian
  //   1 degree = 2 pi / 360 radian
```

```
  //   1 degree = pi / 180 radian
  return (degree * PI) / 180.0;
}

void segiBeraturan(float xPusat, float yPusat, float r, int segi, float sudutAwal, float sudutAkhir) {
  float besarSudutRad = degreeToRadian(360.0/segi);
  float sudutAwalRad = degreeToRadian(sudutAwal);
  float sudutAkhirRad = degreeToRadian(sudutAkhir);
  glBegin(GL_LINES);
  for (int titikKe = 0; titikKe < segi; titikKe ++) {
    float sudut1 = besarSudutRad * titikKe + sudutAwalRad;
    float sudut2 = besarSudutRad * (titikKe + 1) + sudutAwalRad;
    float x1 = cos(sudut1) * r + xPusat;
    float x2 = cos(sudut2) * r + xPusat;
    float y1 = sin(sudut1) * r + yPusat;
    float y2 = sin(sudut2) * r + yPusat;
    glVertex3f(x1, y1, 0);
    glVertex3f(x2, y2, 0);
    if (sudut2 >= sudutAkhirRad) {
      break;
    }
  }
  glEnd();
}
void linesXY(){
    glBegin(GL_LINES);
        glVertex3f(-1.414, 0, 0);
        glVertex3f(0, -1.414, 0);
        glVertex3f(0, -1.414, 0);
        glVertex3f(1.414, 0, 0);
    glEnd();
}
void segi3(){
    glBegin(GL_TRIANGLES);
        glColor3f(1.0f, 0.0f, 0.0f);
        glVertex3f(0.0f, 0.5f, 0.0f);
        glColor3f(1.0f, 0.0f, 1.0f);
        glVertex3f(-0.5f, -0.5f, 0.0f);
        glColor3f(1.0f, 1.0f, 0.0f);
        glVertex3f(0.5f, -0.5f, 0.0f);
        glVertex3f(1.0f, -0.5f, 0.0f);
        glVertex3f(0.5f, -0.5f, 1.0f);
        glVertex3f(0.5f, -1.5f, 0.0f);

    glEnd();
}

void strip_segi3(){
    glBegin(GL_TRIANGLE_STRIP);
        glVertex3f(0, 0.25f,0);
        glVertex3f(-0.25f, -0.375f, 0);
        glVertex3f(0.14f, 0.03f, 0);
        glColor3f(1,0,0);
        glVertex3f(0.35f, 0.25f, 0);
        glVertex3f(0.85f, -0.35f, 0);
    glEnd();
}
void quads(){
    glBegin(GL_QUADS);
        glVertex3f(0,0.75f,0);
```

```
97.          glVertex3f(-0.75f,0,0);
98.          glVertex3f(0,-0.75f,0);
99.          glVertex3f(0.75f,0,0);
100.             glEnd();
101.         }
102.         void poligami(){
103.             glBegin(GL_POLYGON);
104.                 glVertex3f(0,0.5f,0);
105.                 glVertex3f(-0.5f,0.2f,0);
106.                 glVertex3f(-0.5f,-0.2f,0);
107.                 glVertex3f(0,-0.5f,0);
108.                 glVertex3f(0,0.5f,0);
109.                 glVertex3f(0.5f,0.2f,0);
110.                 glVertex3f(0.5f,-0.2f,0);
111.                 glVertex3f(0,-0.5f,0);
112.             glEnd();
113.
114.         }
115.         void hurufT(){
116.             glBegin(GL_POLYGON);
117.                 glVertex3f(0.1f,0.2f,0);
118.                 glVertex3f(0.1f,-0.2f,0);
119.                 glVertex3f(-0.1f,-0.2f,0);
120.                 glVertex3f(-0.1f,0.2f,0);
121.                 glVertex3f(-0.3f,0.2f,0);
122.                 glVertex3f(-0.3f,0.4f,0);
123.                 glVertex3f(0.3f,0.4f,0);
124.                 glVertex3f(0.3f,0.2f,0);
125.             glEnd();
126.
127.         }
128.         void bintang(){
129.             glBegin(GL_POLYGON);
130.              glColor3f(1.0f, 0.0f, 0.0f);
131.              glVertex3f(0.2f,-0.1f,0);
132.              glVertex3f(0.3f,-0.5f,0);;
133.              glVertex3f(0.0f,-0.2f,0);
134.              glColor3f(1.0f, 0.0f, 0.0f);
135.              glVertex3f(-0.2f,-0.5f,0);
136.              glColor3f(1.0f, 1.0f, 0.0f);
137.              glVertex3f(-0.1f,-0.1f,0);;
138.              glVertex3f(-0.5f,0.0f,0);;
139.              glVertex3f(-0.05f,0.1f,0);
140.              glVertex3f(0.05f,0.5f,0);
141.              glVertex3f(0.1f,0.1f,0);
142.              glVertex3f(0.5f,0.0f,0);
143.
144.              glEnd();
145.
146.         }
147.         void gambarHati(){
148.             glBegin(GL_LINES);
149.                 glVertex3f(-1.414, 0, 0);
150.                 glVertex3f(0, -1.414, 0);
151.                 glVertex3f(0, -1.414, 0);
152.                 glVertex3f(1.414, 0, 0);
153.             glEnd();
154.             segiBeraturan( 0.707, 0.707, 1, 30, -45, 135);
155.             segiBeraturan(-0.707, 0.707, 1, 30, 45, 225);
156.         }
157.         float sudut = 0;
```

```
158.        void lingkaran1(){
159.            int i,radius,jumlah_titik,x_tengah,y_tengah;
160.            radius = 70;
161.            jumlah_titik = 360;
162.            x_tengah = 50;
163.            y_tengah = 50;
164.            glBegin(GL_POLYGON);
165.                for (i=0;i<jumlah_titik; i++){
166.                //float sudut;
167.                if(i>(jumlah_titik/3*2)){
168.                    glColor3f(0,1,0);
169.                }else if(i>(jumlah_titik/3)){
170.                    glColor3f(0,0,0);
171.                }else{
172.                    glColor3f(1,0,0);
173.                }
174.                sudut = (float) (i*(2*PI/jumlah_titik));
175.                float x = (float) (x_tengah+radius * cos(sudut));
176.                float y = (float) (y_tengah+radius * sin(sudut));
177.                glVertex2f(x/100, y/100);
178.                }
179.            glEnd();
180.        }
181.        void lingkaran2(){
182.            int i,radius,jumlah_titik,x_tengah,y_tengah;
183.            radius = 35;
184.            jumlah_titik = 360;
185.            x_tengah = 50;
186.            y_tengah = 50;
187.            glBegin(GL_POLYGON);
188.                for (i=0;i<jumlah_titik; i++){
189.                //float sudut;
190.                sudut = (float) (i*(2*PI/jumlah_titik));
191.                float x = (float) (x_tengah+radius * cos(sudut));
192.                float y = (float) (y_tengah+radius * sin(sudut));
193.                glVertex2f(x/100, y/100);
194.                }
195.            glEnd();
196.        }
197.
198.        void display()
199.        {
200.          glClear(GL_COLOR_BUFFER_BIT | GL_DEPTH_BUFFER_BIT);
201.          glMatrixMode(GL_MODELVIEW);
202.          glLoadIdentity();
203.
204.          glTranslatef(-0.5, -0.5, -3.0);
205.          //glRotatef(sudut, 0,0,1);
206.          glColor3f(0,1,0);
207.          lingkaran1();
208.          glTranslatef(0, 0, 0);
209.          glColor3f(1,1,1);
210.          lingkaran2();
211.
212.          sudut++;
213.
214.          glFlush();
215.          glutSwapBuffers();
216.        }
217.
218.        int main(int argc, char **argv)
```

```
219.        {
220.          glutInit(&argc, argv);
221.          glutInitDisplayMode(GLUT_DOUBLE | GLUT_DEPTH);
222.          glutInitWindowSize(640, 480);
223.          glutInitWindowPosition(50, 50);
224.          glutCreateWindow("coba");
225.          glutDisplayFunc(display);
226.          glutReshapeFunc(reshape);
227.          initGL();
228.          glutTimerFunc(0, timer, 0);
229.          glutMainLoop();
230.          return 0;
231.        }
```