FLYING ROCKET

Problem Statement

Write a Computer Graphics program in C to display A Flying Rocket

Source Code

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

#include<stdlib.h>

#include<stdio.h>

#include<math.h>

#include<string.h>

const float DEG2RAD = 3.14159/180;

void display1();

void stars();

int p;

void stars1();

void static_rocket();

void rocket_to_cam_pos();

void rocket_in_motion();

float i,j,count=0,count1=0,count3=0,flag=0,flag1=0,t=0,f=0,flag3=0;

void semicircle(float radius,float u,float v)

{

        glColor3f(1.0 ,1.0 ,1.0);

  glBegin(GL_POLYGON);

  for (int i=135; i<=315; i++)

  {

    float degInRad = i*DEG2RAD;

    glVertex2f(u+cos(degInRad)*radius,v+(sin(degInRad))*radius);//100,100 specifies centre of the circle

  }

  glEnd();

}

void display1()
```

```c
{

count1++;
 if(count1==250)
     flag=1;
  if(flag==0)
     static_rocket();
 else if((count1==151)| (count1==152))
     rocket_to_cam_pos();
 else
     rocket_in_motion();
}
void stars()
{
            glColor3f(1.0,1.0,1.0);
            glPointSize(0.37);
            glBegin(GL_POINTS);
            glVertex2i(10,20);
            glVertex2i(20,100);
            glVertex2i(30,10);
            glVertex2i(15,150);
            glVertex2i(17,80);
            glVertex2i(200,200);
            glVertex2i(55,33);
            glVertex2i(400,300);
            glVertex2i(330,110);
            glVertex2i(125,63);
            glVertex2i(63,125);
            glVertex2i(20,10);
            glVertex2i(110,330);
            glVertex2i(440,430);
            glVertex2i(32,65);
```

```
glVertex2i(110,440);

glVertex2i(210,230);

glVertex2i(390,490);

glVertex2i(12,90);

glVertex2i(400,322);

glVertex2i(420,366);

glVertex2i(455,400);

glVertex2i(20,20);

glVertex2i(111,120);

glVertex2i(401,200);

glVertex2i(230,30);

glVertex2i(220,20);

glVertex2i(122,378);

glVertex2i(133,340);

glVertex2i(345,420);

glVertex2i(130,360);

glVertex2i(333,120);

glVertex2i(250,22);

glVertex2i(242,11);

glVertex2i(280,332);

glVertex2i(233,40);

glVertex2i(210,418);

glVertex2i(256,12);

glVertex2i(288,232);

glVertex2i(247,36);

glVertex2i(229,342);

glVertex2i(257,47);

glVertex2i(290,63);

glVertex2i(232,72);

glVertex2i(243,143);

glVertex2i(100,200);

glVertex2i(90,250);
```

```
        glVertex2i(80,225);

        glVertex2i(50,333);

        glVertex2i(60,350);

        glVertex2i(243,143);

        glVertex2i(243,143);

        glEnd();

}\

void stars1()

{

        int l;

        glColor3f(1.0,1.0,1.0);

        glPointSize(0.3);

        glBegin(GL_POINTS);

        glVertex2i(50,20);

        glVertex2i(70,100);

        glVertex2i(80,10);

        glVertex2i(65,150);

        glVertex2i(67,80);

        glVertex2i(105,33);

        glVertex2i(450,300);

        glVertex2i(380,110);

        glVertex2i(175,63);

        glVertex2i(113,125);

        glVertex2i(70,10);

        glVertex2i(160,330);

        glVertex2i(490,430);

        glVertex2i(82,65);

        glVertex2i(160,440);

        glVertex2i(440,490);

        glVertex2i(62,90);

        glVertex2i(450,322);

        glVertex2i(420,366);
```

```
glVertex2i(455,400);

glVertex2i(60,20);

glVertex2i(111,120);

glVertex2i(451,200);

glVertex2i(280,30);

glVertex2i(220,20);

glVertex2i(132,378);

glVertex2i(173,340);

glVertex2i(325,420);

glVertex2i(180,360);

glVertex2i(383,120);

glVertex2i(200,22);

glVertex2i(342,11);

glVertex2i(330,332);

glVertex2i(283,40);

glVertex2i(210,418);

glVertex2i(256,12);

glVertex2i(288,232);

glVertex2i(247,36);

glVertex2i(229,342);

glVertex2i(257,47);

glVertex2i(290,63);

glVertex2i(232,72);

glVertex2i(243,143);

glVertex2i(100,200);

glVertex2i(90,250);

glVertex2i(80,225);

glVertex2i(50,333);

glVertex2i(60,350);

glVertex2i(243,143);

glVertex2i(243,143);

glEnd();
```

```c
        for(l=0;l<=10000;l++)
                ;
}
void static_rocket()
{
count1++;
if(count1==150)
flag=1;
 if(flag==0)
 {
        glClearColor(0.196078  ,0.6 ,0.8,1.0);
        glClear(GL_COLOR_BUFFER_BIT|GL_DEPTH_BUFFER_BIT);
        glColor3f(0.4,0.25,0.1);
                glBegin(GL_POLYGON);//green ground
                glVertex2f(0.0,0.0);
                glVertex2f(0.0,250.0);
                glVertex2f(270.0,250.0);
                glVertex2f(500.0,50.0);
                glVertex2f(500.0,0.0);
                glEnd();
                glBegin(GL_POLYGON);//green ground
                glVertex2f(280.0,250.0);
                glVertex2f(500.0,250.0);
                glVertex2f(500.0,60.0);
                glEnd();
                glColor3f(0.0,0.0,0.0);
                        glBegin(GL_POLYGON);//road
                glVertex2f(260.0,250.0);
                glVertex2f(290.0,250.0);
                glVertex2f(500.0,70.0);
                glVertex2f(500.0,40.0);
                glEnd();
```

```
glColor3f(0.0,0.0,0.0);


glColor3f(0.8,0.498039 ,0.196078);
                glBegin(GL_POLYGON);//house 1
glVertex2f(250.0,250.0);

glVertex2f(300.0,250.0);

glVertex2f(300.0,350.0);

glVertex2f(250.0,350.0);

glEnd();

glColor3f(0.7,0.7,0.7);

glBegin(GL_POLYGON);//HOUSE A

        glVertex2f(255,267.5);

        glVertex2f(275.0,267.5);

        glVertex2f(275.0,277.5);

        glVertex2f(255.0,277.5);

        glEnd();

glBegin(GL_POLYGON);//HOUSE B

        glVertex2f(255,285.0);

        glVertex2f(275.0,285);

        glVertex2f(275.0,295);

        glVertex2f(255.0,295);

        glEnd();

glBegin(GL_POLYGON);//HOUSE C

        glVertex2f(255,302.5);

        glVertex2f(275.0,302.5);

        glVertex2f(275.0,312.5);

        glVertex2f(255.0,312.5);

        glEnd();

glBegin(GL_POLYGON);//HOUSE D

        glVertex2f(255,320.0);

        glVertex2f(275.0,320.0);

        glVertex2f(275.0,330.0);
```

```
                    glVertex2f(255.0,330.0);

                glEnd();


glBegin(GL_POLYGON);//HOUSE E

                glVertex2f(285,267.5);

                glVertex2f(295.0,267.5);

                glVertex2f(295.0,277.5);

                glVertex2f(285.0,277.5);

                glEnd();
glBegin(GL_POLYGON);//HOUSE F

                glVertex2f(285,285.0);

                glVertex2f(295.0,285);

                glVertex2f(295.0,295);

                glVertex2f(285.0,295);

                glEnd();
glBegin(GL_POLYGON);//HOUSE G

                glVertex2f(285,302.5);

                glVertex2f(295.0,302.5);

                glVertex2f(295.0,312.5);

                glVertex2f(285.0,312.5);

                glEnd();
glBegin(GL_POLYGON);//HOUSE H

                glVertex2f(285,320.0);

                glVertex2f(295.0,320.0);

                glVertex2f(295.0,330.0);

                glVertex2f(285.0,330.0);

                glEnd();

                glColor3f(0.647059 ,0.164706  ,0.164706);

                glBegin(GL_POLYGON);//solid cone

                glVertex2f(26,250);

                glVertex2f(52,250);

                glVertex2f(39,290);
```

```
                                    glEnd();

                                    semicircle(20.0,50,300);

glColor3f(0.0,0.0 ,0.0);

                                    glBegin(GL_LINES);//wires

                                    glVertex2f(37,313);

                                    glVertex2f(62,310);

                                    glVertex2f(63,287);

                                    glVertex2f(62,310);

                                    glEnd();

                    glColor3f(1.0,1.0,1.0);

                    glEnd();

                    glPointSize(2.0);

glColor3f(1.0,1.0 ,1.0);

                                    glBegin(GL_POINTS);//road paint

                                    glVertex2f(497,56);

                                    glVertex2f(488,65);

                                    glVertex2f(479,74);

                                    glVertex2f(470,83);

                                    glVertex2f(460,92);

                                    glVertex2f(450,101);

                                    glVertex2f(439,110);

                                    glVertex2f(428,119);

                                    glVertex2f(418,128);

                                    glVertex2f(408,137);

                                    glVertex2f(398,146);

                                    glVertex2f(388,155);

                                    glVertex2f(378,164);

                                    glVertex2f(366,173);

                                    glVertex2f(356,182);

                                    glVertex2f(346,191);

                                    glVertex2f(336,200);

                                    glVertex2f(324,209);
```

```
                    glVertex2f(314,218);

                    glVertex2f(304,227);

                    glVertex2f(294,234);

                    glVertex2f(284,243);

        glVertex2f(278,248);

                    glEnd();

glColor3f(0.8,0.498039 ,0.196078);

glBegin(GL_POLYGON);//core

            glVertex2f(237.5,20.0);

            glVertex2f(262.5,20.0);

            glVertex2f(262.5,120.0);

            glVertex2f(237.5,120.0);

glEnd();

glColor3f(1.0,1.0,1.0);//bonnet

glBegin(GL_POLYGON);//front

glVertex2f(237.5,120.0);

glVertex2f(262.5,120.0);

glVertex2f(250,170.0);

glEnd();

glColor3f(1.0,0.0,0.0);

glBegin(GL_POLYGON);//left_side_top

glVertex2f(237.5,120.0);

glVertex2f(217.5,95.0);

glVertex2f(237.5,95.0);

glEnd();

        glBegin(GL_POLYGON);//left_side_bottom

glVertex2f(237.5,20.0);

glVertex2f(217.5,20.0);

glVertex2f(237.5,70.0);

glEnd();

        glBegin(GL_POLYGON);//right_side_bottom

glVertex2f(262.5,20.0);
```

```
glVertex2f(282.5,20.0);

glVertex2f(262.5,70.0);

glEnd();

        glBegin(GL_POLYGON);//right_side_top

glVertex2f(262.5,120.0);

glVertex2f(262.5,95.0);

glVertex2f(282.5,95.0);

glEnd();

glColor3f(0.556863 ,0.137255  ,0.419608);

        glBegin(GL_POLYGON);//bottom_1_exhaust

glVertex2f(237.5,20.0);

glVertex2f(244.5,20.0);

glVertex2f(241,0.0);

glEnd();

        glBegin(GL_POLYGON);//bottom_2_exhaust

glVertex2f(246.5,20.0);

glVertex2f(253.5,20.0);

glVertex2f(249.5,0.0);

glEnd();

        glBegin(GL_POLYGON);//bottom_3_exhaust

glVertex2f(262.5,20.0);

glVertex2f(255.5,20.0);

glVertex2f(258.5,0.0);

glEnd();

glBegin(GL_POLYGON);//left_stand_holder

glVertex2f(182.5,85.0);

glVertex2f(182.5,0.0);

glVertex2f(187.5,0.0);

glVertex2f(187.5,80.0);

glVertex2f(237.5,80.0);

glVertex2f(237.5,85.0);

glVertex2f(182.5,85.0);
```

```
		glEnd();

		glBegin(GL_POLYGON);

glVertex2f(312.5,85.0);//right_stand_holder

		glVertex2f(312.5,0.0);

		glVertex2f(307.5,0.0);

		glVertex2f(307.5,80.0);

		glVertex2f(262.5,80.0);

		glVertex2f(262.5,85.0);

		glVertex2f(312.5,85.0);

		glEnd();

		for(j=0;j<=1000000;j++);

		glutSwapBuffers();

		glutPostRedisplay();

		glFlush();

}

}

void rocket_to_cam_pos()

{

		count++;

count3++;

for(i=0;i<=200;i++)

{

		glClearColor(0.196078  ,0.6 ,0.8,1.0);

		glClear(GL_COLOR_BUFFER_BIT|GL_DEPTH_BUFFER_BIT);

		glColor3f(0.8,0.498039 ,0.196078);

		glBegin(GL_POLYGON);//core

				glVertex2f(237.5,20.0+i);

				glVertex2f(262.5,20.0+i);

				glVertex2f(262.5,120.0+i);

				glVertex2f(237.5,120.0+i);

		glEnd();

		glColor3f(1.0,1.0,1.0);//bonnet
```

```
glBegin(GL_POLYGON);//front

glVertex2f(237.5,120.0+i);

glVertex2f(262.5,120.0+i);

glVertex2f(250,170.0+i);

glEnd();

glColor3f(1.0,0.0,0.0);

glBegin(GL_POLYGON);//left_side_top

glVertex2f(237.5,120.0+i);

glVertex2f(217.5,95.0+i);

glVertex2f(237.5,95.0+i);

glEnd();

        glBegin(GL_POLYGON);//left_side_bottom

glVertex2f(237.5,20.0+i);

glVertex2f(217.5,20.0+i);

glVertex2f(237.5,70.0+i);

glEnd();

        glBegin(GL_POLYGON);//right_side_bottom

glVertex2f(262.5,20.0+i);

glVertex2f(282.5,20.0+i);

glVertex2f(262.5,70.0+i);

glEnd();

        glBegin(GL_POLYGON);//right_side_top

glVertex2f(262.5,120.0+i);

glVertex2f(262.5,95.0+i);

glVertex2f(282.5,95.0+i);

glEnd();

glColor3f(0.556863 ,0.137255  ,0.419608);

        glBegin(GL_POLYGON);//bottom_1_exhaust

glVertex2f(237.5,20.0+i);

glVertex2f(244.5,20.0+i);

glVertex2f(241,0.0+i);

glEnd();
```

```
        glBegin(GL_POLYGON);//bottom_2_exhaust
glVertex2f(246.5,20.0+i);

glVertex2f(253.5,20.0+i);

glVertex2f(249.5,0.0+i);

glEnd();
        glBegin(GL_POLYGON);//bottom_3_exhaust
glVertex2f(262.5,20.0+i);

glVertex2f(255.5,20.0+i);

glVertex2f(258.5,0.0+i);

glEnd();

if((p%2)==0)
                glColor3f(1.0,0.25,0.0);
            else
                    glColor3f(1.0,0.816,0.0);
                glBegin(GL_POLYGON);//outer fume
glVertex2f(237.5,20+i);

glVertex2f(234.16,16.66+i);

glVertex2f(230.82,13.32+i);

glVertex2f(227.48,9.98+i);

glVertex2f(224.14,6.64+i);

glVertex2f(220.8,3.3+i);

glVertex2f(217.5,0+i);

glVertex2f(221.56,-5+i);

glVertex2f(225.62,-10+i);

glVertex2f(229.68,-15+i);

glVertex2f(233.74,-20+i);

glVertex2f(237.8,-25+i);

glVertex2f(241.86,-30+i);

glVertex2f(245.92,-35+i);

glVertex2f(250,-40+i);

glVertex2f(254.06,-35+i);

glVertex2f(258.12,-30+i);
```

```
glVertex2f(262.18,-25+i);

glVertex2f(266.24,-20+i);

glVertex2f(270.3,-15+i);

glVertex2f(274.36,-10+i);

glVertex2f(278.42,-5+i);

glVertex2f(282.5,0+i);

glVertex2f(278.5,4+i);

glVertex2f(274.5,8+i);

glVertex2f(270.5,12+i);

glVertex2f(266.5,16+i);

glVertex2f(262.5,20+i);//28 points

glEnd();


                         if((p%2)==0)

                 glColor3f(1.0,0.816,0.0);

                 else

                         glColor3f(1.0,0.25,0.0);

glBegin(GL_POLYGON);//inner fume

glVertex2f(237.5,20+i);

glVertex2f(236.5,17.5+i);

glVertex2f(235.5,15+i);

glVertex2f(234.5,12.5+i);

glVertex2f(233.5,10+i);

glVertex2f(232.5,7.5+i);

glVertex2f(236,5+i);

glVertex2f(239.5,2.5+i);

glVertex2f(243,0+i);

glVertex2f(246.5,-2.5+i);

glVertex2f(250,-5+i);

glVertex2f(253.5,-2.5+i);

glVertex2f(257,0+i);

glVertex2f(260.5,2.5+i);
```

```
                    glVertex2f(264,5+i);

                    glVertex2f(267.5,7.5+i);

                    glVertex2f(266.5,10+i);

                    glVertex2f(265.5,12.5+i);

                    glVertex2f(264.5,15+i);

                    glVertex2f(263.5,17.5+i);

                    glVertex2f(262.5,20+i);//21 points

                    glEnd();

                    p=p+1;

        for(j=0;j<=1000000;j++);

        glutSwapBuffers();

        glutPostRedisplay();

        glFlush();

}

}

void rocket_in_motion()

{

        count++;

for(i=195;i<=200;i++)

{

    if(count>=5)

        {

                        glClearColor(0.0 ,0.0 ,0.0,1.0);

        glClear(GL_COLOR_BUFFER_BIT|GL_DEPTH_BUFFER_BIT);

        if(flag1==0)

        {

        stars();

        flag1=1;

        }

        else

        {

                stars1();
```

```
                flag1=0;

}


}
else
{
glClearColor(0.196078  ,0.6 ,0.8,1.0);

glClear(GL_COLOR_BUFFER_BIT|GL_DEPTH_BUFFER_BIT);

}
glColor3f(0.8,0.498039 ,0.196078);

glBegin(GL_POLYGON);//core

        glVertex2f(237.5,20.0+i);

        glVertex2f(262.5,20.0+i);

        glVertex2f(262.5,120.0+i);

        glVertex2f(237.5,120.0+i);
glEnd();

glColor3f(1.0,1.0,1.0);//bonnet

glBegin(GL_POLYGON);//front

glVertex2f(237.5,120.0+i);

glVertex2f(262.5,120.0+i);

glVertex2f(250,170.0+i);

glEnd();

glColor3f(1.0,0.0,0.0);

glBegin(GL_POLYGON);//left_side_top

glVertex2f(237.5,120.0+i);

glVertex2f(217.5,95.0+i);

glVertex2f(237.5,95.0+i);

glEnd();

        glBegin(GL_POLYGON);//left_side_bottom

glVertex2f(237.5,20.0+i);

glVertex2f(217.5,20.0+i);

glVertex2f(237.5,70.0+i);
```

```
glEnd();
        glBegin(GL_POLYGON);//right_side_bottom
glVertex2f(262.5,20.0+i);
glVertex2f(282.5,20.0+i);
glVertex2f(262.5,70.0+i);
glEnd();
        glBegin(GL_POLYGON);//right_side_top
glVertex2f(262.5,120.0+i);
glVertex2f(262.5,95.0+i);
glVertex2f(282.5,95.0+i);
glEnd();
glColor3f(0.556863 ,0.137255  ,0.419608);
        glBegin(GL_POLYGON);//bottom_1_exhaust
glVertex2f(237.5,20.0+i);
glVertex2f(244.5,20.0+i);
glVertex2f(241,0.0+i);
glEnd();
        glBegin(GL_POLYGON);//bottom_2_exhaust
glVertex2f(246.5,20.0+i);
glVertex2f(253.5,20.0+i);
glVertex2f(249.5,0.0+i);
glEnd();
        glBegin(GL_POLYGON);//bottom_3_exhaust
glVertex2f(262.5,20.0+i);
glVertex2f(255.5,20.0+i);
glVertex2f(258.5,0.0+i);
glEnd();
if((p%2)==0)
                        glColor3f(1.0,0.25,0.0);
                    else
                            glColor3f(1.0,0.816,0.0);
                    glBegin(GL_POLYGON);//outer fume
```

```
glVertex2f(237.5,20+i);

glVertex2f(234.16,16.66+i);

glVertex2f(230.82,13.32+i);

glVertex2f(227.48,9.98+i);

glVertex2f(224.14,6.64+i);

glVertex2f(220.8,3.3+i);

glVertex2f(217.5,0+i);

glVertex2f(221.56,-5+i);

glVertex2f(225.62,-10+i);

glVertex2f(229.68,-15+i);

glVertex2f(233.74,-20+i);

glVertex2f(237.8,-25+i);

glVertex2f(241.86,-30+i);

glVertex2f(245.92,-35+i);

glVertex2f(250,-40+i);

glVertex2f(254.06,-35+i);

glVertex2f(258.12,-30+i);

glVertex2f(262.18,-25+i);

glVertex2f(266.24,-20+i);

glVertex2f(270.3,-15+i);

glVertex2f(274.36,-10+i);

glVertex2f(278.42,-5+i);

glVertex2f(282.5,0+i);

glVertex2f(278.5,4+i);

glVertex2f(274.5,8+i);

glVertex2f(270.5,12+i);

glVertex2f(266.5,16+i);

glVertex2f(262.5,20+i);//28 points

glEnd();

                              if((p%2)==0)

                    glColor3f(1.0,0.816,0.0);

                    else
```

```
                                                    glColor3f(1.0,0.25,0.0);

                    glBegin(GL_POLYGON);//inner fume

                    glVertex2f(237.5,20+i);

                    glVertex2f(236.5,17.5+i);

                    glVertex2f(235.5,15+i);

                    glVertex2f(234.5,12.5+i);

                    glVertex2f(233.5,10+i);

                    glVertex2f(232.5,7.5+i);

                    glVertex2f(236,5+i);

                    glVertex2f(239.5,2.5+i);

                    glVertex2f(243,0+i);

                    glVertex2f(246.5,-2.5+i);

                    glVertex2f(250,-5+i);

                    glVertex2f(253.5,-2.5+i);

                    glVertex2f(257,0+i);

                    glVertex2f(260.5,2.5+i);

                    glVertex2f(264,5+i);

                    glVertex2f(267.5,7.5+i);

                    glVertex2f(266.5,10+i);

                    glVertex2f(265.5,12.5+i);

                    glVertex2f(264.5,15+i);

                    glVertex2f(263.5,17.5+i);

                    glVertex2f(262.5,20+i);//21 points

                    glEnd();

                    p=p+1;

            for(j=0;j<=1000000;j++)

                    ;

            glutSwapBuffers();

            glutPostRedisplay();

            glFlush();

    }

    }
```

```c
void myinit()
{
        //int i;

        glClearColor(0.196078  ,0.6 ,0.8,1.0);

        glPointSize(1.0);

        gluOrtho2D(0.0,499.0,0.0,499.0);
}
int main(int argc,char*argv[])
{
        glutInit(&argc,argv);

        glutInitDisplayMode(GLUT_DOUBLE|GLUT_RGB);

        glutInitWindowSize(500,500);

        glutCreateWindow("rocket");

        glutIdleFunc(display1);

        glutDisplayFunc(display1);

        myinit();

  glutMainLoop();

  return 0;
}
```