Assignment No. 5

Title :- Write an OpenGL program to Sunrise and Sunset.

Source Code :-

```
#include<iostream>
#include<stdlib.h>

#ifdef __APPLE__
#include<openGL/openGL.h>
#include<GLUT/glut.h>
#else
#include<GL/glut.h>
#endif  using
namespace std;
 float ballX = -
0.8f; float ballY =
-0.3f; float ballZ =
-1.2f; float
colR=3.0; float
colG=1.5; float
colB=1.0; float
bgColR=0.0; float
bgColG=0.0; float
bgColB=0.0;
 static int
flag=1;

void drawBall(void) {

        glColor3f(colR,colG,colB); //set ball colour
glTranslatef(ballX,ballY,ballZ); //moving it toward the screen a bit on
creation         glutSolidSphere (0.05, 30, 30); //create ball.

}  void
drawAv(void) {

glBegin(GL_POLYGON);
glColor3f(1.0,1.0,1.0);
            glVertex3f(-0.9,-0.7,-
1.0);
         glVertex3f(-0.5,-0.1,-
1.0);
         glVertex3f(-0.2,-1.0,-
1.0);
         glVertex3f(0.5,0.0,-
1.0);
         glVertex3f(0.6,-0.2,-
1.0);
```

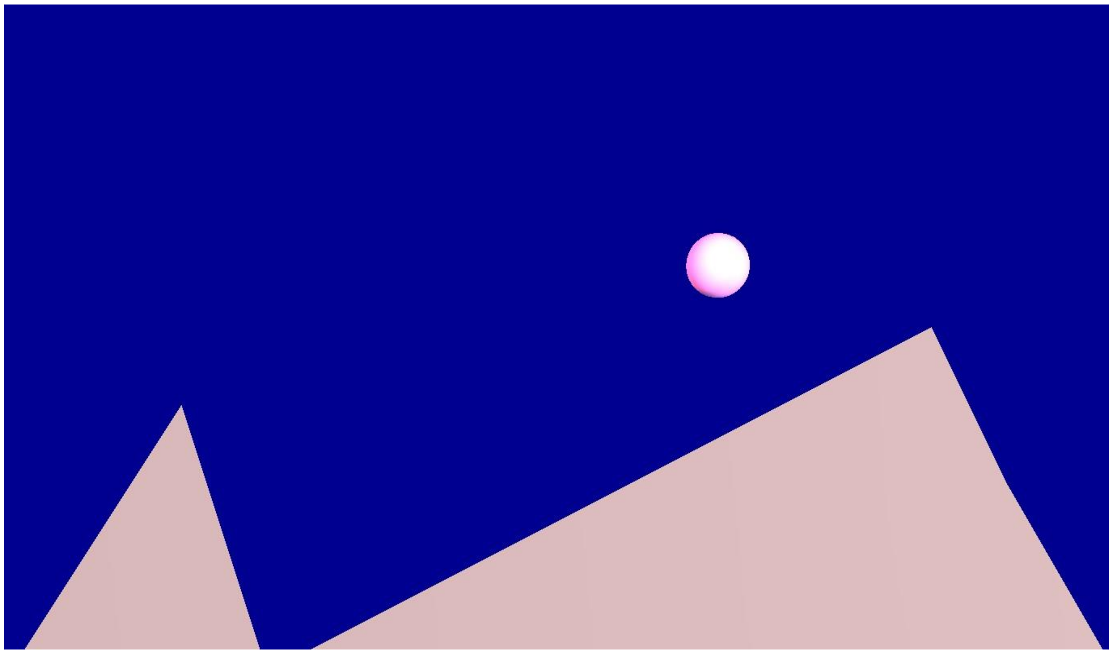
```
         glVertex3f(0.9,-0.7,-
1.0);

    glEnd();

}  void drawClouds(){} void
keyPress(int key, int x, int y)
{
if(key==GLUT_KEY_RIGHT)
ballX        -=        0.05f;
if(key==GLUT_KEY_LEFT)
ballX  += 0.05f;

glutPostRedisplay();
}  void initRendering() {     glEnable(GL_DEPTH_TEST);
glEnable(GL_COLOR_MATERIAL);     glEnable(GL_LIGHTING);
//Enable lighting     glEnable(GL_LIGHT0); //Enable light #0
glEnable(GL_LIGHT1); //Enable light #1
glEnable(GL_NORMALIZE); //Automatically normalize normals
    //glShadeModel(GL_SMOOTH); //Enable smooth shading
}

//Called when the window is resized void
handleResize(int w, int h) {
    //Tell OpenGL how to convert from coordinates to pixel values
glViewport(0, 0, w, h);
         glMatrixMode(GL_PROJECTION); //Switch to setting the camera
perspective
    //Set the camera perspective     glLoadIdentity();
//Reset the camera     gluPerspective(45.0,
//The camera angle
                   (double)w / (double)h, //The width-to-height ratio
                   1.0,                   //The near z clipping coordinate
200.0);                //The far z clipping coordinate
}  void
drawScene()
{
glClear(GL_COLOR_BUFFER_BIT|GL_DEPTH_BUFFER_BIT);
glClearColor(bgColR,bgColG,bgColB,0.0);
glMatrixMode(GL_MODELVIEW);

glLoadIdentity();

    //Add ambient light
    GLfloat ambientColor[] = {0.2f, 0.2f, 0.2f, 1.0f}; //Color (0.2, 0.2,
0.2)     glLightModelfv(GL_LIGHT_MODEL_AMBIENT,
ambientColor);
    //Add positioned light
    GLfloat lightColor0[] = {0.5f, 0.5f, 0.5f, 1.0f}; //Color (0.5, 0.5, 0.5)
GLfloat lightPos0[] = {4.0f, 0.0f, 8.0f, 1.0f}; //Positioned at (4, 0, 8)
```

```
glLightfv(GL_LIGHT0, GL_DIFFUSE, lightColor0);     glLightfv(GL_LIGHT0,
GL_POSITION, lightPos0);
    //Add directed light
    GLfloat lightColor1[] = {0.5f, 0.2f, 0.2f, 1.0f}; //Color (0.5, 0.2, 0.2)
    //Coming from the direction (-1, 0.5, 0.5)
GLfloat lightPos1[] = {-1.0f, 0.5f, 0.5f, 0.0f};
glLightfv(GL_LIGHT1, GL_DIFFUSE, lightColor1);
glLightfv(GL_LIGHT1, GL_POSITION, lightPos1);
    //drawing the SUN
glPushMatrix();
drawBall();     glPopMatrix();
    //drawing the Mount Avarest
glPushMatrix();
drawAv();     glPopMatrix();

    //drawing the Clouds
glPushMatrix();
drawClouds();
glPopMatrix();

    glutSwapBuffers();
}

//float _angle = 30.0f; void
update(int value) {

if(ballX>0.9f)
    {         ballX =
-0.8f;         ballY =
-0.3f;         flag=1;
colR=2.0;
colG=1.50;
colB=1.0;

bgColB=0.0;
    }
if(flag)     {
ballX += 0.001f;
ballY +=0.0007f;
colR-=0.001;
//colG+=0.002;
colB+=0.005;

bgColB+=0.001;

if(ballX>0.01)
       {
flag=0;

       }     }     if
(!flag)     {
```

```
ballX += 0.001f;
ballY -=0.0007f;
colR+=0.001;
colB-=0.01;
         bgColB-
=0.001;
         if(ballX<-
0.3)
       {
flag=1;

       }
    }         glutPostRedisplay(); //Tell GLUT that the display
has changed
    //Tell GLUT to call update again in 25 milliseconds
glutTimerFunc(25, update, 0);
}
int main(int argc,char** argv)
{
glutInit(&argc,argv);

glutInitDisplayMode(GLUT_DOUBLE|GLUT_RGB|GLUT_DEPTH);
glutInitWindowSize(400,400);

glutCreateWindow("Sun");

initRendering();

glutDisplayFunc(drawScene);

glutFullScreen();
        glutSpecialFunc(keyPress);
glutReshapeFunc(handleResize);
     glutTimerFunc(25, update,
0);

glutMainLoop();

    return(0);
}
```

Output :-

1. **For Sunrise:-**



2. **For Sunset:-**