**Lab Practice-7**

Submission Guidelines-

* Rename the file to your id only. If your id is 18-XXXXX-1, then the file name must be 18-XXXXX-1.docx.

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| **Question-**  Create a simple day and night scenario that will automatically change from day to night |
| **Code**  **#include <windows.h> // for MS Windows**  **#include <GL/glut.h> // GLUT, include glu.h and gl.h**  **#include <math.h>**  **#include<cstdio>**  **#include <GL/gl.h>**  **GLfloat position = 0.0f;**  **GLfloat position1 = 0.0f;**  **GLfloat speed = 0.1f;**  **void dis();**  **void display();**  **void update(int value) {**  **if(position <-1.5)**  **position = 1.0f;**  **position -= speed;**  **glutPostRedisplay();**  **glutTimerFunc(100,update,0);**  **}**  **void update1(int value) {**  **if(position1 >1.0)**  **position1 = -1.0f;**  **position1 += speed;**  **glutPostRedisplay();**  **glutTimerFunc(100,update1,0);**  **}**  **void init() {**  **glClearColor(0.0f, 0.0f, 0.0f, 1.0f);**  **}**  **/\* Handler for window-repaint event. Call back when the window first appears and**  **whenever the window needs to be re-painted. \*/**  **void circle(float radius, float cX, float cY, float r, float g, float b)**  **{**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3f(r,g,b);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=radius;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x+cX,y+cY);**  **}**  **glEnd();**  **}**  **void display4(int val) {**  **glutDisplayFunc(dis);**  **}**  **void display3() {**  **glClear(GL\_COLOR\_BUFFER\_BIT); // Clear the color buffer (background)**  **glClearColor(1.0f, 1.0f, 1.0f, 1.0f); // Set background color to black and opaque**  **//glLineWidth(7.5);**  **//circle(10,0,0,1.0,1.0,0.0);**  **/\*glBegin(GL\_LINES);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(0.0f, 0.0f);**  **glVertex2f(20.0f, 0.0f);**  **glEnd();**  **glEnd();\*/**  **//GreenBG1**  **glBegin(GL\_POLYGON);**  **glColor3f(0.03f, 0.85f, 0.26f);**  **glVertex2f(-32.0f, 8.0f);**  **glVertex2f(-32.0f, -8.0f);**  **glVertex2f(32.0f, -8.0f);**  **glVertex2f(32.0f, 8.0f);**  **glEnd();**  **//SkyBG**  **glBegin(GL\_POLYGON);**  **glColor3f(0.40f, 0.75f, 0.91f);**  **glVertex2f(-32.0f, 32.0f);**  **glVertex2f(-32.0f, 8.0f);**  **glVertex2f(32.0f, 8.0f);**  **glVertex2f(32.0f, 32.0f);**  **glEnd();**  **//Sun**  **circle(3,-27,27,0.95,0.88,0.10);**  **glBegin(GL\_POLYGON);**  **glColor3f(0.78f, 0.11f, 0.11f);**  **glVertex2f(0.0f, 6.0f);**  **glVertex2f(0.0f, 0.0f);**  **glVertex2f(24.0f, 0.0f);**  **glVertex2f(24.0f, 6.0f);**  **glEnd();**  **//Floors**  **glBegin(GL\_POLYGON);**  **glColor3f(0.58f, 0.11f, 0.11f);**  **glVertex2f(0.0f, 6.0f);**  **glVertex2f(24.0f, 6.0f);**  **glVertex2f(24.0f, 10.0f);**  **glVertex2f(0.0f, 10.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.78f, 0.11f, 0.11f);**  **glVertex2f(0.0f, 10.0f);**  **glVertex2f(24.0f, 10.0f);**  **glVertex2f(24.0f, 14.0f);**  **glVertex2f(0.0f, 14.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.58f, 0.11f, 0.11f);**  **glVertex2f(0.0f, 14.0f);**  **glVertex2f(24.0f, 14.0f);**  **glVertex2f(24.0f, 18.0f);**  **glVertex2f(0.0f, 18.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.78f, 0.11f, 0.11f);**  **glVertex2f(0.0f, 18.0f);**  **glVertex2f(24.0f, 18.0f);**  **glVertex2f(24.0f, 22.0f);**  **glVertex2f(0.0f, 22.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.58f, 0.11f, 0.11f);**  **glVertex2f(0.0f, 22.0f);**  **glVertex2f(24.0f, 22.0f);**  **glVertex2f(24.0f, 26.0f);**  **glVertex2f(0.0f, 26.0f);**  **glEnd();**  **//Door**  **glBegin(GL\_POLYGON);**  **glColor3f(0.6f, 0.60f, 0.44f);**  **glVertex2f(10.0f, 0.0f);**  **glVertex2f(14.0f, 0.0f);**  **glVertex2f(14.0f, 4.0f);**  **glVertex2f(10.0f, 4.0f);**  **glEnd();**  **//Left Windows 5**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(2.0f, 7.0f);**  **glVertex2f(4.0f, 7.0f);**  **glVertex2f(4.0f, 9.0f);**  **glVertex2f(2.0f, 9.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(2.0f, 11.0f);**  **glVertex2f(4.0f, 11.0f);**  **glVertex2f(4.0f, 13.0f);**  **glVertex2f(2.0f, 13.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(2.0f, 15.0f);**  **glVertex2f(4.0f, 15.0f);**  **glVertex2f(4.0f, 17.0f);**  **glVertex2f(2.0f, 17.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(2.0f, 19.0f);**  **glVertex2f(4.0f, 19.0f);**  **glVertex2f(4.0f, 21.0f);**  **glVertex2f(2.0f, 21.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(2.0f, 23.0f);**  **glVertex2f(4.0f, 23.0f);**  **glVertex2f(4.0f, 25.0f);**  **glVertex2f(2.0f, 25.0f);**  **glEnd();**  **//Right Windows 5**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(20.0f, 7.0f);**  **glVertex2f(22.0f, 7.0f);**  **glVertex2f(22.0f, 9.0f);**  **glVertex2f(20.0f, 9.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(20.0f, 11.0f);**  **glVertex2f(22.0f, 11.0f);**  **glVertex2f(22.0f, 13.0f);**  **glVertex2f(20.0f, 13.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(20.0f, 15.0f);**  **glVertex2f(22.0f, 15.0f);**  **glVertex2f(22.0f, 17.0f);**  **glVertex2f(20.0f, 17.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(20.0f, 19.0f);**  **glVertex2f(22.0f, 19.0f);**  **glVertex2f(22.0f, 21.0f);**  **glVertex2f(20.0f, 21.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(20.0f, 23.0f);**  **glVertex2f(22.0f, 23.0f);**  **glVertex2f(22.0f, 25.0f);**  **glVertex2f(20.0f, 25.0f);**  **glEnd();**  **//Root of Tree**  **glBegin(GL\_POLYGON);**  **glColor3f(0.678f, 0.463f, 0.082f);**  **glVertex2f(-26.0f, 13.0f);**  **glVertex2f(-25.5f, 10.0f);**  **glVertex2f(-21.5f, 10.0f);**  **glVertex2f(-21.0f, 13.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.678f, 0.463f, 0.082f);**  **glVertex2f(-21.5f, 10.0f);**  **glVertex2f(-25.5f, 10.0f);**  **glVertex2f(-25.5f, 8.0f);**  **glVertex2f(-22.0f, 8.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.678f, 0.463f, 0.082f);**  **glVertex2f(-25.0f, 8.0f);**  **glVertex2f(-25.0f, 3.0f);**  **glVertex2f(-22.0f, 3.0f);**  **glVertex2f(-22.0f, 8.0f);**  **glEnd();**  **circle(5,-23,18, 0.10,0.61,0.10);**  **circle(5,-22,16, 0.25,0.53,0.078);**  **circle(5,-27,13, 0.25,0.63,0.012);**  **circle(5,-27,16, 0.10,0.61,0.10);**  **circle(5,-21,13, 0.25,0.53,0.078);**  **glBegin(GL\_POLYGON);**  **glColor3f(0.678f, 0.463f, 0.082f);**  **glVertex2f(-25.0f, 3.0f);**  **glVertex2f(-26.0f, 1.0f);**  **glVertex2f(-25.0f, 1.0f);**  **glVertex2f(-24.0f, 3.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.678f, 0.463f, 0.082f);**  **glVertex2f(-24.0f, 3.0f);**  **glVertex2f(-24.0f, 1.0f);**  **glVertex2f(-21.0f, 1.0f);**  **glVertex2f(-22.0f, 3.0f);**  **glEnd();**  **glutTimerFunc(1500,display4,0);**  **glFlush(); // Render now**  **}**  **void display2(int val) {**  **glutDisplayFunc(display3);**  **}**  **void display() {**  **glClear(GL\_COLOR\_BUFFER\_BIT); // Clear the color buffer (background)**  **glClearColor(1.0f, 1.0f, 1.0f, 1.0f); // Set background color to black and opaque**  **//glLineWidth(7.5);**  **//circle(10,0,0,1.0,1.0,0.0);**  **/\*glBegin(GL\_LINES);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(0.0f, 0.0f);**  **glVertex2f(20.0f, 0.0f);**  **glEnd();**  **glEnd();\*/**  **//GreenBG1**  **glBegin(GL\_POLYGON);**  **glColor3f(0.03f, 0.85f, 0.26f);**  **glVertex2f(-32.0f, 8.0f);**  **glVertex2f(-32.0f, -8.0f);**  **glVertex2f(32.0f, -8.0f);**  **glVertex2f(32.0f, 8.0f);**  **glEnd();**  **//SkyBG**  **glBegin(GL\_POLYGON);**  **glColor3f(0.20f, 0.20f, 0.22f);**  **glVertex2f(-32.0f, 32.0f);**  **glVertex2f(-32.0f, 8.0f);**  **glVertex2f(32.0f, 8.0f);**  **glVertex2f(32.0f, 32.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.78f, 0.11f, 0.11f);**  **glVertex2f(0.0f, 6.0f);**  **glVertex2f(0.0f, 0.0f);**  **glVertex2f(24.0f, 0.0f);**  **glVertex2f(24.0f, 6.0f);**  **glEnd();**  **//Floors**  **glBegin(GL\_POLYGON);**  **glColor3f(0.58f, 0.11f, 0.11f);**  **glVertex2f(0.0f, 6.0f);**  **glVertex2f(24.0f, 6.0f);**  **glVertex2f(24.0f, 10.0f);**  **glVertex2f(0.0f, 10.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.78f, 0.11f, 0.11f);**  **glVertex2f(0.0f, 10.0f);**  **glVertex2f(24.0f, 10.0f);**  **glVertex2f(24.0f, 14.0f);**  **glVertex2f(0.0f, 14.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.58f, 0.11f, 0.11f);**  **glVertex2f(0.0f, 14.0f);**  **glVertex2f(24.0f, 14.0f);**  **glVertex2f(24.0f, 18.0f);**  **glVertex2f(0.0f, 18.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.78f, 0.11f, 0.11f);**  **glVertex2f(0.0f, 18.0f);**  **glVertex2f(24.0f, 18.0f);**  **glVertex2f(24.0f, 22.0f);**  **glVertex2f(0.0f, 22.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.58f, 0.11f, 0.11f);**  **glVertex2f(0.0f, 22.0f);**  **glVertex2f(24.0f, 22.0f);**  **glVertex2f(24.0f, 26.0f);**  **glVertex2f(0.0f, 26.0f);**  **glEnd();**  **//Door**  **glBegin(GL\_POLYGON);**  **glColor3f(0.6f, 0.60f, 0.44f);**  **glVertex2f(10.0f, 0.0f);**  **glVertex2f(14.0f, 0.0f);**  **glVertex2f(14.0f, 4.0f);**  **glVertex2f(10.0f, 4.0f);**  **glEnd();**  **//Left Windows 5**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(2.0f, 7.0f);**  **glVertex2f(4.0f, 7.0f);**  **glVertex2f(4.0f, 9.0f);**  **glVertex2f(2.0f, 9.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(2.0f, 11.0f);**  **glVertex2f(4.0f, 11.0f);**  **glVertex2f(4.0f, 13.0f);**  **glVertex2f(2.0f, 13.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(2.0f, 15.0f);**  **glVertex2f(4.0f, 15.0f);**  **glVertex2f(4.0f, 17.0f);**  **glVertex2f(2.0f, 17.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(2.0f, 19.0f);**  **glVertex2f(4.0f, 19.0f);**  **glVertex2f(4.0f, 21.0f);**  **glVertex2f(2.0f, 21.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(2.0f, 23.0f);**  **glVertex2f(4.0f, 23.0f);**  **glVertex2f(4.0f, 25.0f);**  **glVertex2f(2.0f, 25.0f);**  **glEnd();**  **//Right Windows 5**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(20.0f, 7.0f);**  **glVertex2f(22.0f, 7.0f);**  **glVertex2f(22.0f, 9.0f);**  **glVertex2f(20.0f, 9.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(20.0f, 11.0f);**  **glVertex2f(22.0f, 11.0f);**  **glVertex2f(22.0f, 13.0f);**  **glVertex2f(20.0f, 13.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(20.0f, 15.0f);**  **glVertex2f(22.0f, 15.0f);**  **glVertex2f(22.0f, 17.0f);**  **glVertex2f(20.0f, 17.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(20.0f, 19.0f);**  **glVertex2f(22.0f, 19.0f);**  **glVertex2f(22.0f, 21.0f);**  **glVertex2f(20.0f, 21.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(20.0f, 23.0f);**  **glVertex2f(22.0f, 23.0f);**  **glVertex2f(22.0f, 25.0f);**  **glVertex2f(20.0f, 25.0f);**  **glEnd();**  **//Root of Tree**  **glBegin(GL\_POLYGON);**  **glColor3f(0.678f, 0.463f, 0.082f);**  **glVertex2f(-26.0f, 13.0f);**  **glVertex2f(-25.5f, 10.0f);**  **glVertex2f(-21.5f, 10.0f);**  **glVertex2f(-21.0f, 13.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.678f, 0.463f, 0.082f);**  **glVertex2f(-21.5f, 10.0f);**  **glVertex2f(-25.5f, 10.0f);**  **glVertex2f(-25.5f, 8.0f);**  **glVertex2f(-22.0f, 8.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.678f, 0.463f, 0.082f);**  **glVertex2f(-25.0f, 8.0f);**  **glVertex2f(-25.0f, 3.0f);**  **glVertex2f(-22.0f, 3.0f);**  **glVertex2f(-22.0f, 8.0f);**  **glEnd();**  **circle(5,-23,18, 0.10,0.61,0.10);**  **circle(5,-22,16, 0.25,0.53,0.078);**  **circle(5,-27,13, 0.25,0.63,0.012);**  **circle(5,-27,16, 0.10,0.61,0.10);**  **circle(5,-21,13, 0.25,0.53,0.078);**  **glBegin(GL\_POLYGON);**  **glColor3f(0.678f, 0.463f, 0.082f);**  **glVertex2f(-25.0f, 3.0f);**  **glVertex2f(-26.0f, 1.0f);**  **glVertex2f(-25.0f, 1.0f);**  **glVertex2f(-24.0f, 3.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.678f, 0.463f, 0.082f);**  **glVertex2f(-24.0f, 3.0f);**  **glVertex2f(-24.0f, 1.0f);**  **glVertex2f(-21.0f, 1.0f);**  **glVertex2f(-22.0f, 3.0f);**  **glEnd();**  **glutTimerFunc(1500,display2,0);**  **glFlush(); // Render now**  **}**  **void dis()**  **{**  **glutDisplayFunc(display);**  **}**  **/\* Main function: GLUT runs as a console application starting at main() \*/**  **int main(int argc, char\*\* argv) {**  **glutInit(&argc, argv); // Initialize GLUT**  **glutCreateWindow(" Day Night Scenario");**  **//gluOrtho2D(-0.1,0.7,-0.1,0.3); // Create a window with the given title**  **glutInitWindowSize(320, 320);// Set the window's initial width & height**  **glutDisplayFunc(dis);// Register display callback handler for window re-paint**  **init();**  **gluOrtho2D(-32,32,-8,32);**  **glutTimerFunc(200, update, 0);**  **glutTimerFunc(200, update1, 0);**  **glutMainLoop(); // Enter the event-processing loop**  **return 0;**  **}** |
| **Output Screenshot (Full Screen)-** |

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| **Question-**  Create a simple day and night scenario using keyboard interaction. The key ‘D’ or ‘d’ will initiate the day mode and the key ‘N’ or ‘n’ will initiate the night mode. |
| **Code**  **#include <windows.h> // for MS Windows**  **#include <GL/glut.h> // GLUT, include glu.h and gl.h**  **#include <math.h>**  **#include<cstdio>**  **#include <GL/gl.h>**  **GLfloat position = 0.0f;**  **GLfloat position1 = 0.0f;**  **GLfloat speed = 0.1f;**  **void dis();**  **void display();**  **void update(int value) {**  **if(position <-1.5)**  **position = 1.0f;**  **position -= speed;**  **glutPostRedisplay();**  **glutTimerFunc(100,update,0);**  **}**  **void update1(int value) {**  **if(position1 >1.0)**  **position1 = -1.0f;**  **position1 += speed;**  **glutPostRedisplay();**  **glutTimerFunc(100,update1,0);**  **}**  **void init() {**  **glClearColor(0.0f, 0.0f, 0.0f, 1.0f);**  **}**  **/\* Handler for window-repaint event. Call back when the window first appears and**  **whenever the window needs to be re-painted. \*/**  **void circle(float radius, float cX, float cY, float r, float g, float b)**  **{**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3f(r,g,b);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=radius;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x+cX,y+cY);**  **}**  **glEnd();**  **}**  **void display4(int val) {**  **glutDisplayFunc(dis);**  **}**  **void display3() {**  **glClear(GL\_COLOR\_BUFFER\_BIT); // Clear the color buffer (background)**  **glClearColor(1.0f, 1.0f, 1.0f, 1.0f); // Set background color to black and opaque**  **//glLineWidth(7.5);**  **//circle(10,0,0,1.0,1.0,0.0);**  **/\*glBegin(GL\_LINES);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(0.0f, 0.0f);**  **glVertex2f(20.0f, 0.0f);**  **glEnd();**  **glEnd();\*/**  **//GreenBG1**  **glBegin(GL\_POLYGON);**  **glColor3f(0.03f, 0.85f, 0.26f);**  **glVertex2f(-32.0f, 8.0f);**  **glVertex2f(-32.0f, -8.0f);**  **glVertex2f(32.0f, -8.0f);**  **glVertex2f(32.0f, 8.0f);**  **glEnd();**  **//Sun**  **circle(3,-27,27,0.95,0.88,0.10);**  **//GroundFloor**  **glBegin(GL\_POLYGON);**  **glColor3f(0.78f, 0.11f, 0.11f);**  **glVertex2f(0.0f, 6.0f);**  **glVertex2f(0.0f, 0.0f);**  **glVertex2f(24.0f, 0.0f);**  **glVertex2f(24.0f, 6.0f);**  **glEnd();**  **//Floors**  **glBegin(GL\_POLYGON);**  **glColor3f(0.58f, 0.11f, 0.11f);**  **glVertex2f(0.0f, 6.0f);**  **glVertex2f(24.0f, 6.0f);**  **glVertex2f(24.0f, 10.0f);**  **glVertex2f(0.0f, 10.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.78f, 0.11f, 0.11f);**  **glVertex2f(0.0f, 10.0f);**  **glVertex2f(24.0f, 10.0f);**  **glVertex2f(24.0f, 14.0f);**  **glVertex2f(0.0f, 14.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.58f, 0.11f, 0.11f);**  **glVertex2f(0.0f, 14.0f);**  **glVertex2f(24.0f, 14.0f);**  **glVertex2f(24.0f, 18.0f);**  **glVertex2f(0.0f, 18.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.78f, 0.11f, 0.11f);**  **glVertex2f(0.0f, 18.0f);**  **glVertex2f(24.0f, 18.0f);**  **glVertex2f(24.0f, 22.0f);**  **glVertex2f(0.0f, 22.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.58f, 0.11f, 0.11f);**  **glVertex2f(0.0f, 22.0f);**  **glVertex2f(24.0f, 22.0f);**  **glVertex2f(24.0f, 26.0f);**  **glVertex2f(0.0f, 26.0f);**  **glEnd();**  **//Door**  **glBegin(GL\_POLYGON);**  **glColor3f(0.6f, 0.60f, 0.44f);**  **glVertex2f(10.0f, 0.0f);**  **glVertex2f(14.0f, 0.0f);**  **glVertex2f(14.0f, 4.0f);**  **glVertex2f(10.0f, 4.0f);**  **glEnd();**  **//Left Windows 5**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(2.0f, 7.0f);**  **glVertex2f(4.0f, 7.0f);**  **glVertex2f(4.0f, 9.0f);**  **glVertex2f(2.0f, 9.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(2.0f, 11.0f);**  **glVertex2f(4.0f, 11.0f);**  **glVertex2f(4.0f, 13.0f);**  **glVertex2f(2.0f, 13.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(2.0f, 15.0f);**  **glVertex2f(4.0f, 15.0f);**  **glVertex2f(4.0f, 17.0f);**  **glVertex2f(2.0f, 17.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(2.0f, 19.0f);**  **glVertex2f(4.0f, 19.0f);**  **glVertex2f(4.0f, 21.0f);**  **glVertex2f(2.0f, 21.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(2.0f, 23.0f);**  **glVertex2f(4.0f, 23.0f);**  **glVertex2f(4.0f, 25.0f);**  **glVertex2f(2.0f, 25.0f);**  **glEnd();**  **//Right Windows 5**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(20.0f, 7.0f);**  **glVertex2f(22.0f, 7.0f);**  **glVertex2f(22.0f, 9.0f);**  **glVertex2f(20.0f, 9.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(20.0f, 11.0f);**  **glVertex2f(22.0f, 11.0f);**  **glVertex2f(22.0f, 13.0f);**  **glVertex2f(20.0f, 13.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(20.0f, 15.0f);**  **glVertex2f(22.0f, 15.0f);**  **glVertex2f(22.0f, 17.0f);**  **glVertex2f(20.0f, 17.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(20.0f, 19.0f);**  **glVertex2f(22.0f, 19.0f);**  **glVertex2f(22.0f, 21.0f);**  **glVertex2f(20.0f, 21.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(20.0f, 23.0f);**  **glVertex2f(22.0f, 23.0f);**  **glVertex2f(22.0f, 25.0f);**  **glVertex2f(20.0f, 25.0f);**  **glEnd();**  **//Root of Tree**  **glBegin(GL\_POLYGON);**  **glColor3f(0.678f, 0.463f, 0.082f);**  **glVertex2f(-26.0f, 13.0f);**  **glVertex2f(-25.5f, 10.0f);**  **glVertex2f(-21.5f, 10.0f);**  **glVertex2f(-21.0f, 13.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.678f, 0.463f, 0.082f);**  **glVertex2f(-21.5f, 10.0f);**  **glVertex2f(-25.5f, 10.0f);**  **glVertex2f(-25.5f, 8.0f);**  **glVertex2f(-22.0f, 8.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.678f, 0.463f, 0.082f);**  **glVertex2f(-25.0f, 8.0f);**  **glVertex2f(-25.0f, 3.0f);**  **glVertex2f(-22.0f, 3.0f);**  **glVertex2f(-22.0f, 8.0f);**  **glEnd();**  **circle(5,-23,18, 0.10,0.61,0.10);**  **circle(5,-22,16, 0.25,0.53,0.078);**  **circle(5,-27,13, 0.25,0.63,0.012);**  **circle(5,-27,16, 0.10,0.61,0.10);**  **circle(5,-21,13, 0.25,0.53,0.078);**  **glBegin(GL\_POLYGON);**  **glColor3f(0.678f, 0.463f, 0.082f);**  **glVertex2f(-25.0f, 3.0f);**  **glVertex2f(-26.0f, 1.0f);**  **glVertex2f(-25.0f, 1.0f);**  **glVertex2f(-24.0f, 3.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.678f, 0.463f, 0.082f);**  **glVertex2f(-24.0f, 3.0f);**  **glVertex2f(-24.0f, 1.0f);**  **glVertex2f(-21.0f, 1.0f);**  **glVertex2f(-22.0f, 3.0f);**  **glEnd();**  **//glutTimerFunc(1500,display4,0);**  **glFlush(); // Render now**  **}**  **void display2(int val) {**  **glutDisplayFunc(display3);**  **}**  **void display() {**  **glClear(GL\_COLOR\_BUFFER\_BIT); // Clear the color buffer (background)**  **glClearColor(1.0f, 1.0f, 1.0f, 1.0f); // Set background color to black and opaque**  **//glLineWidth(7.5);**  **//circle(10,0,0,1.0,1.0,0.0);**  **/\*glBegin(GL\_LINES);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(0.0f, 0.0f);**  **glVertex2f(20.0f, 0.0f);**  **glEnd();**  **glEnd();\*/**  **//GreenBG1**  **glBegin(GL\_POLYGON);**  **glColor3f(0.03f, 0.85f, 0.26f);**  **glVertex2f(-32.0f, 8.0f);**  **glVertex2f(-32.0f, -8.0f);**  **glVertex2f(32.0f, -8.0f);**  **glVertex2f(32.0f, 8.0f);**  **glEnd();**  **//SkyBG**  **glBegin(GL\_POLYGON);**  **glColor3f(0.20f, 0.20f, 0.22f);**  **glVertex2f(-32.0f, 32.0f);**  **glVertex2f(-32.0f, 8.0f);**  **glVertex2f(32.0f, 8.0f);**  **glVertex2f(32.0f, 32.0f);**  **glEnd();**  **//GroundFloor**  **glBegin(GL\_POLYGON);**  **glColor3f(0.78f, 0.11f, 0.11f);**  **glVertex2f(0.0f, 6.0f);**  **glVertex2f(0.0f, 0.0f);**  **glVertex2f(24.0f, 0.0f);**  **glVertex2f(24.0f, 6.0f);**  **glEnd();**  **//Floors**  **glBegin(GL\_POLYGON);**  **glColor3f(0.58f, 0.11f, 0.11f);**  **glVertex2f(0.0f, 6.0f);**  **glVertex2f(24.0f, 6.0f);**  **glVertex2f(24.0f, 10.0f);**  **glVertex2f(0.0f, 10.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.78f, 0.11f, 0.11f);**  **glVertex2f(0.0f, 10.0f);**  **glVertex2f(24.0f, 10.0f);**  **glVertex2f(24.0f, 14.0f);**  **glVertex2f(0.0f, 14.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.58f, 0.11f, 0.11f);**  **glVertex2f(0.0f, 14.0f);**  **glVertex2f(24.0f, 14.0f);**  **glVertex2f(24.0f, 18.0f);**  **glVertex2f(0.0f, 18.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.78f, 0.11f, 0.11f);**  **glVertex2f(0.0f, 18.0f);**  **glVertex2f(24.0f, 18.0f);**  **glVertex2f(24.0f, 22.0f);**  **glVertex2f(0.0f, 22.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.58f, 0.11f, 0.11f);**  **glVertex2f(0.0f, 22.0f);**  **glVertex2f(24.0f, 22.0f);**  **glVertex2f(24.0f, 26.0f);**  **glVertex2f(0.0f, 26.0f);**  **glEnd();**  **//Door**  **glBegin(GL\_POLYGON);**  **glColor3f(0.6f, 0.60f, 0.44f);**  **glVertex2f(10.0f, 0.0f);**  **glVertex2f(14.0f, 0.0f);**  **glVertex2f(14.0f, 4.0f);**  **glVertex2f(10.0f, 4.0f);**  **glEnd();**  **//Left Windows 5**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(2.0f, 7.0f);**  **glVertex2f(4.0f, 7.0f);**  **glVertex2f(4.0f, 9.0f);**  **glVertex2f(2.0f, 9.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(2.0f, 11.0f);**  **glVertex2f(4.0f, 11.0f);**  **glVertex2f(4.0f, 13.0f);**  **glVertex2f(2.0f, 13.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(2.0f, 15.0f);**  **glVertex2f(4.0f, 15.0f);**  **glVertex2f(4.0f, 17.0f);**  **glVertex2f(2.0f, 17.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(2.0f, 19.0f);**  **glVertex2f(4.0f, 19.0f);**  **glVertex2f(4.0f, 21.0f);**  **glVertex2f(2.0f, 21.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(2.0f, 23.0f);**  **glVertex2f(4.0f, 23.0f);**  **glVertex2f(4.0f, 25.0f);**  **glVertex2f(2.0f, 25.0f);**  **glEnd();**  **//Right Windows 5**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(20.0f, 7.0f);**  **glVertex2f(22.0f, 7.0f);**  **glVertex2f(22.0f, 9.0f);**  **glVertex2f(20.0f, 9.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(20.0f, 11.0f);**  **glVertex2f(22.0f, 11.0f);**  **glVertex2f(22.0f, 13.0f);**  **glVertex2f(20.0f, 13.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(20.0f, 15.0f);**  **glVertex2f(22.0f, 15.0f);**  **glVertex2f(22.0f, 17.0f);**  **glVertex2f(20.0f, 17.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(20.0f, 19.0f);**  **glVertex2f(22.0f, 19.0f);**  **glVertex2f(22.0f, 21.0f);**  **glVertex2f(20.0f, 21.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(20.0f, 23.0f);**  **glVertex2f(22.0f, 23.0f);**  **glVertex2f(22.0f, 25.0f);**  **glVertex2f(20.0f, 25.0f);**  **glEnd();**  **//Root of Tree**  **glBegin(GL\_POLYGON);**  **glColor3f(0.678f, 0.463f, 0.082f);**  **glVertex2f(-26.0f, 13.0f);**  **glVertex2f(-25.5f, 10.0f);**  **glVertex2f(-21.5f, 10.0f);**  **glVertex2f(-21.0f, 13.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.678f, 0.463f, 0.082f);**  **glVertex2f(-21.5f, 10.0f);**  **glVertex2f(-25.5f, 10.0f);**  **glVertex2f(-25.5f, 8.0f);**  **glVertex2f(-22.0f, 8.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.678f, 0.463f, 0.082f);**  **glVertex2f(-25.0f, 8.0f);**  **glVertex2f(-25.0f, 3.0f);**  **glVertex2f(-22.0f, 3.0f);**  **glVertex2f(-22.0f, 8.0f);**  **glEnd();**  **circle(5,-23,18, 0.10,0.61,0.10);**  **circle(5,-22,16, 0.25,0.53,0.078);**  **circle(5,-27,13, 0.25,0.63,0.012);**  **circle(5,-27,16, 0.10,0.61,0.10);**  **circle(5,-21,13, 0.25,0.53,0.078);**  **glBegin(GL\_POLYGON);**  **glColor3f(0.678f, 0.463f, 0.082f);**  **glVertex2f(-25.0f, 3.0f);**  **glVertex2f(-26.0f, 1.0f);**  **glVertex2f(-25.0f, 1.0f);**  **glVertex2f(-24.0f, 3.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.678f, 0.463f, 0.082f);**  **glVertex2f(-24.0f, 3.0f);**  **glVertex2f(-24.0f, 1.0f);**  **glVertex2f(-21.0f, 1.0f);**  **glVertex2f(-22.0f, 3.0f);**  **glEnd();**  **//glutTimerFunc(1500,display2,0);**  **glFlush(); // Render now**  **}**  **void dis()**  **{**  **glutDisplayFunc(display);**  **}**  **void handleKeypress(unsigned char key, int x, int y) {**  **switch (key) {**  **case 'D':**  **glutDisplayFunc(display3);**  **break;**  **case 'd':**  **glutDisplayFunc(display3);**  **break;**  **case 'N':**  **glutDisplayFunc(display);**  **break;**  **case 'n':**  **glutDisplayFunc(display);**  **break;**  **glutPostRedisplay();**  **}}**  **/\* Main function: GLUT runs as a console application starting at main() \*/**  **int main(int argc, char\*\* argv) {**  **glutInit(&argc, argv); // Initialize GLUT**  **glutCreateWindow(" DAY NIGHT KEYBOARD");**  **//gluOrtho2D(-0.1,0.7,-0.1,0.3); // Create a window with the given title**  **glutInitWindowSize(320, 320);// Set the window's initial width & height**  **glutDisplayFunc(dis);// Register display callback handler for window re-paint**  **init();**  **gluOrtho2D(-32,32,-8,32);**  **glutTimerFunc(200, update, 0);**  **glutTimerFunc(200, update1, 0);**  **glutKeyboardFunc(handleKeypress);**  **glutMainLoop(); // Enter the event-processing loop**  **return 0;**  **}** |
| **Output Screenshot (Full Screen)-** |