**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 <math.h>**  **#include <iostream>**  **#include<GL/gl.h>**  **#include <GL/glut.h>**  **using namespace std;**  **void display();**  **void scene();**  **float move\_car = 0.0f;**  **//DAY START**  **void background()**  **{**  **glColor3ub(135,235,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(0.0f,140.0f);**  **glVertex2f(120.0f,140.0f);**  **glVertex2f(120.0f,220.0f);**  **glVertex2f(0.0f,220.0f);**  **glEnd();**  **}**  **void bottom\_grass()**  **{**  **glColor3ub(50,205,50); // Clear the color buffer (background)**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(0.0f,-10.0f);**  **glVertex2f(120.0f,-10.0f);**  **glVertex2f(120.0f,40.0f);**  **glVertex2f(0.0f,40.0f);**  **glEnd();**  **}**  **void rail\_line()**  **{**  **glLineWidth(10.0f);**  **glColor3ub(0,0,0); // Clear the color buffer (background)**  **glBegin(GL\_LINES);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(0.0f,0.0f);**  **glVertex2f(120.0f,0.0f);**  **glVertex2f(120.0f,20.0f);**  **glVertex2f(0.0f,20.0f);**  **glEnd();**  **}**  **void rail\_line\_slipper()**  **{**  **glLineWidth(25.0f);**  **glColor3ub(0,0,0); // Clear the color buffer (background)**  **glBegin(GL\_LINES);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(5.0f,-5.0f);**  **glVertex2f(5.0f,25.0f);**  **glVertex2f(10.0f,-5.0f);**  **glVertex2f(10.0f,25.0f);**  **glVertex2f(15.0f,-5.0f);**  **glVertex2f(15.0f,25.0f);**  **glVertex2f(20.0f,-5.0f);**  **glVertex2f(20.0f,25.0f);**  **glVertex2f(25.0f,-5.0f);**  **glVertex2f(25.0f,25.0f);**  **glVertex2f(30.0f,-5.0f);**  **glVertex2f(30.0f,25.0f);**  **glVertex2f(35.0f,-5.0f);**  **glVertex2f(35.0f,25.0f);**  **glVertex2f(40.0f,-5.0f);**  **glVertex2f(40.0f,25.0f);**  **glVertex2f(45.0f,-5.0f);**  **glVertex2f(45.0f,25.0f);**  **glVertex2f(50.0f,-5.0f);**  **glVertex2f(50.0f,25.0f);**  **glVertex2f(55.0f,-5.0f);**  **glVertex2f(55.0f,25.0f);**  **glVertex2f(60.0f,-5.0f);**  **glVertex2f(60.0f,25.0f);**  **glVertex2f(65.0f,-5.0f);**  **glVertex2f(65.0f,25.0f);**  **glVertex2f(70.0f,-5.0f);**  **glVertex2f(70.0f,25.0f);**  **glVertex2f(75.0f,-5.0f);**  **glVertex2f(75.0f,25.0f);**  **glVertex2f(80.0f,-5.0f);**  **glVertex2f(80.0f,25.0f);**  **glVertex2f(85.0f,-5.0f);**  **glVertex2f(85.0f,25.0f);**  **glVertex2f(90.0f,-5.0f);**  **glVertex2f(90.0f,25.0f);**  **glVertex2f(95.0f,-5.0f);**  **glVertex2f(95.0f,25.0f);**  **glVertex2f(100.0f,-5.0f);**  **glVertex2f(100.0f,25.0f);**  **glVertex2f(105.0f,-5.0f);**  **glVertex2f(105.0f,25.0f);**  **glVertex2f(110.0f,-5.0f);**  **glVertex2f(110.0f,25.0f);**  **glVertex2f(115.0f,-5.0f);**  **glVertex2f(115.0f,25.0f);**  **glEnd();**  **}**  **void road()**  **{**  **glColor3ub(128,128,128); // Clear the color buffer (background)**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(0.0f,40.0f);**  **glVertex2f(120.0f,40.0f);**  **glVertex2f(120.0f,100.0f);**  **glVertex2f(0.0f,100.0f);**  **glEnd();**  **}**  **//Road Side line**  **void road\_line()**  **{**  **glLineWidth(7.0f);**  **glColor3ub(255,255,255); // Clear the color buffer (background)**  **glBegin(GL\_LINES);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(0.0f,45.0f);**  **glVertex2f(120.0f,45.0f);**  **glVertex2f(120.0f,95.0f);**  **glVertex2f(0.0f,95.0f);**  **glEnd();**  **}**  **//Road Middle line**  **void road\_middle\_line()**  **{**  **glLineWidth(12.0f);**  **glColor3ub(255,255,255); // Clear the color buffer (background)**  **glBegin(GL\_LINES);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(5.0f,70.0f);**  **glVertex2f(10.0f,70.0f);**  **glVertex2f(15.0f,70.0f);**  **glVertex2f(20.0f,70.0f);**  **glVertex2f(25.0f,70.0f);**  **glVertex2f(30.0f,70.0f);**  **glVertex2f(35.0f,70.0f);**  **glVertex2f(40.0f,70.0f);**  **glVertex2f(45.0f,70.0f);**  **glVertex2f(50.0f,70.0f);**  **glVertex2f(55.0f,70.0f);**  **glVertex2f(60.0f,70.0f);**  **glEnd();**  **//Zebra Crossing**  **glLineWidth(10.0f);**  **glColor3f(1.0f,1.0f,0.0f); // Clear the color buffer (background)**  **glBegin(GL\_LINES);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(65.0f,50.0f);**  **glVertex2f(70.0f,50.0f);**  **glVertex2f(65.0f,55.0f);**  **glVertex2f(70.0f,55.0f);**  **glVertex2f(65.0f,60.0f);**  **glVertex2f(70.0f,60.0f);**  **glVertex2f(65.0f,65.0f);**  **glVertex2f(70.0f,65.0f);**  **glVertex2f(65.0f,70.0f);**  **glVertex2f(70.0f,70.0f);**  **glVertex2f(65.0f,75.0f);**  **glVertex2f(70.0f,75.0f);**  **glVertex2f(65.0f,80.0f);**  **glVertex2f(70.0f,80.0f);**  **glVertex2f(65.0f,85.0f);**  **glVertex2f(70.0f,85.0f);**  **glVertex2f(65.0f,90.0f);**  **glVertex2f(70.0f,90.0f);**  **glEnd();**  **glLineWidth(12.0f);**  **glColor3ub(255,255,255); // Clear the color buffer (background)**  **glBegin(GL\_LINES);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(75.0f,70.0f);**  **glVertex2f(80.0f,70.0f);**  **glVertex2f(85.0f,70.0f);**  **glVertex2f(90.0f,70.0f);**  **glVertex2f(95.0f,70.0f);**  **glVertex2f(100.0f,70.0f);**  **glVertex2f(105.0f,70.0f);**  **glVertex2f(110.0f,70.0f);**  **glVertex2f(115.0f,70.0f);**  **glVertex2f(120.f,70.0f);**  **glEnd();**  **}**  **void top\_grass()**  **{**  **glColor3ub(50,205,50); // Clear the color buffer (background)**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(0.0f,100.0f);**  **glVertex2f(120.0f,100.0f);**  **glVertex2f(120.0f,140.0f);**  **glVertex2f(0.0f,140.0f);**  **glEnd();**  **}**  **//LEFT SIDE BUILDING**  **//1ST BUILDING**  **void first\_building()**  **{**  **//Building Structure**  **glColor3ub(127,255,212);**  **glBegin(GL\_QUADS);**  **glVertex2f(5.0f,120.0f);**  **glVertex2f(20.0f,120.0f);**  **glVertex2f(20.0f,210.0f);**  **glVertex2f(5.0f,210.0f);**  **glEnd();**  **// building\_structure\_2D\_view**  **glColor3ub(47,79,79);**  **glBegin(GL\_QUADS);**  **glVertex2f(0.0f,120.0f);**  **glVertex2f(5.0f,120.0f);**  **glVertex2f(5.0f,210.0f);**  **glVertex2f(0.0f,200.0f);**  **glEnd();**  **glLineWidth(5.0f);**  **//building\_door**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(10.0f,120.0f);**  **glVertex2f(15.0f,120.0f);**  **glVertex2f(15.0f,140.0f);**  **glVertex2f(10.0f,140.0f);**  **glEnd();**  **//for line above the door**  **glColor3ub(47,79,79);**  **glBegin(GL\_LINES);**  **glVertex2f(5.0f,142.0f);**  **glVertex2f(20.0f,142.0f);**  **glEnd();**  **//LEFT WINDOWS**  **//First Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(6.0f,145.0f);**  **glVertex2f(9.0f,145.0f);**  **glVertex2f(9.0f,155.0f);**  **glVertex2f(6.0f,155.0f);**  **glEnd();**  **//Second Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(6.0f,160.0f);**  **glVertex2f(9.0f,160.0f);**  **glVertex2f(9.0f,170.0f);**  **glVertex2f(6.0f,170.0f);**  **glEnd();**  **//Third Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(6.0f,175.0f);**  **glVertex2f(9.0f,175.0f);**  **glVertex2f(9.0f,185.0f);**  **glVertex2f(6.0f,185.0f);**  **glEnd();**  **//Fourth Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(6.0f,190.0f);**  **glVertex2f(9.0f,190.0f);**  **glVertex2f(9.0f,200.0f);**  **glVertex2f(6.0f,200.0f);**  **glEnd();**  **//RIGHT WINDOWS**  **//First Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(16.0f,145.0f);**  **glVertex2f(19.0f,145.0f);**  **glVertex2f(19.0f,155.0f);**  **glVertex2f(16.0f,155.0f);**  **glEnd();**  **//Second Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(16.0f,160.0f);**  **glVertex2f(19.0f,160.0f);**  **glVertex2f(19.0f,170.0f);**  **glVertex2f(16.0f,170.0f);**  **glEnd();**  **//Third Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(16.0f,175.0f);**  **glVertex2f(19.0f,175.0f);**  **glVertex2f(19.0f,185.0f);**  **glVertex2f(16.0f,185.0f);**  **glEnd();**  **//Fourth Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(16.0f,190.0f);**  **glVertex2f(19.0f,190.0f);**  **glVertex2f(19.0f,200.0f);**  **glVertex2f(16.0f,200.0f);**  **glEnd();**  **//Upper Triangle Design**  **glColor3ub(75,0,130);**  **glBegin(GL\_TRIANGLES);**  **glVertex2f(10.0f,200.0f);**  **glVertex2f(15.0f,200.0f);**  **glVertex2f(12.5f,172.5f);**  **glEnd();**  **//Lower Triangle Design**  **glColor3ub(75,0,130);**  **glBegin(GL\_TRIANGLES);**  **glVertex2f(10.0f,145.0f);**  **glVertex2f(15.0f,145.0f);**  **glVertex2f(12.5f,172.5f);**  **glEnd();**  **}**  **//RIGHT SIDE BUILDING**  **//2ND BUILDING**  **void second\_building()**  **{**  **//Building Structure**  **glColor3ub(138,43,226);**  **glBegin(GL\_QUADS);**  **glVertex2f(100.0f,120.0f);**  **glVertex2f(115.0f,120.0f);**  **glVertex2f(115.0f,210.0f);**  **glVertex2f(100.0f,210.0f);**  **glEnd();**  **// building\_structure\_2D\_view**  **glColor3ub(255,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(120.0f,120.0f);**  **glVertex2f(115.0f,120.0f);**  **glVertex2f(115.0f,210.0f);**  **glVertex2f(120.0f,200.0f);**  **glEnd();**  **glLineWidth(5.0f);**  **//building\_door**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(110.0f,120.0f);**  **glVertex2f(105.0f,120.0f);**  **glVertex2f(105.0f,140.0f);**  **glVertex2f(110.0f,140.0f);**  **glEnd();**  **//for line above the door**  **glColor3ub(255,0,255);**  **glBegin(GL\_LINES);**  **glVertex2f(115.0f,142.0f);**  **glVertex2f(100.0f,142.0f);**  **glEnd();**  **//LEFT WINDOWS**  **//First Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(104.0f,145.0f);**  **glVertex2f(101.0f,145.0f);**  **glVertex2f(101.0f,155.0f);**  **glVertex2f(104.0f,155.0f);**  **glEnd();**  **//Second Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(104.0f,160.0f);**  **glVertex2f(101.0f,160.0f);**  **glVertex2f(101.0f,170.0f);**  **glVertex2f(104.0f,170.0f);**  **glEnd();**  **//Third Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(104.0f,175.0f);**  **glVertex2f(101.0f,175.0f);**  **glVertex2f(101.0f,185.0f);**  **glVertex2f(104.0f,185.0f);**  **glEnd();**  **//Fourth Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(104.0f,190.0f);**  **glVertex2f(101.0f,190.0f);**  **glVertex2f(101.0f,200.0f);**  **glVertex2f(104.0f,200.0f);**  **glEnd();**  **//RIGHT WINDOWS**  **//First Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(114.0f,145.0f);**  **glVertex2f(111.0f,145.0f);**  **glVertex2f(111.0f,155.0f);**  **glVertex2f(114.0f,155.0f);**  **glEnd();**  **//Second Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(114.0f,160.0f);**  **glVertex2f(111.0f,160.0f);**  **glVertex2f(111.0f,170.0f);**  **glVertex2f(114.0f,170.0f);**  **glEnd();**  **//Third Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(114.0f,175.0f);**  **glVertex2f(111.0f,175.0f);**  **glVertex2f(111.0f,185.0f);**  **glVertex2f(114.0f,185.0f);**  **glEnd();**  **//Fourth Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(114.0f,190.0f);**  **glVertex2f(111.0f,190.0f);**  **glVertex2f(111.0f,200.0f);**  **glVertex2f(114.0f,200.0f);**  **glEnd();**  **//Upper Triangle Design**  **glColor3ub(127,255,212);**  **glBegin(GL\_TRIANGLES);**  **glVertex2f(110.0f,200.0f);**  **glVertex2f(105.0f,200.0f);**  **glVertex2f(107.5f,172.5f);**  **glEnd();**  **//Lower Triangle Design**  **glColor3ub(127,255,212);**  **glBegin(GL\_TRIANGLES);**  **glVertex2f(105.0f,145.0f);**  **glVertex2f(110.0f,145.0f);**  **glVertex2f(107.5f,172.5f);**  **glEnd();**  **}**  **//Building Road to Door Path**  **void building\_path()**  **{**  **//For First Building Left Side**  **glColor3ub(240,230,140); // Clear the color buffer (background)**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(15.0f,100.0f);**  **glVertex2f(20.0f,100.0f);**  **glVertex2f(15.0f,120.0f);**  **glVertex2f(10.0f,120.0f);**  **glEnd();**  **//For Second Building Left Side**  **glColor3ub(240,230,140); // Clear the color buffer (background)**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(105.0f,120.0f);**  **glVertex2f(100.0f,100.0f);**  **glVertex2f(105.0f,100.0f);**  **glVertex2f(110.0f,120.0f);**  **glEnd();**  **//For Building Outside Path**  **glColor3ub(240,230,140); // Clear the color buffer (background)**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(20.0f,130.0f);**  **glVertex2f(100.0f,130.0f);**  **glVertex2f(100.0f,140.0f);**  **glVertex2f(20.0f,140.0f);**  **glEnd();**  **}**  **void tree()**  **{**  **//Left Side First Tree**  **//for Tree trunk**  **glColor3ub(184,134,11);**  **glBegin(GL\_QUADS);**  **glVertex2f(30.0f,140.0f);**  **glVertex2f(33.0f,140.0f);**  **glVertex2f(32.0f,170.0f);**  **glVertex2f(31.0f,170.0f);**  **glEnd();**  **//for first layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_QUADS);**  **glVertex2f(27.0f,170.0f);**  **glVertex2f(36.0f,170.0f);**  **glVertex2f(34.0f,175.0f);**  **glVertex2f(29.0f,175.0f);**  **glEnd();**  **//for second layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_QUADS);**  **glVertex2f(28.0f,175.0f);**  **glVertex2f(35.0f,175.0f);**  **glVertex2f(33.0f,180.0f);**  **glVertex2f(30.0f,180.0f);**  **glEnd();**  **//for third layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_QUADS);**  **glVertex2f(29.0f,180.0f);**  **glVertex2f(34.0f,180.0f);**  **glVertex2f(32.0f,185.0f);**  **glVertex2f(31.0f,185.0f);**  **glEnd();**  **//for fourth layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_POLYGON);**  **glVertex2f(30.0f,185.0f);**  **glVertex2f(33.0f,185.0f);**  **glVertex2f(31.5f,192.0f);**  **glEnd();**  **//Right Side Second Tree**  **//for Tree trunk**  **glColor3ub(184,134,11);**  **glBegin(GL\_QUADS);**  **glVertex2f(90.0f,140.0f);**  **glVertex2f(87.0f,140.0f);**  **glVertex2f(88.0f,170.0f);**  **glVertex2f(89.0f,170.0f);**  **glEnd();**  **//for first layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_QUADS);**  **glVertex2f(84.0f,170.0f);**  **glVertex2f(93.0f,170.0f);**  **glVertex2f(91.0f,175.0f);**  **glVertex2f(86.0f,175.0f);**  **glEnd();**  **//for second layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_QUADS);**  **glVertex2f(85.0f,175.0f);**  **glVertex2f(92.0f,175.0f);**  **glVertex2f(90.0f,180.0f);**  **glVertex2f(87.0f,180.0f);**  **glEnd();**  **//for third layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_QUADS);**  **glVertex2f(86.0f,180.0f);**  **glVertex2f(91.0f,180.0f);**  **glVertex2f(89.0f,185.0f);**  **glVertex2f(88.0f,185.0f);**  **glEnd();**  **//for fourth layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_POLYGON);**  **glVertex2f(87.0f,185.0f);**  **glVertex2f(90.0f,185.0f);**  **glVertex2f(88.5f,192.0f);**  **glEnd();**  **}**  **void lamppost()**  **{**  **//lamppost pillar**  **glLineWidth(15.0f);**  **glColor3ub(178,34,34);**  **glBegin(GL\_LINES);**  **glVertex2f(60.0f,140.0f);**  **glVertex2f(60.0,195.0f);**  **glEnd();**  **//lamppost light holder 2 side**  **glLineWidth(15.0f);**  **glColor3ub(178,34,34);**  **glBegin(GL\_LINES);**  **glVertex2f(60.0f,195.0f);**  **glVertex2f(67.0f,195.0f);**  **glVertex2f(60.0f,195.0f);**  **glVertex2f(53.0f,195.0f);**  **glEnd();**  **//Right light**  **glColor3ub(255,255,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(64.0f,192.0f);**  **glVertex2f(67.0f,192.0f);**  **glVertex2f(67.0f,195.0f);**  **glVertex2f(64.0f,195.0f);**  **glEnd();**  **//Left light**  **glColor3ub(255,255,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(53.0f,192.0f);**  **glVertex2f(56.0f,192.0f);**  **glVertex2f(56.0f,195.0f);**  **glVertex2f(53.0f,195.0f);**  **glEnd();**  **}**  **void sun()**  **{**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3ub(255,255,0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=4.0f;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x+40,y+210 );**  **}**  **glEnd();**  **}**  **void bench()**  **{**  **//left side first bench**  **glLineWidth(9.0f);**  **glColor3ub(210,105,30);**  **glBegin(GL\_LINES);**  **glVertex2f(35.0f,140.0f);**  **glVertex2f(35.0f,150.0f);**  **glEnd();**  **glLineWidth(9.0f);**  **glColor3ub(210,105,30);**  **glBegin(GL\_LINES);**  **glVertex2f(42.0f,140.0f);**  **glVertex2f(42.0f,150.0f);**  **glEnd();**  **glLineWidth(11.0f);**  **glColor3ub(210,105,30);**  **glBegin(GL\_LINES);**  **glVertex2f(34.0f,150.0f);**  **glVertex2f(43.0f,150.0f);**  **glEnd();**  **//left side second bench**  **glLineWidth(9.0f);**  **glColor3ub(210,105,30);**  **glBegin(GL\_LINES);**  **glVertex2f(45.0f,140.0f);**  **glVertex2f(45.0f,150.0f);**  **glEnd();**  **glLineWidth(9.0f);**  **glColor3ub(210,105,30);**  **glBegin(GL\_LINES);**  **glVertex2f(52.0f,140.0f);**  **glVertex2f(52.0f,150.0f);**  **glEnd();**  **glLineWidth(11.0f);**  **glColor3ub(210,105,30);**  **glBegin(GL\_LINES);**  **glVertex2f(44.0f,150.0f);**  **glVertex2f(53.0f,150.0f);**  **glEnd();**  **}**  **void traffic\_light()**  **{**  **//traffic light pillar**  **glLineWidth(15.0f);**  **glColor3ub(0,0,0);**  **glBegin(GL\_LINES);**  **glVertex2f(75.0f,100.0f);**  **glVertex2f(75.0f,135.0f);**  **glEnd();**  **//light holder**  **glColor3ub(0,0,0);**  **glBegin(GL\_POLYGON);**  **glVertex2f(72.5f,135.0f);**  **glVertex2f(77.5f,135.0f);**  **glVertex2f(77.5f,165.0f);**  **glVertex2f(72.5f,165.0f);**  **glEnd();**  **//red light**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3ub(255,0,0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=1.8f;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x+75,y+140 );**  **}**  **glEnd();**  **//yellow light**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3ub(255,255,0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=1.8f;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x+75,y+150 );**  **}**  **glEnd();**  **//green light**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3ub(0,255,0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=1.8f;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x+75,y+160 );**  **}**  **glEnd();**  **}**  **void car()**  **{**  **//car middle body**  **glColor3ub(255,0,0);**  **glMatrixMode(GL\_MODELVIEW);**  **glPushMatrix();**  **glTranslatef(move\_car, 0.0f, 0.0f);**  **glBegin(GL\_POLYGON);**  **glVertex2f(28.0f,81.0f);**  **glVertex2f(63.0f,81.0f);**  **glVertex2f(61.0f,101.0f);**  **glVertex2f(28.0f,101.0f);**  **glEnd();**  **//upper part of car**  **glColor3ub(255,0,0);**  **glBegin(GL\_POLYGON);**  **glVertex2f(35.0f,101.0f);**  **glVertex2f(55.0f,101.0f);**  **glVertex2f(52.0f,116.0f);**  **glVertex2f(38.0f,116.0f);**  **glEnd();**  **//car rear window glass**  **glColor3ub(0,0,0);**  **glBegin(GL\_POLYGON);**  **glVertex2f(37.0f,103.0f);**  **glVertex2f(44.5f,103.0f);**  **glVertex2f(44.5f,114.0f);**  **glVertex2f(39.0f,114.0f);**  **glEnd();**  **//car front window glass**  **glColor3ub(0,0,0);**  **glBegin(GL\_POLYGON);**  **glVertex2f(45.5f,103.0f);**  **glVertex2f(53.0f,103.0f);**  **glVertex2f(51.0f,114.0f);**  **glVertex2f(45.5f,114.0f);**  **glEnd();**  **//rear wheel**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3ub(0,0,0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=4.1f;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x+38,y+83 );**  **}**  **glEnd();**  **//front wheel**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3ub(0,0,0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=4.1f;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x+52,y+83 );**  **}**  **glEnd();**  **glPopMatrix();**  **}**  **//DAY END**  **//NIGHT START**  **void background\_night()**  **{**  **glColor3ub(36,52,71);**  **glBegin(GL\_QUADS);**  **glVertex2f(0.0f,140.0f);**  **glVertex2f(120.0f,140.0f);**  **glVertex2f(120.0f,220.0f);**  **glVertex2f(0.0f,220.0f);**  **glEnd();**  **}**  **void bottom\_grass\_night()**  **{**  **glColor3ub(40,190,30); // Clear the color buffer (background)**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(0.0f,-10.0f);**  **glVertex2f(120.0f,-10.0f);**  **glVertex2f(120.0f,40.0f);**  **glVertex2f(0.0f,40.0f);**  **glEnd();**  **}**  **void rail\_line\_night()**  **{**  **glLineWidth(10.0f);**  **glColor3ub(0,0,0); // Clear the color buffer (background)**  **glBegin(GL\_LINES);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(0.0f,0.0f);**  **glVertex2f(120.0f,0.0f);**  **glVertex2f(120.0f,20.0f);**  **glVertex2f(0.0f,20.0f);**  **glEnd();**  **}**  **void rail\_line\_slipper\_night()**  **{**  **glLineWidth(25.0f);**  **glColor3ub(0,0,0); // Clear the color buffer (background)**  **glBegin(GL\_LINES);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(5.0f,-5.0f);**  **glVertex2f(5.0f,25.0f);**  **glVertex2f(10.0f,-5.0f);**  **glVertex2f(10.0f,25.0f);**  **glVertex2f(15.0f,-5.0f);**  **glVertex2f(15.0f,25.0f);**  **glVertex2f(20.0f,-5.0f);**  **glVertex2f(20.0f,25.0f);**  **glVertex2f(25.0f,-5.0f);**  **glVertex2f(25.0f,25.0f);**  **glVertex2f(30.0f,-5.0f);**  **glVertex2f(30.0f,25.0f);**  **glVertex2f(35.0f,-5.0f);**  **glVertex2f(35.0f,25.0f);**  **glVertex2f(40.0f,-5.0f);**  **glVertex2f(40.0f,25.0f);**  **glVertex2f(45.0f,-5.0f);**  **glVertex2f(45.0f,25.0f);**  **glVertex2f(50.0f,-5.0f);**  **glVertex2f(50.0f,25.0f);**  **glVertex2f(55.0f,-5.0f);**  **glVertex2f(55.0f,25.0f);**  **glVertex2f(60.0f,-5.0f);**  **glVertex2f(60.0f,25.0f);**  **glVertex2f(65.0f,-5.0f);**  **glVertex2f(65.0f,25.0f);**  **glVertex2f(70.0f,-5.0f);**  **glVertex2f(70.0f,25.0f);**  **glVertex2f(75.0f,-5.0f);**  **glVertex2f(75.0f,25.0f);**  **glVertex2f(80.0f,-5.0f);**  **glVertex2f(80.0f,25.0f);**  **glVertex2f(85.0f,-5.0f);**  **glVertex2f(85.0f,25.0f);**  **glVertex2f(90.0f,-5.0f);**  **glVertex2f(90.0f,25.0f);**  **glVertex2f(95.0f,-5.0f);**  **glVertex2f(95.0f,25.0f);**  **glVertex2f(100.0f,-5.0f);**  **glVertex2f(100.0f,25.0f);**  **glVertex2f(105.0f,-5.0f);**  **glVertex2f(105.0f,25.0f);**  **glVertex2f(110.0f,-5.0f);**  **glVertex2f(110.0f,25.0f);**  **glVertex2f(115.0f,-5.0f);**  **glVertex2f(115.0f,25.0f);**  **glEnd();**  **}**  **void road\_night()**  **{**  **glColor3ub(110,110,110); // Clear the color buffer (background)**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(0.0f,40.0f);**  **glVertex2f(120.0f,40.0f);**  **glVertex2f(120.0f,100.0f);**  **glVertex2f(0.0f,100.0f);**  **glEnd();**  **}**  **//Road Side line**  **void road\_line\_night()**  **{**  **glLineWidth(7.0f);**  **glColor3ub(255,255,255); // Clear the color buffer (background)**  **glBegin(GL\_LINES);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(0.0f,45.0f);**  **glVertex2f(120.0f,45.0f);**  **glVertex2f(120.0f,95.0f);**  **glVertex2f(0.0f,95.0f);**  **glEnd();**  **}**  **//Road Middle line**  **void road\_middle\_line\_night()**  **{**  **glLineWidth(12.0f);**  **glColor3ub(255,255,255); // Clear the color buffer (background)**  **glBegin(GL\_LINES);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(5.0f,70.0f);**  **glVertex2f(10.0f,70.0f);**  **glVertex2f(15.0f,70.0f);**  **glVertex2f(20.0f,70.0f);**  **glVertex2f(25.0f,70.0f);**  **glVertex2f(30.0f,70.0f);**  **glVertex2f(35.0f,70.0f);**  **glVertex2f(40.0f,70.0f);**  **glVertex2f(45.0f,70.0f);**  **glVertex2f(50.0f,70.0f);**  **glVertex2f(55.0f,70.0f);**  **glVertex2f(60.0f,70.0f);**  **glEnd();**  **//Zebra Crossing**  **glLineWidth(10.0f);**  **glColor3f(1.0f,1.0f,0.0f); // Clear the color buffer (background)**  **glBegin(GL\_LINES);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(65.0f,50.0f);**  **glVertex2f(70.0f,50.0f);**  **glVertex2f(65.0f,55.0f);**  **glVertex2f(70.0f,55.0f);**  **glVertex2f(65.0f,60.0f);**  **glVertex2f(70.0f,60.0f);**  **glVertex2f(65.0f,65.0f);**  **glVertex2f(70.0f,65.0f);**  **glVertex2f(65.0f,70.0f);**  **glVertex2f(70.0f,70.0f);**  **glVertex2f(65.0f,75.0f);**  **glVertex2f(70.0f,75.0f);**  **glVertex2f(65.0f,80.0f);**  **glVertex2f(70.0f,80.0f);**  **glVertex2f(65.0f,85.0f);**  **glVertex2f(70.0f,85.0f);**  **glVertex2f(65.0f,90.0f);**  **glVertex2f(70.0f,90.0f);**  **glEnd();**  **glLineWidth(12.0f);**  **glColor3ub(255,255,255); // Clear the color buffer (background)**  **glBegin(GL\_LINES);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(75.0f,70.0f);**  **glVertex2f(80.0f,70.0f);**  **glVertex2f(85.0f,70.0f);**  **glVertex2f(90.0f,70.0f);**  **glVertex2f(95.0f,70.0f);**  **glVertex2f(100.0f,70.0f);**  **glVertex2f(105.0f,70.0f);**  **glVertex2f(110.0f,70.0f);**  **glVertex2f(115.0f,70.0f);**  **glVertex2f(120.f,70.0f);**  **glEnd();**  **}**  **void top\_grass\_night()**  **{**  **glColor3ub(40,190,30); // Clear the color buffer (background)**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(0.0f,100.0f);**  **glVertex2f(120.0f,100.0f);**  **glVertex2f(120.0f,140.0f);**  **glVertex2f(0.0f,140.0f);**  **glEnd();**  **}**  **//LEFT SIDE BUILDING**  **//1ST BUILDING**  **void first\_building\_night()**  **{**  **//Building Structure**  **glColor3ub(127,255,212);**  **glBegin(GL\_QUADS);**  **glVertex2f(5.0f,120.0f);**  **glVertex2f(20.0f,120.0f);**  **glVertex2f(20.0f,210.0f);**  **glVertex2f(5.0f,210.0f);**  **glEnd();**  **// building\_structure\_2D\_view**  **glColor3ub(47,79,79);**  **glBegin(GL\_QUADS);**  **glVertex2f(0.0f,120.0f);**  **glVertex2f(5.0f,120.0f);**  **glVertex2f(5.0f,210.0f);**  **glVertex2f(0.0f,200.0f);**  **glEnd();**  **glLineWidth(5.0f);**  **//building\_door**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(10.0f,120.0f);**  **glVertex2f(15.0f,120.0f);**  **glVertex2f(15.0f,140.0f);**  **glVertex2f(10.0f,140.0f);**  **glEnd();**  **//for line above the door**  **glColor3ub(47,79,79);**  **glBegin(GL\_LINES);**  **glVertex2f(5.0f,142.0f);**  **glVertex2f(20.0f,142.0f);**  **glEnd();**  **//LEFT WINDOWS**  **//First Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(6.0f,145.0f);**  **glVertex2f(9.0f,145.0f);**  **glVertex2f(9.0f,155.0f);**  **glVertex2f(6.0f,155.0f);**  **glEnd();**  **//Second Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(6.0f,160.0f);**  **glVertex2f(9.0f,160.0f);**  **glVertex2f(9.0f,170.0f);**  **glVertex2f(6.0f,170.0f);**  **glEnd();**  **//Third Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(6.0f,175.0f);**  **glVertex2f(9.0f,175.0f);**  **glVertex2f(9.0f,185.0f);**  **glVertex2f(6.0f,185.0f);**  **glEnd();**  **//Fourth Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(6.0f,190.0f);**  **glVertex2f(9.0f,190.0f);**  **glVertex2f(9.0f,200.0f);**  **glVertex2f(6.0f,200.0f);**  **glEnd();**  **//RIGHT WINDOWS**  **//First Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(16.0f,145.0f);**  **glVertex2f(19.0f,145.0f);**  **glVertex2f(19.0f,155.0f);**  **glVertex2f(16.0f,155.0f);**  **glEnd();**  **//Second Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(16.0f,160.0f);**  **glVertex2f(19.0f,160.0f);**  **glVertex2f(19.0f,170.0f);**  **glVertex2f(16.0f,170.0f);**  **glEnd();**  **//Third Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(16.0f,175.0f);**  **glVertex2f(19.0f,175.0f);**  **glVertex2f(19.0f,185.0f);**  **glVertex2f(16.0f,185.0f);**  **glEnd();**  **//Fourth Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(16.0f,190.0f);**  **glVertex2f(19.0f,190.0f);**  **glVertex2f(19.0f,200.0f);**  **glVertex2f(16.0f,200.0f);**  **glEnd();**  **//Upper Triangle Design**  **glColor3ub(75,0,130);**  **glBegin(GL\_TRIANGLES);**  **glVertex2f(10.0f,200.0f);**  **glVertex2f(15.0f,200.0f);**  **glVertex2f(12.5f,172.5f);**  **glEnd();**  **//Lower Triangle Design**  **glColor3ub(75,0,130);**  **glBegin(GL\_TRIANGLES);**  **glVertex2f(10.0f,145.0f);**  **glVertex2f(15.0f,145.0f);**  **glVertex2f(12.5f,172.5f);**  **glEnd();**  **}**  **//RIGHT SIDE BUILDING**  **//2ND BUILDING**  **void second\_building\_night()**  **{**  **//Building Structure**  **glColor3ub(138,43,226);**  **glBegin(GL\_QUADS);**  **glVertex2f(100.0f,120.0f);**  **glVertex2f(115.0f,120.0f);**  **glVertex2f(115.0f,210.0f);**  **glVertex2f(100.0f,210.0f);**  **glEnd();**  **// building\_structure\_2D\_view**  **glColor3ub(255,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(120.0f,120.0f);**  **glVertex2f(115.0f,120.0f);**  **glVertex2f(115.0f,210.0f);**  **glVertex2f(120.0f,200.0f);**  **glEnd();**  **glLineWidth(5.0f);**  **//building\_door**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(110.0f,120.0f);**  **glVertex2f(105.0f,120.0f);**  **glVertex2f(105.0f,140.0f);**  **glVertex2f(110.0f,140.0f);**  **glEnd();**  **//for line above the door**  **glColor3ub(255,0,255);**  **glBegin(GL\_LINES);**  **glVertex2f(115.0f,142.0f);**  **glVertex2f(100.0f,142.0f);**  **glEnd();**  **//LEFT WINDOWS**  **//First Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(104.0f,145.0f);**  **glVertex2f(101.0f,145.0f);**  **glVertex2f(101.0f,155.0f);**  **glVertex2f(104.0f,155.0f);**  **glEnd();**  **//Second Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(104.0f,160.0f);**  **glVertex2f(101.0f,160.0f);**  **glVertex2f(101.0f,170.0f);**  **glVertex2f(104.0f,170.0f);**  **glEnd();**  **//Third Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(104.0f,175.0f);**  **glVertex2f(101.0f,175.0f);**  **glVertex2f(101.0f,185.0f);**  **glVertex2f(104.0f,185.0f);**  **glEnd();**  **//Fourth Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(104.0f,190.0f);**  **glVertex2f(101.0f,190.0f);**  **glVertex2f(101.0f,200.0f);**  **glVertex2f(104.0f,200.0f);**  **glEnd();**  **//RIGHT WINDOWS**  **//First Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(114.0f,145.0f);**  **glVertex2f(111.0f,145.0f);**  **glVertex2f(111.0f,155.0f);**  **glVertex2f(114.0f,155.0f);**  **glEnd();**  **//Second Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(114.0f,160.0f);**  **glVertex2f(111.0f,160.0f);**  **glVertex2f(111.0f,170.0f);**  **glVertex2f(114.0f,170.0f);**  **glEnd();**  **//Third Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(114.0f,175.0f);**  **glVertex2f(111.0f,175.0f);**  **glVertex2f(111.0f,185.0f);**  **glVertex2f(114.0f,185.0f);**  **glEnd();**  **//Fourth Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(114.0f,190.0f);**  **glVertex2f(111.0f,190.0f);**  **glVertex2f(111.0f,200.0f);**  **glVertex2f(114.0f,200.0f);**  **glEnd();**  **//Upper Triangle Design**  **glColor3ub(127,255,212);**  **glBegin(GL\_TRIANGLES);**  **glVertex2f(110.0f,200.0f);**  **glVertex2f(105.0f,200.0f);**  **glVertex2f(107.5f,172.5f);**  **glEnd();**  **//Lower Triangle Design**  **glColor3ub(127,255,212);**  **glBegin(GL\_TRIANGLES);**  **glVertex2f(105.0f,145.0f);**  **glVertex2f(110.0f,145.0f);**  **glVertex2f(107.5f,172.5f);**  **glEnd();**  **}**  **//Building Road to Door Path**  **void building\_path\_night()**  **{**  **//For First Building Left Side**  **glColor3ub(225,215,125); // Clear the color buffer (background)**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(15.0f,100.0f);**  **glVertex2f(20.0f,100.0f);**  **glVertex2f(15.0f,120.0f);**  **glVertex2f(10.0f,120.0f);**  **glEnd();**  **//For Second Building Left Side**  **glColor3ub(225,215,125); // Clear the color buffer (background)**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(105.0f,120.0f);**  **glVertex2f(100.0f,100.0f);**  **glVertex2f(105.0f,100.0f);**  **glVertex2f(110.0f,120.0f);**  **glEnd();**  **//For Building Outside Path**  **glColor3ub(225,215,125); // Clear the color buffer (background)**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(20.0f,130.0f);**  **glVertex2f(100.0f,130.0f);**  **glVertex2f(100.0f,140.0f);**  **glVertex2f(20.0f,140.0f);**  **glEnd();**  **}**  **void tree\_night()**  **{**  **//Left Side First Tree**  **//for Tree trunk**  **glColor3ub(184,134,11);**  **glBegin(GL\_QUADS);**  **glVertex2f(30.0f,140.0f);**  **glVertex2f(33.0f,140.0f);**  **glVertex2f(32.0f,170.0f);**  **glVertex2f(31.0f,170.0f);**  **glEnd();**  **//for first layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_QUADS);**  **glVertex2f(27.0f,170.0f);**  **glVertex2f(36.0f,170.0f);**  **glVertex2f(34.0f,175.0f);**  **glVertex2f(29.0f,175.0f);**  **glEnd();**  **//for second layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_QUADS);**  **glVertex2f(28.0f,175.0f);**  **glVertex2f(35.0f,175.0f);**  **glVertex2f(33.0f,180.0f);**  **glVertex2f(30.0f,180.0f);**  **glEnd();**  **//for third layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_QUADS);**  **glVertex2f(29.0f,180.0f);**  **glVertex2f(34.0f,180.0f);**  **glVertex2f(32.0f,185.0f);**  **glVertex2f(31.0f,185.0f);**  **glEnd();**  **//for fourth layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_POLYGON);**  **glVertex2f(30.0f,185.0f);**  **glVertex2f(33.0f,185.0f);**  **glVertex2f(31.5f,192.0f);**  **glEnd();**  **//Right Side Second Tree**  **//for Tree trunk**  **glColor3ub(184,134,11);**  **glBegin(GL\_QUADS);**  **glVertex2f(90.0f,140.0f);**  **glVertex2f(87.0f,140.0f);**  **glVertex2f(88.0f,170.0f);**  **glVertex2f(89.0f,170.0f);**  **glEnd();**  **//for first layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_QUADS);**  **glVertex2f(84.0f,170.0f);**  **glVertex2f(93.0f,170.0f);**  **glVertex2f(91.0f,175.0f);**  **glVertex2f(86.0f,175.0f);**  **glEnd();**  **//for second layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_QUADS);**  **glVertex2f(85.0f,175.0f);**  **glVertex2f(92.0f,175.0f);**  **glVertex2f(90.0f,180.0f);**  **glVertex2f(87.0f,180.0f);**  **glEnd();**  **//for third layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_QUADS);**  **glVertex2f(86.0f,180.0f);**  **glVertex2f(91.0f,180.0f);**  **glVertex2f(89.0f,185.0f);**  **glVertex2f(88.0f,185.0f);**  **glEnd();**  **//for fourth layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_POLYGON);**  **glVertex2f(87.0f,185.0f);**  **glVertex2f(90.0f,185.0f);**  **glVertex2f(88.5f,192.0f);**  **glEnd();**  **}**  **void lamppost\_night()**  **{**  **//lamppost pillar**  **glLineWidth(15.0f);**  **glColor3ub(178,34,34);**  **glBegin(GL\_LINES);**  **glVertex2f(60.0f,140.0f);**  **glVertex2f(60.0,195.0f);**  **glEnd();**  **//lamppost light holder 2 side**  **glLineWidth(15.0f);**  **glColor3ub(178,34,34);**  **glBegin(GL\_LINES);**  **glVertex2f(60.0f,195.0f);**  **glVertex2f(67.0f,195.0f);**  **glVertex2f(60.0f,195.0f);**  **glVertex2f(53.0f,195.0f);**  **glEnd();**  **//Right light**  **glColor3ub(255,255,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(64.0f,192.0f);**  **glVertex2f(67.0f,192.0f);**  **glVertex2f(67.0f,195.0f);**  **glVertex2f(64.0f,195.0f);**  **glEnd();**  **//Left light**  **glColor3ub(255,255,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(53.0f,192.0f);**  **glVertex2f(56.0f,192.0f);**  **glVertex2f(56.0f,195.0f);**  **glVertex2f(53.0f,195.0f);**  **glEnd();**  **}**  **void moon()**  **{**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3ub(255,255,255);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=4.0f;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x+40,y+210 );**  **}**  **glEnd();**  **}**  **void bench\_night()**  **{**  **//left side first bench**  **glLineWidth(9.0f);**  **glColor3ub(210,105,30);**  **glBegin(GL\_LINES);**  **glVertex2f(35.0f,140.0f);**  **glVertex2f(35.0f,150.0f);**  **glEnd();**  **glLineWidth(9.0f);**  **glColor3ub(210,105,30);**  **glBegin(GL\_LINES);**  **glVertex2f(42.0f,140.0f);**  **glVertex2f(42.0f,150.0f);**  **glEnd();**  **glLineWidth(11.0f);**  **glColor3ub(210,105,30);**  **glBegin(GL\_LINES);**  **glVertex2f(34.0f,150.0f);**  **glVertex2f(43.0f,150.0f);**  **glEnd();**  **//left side second bench**  **glLineWidth(9.0f);**  **glColor3ub(210,105,30);**  **glBegin(GL\_LINES);**  **glVertex2f(45.0f,140.0f);**  **glVertex2f(45.0f,150.0f);**  **glEnd();**  **glLineWidth(9.0f);**  **glColor3ub(210,105,30);**  **glBegin(GL\_LINES);**  **glVertex2f(52.0f,140.0f);**  **glVertex2f(52.0f,150.0f);**  **glEnd();**  **glLineWidth(11.0f);**  **glColor3ub(210,105,30);**  **glBegin(GL\_LINES);**  **glVertex2f(44.0f,150.0f);**  **glVertex2f(53.0f,150.0f);**  **glEnd();**  **}**  **void traffic\_light\_night()**  **{**  **//traffic light pillar**  **glLineWidth(15.0f);**  **glColor3ub(0,0,0);**  **glBegin(GL\_LINES);**  **glVertex2f(75.0f,100.0f);**  **glVertex2f(75.0f,135.0f);**  **glEnd();**  **//light holder**  **glColor3ub(0,0,0);**  **glBegin(GL\_POLYGON);**  **glVertex2f(72.5f,135.0f);**  **glVertex2f(77.5f,135.0f);**  **glVertex2f(77.5f,165.0f);**  **glVertex2f(72.5f,165.0f);**  **glEnd();**  **//red light**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3ub(255,0,0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=1.8f;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x+75,y+140 );**  **}**  **glEnd();**  **//yellow light**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3ub(255,255,0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=1.8f;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x+75,y+150 );**  **}**  **glEnd();**  **//green light**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3ub(0,255,0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=1.8f;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x+75,y+160 );**  **}**  **glEnd();**  **}**  **void car\_night()**  **{**  **//car middle body**  **glColor3ub(240,0,0);**  **glMatrixMode(GL\_MODELVIEW);**  **glPushMatrix();**  **glTranslatef(move\_car, 0.0f, 0.0f);**  **glBegin(GL\_POLYGON);**  **glVertex2f(28.0f,81.0f);**  **glVertex2f(63.0f,81.0f);**  **glVertex2f(61.0f,101.0f);**  **glVertex2f(28.0f,101.0f);**  **glEnd();**  **//upper part of car**  **glColor3ub(240,0,0);**  **glBegin(GL\_POLYGON);**  **glVertex2f(35.0f,101.0f);**  **glVertex2f(55.0f,101.0f);**  **glVertex2f(52.0f,116.0f);**  **glVertex2f(38.0f,116.0f);**  **glEnd();**  **//car rear window glass**  **glColor3ub(0,0,0);**  **glBegin(GL\_POLYGON);**  **glVertex2f(37.0f,103.0f);**  **glVertex2f(44.5f,103.0f);**  **glVertex2f(44.5f,114.0f);**  **glVertex2f(39.0f,114.0f);**  **glEnd();**  **//car front window glass**  **glColor3ub(0,0,0);**  **glBegin(GL\_POLYGON);**  **glVertex2f(45.5f,103.0f);**  **glVertex2f(53.0f,103.0f);**  **glVertex2f(51.0f,114.0f);**  **glVertex2f(45.5f,114.0f);**  **glEnd();**  **//rear wheel**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3ub(0,0,0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=4.1f;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x+38,y+83 );**  **}**  **glEnd();**  **//front wheel**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3ub(0,0,0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=4.1f;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x+52,y+83 );**  **}**  **glEnd();**  **glPopMatrix();**  **}**  **//NIGHT END**  **void update\_car(int value) {**  **move\_car += 0.49999; //assume as moving speed**  **if(move\_car>148) //boundary for the positive x axis for last part of the box**  **{**  **move\_car = -63;//reappear the box**  **}**  **glutPostRedisplay();**  **glutTimerFunc(20, update\_car, 0);**  **}**  **void displayback(int val)**  **{**  **glutDisplayFunc(display);**  **}**  **void display1() {**  **glClearColor(0.0f, 0.0f, 0.0f, 1.0f); // Set background color to black and opaque**  **glClear(GL\_COLOR\_BUFFER\_BIT);**  **//function calling**  **background\_night();**  **bottom\_grass\_night();**  **rail\_line\_night();**  **rail\_line\_slipper\_night();**  **road\_night();**  **road\_line\_night();**  **road\_middle\_line\_night();**  **top\_grass\_night();**  **first\_building\_night();**  **second\_building\_night();**  **building\_path\_night();**  **tree\_night();**  **lamppost\_night();**  **moon();**  **bench\_night();**  **traffic\_light\_night();**  **car\_night();**  **glutTimerFunc(1500,displayback,0);**  **glFlush();**  **}**  **void scene\_1(int val)**  **{**  **glutDisplayFunc(display1);**  **}**  **void display() {**  **glClearColor(0.0f, 0.0f, 0.0f, 1.0f); // Set background color to black and opaque**  **glClear(GL\_COLOR\_BUFFER\_BIT);**  **//function calling**  **background();**  **bottom\_grass();**  **rail\_line();**  **rail\_line\_slipper();**  **road();**  **road\_line();**  **road\_middle\_line();**  **top\_grass();**  **first\_building();**  **second\_building();**  **building\_path();**  **tree();**  **lamppost();**  **sun();**  **bench();**  **traffic\_light();**  **car();**  **glutTimerFunc(1500,scene\_1,0);**  **glFlush();**  **}**  **void scene()**  **{**  **glutDisplayFunc(display);**  **}**  **void identity\_axis()**  **{**  **glLoadIdentity(); //Reset the drawing perspective**  **gluOrtho2D(0.0,120.0,-10.0,220.0); //resize the axis size**  **}**  **int main(int argc, char\*\* argv) {**  **glutInit(&argc, argv); // Initialize GLUT**  **glutCreateWindow("Day Night Scenario");**  **glutInitWindowSize(320, 320);// Set the window's initial width & height**  **glutDisplayFunc(scene);// Register display callback handler for window re-paint**  **identity\_axis();**  **glutTimerFunc(20, update\_car, 0);**  **glutMainLoop(); // Enter the event-processing loop**  **return 0;**  **}** |
| **Output Screenshot (Full Screen)-** |

|  |
| --- |
| **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 <math.h>**  **#include <iostream>**  **#include<GL/gl.h>**  **#include <GL/glut.h>**  **using namespace std;**  **float move\_car = 0.0f;**  **//DAY START**  **void background()**  **{**  **glColor3ub(135,235,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(0.0f,140.0f);**  **glVertex2f(120.0f,140.0f);**  **glVertex2f(120.0f,220.0f);**  **glVertex2f(0.0f,220.0f);**  **glEnd();**  **}**  **void bottom\_grass()**  **{**  **glColor3ub(50,205,50); // Clear the color buffer (background)**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(0.0f,-10.0f);**  **glVertex2f(120.0f,-10.0f);**  **glVertex2f(120.0f,40.0f);**  **glVertex2f(0.0f,40.0f);**  **glEnd();**  **}**  **void rail\_line()**  **{**  **glLineWidth(10.0f);**  **glColor3ub(0,0,0); // Clear the color buffer (background)**  **glBegin(GL\_LINES);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(0.0f,0.0f);**  **glVertex2f(120.0f,0.0f);**  **glVertex2f(120.0f,20.0f);**  **glVertex2f(0.0f,20.0f);**  **glEnd();**  **}**  **void rail\_line\_slipper()**  **{**  **glLineWidth(25.0f);**  **glColor3ub(0,0,0); // Clear the color buffer (background)**  **glBegin(GL\_LINES);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(5.0f,-5.0f);**  **glVertex2f(5.0f,25.0f);**  **glVertex2f(10.0f,-5.0f);**  **glVertex2f(10.0f,25.0f);**  **glVertex2f(15.0f,-5.0f);**  **glVertex2f(15.0f,25.0f);**  **glVertex2f(20.0f,-5.0f);**  **glVertex2f(20.0f,25.0f);**  **glVertex2f(25.0f,-5.0f);**  **glVertex2f(25.0f,25.0f);**  **glVertex2f(30.0f,-5.0f);**  **glVertex2f(30.0f,25.0f);**  **glVertex2f(35.0f,-5.0f);**  **glVertex2f(35.0f,25.0f);**  **glVertex2f(40.0f,-5.0f);**  **glVertex2f(40.0f,25.0f);**  **glVertex2f(45.0f,-5.0f);**  **glVertex2f(45.0f,25.0f);**  **glVertex2f(50.0f,-5.0f);**  **glVertex2f(50.0f,25.0f);**  **glVertex2f(55.0f,-5.0f);**  **glVertex2f(55.0f,25.0f);**  **glVertex2f(60.0f,-5.0f);**  **glVertex2f(60.0f,25.0f);**  **glVertex2f(65.0f,-5.0f);**  **glVertex2f(65.0f,25.0f);**  **glVertex2f(70.0f,-5.0f);**  **glVertex2f(70.0f,25.0f);**  **glVertex2f(75.0f,-5.0f);**  **glVertex2f(75.0f,25.0f);**  **glVertex2f(80.0f,-5.0f);**  **glVertex2f(80.0f,25.0f);**  **glVertex2f(85.0f,-5.0f);**  **glVertex2f(85.0f,25.0f);**  **glVertex2f(90.0f,-5.0f);**  **glVertex2f(90.0f,25.0f);**  **glVertex2f(95.0f,-5.0f);**  **glVertex2f(95.0f,25.0f);**  **glVertex2f(100.0f,-5.0f);**  **glVertex2f(100.0f,25.0f);**  **glVertex2f(105.0f,-5.0f);**  **glVertex2f(105.0f,25.0f);**  **glVertex2f(110.0f,-5.0f);**  **glVertex2f(110.0f,25.0f);**  **glVertex2f(115.0f,-5.0f);**  **glVertex2f(115.0f,25.0f);**  **glEnd();**  **}**  **void road()**  **{**  **glColor3ub(128,128,128); // Clear the color buffer (background)**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(0.0f,40.0f);**  **glVertex2f(120.0f,40.0f);**  **glVertex2f(120.0f,100.0f);**  **glVertex2f(0.0f,100.0f);**  **glEnd();**  **}**  **//Road Side line**  **void road\_line()**  **{**  **glLineWidth(7.0f);**  **glColor3ub(255,255,255); // Clear the color buffer (background)**  **glBegin(GL\_LINES);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(0.0f,45.0f);**  **glVertex2f(120.0f,45.0f);**  **glVertex2f(120.0f,95.0f);**  **glVertex2f(0.0f,95.0f);**  **glEnd();**  **}**  **//Road Middle line**  **void road\_middle\_line()**  **{**  **glLineWidth(12.0f);**  **glColor3ub(255,255,255); // Clear the color buffer (background)**  **glBegin(GL\_LINES);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(5.0f,70.0f);**  **glVertex2f(10.0f,70.0f);**  **glVertex2f(15.0f,70.0f);**  **glVertex2f(20.0f,70.0f);**  **glVertex2f(25.0f,70.0f);**  **glVertex2f(30.0f,70.0f);**  **glVertex2f(35.0f,70.0f);**  **glVertex2f(40.0f,70.0f);**  **glVertex2f(45.0f,70.0f);**  **glVertex2f(50.0f,70.0f);**  **glVertex2f(55.0f,70.0f);**  **glVertex2f(60.0f,70.0f);**  **glEnd();**  **//Zebra Crossing**  **glLineWidth(10.0f);**  **glColor3f(1.0f,1.0f,0.0f); // Clear the color buffer (background)**  **glBegin(GL\_LINES);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(65.0f,50.0f);**  **glVertex2f(70.0f,50.0f);**  **glVertex2f(65.0f,55.0f);**  **glVertex2f(70.0f,55.0f);**  **glVertex2f(65.0f,60.0f);**  **glVertex2f(70.0f,60.0f);**  **glVertex2f(65.0f,65.0f);**  **glVertex2f(70.0f,65.0f);**  **glVertex2f(65.0f,70.0f);**  **glVertex2f(70.0f,70.0f);**  **glVertex2f(65.0f,75.0f);**  **glVertex2f(70.0f,75.0f);**  **glVertex2f(65.0f,80.0f);**  **glVertex2f(70.0f,80.0f);**  **glVertex2f(65.0f,85.0f);**  **glVertex2f(70.0f,85.0f);**  **glVertex2f(65.0f,90.0f);**  **glVertex2f(70.0f,90.0f);**  **glEnd();**  **glLineWidth(12.0f);**  **glColor3ub(255,255,255); // Clear the color buffer (background)**  **glBegin(GL\_LINES);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(75.0f,70.0f);**  **glVertex2f(80.0f,70.0f);**  **glVertex2f(85.0f,70.0f);**  **glVertex2f(90.0f,70.0f);**  **glVertex2f(95.0f,70.0f);**  **glVertex2f(100.0f,70.0f);**  **glVertex2f(105.0f,70.0f);**  **glVertex2f(110.0f,70.0f);**  **glVertex2f(115.0f,70.0f);**  **glVertex2f(120.f,70.0f);**  **glEnd();**  **}**  **void top\_grass()**  **{**  **glColor3ub(50,205,50); // Clear the color buffer (background)**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(0.0f,100.0f);**  **glVertex2f(120.0f,100.0f);**  **glVertex2f(120.0f,140.0f);**  **glVertex2f(0.0f,140.0f);**  **glEnd();**  **}**  **//LEFT SIDE BUILDING**  **//1ST BUILDING**  **void first\_building()**  **{**  **//Building Structure**  **glColor3ub(127,255,212);**  **glBegin(GL\_QUADS);**  **glVertex2f(5.0f,120.0f);**  **glVertex2f(20.0f,120.0f);**  **glVertex2f(20.0f,210.0f);**  **glVertex2f(5.0f,210.0f);**  **glEnd();**  **// building\_structure\_2D\_view**  **glColor3ub(47,79,79);**  **glBegin(GL\_QUADS);**  **glVertex2f(0.0f,120.0f);**  **glVertex2f(5.0f,120.0f);**  **glVertex2f(5.0f,210.0f);**  **glVertex2f(0.0f,200.0f);**  **glEnd();**  **glLineWidth(5.0f);**  **//building\_door**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(10.0f,120.0f);**  **glVertex2f(15.0f,120.0f);**  **glVertex2f(15.0f,140.0f);**  **glVertex2f(10.0f,140.0f);**  **glEnd();**  **//for line above the door**  **glColor3ub(47,79,79);**  **glBegin(GL\_LINES);**  **glVertex2f(5.0f,142.0f);**  **glVertex2f(20.0f,142.0f);**  **glEnd();**  **//LEFT WINDOWS**  **//First Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(6.0f,145.0f);**  **glVertex2f(9.0f,145.0f);**  **glVertex2f(9.0f,155.0f);**  **glVertex2f(6.0f,155.0f);**  **glEnd();**  **//Second Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(6.0f,160.0f);**  **glVertex2f(9.0f,160.0f);**  **glVertex2f(9.0f,170.0f);**  **glVertex2f(6.0f,170.0f);**  **glEnd();**  **//Third Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(6.0f,175.0f);**  **glVertex2f(9.0f,175.0f);**  **glVertex2f(9.0f,185.0f);**  **glVertex2f(6.0f,185.0f);**  **glEnd();**  **//Fourth Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(6.0f,190.0f);**  **glVertex2f(9.0f,190.0f);**  **glVertex2f(9.0f,200.0f);**  **glVertex2f(6.0f,200.0f);**  **glEnd();**  **//RIGHT WINDOWS**  **//First Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(16.0f,145.0f);**  **glVertex2f(19.0f,145.0f);**  **glVertex2f(19.0f,155.0f);**  **glVertex2f(16.0f,155.0f);**  **glEnd();**  **//Second Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(16.0f,160.0f);**  **glVertex2f(19.0f,160.0f);**  **glVertex2f(19.0f,170.0f);**  **glVertex2f(16.0f,170.0f);**  **glEnd();**  **//Third Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(16.0f,175.0f);**  **glVertex2f(19.0f,175.0f);**  **glVertex2f(19.0f,185.0f);**  **glVertex2f(16.0f,185.0f);**  **glEnd();**  **//Fourth Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(16.0f,190.0f);**  **glVertex2f(19.0f,190.0f);**  **glVertex2f(19.0f,200.0f);**  **glVertex2f(16.0f,200.0f);**  **glEnd();**  **//Upper Triangle Design**  **glColor3ub(75,0,130);**  **glBegin(GL\_TRIANGLES);**  **glVertex2f(10.0f,200.0f);**  **glVertex2f(15.0f,200.0f);**  **glVertex2f(12.5f,172.5f);**  **glEnd();**  **//Lower Triangle Design**  **glColor3ub(75,0,130);**  **glBegin(GL\_TRIANGLES);**  **glVertex2f(10.0f,145.0f);**  **glVertex2f(15.0f,145.0f);**  **glVertex2f(12.5f,172.5f);**  **glEnd();**  **}**  **//RIGHT SIDE BUILDING**  **//2ND BUILDING**  **void second\_building()**  **{**  **//Building Structure**  **glColor3ub(138,43,226);**  **glBegin(GL\_QUADS);**  **glVertex2f(100.0f,120.0f);**  **glVertex2f(115.0f,120.0f);**  **glVertex2f(115.0f,210.0f);**  **glVertex2f(100.0f,210.0f);**  **glEnd();**  **// building\_structure\_2D\_view**  **glColor3ub(255,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(120.0f,120.0f);**  **glVertex2f(115.0f,120.0f);**  **glVertex2f(115.0f,210.0f);**  **glVertex2f(120.0f,200.0f);**  **glEnd();**  **glLineWidth(5.0f);**  **//building\_door**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(110.0f,120.0f);**  **glVertex2f(105.0f,120.0f);**  **glVertex2f(105.0f,140.0f);**  **glVertex2f(110.0f,140.0f);**  **glEnd();**  **//for line above the door**  **glColor3ub(255,0,255);**  **glBegin(GL\_LINES);**  **glVertex2f(115.0f,142.0f);**  **glVertex2f(100.0f,142.0f);**  **glEnd();**  **//LEFT WINDOWS**  **//First Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(104.0f,145.0f);**  **glVertex2f(101.0f,145.0f);**  **glVertex2f(101.0f,155.0f);**  **glVertex2f(104.0f,155.0f);**  **glEnd();**  **//Second Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(104.0f,160.0f);**  **glVertex2f(101.0f,160.0f);**  **glVertex2f(101.0f,170.0f);**  **glVertex2f(104.0f,170.0f);**  **glEnd();**  **//Third Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(104.0f,175.0f);**  **glVertex2f(101.0f,175.0f);**  **glVertex2f(101.0f,185.0f);**  **glVertex2f(104.0f,185.0f);**  **glEnd();**  **//Fourth Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(104.0f,190.0f);**  **glVertex2f(101.0f,190.0f);**  **glVertex2f(101.0f,200.0f);**  **glVertex2f(104.0f,200.0f);**  **glEnd();**  **//RIGHT WINDOWS**  **//First Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(114.0f,145.0f);**  **glVertex2f(111.0f,145.0f);**  **glVertex2f(111.0f,155.0f);**  **glVertex2f(114.0f,155.0f);**  **glEnd();**  **//Second Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(114.0f,160.0f);**  **glVertex2f(111.0f,160.0f);**  **glVertex2f(111.0f,170.0f);**  **glVertex2f(114.0f,170.0f);**  **glEnd();**  **//Third Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(114.0f,175.0f);**  **glVertex2f(111.0f,175.0f);**  **glVertex2f(111.0f,185.0f);**  **glVertex2f(114.0f,185.0f);**  **glEnd();**  **//Fourth Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(114.0f,190.0f);**  **glVertex2f(111.0f,190.0f);**  **glVertex2f(111.0f,200.0f);**  **glVertex2f(114.0f,200.0f);**  **glEnd();**  **//Upper Triangle Design**  **glColor3ub(127,255,212);**  **glBegin(GL\_TRIANGLES);**  **glVertex2f(110.0f,200.0f);**  **glVertex2f(105.0f,200.0f);**  **glVertex2f(107.5f,172.5f);**  **glEnd();**  **//Lower Triangle Design**  **glColor3ub(127,255,212);**  **glBegin(GL\_TRIANGLES);**  **glVertex2f(105.0f,145.0f);**  **glVertex2f(110.0f,145.0f);**  **glVertex2f(107.5f,172.5f);**  **glEnd();**  **}**  **//Building Road to Door Path**  **void building\_path()**  **{**  **//For First Building Left Side**  **glColor3ub(240,230,140); // Clear the color buffer (background)**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(15.0f,100.0f);**  **glVertex2f(20.0f,100.0f);**  **glVertex2f(15.0f,120.0f);**  **glVertex2f(10.0f,120.0f);**  **glEnd();**  **//For Second Building Left Side**  **glColor3ub(240,230,140); // Clear the color buffer (background)**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(105.0f,120.0f);**  **glVertex2f(100.0f,100.0f);**  **glVertex2f(105.0f,100.0f);**  **glVertex2f(110.0f,120.0f);**  **glEnd();**  **//For Building Outside Path**  **glColor3ub(240,230,140); // Clear the color buffer (background)**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(20.0f,130.0f);**  **glVertex2f(100.0f,130.0f);**  **glVertex2f(100.0f,140.0f);**  **glVertex2f(20.0f,140.0f);**  **glEnd();**  **}**  **void tree()**  **{**  **//Left Side First Tree**  **//for Tree trunk**  **glColor3ub(184,134,11);**  **glBegin(GL\_QUADS);**  **glVertex2f(30.0f,140.0f);**  **glVertex2f(33.0f,140.0f);**  **glVertex2f(32.0f,170.0f);**  **glVertex2f(31.0f,170.0f);**  **glEnd();**  **//for first layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_QUADS);**  **glVertex2f(27.0f,170.0f);**  **glVertex2f(36.0f,170.0f);**  **glVertex2f(34.0f,175.0f);**  **glVertex2f(29.0f,175.0f);**  **glEnd();**  **//for second layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_QUADS);**  **glVertex2f(28.0f,175.0f);**  **glVertex2f(35.0f,175.0f);**  **glVertex2f(33.0f,180.0f);**  **glVertex2f(30.0f,180.0f);**  **glEnd();**  **//for third layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_QUADS);**  **glVertex2f(29.0f,180.0f);**  **glVertex2f(34.0f,180.0f);**  **glVertex2f(32.0f,185.0f);**  **glVertex2f(31.0f,185.0f);**  **glEnd();**  **//for fourth layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_POLYGON);**  **glVertex2f(30.0f,185.0f);**  **glVertex2f(33.0f,185.0f);**  **glVertex2f(31.5f,192.0f);**  **glEnd();**  **//Right Side Second Tree**  **//for Tree trunk**  **glColor3ub(184,134,11);**  **glBegin(GL\_QUADS);**  **glVertex2f(90.0f,140.0f);**  **glVertex2f(87.0f,140.0f);**  **glVertex2f(88.0f,170.0f);**  **glVertex2f(89.0f,170.0f);**  **glEnd();**  **//for first layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_QUADS);**  **glVertex2f(84.0f,170.0f);**  **glVertex2f(93.0f,170.0f);**  **glVertex2f(91.0f,175.0f);**  **glVertex2f(86.0f,175.0f);**  **glEnd();**  **//for second layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_QUADS);**  **glVertex2f(85.0f,175.0f);**  **glVertex2f(92.0f,175.0f);**  **glVertex2f(90.0f,180.0f);**  **glVertex2f(87.0f,180.0f);**  **glEnd();**  **//for third layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_QUADS);**  **glVertex2f(86.0f,180.0f);**  **glVertex2f(91.0f,180.0f);**  **glVertex2f(89.0f,185.0f);**  **glVertex2f(88.0f,185.0f);**  **glEnd();**  **//for fourth layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_POLYGON);**  **glVertex2f(87.0f,185.0f);**  **glVertex2f(90.0f,185.0f);**  **glVertex2f(88.5f,192.0f);**  **glEnd();**  **}**  **void lamppost()**  **{**  **//lamppost pillar**  **glLineWidth(15.0f);**  **glColor3ub(178,34,34);**  **glBegin(GL\_LINES);**  **glVertex2f(60.0f,140.0f);**  **glVertex2f(60.0,195.0f);**  **glEnd();**  **//lamppost light holder 2 side**  **glLineWidth(15.0f);**  **glColor3ub(178,34,34);**  **glBegin(GL\_LINES);**  **glVertex2f(60.0f,195.0f);**  **glVertex2f(67.0f,195.0f);**  **glVertex2f(60.0f,195.0f);**  **glVertex2f(53.0f,195.0f);**  **glEnd();**  **//Right light**  **glColor3ub(255,255,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(64.0f,192.0f);**  **glVertex2f(67.0f,192.0f);**  **glVertex2f(67.0f,195.0f);**  **glVertex2f(64.0f,195.0f);**  **glEnd();**  **//Left light**  **glColor3ub(255,255,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(53.0f,192.0f);**  **glVertex2f(56.0f,192.0f);**  **glVertex2f(56.0f,195.0f);**  **glVertex2f(53.0f,195.0f);**  **glEnd();**  **}**  **void sun()**  **{**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3ub(255,255,0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=4.0f;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x+40,y+210 );**  **}**  **glEnd();**  **}**  **void bench()**  **{**  **//left side first bench**  **glLineWidth(9.0f);**  **glColor3ub(210,105,30);**  **glBegin(GL\_LINES);**  **glVertex2f(35.0f,140.0f);**  **glVertex2f(35.0f,150.0f);**  **glEnd();**  **glLineWidth(9.0f);**  **glColor3ub(210,105,30);**  **glBegin(GL\_LINES);**  **glVertex2f(42.0f,140.0f);**  **glVertex2f(42.0f,150.0f);**  **glEnd();**  **glLineWidth(11.0f);**  **glColor3ub(210,105,30);**  **glBegin(GL\_LINES);**  **glVertex2f(34.0f,150.0f);**  **glVertex2f(43.0f,150.0f);**  **glEnd();**  **//left side second bench**  **glLineWidth(9.0f);**  **glColor3ub(210,105,30);**  **glBegin(GL\_LINES);**  **glVertex2f(45.0f,140.0f);**  **glVertex2f(45.0f,150.0f);**  **glEnd();**  **glLineWidth(9.0f);**  **glColor3ub(210,105,30);**  **glBegin(GL\_LINES);**  **glVertex2f(52.0f,140.0f);**  **glVertex2f(52.0f,150.0f);**  **glEnd();**  **glLineWidth(11.0f);**  **glColor3ub(210,105,30);**  **glBegin(GL\_LINES);**  **glVertex2f(44.0f,150.0f);**  **glVertex2f(53.0f,150.0f);**  **glEnd();**  **}**  **void traffic\_light()**  **{**  **//traffic light pillar**  **glLineWidth(15.0f);**  **glColor3ub(0,0,0);**  **glBegin(GL\_LINES);**  **glVertex2f(75.0f,100.0f);**  **glVertex2f(75.0f,135.0f);**  **glEnd();**  **//light holder**  **glColor3ub(0,0,0);**  **glBegin(GL\_POLYGON);**  **glVertex2f(72.5f,135.0f);**  **glVertex2f(77.5f,135.0f);**  **glVertex2f(77.5f,165.0f);**  **glVertex2f(72.5f,165.0f);**  **glEnd();**  **//red light**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3ub(255,0,0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=1.8f;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x+75,y+140 );**  **}**  **glEnd();**  **//yellow light**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3ub(255,255,0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=1.8f;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x+75,y+150 );**  **}**  **glEnd();**  **//green light**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3ub(0,255,0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=1.8f;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x+75,y+160 );**  **}**  **glEnd();**  **}**  **void car()**  **{**  **//car middle body**  **glColor3ub(255,0,0);**  **glMatrixMode(GL\_MODELVIEW);**  **glPushMatrix();**  **glTranslatef(move\_car, 0.0f, 0.0f);**  **glBegin(GL\_POLYGON);**  **glVertex2f(28.0f,81.0f);**  **glVertex2f(63.0f,81.0f);**  **glVertex2f(61.0f,101.0f);**  **glVertex2f(28.0f,101.0f);**  **glEnd();**  **//upper part of car**  **glColor3ub(255,0,0);**  **glBegin(GL\_POLYGON);**  **glVertex2f(35.0f,101.0f);**  **glVertex2f(55.0f,101.0f);**  **glVertex2f(52.0f,116.0f);**  **glVertex2f(38.0f,116.0f);**  **glEnd();**  **//car rear window glass**  **glColor3ub(0,0,0);**  **glBegin(GL\_POLYGON);**  **glVertex2f(37.0f,103.0f);**  **glVertex2f(44.5f,103.0f);**  **glVertex2f(44.5f,114.0f);**  **glVertex2f(39.0f,114.0f);**  **glEnd();**  **//car front window glass**  **glColor3ub(0,0,0);**  **glBegin(GL\_POLYGON);**  **glVertex2f(45.5f,103.0f);**  **glVertex2f(53.0f,103.0f);**  **glVertex2f(51.0f,114.0f);**  **glVertex2f(45.5f,114.0f);**  **glEnd();**  **//rear wheel**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3ub(0,0,0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=4.1f;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x+38,y+83 );**  **}**  **glEnd();**  **//front wheel**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3ub(0,0,0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=4.1f;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x+52,y+83 );**  **}**  **glEnd();**  **glPopMatrix();**  **}**  **//DAY END**  **//NIGHT START**  **void background\_night()**  **{**  **glColor3ub(36,52,71);**  **glBegin(GL\_QUADS);**  **glVertex2f(0.0f,140.0f);**  **glVertex2f(120.0f,140.0f);**  **glVertex2f(120.0f,220.0f);**  **glVertex2f(0.0f,220.0f);**  **glEnd();**  **}**  **void bottom\_grass\_night()**  **{**  **glColor3ub(40,190,30); // Clear the color buffer (background)**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(0.0f,-10.0f);**  **glVertex2f(120.0f,-10.0f);**  **glVertex2f(120.0f,40.0f);**  **glVertex2f(0.0f,40.0f);**  **glEnd();**  **}**  **void rail\_line\_night()**  **{**  **glLineWidth(10.0f);**  **glColor3ub(0,0,0); // Clear the color buffer (background)**  **glBegin(GL\_LINES);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(0.0f,0.0f);**  **glVertex2f(120.0f,0.0f);**  **glVertex2f(120.0f,20.0f);**  **glVertex2f(0.0f,20.0f);**  **glEnd();**  **}**  **void rail\_line\_slipper\_night()**  **{**  **glLineWidth(25.0f);**  **glColor3ub(0,0,0); // Clear the color buffer (background)**  **glBegin(GL\_LINES);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(5.0f,-5.0f);**  **glVertex2f(5.0f,25.0f);**  **glVertex2f(10.0f,-5.0f);**  **glVertex2f(10.0f,25.0f);**  **glVertex2f(15.0f,-5.0f);**  **glVertex2f(15.0f,25.0f);**  **glVertex2f(20.0f,-5.0f);**  **glVertex2f(20.0f,25.0f);**  **glVertex2f(25.0f,-5.0f);**  **glVertex2f(25.0f,25.0f);**  **glVertex2f(30.0f,-5.0f);**  **glVertex2f(30.0f,25.0f);**  **glVertex2f(35.0f,-5.0f);**  **glVertex2f(35.0f,25.0f);**  **glVertex2f(40.0f,-5.0f);**  **glVertex2f(40.0f,25.0f);**  **glVertex2f(45.0f,-5.0f);**  **glVertex2f(45.0f,25.0f);**  **glVertex2f(50.0f,-5.0f);**  **glVertex2f(50.0f,25.0f);**  **glVertex2f(55.0f,-5.0f);**  **glVertex2f(55.0f,25.0f);**  **glVertex2f(60.0f,-5.0f);**  **glVertex2f(60.0f,25.0f);**  **glVertex2f(65.0f,-5.0f);**  **glVertex2f(65.0f,25.0f);**  **glVertex2f(70.0f,-5.0f);**  **glVertex2f(70.0f,25.0f);**  **glVertex2f(75.0f,-5.0f);**  **glVertex2f(75.0f,25.0f);**  **glVertex2f(80.0f,-5.0f);**  **glVertex2f(80.0f,25.0f);**  **glVertex2f(85.0f,-5.0f);**  **glVertex2f(85.0f,25.0f);**  **glVertex2f(90.0f,-5.0f);**  **glVertex2f(90.0f,25.0f);**  **glVertex2f(95.0f,-5.0f);**  **glVertex2f(95.0f,25.0f);**  **glVertex2f(100.0f,-5.0f);**  **glVertex2f(100.0f,25.0f);**  **glVertex2f(105.0f,-5.0f);**  **glVertex2f(105.0f,25.0f);**  **glVertex2f(110.0f,-5.0f);**  **glVertex2f(110.0f,25.0f);**  **glVertex2f(115.0f,-5.0f);**  **glVertex2f(115.0f,25.0f);**  **glEnd();**  **}**  **void road\_night()**  **{**  **glColor3ub(110,110,110); // Clear the color buffer (background)**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(0.0f,40.0f);**  **glVertex2f(120.0f,40.0f);**  **glVertex2f(120.0f,100.0f);**  **glVertex2f(0.0f,100.0f);**  **glEnd();**  **}**  **//Road Side line**  **void road\_line\_night()**  **{**  **glLineWidth(7.0f);**  **glColor3ub(255,255,255); // Clear the color buffer (background)**  **glBegin(GL\_LINES);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(0.0f,45.0f);**  **glVertex2f(120.0f,45.0f);**  **glVertex2f(120.0f,95.0f);**  **glVertex2f(0.0f,95.0f);**  **glEnd();**  **}**  **//Road Middle line**  **void road\_middle\_line\_night()**  **{**  **glLineWidth(12.0f);**  **glColor3ub(255,255,255); // Clear the color buffer (background)**  **glBegin(GL\_LINES);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(5.0f,70.0f);**  **glVertex2f(10.0f,70.0f);**  **glVertex2f(15.0f,70.0f);**  **glVertex2f(20.0f,70.0f);**  **glVertex2f(25.0f,70.0f);**  **glVertex2f(30.0f,70.0f);**  **glVertex2f(35.0f,70.0f);**  **glVertex2f(40.0f,70.0f);**  **glVertex2f(45.0f,70.0f);**  **glVertex2f(50.0f,70.0f);**  **glVertex2f(55.0f,70.0f);**  **glVertex2f(60.0f,70.0f);**  **glEnd();**  **//Zebra Crossing**  **glLineWidth(10.0f);**  **glColor3f(1.0f,1.0f,0.0f); // Clear the color buffer (background)**  **glBegin(GL\_LINES);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(65.0f,50.0f);**  **glVertex2f(70.0f,50.0f);**  **glVertex2f(65.0f,55.0f);**  **glVertex2f(70.0f,55.0f);**  **glVertex2f(65.0f,60.0f);**  **glVertex2f(70.0f,60.0f);**  **glVertex2f(65.0f,65.0f);**  **glVertex2f(70.0f,65.0f);**  **glVertex2f(65.0f,70.0f);**  **glVertex2f(70.0f,70.0f);**  **glVertex2f(65.0f,75.0f);**  **glVertex2f(70.0f,75.0f);**  **glVertex2f(65.0f,80.0f);**  **glVertex2f(70.0f,80.0f);**  **glVertex2f(65.0f,85.0f);**  **glVertex2f(70.0f,85.0f);**  **glVertex2f(65.0f,90.0f);**  **glVertex2f(70.0f,90.0f);**  **glEnd();**  **glLineWidth(12.0f);**  **glColor3ub(255,255,255); // Clear the color buffer (background)**  **glBegin(GL\_LINES);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(75.0f,70.0f);**  **glVertex2f(80.0f,70.0f);**  **glVertex2f(85.0f,70.0f);**  **glVertex2f(90.0f,70.0f);**  **glVertex2f(95.0f,70.0f);**  **glVertex2f(100.0f,70.0f);**  **glVertex2f(105.0f,70.0f);**  **glVertex2f(110.0f,70.0f);**  **glVertex2f(115.0f,70.0f);**  **glVertex2f(120.f,70.0f);**  **glEnd();**  **}**  **void top\_grass\_night()**  **{**  **glColor3ub(40,190,30); // Clear the color buffer (background)**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(0.0f,100.0f);**  **glVertex2f(120.0f,100.0f);**  **glVertex2f(120.0f,140.0f);**  **glVertex2f(0.0f,140.0f);**  **glEnd();**  **}**  **//LEFT SIDE BUILDING**  **//1ST BUILDING**  **void first\_building\_night()**  **{**  **//Building Structure**  **glColor3ub(127,255,212);**  **glBegin(GL\_QUADS);**  **glVertex2f(5.0f,120.0f);**  **glVertex2f(20.0f,120.0f);**  **glVertex2f(20.0f,210.0f);**  **glVertex2f(5.0f,210.0f);**  **glEnd();**  **// building\_structure\_2D\_view**  **glColor3ub(47,79,79);**  **glBegin(GL\_QUADS);**  **glVertex2f(0.0f,120.0f);**  **glVertex2f(5.0f,120.0f);**  **glVertex2f(5.0f,210.0f);**  **glVertex2f(0.0f,200.0f);**  **glEnd();**  **glLineWidth(5.0f);**  **//building\_door**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(10.0f,120.0f);**  **glVertex2f(15.0f,120.0f);**  **glVertex2f(15.0f,140.0f);**  **glVertex2f(10.0f,140.0f);**  **glEnd();**  **//for line above the door**  **glColor3ub(47,79,79);**  **glBegin(GL\_LINES);**  **glVertex2f(5.0f,142.0f);**  **glVertex2f(20.0f,142.0f);**  **glEnd();**  **//LEFT WINDOWS**  **//First Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(6.0f,145.0f);**  **glVertex2f(9.0f,145.0f);**  **glVertex2f(9.0f,155.0f);**  **glVertex2f(6.0f,155.0f);**  **glEnd();**  **//Second Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(6.0f,160.0f);**  **glVertex2f(9.0f,160.0f);**  **glVertex2f(9.0f,170.0f);**  **glVertex2f(6.0f,170.0f);**  **glEnd();**  **//Third Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(6.0f,175.0f);**  **glVertex2f(9.0f,175.0f);**  **glVertex2f(9.0f,185.0f);**  **glVertex2f(6.0f,185.0f);**  **glEnd();**  **//Fourth Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(6.0f,190.0f);**  **glVertex2f(9.0f,190.0f);**  **glVertex2f(9.0f,200.0f);**  **glVertex2f(6.0f,200.0f);**  **glEnd();**  **//RIGHT WINDOWS**  **//First Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(16.0f,145.0f);**  **glVertex2f(19.0f,145.0f);**  **glVertex2f(19.0f,155.0f);**  **glVertex2f(16.0f,155.0f);**  **glEnd();**  **//Second Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(16.0f,160.0f);**  **glVertex2f(19.0f,160.0f);**  **glVertex2f(19.0f,170.0f);**  **glVertex2f(16.0f,170.0f);**  **glEnd();**  **//Third Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(16.0f,175.0f);**  **glVertex2f(19.0f,175.0f);**  **glVertex2f(19.0f,185.0f);**  **glVertex2f(16.0f,185.0f);**  **glEnd();**  **//Fourth Floor Window**  **glColor3ub(0,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(16.0f,190.0f);**  **glVertex2f(19.0f,190.0f);**  **glVertex2f(19.0f,200.0f);**  **glVertex2f(16.0f,200.0f);**  **glEnd();**  **//Upper Triangle Design**  **glColor3ub(75,0,130);**  **glBegin(GL\_TRIANGLES);**  **glVertex2f(10.0f,200.0f);**  **glVertex2f(15.0f,200.0f);**  **glVertex2f(12.5f,172.5f);**  **glEnd();**  **//Lower Triangle Design**  **glColor3ub(75,0,130);**  **glBegin(GL\_TRIANGLES);**  **glVertex2f(10.0f,145.0f);**  **glVertex2f(15.0f,145.0f);**  **glVertex2f(12.5f,172.5f);**  **glEnd();**  **}**  **//RIGHT SIDE BUILDING**  **//2ND BUILDING**  **void second\_building\_night()**  **{**  **//Building Structure**  **glColor3ub(138,43,226);**  **glBegin(GL\_QUADS);**  **glVertex2f(100.0f,120.0f);**  **glVertex2f(115.0f,120.0f);**  **glVertex2f(115.0f,210.0f);**  **glVertex2f(100.0f,210.0f);**  **glEnd();**  **// building\_structure\_2D\_view**  **glColor3ub(255,0,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(120.0f,120.0f);**  **glVertex2f(115.0f,120.0f);**  **glVertex2f(115.0f,210.0f);**  **glVertex2f(120.0f,200.0f);**  **glEnd();**  **glLineWidth(5.0f);**  **//building\_door**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(110.0f,120.0f);**  **glVertex2f(105.0f,120.0f);**  **glVertex2f(105.0f,140.0f);**  **glVertex2f(110.0f,140.0f);**  **glEnd();**  **//for line above the door**  **glColor3ub(255,0,255);**  **glBegin(GL\_LINES);**  **glVertex2f(115.0f,142.0f);**  **glVertex2f(100.0f,142.0f);**  **glEnd();**  **//LEFT WINDOWS**  **//First Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(104.0f,145.0f);**  **glVertex2f(101.0f,145.0f);**  **glVertex2f(101.0f,155.0f);**  **glVertex2f(104.0f,155.0f);**  **glEnd();**  **//Second Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(104.0f,160.0f);**  **glVertex2f(101.0f,160.0f);**  **glVertex2f(101.0f,170.0f);**  **glVertex2f(104.0f,170.0f);**  **glEnd();**  **//Third Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(104.0f,175.0f);**  **glVertex2f(101.0f,175.0f);**  **glVertex2f(101.0f,185.0f);**  **glVertex2f(104.0f,185.0f);**  **glEnd();**  **//Fourth Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(104.0f,190.0f);**  **glVertex2f(101.0f,190.0f);**  **glVertex2f(101.0f,200.0f);**  **glVertex2f(104.0f,200.0f);**  **glEnd();**  **//RIGHT WINDOWS**  **//First Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(114.0f,145.0f);**  **glVertex2f(111.0f,145.0f);**  **glVertex2f(111.0f,155.0f);**  **glVertex2f(114.0f,155.0f);**  **glEnd();**  **//Second Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(114.0f,160.0f);**  **glVertex2f(111.0f,160.0f);**  **glVertex2f(111.0f,170.0f);**  **glVertex2f(114.0f,170.0f);**  **glEnd();**  **//Third Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(114.0f,175.0f);**  **glVertex2f(111.0f,175.0f);**  **glVertex2f(111.0f,185.0f);**  **glVertex2f(114.0f,185.0f);**  **glEnd();**  **//Fourth Floor Window**  **glColor3ub(230,230,250);**  **glBegin(GL\_QUADS);**  **glVertex2f(114.0f,190.0f);**  **glVertex2f(111.0f,190.0f);**  **glVertex2f(111.0f,200.0f);**  **glVertex2f(114.0f,200.0f);**  **glEnd();**  **//Upper Triangle Design**  **glColor3ub(127,255,212);**  **glBegin(GL\_TRIANGLES);**  **glVertex2f(110.0f,200.0f);**  **glVertex2f(105.0f,200.0f);**  **glVertex2f(107.5f,172.5f);**  **glEnd();**  **//Lower Triangle Design**  **glColor3ub(127,255,212);**  **glBegin(GL\_TRIANGLES);**  **glVertex2f(105.0f,145.0f);**  **glVertex2f(110.0f,145.0f);**  **glVertex2f(107.5f,172.5f);**  **glEnd();**  **}**  **//Building Road to Door Path**  **void building\_path\_night()**  **{**  **//For First Building Left Side**  **glColor3ub(225,215,125); // Clear the color buffer (background)**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(15.0f,100.0f);**  **glVertex2f(20.0f,100.0f);**  **glVertex2f(15.0f,120.0f);**  **glVertex2f(10.0f,120.0f);**  **glEnd();**  **//For Second Building Left Side**  **glColor3ub(225,215,125); // Clear the color buffer (background)**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(105.0f,120.0f);**  **glVertex2f(100.0f,100.0f);**  **glVertex2f(105.0f,100.0f);**  **glVertex2f(110.0f,120.0f);**  **glEnd();**  **//For Building Outside Path**  **glColor3ub(225,215,125); // Clear the color buffer (background)**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **glVertex2f(20.0f,130.0f);**  **glVertex2f(100.0f,130.0f);**  **glVertex2f(100.0f,140.0f);**  **glVertex2f(20.0f,140.0f);**  **glEnd();**  **}**  **void tree\_night()**  **{**  **//Left Side First Tree**  **//for Tree trunk**  **glColor3ub(184,134,11);**  **glBegin(GL\_QUADS);**  **glVertex2f(30.0f,140.0f);**  **glVertex2f(33.0f,140.0f);**  **glVertex2f(32.0f,170.0f);**  **glVertex2f(31.0f,170.0f);**  **glEnd();**  **//for first layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_QUADS);**  **glVertex2f(27.0f,170.0f);**  **glVertex2f(36.0f,170.0f);**  **glVertex2f(34.0f,175.0f);**  **glVertex2f(29.0f,175.0f);**  **glEnd();**  **//for second layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_QUADS);**  **glVertex2f(28.0f,175.0f);**  **glVertex2f(35.0f,175.0f);**  **glVertex2f(33.0f,180.0f);**  **glVertex2f(30.0f,180.0f);**  **glEnd();**  **//for third layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_QUADS);**  **glVertex2f(29.0f,180.0f);**  **glVertex2f(34.0f,180.0f);**  **glVertex2f(32.0f,185.0f);**  **glVertex2f(31.0f,185.0f);**  **glEnd();**  **//for fourth layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_POLYGON);**  **glVertex2f(30.0f,185.0f);**  **glVertex2f(33.0f,185.0f);**  **glVertex2f(31.5f,192.0f);**  **glEnd();**  **//Right Side Second Tree**  **//for Tree trunk**  **glColor3ub(184,134,11);**  **glBegin(GL\_QUADS);**  **glVertex2f(90.0f,140.0f);**  **glVertex2f(87.0f,140.0f);**  **glVertex2f(88.0f,170.0f);**  **glVertex2f(89.0f,170.0f);**  **glEnd();**  **//for first layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_QUADS);**  **glVertex2f(84.0f,170.0f);**  **glVertex2f(93.0f,170.0f);**  **glVertex2f(91.0f,175.0f);**  **glVertex2f(86.0f,175.0f);**  **glEnd();**  **//for second layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_QUADS);**  **glVertex2f(85.0f,175.0f);**  **glVertex2f(92.0f,175.0f);**  **glVertex2f(90.0f,180.0f);**  **glVertex2f(87.0f,180.0f);**  **glEnd();**  **//for third layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_QUADS);**  **glVertex2f(86.0f,180.0f);**  **glVertex2f(91.0f,180.0f);**  **glVertex2f(89.0f,185.0f);**  **glVertex2f(88.0f,185.0f);**  **glEnd();**  **//for fourth layer Tree leaf**  **glColor3ub(34,139,34);**  **glBegin(GL\_POLYGON);**  **glVertex2f(87.0f,185.0f);**  **glVertex2f(90.0f,185.0f);**  **glVertex2f(88.5f,192.0f);**  **glEnd();**  **}**  **void lamppost\_night()**  **{**  **//lamppost pillar**  **glLineWidth(15.0f);**  **glColor3ub(178,34,34);**  **glBegin(GL\_LINES);**  **glVertex2f(60.0f,140.0f);**  **glVertex2f(60.0,195.0f);**  **glEnd();**  **//lamppost light holder 2 side**  **glLineWidth(15.0f);**  **glColor3ub(178,34,34);**  **glBegin(GL\_LINES);**  **glVertex2f(60.0f,195.0f);**  **glVertex2f(67.0f,195.0f);**  **glVertex2f(60.0f,195.0f);**  **glVertex2f(53.0f,195.0f);**  **glEnd();**  **//Right light**  **glColor3ub(255,255,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(64.0f,192.0f);**  **glVertex2f(67.0f,192.0f);**  **glVertex2f(67.0f,195.0f);**  **glVertex2f(64.0f,195.0f);**  **glEnd();**  **//Left light**  **glColor3ub(255,255,255);**  **glBegin(GL\_QUADS);**  **glVertex2f(53.0f,192.0f);**  **glVertex2f(56.0f,192.0f);**  **glVertex2f(56.0f,195.0f);**  **glVertex2f(53.0f,195.0f);**  **glEnd();**  **}**  **void moon()**  **{**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3ub(255,255,255);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=4.0f;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x+40,y+210 );**  **}**  **glEnd();**  **}**  **void bench\_night()**  **{**  **//left side first bench**  **glLineWidth(9.0f);**  **glColor3ub(210,105,30);**  **glBegin(GL\_LINES);**  **glVertex2f(35.0f,140.0f);**  **glVertex2f(35.0f,150.0f);**  **glEnd();**  **glLineWidth(9.0f);**  **glColor3ub(210,105,30);**  **glBegin(GL\_LINES);**  **glVertex2f(42.0f,140.0f);**  **glVertex2f(42.0f,150.0f);**  **glEnd();**  **glLineWidth(11.0f);**  **glColor3ub(210,105,30);**  **glBegin(GL\_LINES);**  **glVertex2f(34.0f,150.0f);**  **glVertex2f(43.0f,150.0f);**  **glEnd();**  **//left side second bench**  **glLineWidth(9.0f);**  **glColor3ub(210,105,30);**  **glBegin(GL\_LINES);**  **glVertex2f(45.0f,140.0f);**  **glVertex2f(45.0f,150.0f);**  **glEnd();**  **glLineWidth(9.0f);**  **glColor3ub(210,105,30);**  **glBegin(GL\_LINES);**  **glVertex2f(52.0f,140.0f);**  **glVertex2f(52.0f,150.0f);**  **glEnd();**  **glLineWidth(11.0f);**  **glColor3ub(210,105,30);**  **glBegin(GL\_LINES);**  **glVertex2f(44.0f,150.0f);**  **glVertex2f(53.0f,150.0f);**  **glEnd();**  **}**  **void traffic\_light\_night()**  **{**  **//traffic light pillar**  **glLineWidth(15.0f);**  **glColor3ub(0,0,0);**  **glBegin(GL\_LINES);**  **glVertex2f(75.0f,100.0f);**  **glVertex2f(75.0f,135.0f);**  **glEnd();**  **//light holder**  **glColor3ub(0,0,0);**  **glBegin(GL\_POLYGON);**  **glVertex2f(72.5f,135.0f);**  **glVertex2f(77.5f,135.0f);**  **glVertex2f(77.5f,165.0f);**  **glVertex2f(72.5f,165.0f);**  **glEnd();**  **//red light**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3ub(255,0,0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=1.8f;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x+75,y+140 );**  **}**  **glEnd();**  **//yellow light**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3ub(255,255,0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=1.8f;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x+75,y+150 );**  **}**  **glEnd();**  **//green light**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3ub(0,255,0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=1.8f;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x+75,y+160 );**  **}**  **glEnd();**  **}**  **void car\_night()**  **{**  **//car middle body**  **glColor3ub(240,0,0);**  **glMatrixMode(GL\_MODELVIEW);**  **glPushMatrix();**  **glTranslatef(move\_car, 0.0f, 0.0f);**  **glBegin(GL\_POLYGON);**  **glVertex2f(28.0f,81.0f);**  **glVertex2f(63.0f,81.0f);**  **glVertex2f(61.0f,101.0f);**  **glVertex2f(28.0f,101.0f);**  **glEnd();**  **//upper part of car**  **glColor3ub(240,0,0);**  **glBegin(GL\_POLYGON);**  **glVertex2f(35.0f,101.0f);**  **glVertex2f(55.0f,101.0f);**  **glVertex2f(52.0f,116.0f);**  **glVertex2f(38.0f,116.0f);**  **glEnd();**  **//car rear window glass**  **glColor3ub(0,0,0);**  **glBegin(GL\_POLYGON);**  **glVertex2f(37.0f,103.0f);**  **glVertex2f(44.5f,103.0f);**  **glVertex2f(44.5f,114.0f);**  **glVertex2f(39.0f,114.0f);**  **glEnd();**  **//car front window glass**  **glColor3ub(0,0,0);**  **glBegin(GL\_POLYGON);**  **glVertex2f(45.5f,103.0f);**  **glVertex2f(53.0f,103.0f);**  **glVertex2f(51.0f,114.0f);**  **glVertex2f(45.5f,114.0f);**  **glEnd();**  **//rear wheel**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3ub(0,0,0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=4.1f;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x+38,y+83 );**  **}**  **glEnd();**  **//front wheel**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3ub(0,0,0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=4.1f;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x+52,y+83 );**  **}**  **glEnd();**  **glPopMatrix();**  **}**  **//NIGHT END**  **void update\_car(int value) {**  **move\_car += 0.49999; //assume as moving speed**  **if(move\_car>120) //boundary for the positive x axis for last part of the box**  **{**  **move\_car = -63;//reappear the box**  **}**  **glutPostRedisplay();**  **glutTimerFunc(20, update\_car, 0);**  **}**  **void display1() {**  **glClearColor(0.0f, 0.0f, 0.0f, 1.0f); // Set background color to black and opaque**  **glClear(GL\_COLOR\_BUFFER\_BIT);**  **//function calling**  **background\_night();**  **bottom\_grass\_night();**  **rail\_line\_night();**  **rail\_line\_slipper\_night();**  **road\_night();**  **road\_line\_night();**  **road\_middle\_line\_night();**  **top\_grass\_night();**  **first\_building\_night();**  **second\_building\_night();**  **building\_path\_night();**  **tree\_night();**  **lamppost\_night();**  **moon();**  **bench\_night();**  **traffic\_light\_night();**  **car\_night();**  **glFlush();**  **}**  **void display() {**  **glClearColor(0.0f, 0.0f, 0.0f, 1.0f); // Set background color to black and opaque**  **glClear(GL\_COLOR\_BUFFER\_BIT);**  **//function calling**  **background();**  **bottom\_grass();**  **rail\_line();**  **rail\_line\_slipper();**  **road();**  **road\_line();**  **road\_middle\_line();**  **top\_grass();**  **first\_building();**  **second\_building();**  **building\_path();**  **tree();**  **lamppost();**  **sun();**  **bench();**  **traffic\_light();**  **car();**  **glFlush();**  **}**  **void identity\_axis()**  **{**  **glLoadIdentity(); //Reset the drawing perspective**  **gluOrtho2D(0.0,120.0,-10.0,220.0); //resize the axis size**  **}**  **void handleKeypress(unsigned char key, int x, int y)//id41**  **{**  **switch (key) {**  **case 'd': //day**  **glutDisplayFunc(display);**  **glutPostRedisplay();**  **break;**  **case 'n': //night**  **glutDisplayFunc(display1);**  **glutPostRedisplay();**  **break;**  **}**  **}**  **int main(int argc, char\*\* argv) {**  **glutInit(&argc, argv); // Initialize GLUT**  **glutCreateWindow("Day Night Scenario");**  **glutInitWindowSize(320, 320);// Set the window's initial width & height**  **glutDisplayFunc(display);// Register display callback handler for window re-paint**  **glutKeyboardFunc(handleKeypress);**  **identity\_axis();**  **glutTimerFunc(20, update\_car, 0);**  **glutMainLoop(); // Enter the event-processing loop**  **return 0;**  **}** |
| **Output Screenshot (Full Screen)-** |