**Lab Taks-3**

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.
* Must submit within time that will be discussed in class VUES to the section named Lab Tak-3
* Must include resources for all the section in the table

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| **Question- 1**  Draw five storied building with windows and a front door |
| **Graph Plot (Picture)-** |
| **Code-**  **#include <windows.h> // for MS Windows**  **#include <GL/glut.h> // GLUT, include glu.h and gl.h**  **#define A -5.0f,0.0f**  **#define A1 0.0f,8.0f**  **#define B1 0.0f,0.0f**  **#define C 5.0f,2.0f**  **#define D 5.0f,0.0f**  **#define E -5.0f,4.0f**  **#define F 5.0f,4.0f**  **#define H 5.0f,6.0f**  **#define I -5.0f,8.0f**  **#define J 5.0f,8.0f**  **#define K -5.0f,-2.0f**  **#define L 5.0f,-2.0f**  **#define M -0.5f,-2.0f**  **#define N -0.5f, -0.5f**  **#define O 0.5f,-0.5f**  **#define P 0.5f,-2.0f**  **#define G -3.0f,6.0f**  **#define Q 3.0f,6.0f**  **#define B -3.0f,2.0f**  **#define R 3.0f,2.0f**  **#define S -5.0f,6.0f**  **#define T -5.0f,2.0f**  **#define U -2.0f,7.5f**  **#define V -1.0f,7.5f**  **#define W -1.0f,6.5f**  **#define Z -2.0f,6.5f**  **#define A2 1.0f,7.5f**  **#define B2 2.0f,7.5f**  **#define C2 2.0f,6.5f**  **#define D2 1.0f,6.5f**  **#define E2 -2.0f,5.5f**  **#define F2 -1.0f,5.5f**  **#define G2 -1.0f,4.5f**  **#define H2 -2.0f,4.5f**  **#define I2 1.0f,5.5f**  **#define J2 2.0f,5.5f**  **#define K2 2.0f,4.5f**  **#define L2 1.0f,4.5f**  **#define M2 -2.0f,3.5f**  **#define N2 -1.0f,3.5f**  **#define O2 -1.0f,2.5f**  **#define P2 -2.0f,2.5f**  **#define Q2 1.0f,3.5f**  **#define R2 2.0f,3.5f**  **#define S2 2.0f,2.5f**  **#define T2 1.0f,2.5f**  **#define U2 -2.0f,1.5f**  **#define V2 -1.0f,1.5f**  **#define W2 -1.0f,0.5f**  **#define Z2 -2.0f,0.5f**  **#define A3 1.0f,1.5f**  **#define B3 2.0f,1.5f**  **#define C3 2.0f,0.5f**  **#define D3 1.0f,0.5f**  **/\* Program entry point \*/**  **/\* Handler for window-repaint event. Call back when the window first appears and**  **whenever the window needs to be re-painted. \*/**  **void task1() {**  **glClearColor(0.0f, 0.0f, 0.0f, 1.0f); // Set background color to black and opaque**  **glClear(GL\_COLOR\_BUFFER\_BIT); // Clear the color buffer (background)**  **glPointSize(5.0);**  **glLineWidth(1.0f);**  **// Draw a Red 1x1 Square centered at origin**  **glBegin(GL\_POLYGON); // Each set of 4 vertices form a quad**  **glColor3f(0.0f, 0.8f, 0.8f); // Red**  **glVertex2f(A); // x, y**  **glVertex2f(K); // x, y**  **glVertex2f(L); // x, y**  **glVertex2f(D); // x, y**  **glEnd();**  **glBegin(GL\_LINES); // Each set of 4 vertices form a quad**  **glColor3f(0.0f, 0.0f, 0.0f); // Red**  **glVertex2f(A); // x, y**  **glVertex2f(K); // x, y**  **glVertex2f(K); // x, y**  **glVertex2f(L); // x, y**  **glVertex2f(L); // x, y**  **glVertex2f(D); // x, y**  **glVertex2f(D); // x, y**  **glVertex2f(A); // x, y**  **glEnd();**  **glBegin(GL\_POLYGON); // Each set of 4 vertices form a quad**  **glColor3f(0.0f, 0.6f, 0.6f); // Gray**  **glVertex2f(T); // x, y**  **glVertex2f(A); // x, y**  **glVertex2f(D); // x, y**  **glVertex2f(C); // x, y**  **glEnd();**  **glBegin(GL\_LINES); // Each set of 4 vertices form a quad**  **glColor3f(0.0f, 0.0f, 0.0f); // Red**  **glVertex2f(T); // x, y**  **glVertex2f(A); // x, y**  **glVertex2f(A); // x, y**  **glVertex2f(D); // x, y**  **glVertex2f(D); // x, y**  **glVertex2f(C); // x, y**  **glVertex2f(C); // x, y**  **glVertex2f(T); // x, y**  **glEnd();**  **glBegin(GL\_POLYGON); // Each set of 4 vertices form a quad**  **glColor3f(0.0f, 0.8f, 0.8f); // Gray**  **glVertex2f(E); // x, y**  **glVertex2f(T); // x, y**  **glVertex2f(C); // x, y**  **glVertex2f(F); // x, y**  **glEnd();**  **glBegin(GL\_LINES); // Each set of 4 vertices form a quad**  **glColor3f(0.0f, 0.0f, 0.0f); // Red**  **glVertex2f(E); // x, y**  **glVertex2f(T); // x, y**  **glVertex2f(T); // x, y**  **glVertex2f(C); // x, y**  **glVertex2f(C); // x, y**  **glVertex2f(F); // x, y**  **glVertex2f(F); // x, y**  **glVertex2f(E); // x, y**  **glEnd();**  **glBegin(GL\_POLYGON); // Each set of 4 vertices form a quad**  **glColor3f(0.0f, 0.6f, 0.6f); // Gray**  **glVertex2f(S); // x, y**  **glVertex2f(E); // x, y**  **glVertex2f(F); // x, y**  **glVertex2f(H); // x, y**  **glEnd();**  **glBegin(GL\_LINES); // Each set of 4 vertices form a quad**  **glColor3f(0.0f, 0.0f, 0.0f); // Red**  **glVertex2f(S); // x, y**  **glVertex2f(E); // x, y**  **glVertex2f(E); // x, y**  **glVertex2f(F); // x, y**  **glVertex2f(F); // x, y**  **glVertex2f(H); // x, y**  **glVertex2f(H); // x, y**  **glVertex2f(S); // x, y**  **glEnd();**  **glBegin(GL\_POLYGON); // Each set of 4 vertices form a quad**  **glColor3f(0.0f, 0.8f, 0.8f); // Red**  **glVertex2f(I); // x, y**  **glVertex2f(S); // x, y**  **glVertex2f(H); // x, y**  **glVertex2f(J); // x, y**  **glEnd();**  **glBegin(GL\_LINES); // Each set of 4 vertices form a quad**  **glColor3f(0.0f, 0.0f, 0.0f); // Red**  **glVertex2f(I); // x, y**  **glVertex2f(S); // x, y**  **glVertex2f(S); // x, y**  **glVertex2f(H); // x, y**  **glVertex2f(H); // x, y**  **glVertex2f(J); // x, y**  **glVertex2f(J); // x, y**  **glVertex2f(I); // x, y**  **glEnd();**  **glBegin(GL\_POLYGON); // Each set of 4 vertices form a quad**  **glColor3f(0.0f, 0.0f, 0.0f); // Red**  **glVertex2f(P); // x, y**  **glVertex2f(O); // x, y**  **glVertex2f(N); // x, y**  **glVertex2f(M); // x, y**  **//glEnd();**  **glColor3f(0.0f, 0.6f, 0.8f); // Red**  **glVertex2f(N); // x, y**  **glVertex2f(P); // x, y**  **glVertex2f(O); // x, y**  **glVertex2f(M); // x, y**  **glEnd();**  **glBegin(GL\_LINES); // Each set of 4 vertices form a quad**  **glColor3f(0.0f, 0.0f, 0.0f); // Red**  **glVertex2f(N); // x, y**  **glVertex2f(M); // x, y**  **glVertex2f(M); // x, y**  **glVertex2f(P); // x, y**  **glVertex2f(P); // x, y**  **glVertex2f(O); // x, y**  **glVertex2f(O); // x, y**  **glVertex2f(N); // x, y**  **glEnd();**  **// Draw a Red 1x1 Square centered at origin**  **glBegin(GL\_LINES); // Each set of 4 vertices form a quad**  **glColor3f(0.0f, 0.0f, 0.0f); // Red**  **glVertex2f(N); // x, y**  **glVertex2f(P); // x, y**  **glEnd();**  **glBegin(GL\_LINES); // Each set of 4 vertices form a quad**  **glColor3f(0.0f, 0.0f, 0.0f); // Red**  **glVertex2f(M); // x, y**  **glVertex2f(O); // x, y**  **glEnd();**  **//Window**  **glBegin(GL\_POLYGON); // Each set of 4 vertices form a quad**  **glColor3f(0.4f, 0.7f, 1.0f); // Red**  **glVertex2f(U2); // x, y**  **glVertex2f(Z2); // x, y**  **glVertex2f(W2); // x, y**  **glVertex2f(V2); // x, y**  **glBegin(GL\_LINES); // Each set of 4 vertices form a quad**  **glColor3f(0.0f, 0.0f, 0.0f); // Red**  **glVertex2f(U2); // x, y**  **glVertex2f(Z2); // x, y**  **glVertex2f(Z2); // x, y**  **glVertex2f(W2); // x, y**  **glVertex2f(W2); // x, y**  **glVertex2f(V2); // x, y**  **glVertex2f(V2); // x, y**  **glVertex2f(U2); // x, y**  **glEnd();**  **glBegin(GL\_POLYGON); // Each set of 4 vertices form a quad**  **glColor3f(0.4f, 0.7f, 1.0f); // Redd**  **glVertex2f(A3); // x, y**  **glVertex2f(D3); // x, y**  **glVertex2f(C3); // x, y**  **glVertex2f(B3); // x, y**  **glBegin(GL\_LINES); // Each set of 4 vertices form a quad**  **glColor3f(0.0f, 0.0f, 0.0f); // Red**  **glVertex2f(A3); // x, y**  **glVertex2f(D3); // x, y**  **glVertex2f(D3); // x, y**  **glVertex2f(C3); // x, y**  **glVertex2f(C3); // x, y**  **glVertex2f(B3); // x, y**  **glVertex2f(B3); // x, y**  **glVertex2f(A3); // x, y**  **glEnd();**  **glBegin(GL\_POLYGON); // Each set of 4 vertices form a quad**  **glColor3f(0.4f, 0.7f, 1.0f); // Redd**  **glVertex2f(M2); // x, y**  **glVertex2f(P2); // x, y**  **glVertex2f(O2); // x, y**  **glVertex2f(N2); // x, y**  **glBegin(GL\_LINES); // Each set of 4 vertices form a quad**  **glColor3f(0.0f, 0.0f, 0.0f); // Red**  **glVertex2f(M2); // x, y**  **glVertex2f(P2); // x, y**  **glVertex2f(P2); // x, y**  **glVertex2f(O2); // x, y**  **glVertex2f(O2); // x, y**  **glVertex2f(N2); // x, y**  **glVertex2f(N2); // x, y**  **glVertex2f(M2); // x, y**  **glEnd();**  **glBegin(GL\_POLYGON); // Each set of 4 vertices form a quad**  **glColor3f(0.4f, 0.7f, 1.0f); // Redd**  **glVertex2f(Q2); // x, y**  **glVertex2f(T2); // x, y**  **glVertex2f(S2); // x, y**  **glVertex2f(R2); // x, y**  **glBegin(GL\_LINES); // Each set of 4 vertices form a quad**  **glColor3f(0.0f, 0.0f, 0.0f); // Red**  **glVertex2f(Q2); // x, y**  **glVertex2f(T2); // x, y**  **glVertex2f(T2); // x, y**  **glVertex2f(S2); // x, y**  **glVertex2f(S2); // x, y**  **glVertex2f(R2); // x, y**  **glVertex2f(R2); // x, y**  **glVertex2f(Q2); // x, y**  **glEnd();**  **glBegin(GL\_POLYGON); // Each set of 4 vertices form a quad**  **glColor3f(0.4f, 0.7f, 1.0f); // Redd**  **glVertex2f(E2); // x, y**  **glVertex2f(H2); // x, y**  **glVertex2f(G2); // x, y**  **glVertex2f(F2); // x, y**  **glBegin(GL\_LINES); // Each set of 4 vertices form a quad**  **glColor3f(0.0f, 0.0f, 0.0f); // Red**  **glVertex2f(E2); // x, y**  **glVertex2f(H2); // x, y**  **glVertex2f(H2); // x, y**  **glVertex2f(G2); // x, y**  **glVertex2f(G2); // x, y**  **glVertex2f(F2); // x, y**  **glVertex2f(F2); // x, y**  **glVertex2f(E2); // x, y**  **glEnd();**  **glBegin(GL\_POLYGON); // Each set of 4 vertices form a quad**  **glColor3f(0.4f, 0.7f, 1.0f); // Redd**  **glVertex2f(I2); // x, y**  **glVertex2f(L2); // x, y**  **glVertex2f(K2); // x, y**  **glVertex2f(J2); // x, y**  **glBegin(GL\_LINES); // Each set of 4 vertices form a quad**  **glColor3f(0.0f, 0.0f, 0.0f); // Red**  **glVertex2f(I2); // x, y**  **glVertex2f(L2); // x, y**  **glVertex2f(L2); // x, y**  **glVertex2f(K2); // x, y**  **glVertex2f(K2); // x, y**  **glVertex2f(J2); // x, y**  **glVertex2f(J2); // x, y**  **glVertex2f(I2); // x, y**  **glEnd();**  **glBegin(GL\_POLYGON); // Each set of 4 vertices form a quad**  **glColor3f(0.4f, 0.7f, 1.0f); // Redd**  **glVertex2f(U); // x, y**  **glVertex2f(Z); // x, y**  **glVertex2f(W); // x, y**  **glVertex2f(V); // x, y**  **glBegin(GL\_LINES); // Each set of 4 vertices form a quad**  **glColor3f(0.0f, 0.0f, 0.0f); // Red**  **glVertex2f(U); // x, y**  **glVertex2f(Z); // x, y**  **glVertex2f(Z); // x, y**  **glVertex2f(W); // x, y**  **glVertex2f(W); // x, y**  **glVertex2f(V); // x, y**  **glVertex2f(V); // x, y**  **glVertex2f(U); // x, y**  **glEnd();**  **glBegin(GL\_POLYGON); // Each set of 4 vertices form a quad**  **glColor3f(0.4f, 0.7f, 1.0f); // Redd**  **glVertex2f(A2); // x, y**  **glVertex2f(D2); // x, y**  **glVertex2f(C2); // x, y**  **glVertex2f(B2); // x, y**  **glBegin(GL\_LINES); // Each set of 4 vertices form a quad**  **glColor3f(0.0f, 0.0f, 0.0f); // Red**  **glVertex2f(A2); // x, y**  **glVertex2f(D2); // x, y**  **glVertex2f(D2); // x, y**  **glVertex2f(C2); // x, y**  **glVertex2f(C2); // x, y**  **glVertex2f(B2); // x, y**  **glVertex2f(B2); // x, y**  **glVertex2f(A2); // x, y**  **glEnd();**  **glBegin(GL\_POLYGON); // Each set of 4 vertices form a quad**  **glColor3f(0.0f, 0.4f, 0.4f); // Red**  **glVertex2f(E); // x, y**  **glVertex2f(B); // x, y**  **glVertex2f(A); // x, y**  **glEnd();**  **glBegin(GL\_LINES); // Each set of 4 vertices form a quad**  **glColor3f(0.0f, 0.0f, 0.0f); // Red**  **glVertex2f(E); // x, y**  **glVertex2f(B); // x, y**  **glVertex2f(B); // x, y**  **glVertex2f(A); // x, y**  **glVertex2f(E); // x, y**  **glEnd();**  **glBegin(GL\_POLYGON); // Each set of 4 vertices form a quad**  **glColor3f(0.0f, 0.4f, 0.4f); // Red**  **glVertex2f(F); // x, y**  **glVertex2f(R); // x, y**  **glVertex2f(D); // x, y**  **glEnd();**  **glBegin(GL\_LINES); // Each set of 4 vertices form a quad**  **glColor3f(0.0f, 0.0f, 0.0f); // Red**  **glVertex2f(F); // x, y**  **glVertex2f(R); // x, y**  **glVertex2f(R); // x, y**  **glVertex2f(D); // x, y**  **glVertex2f(D); // x, y**  **glVertex2f(F); // x, y**  **glEnd();**  **glBegin(GL\_POLYGON); // Each set of 4 vertices form a quad**  **glColor3f(0.0f, 0.4f, 0.4f); // Red**  **glVertex2f(I); // x, y**  **glVertex2f(G); // x, y**  **glVertex2f(E); // x, y**  **glEnd();**  **glBegin(GL\_LINES); // Each set of 4 vertices form a quad**  **glColor3f(0.0f, 0.0f, 0.0f); // Red**  **glVertex2f(I); // x, y**  **glVertex2f(G); // x, y**  **glVertex2f(G); // x, y**  **glVertex2f(E); // x, y**  **glVertex2f(E); // x, y**  **glVertex2f(I); // x, y**  **glEnd();**  **glBegin(GL\_POLYGON); // Each set of 4 vertices form a quad**  **glColor3f(0.0f, 0.4f, 0.4f); // Red**  **glVertex2f(J); // x, y**  **glVertex2f(Q); // x, y**  **glVertex2f(F); // x, y**  **glEnd();**  **glBegin(GL\_LINES); // Each set of 4 vertices form a quad**  **glColor3f(0.0f, 0.0f, 0.0f); // Red**  **glVertex2f(J); // x, y**  **glVertex2f(Q); // x, y**  **glVertex2f(Q); // x, y**  **glVertex2f(F); // x, y**  **glVertex2f(F); // x, y**  **glVertex2f(J); // x, y**  **glEnd();**  **glBegin(GL\_LINES);**  **glColor3f(0.0f, 0.0f, 0.0f);**  **glVertex2f(A1); // x, y**  **glVertex2f(B1); // x, y**  **glEnd();**  **glFlush(); // Render now**  **}**  **/\* Main function: GLUT runs as a console application starting at main() \*/**  **int main(int argc, char\*\* argv) {**  **glutInit(&argc, argv); // Initialize GLUT**  **glutCreateWindow("OpenGL Setup Test"); // Create a window with the given title**  **glutInitWindowSize(320, 320); // Set the window's initial width & height**  **glutReshapeWindow (1024,720);**  **glutDisplayFunc(task1); // Register display callback handler for window re-paint**  **gluOrtho2D(-10,10,-10,10);**  **glutMainLoop(); // Enter the event-processing loop**  **return 0;**  **}** |
| **Output Screenshot (Full Screen)-** |

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| **Question- 2**  Draw a tree |
| **Graph Plot (Picture)-** |
| **Code-**  **#include <windows.h> // for MS Windows**  **#include <GL/glut.h> // GLUT, include glu.h and gl.h**  **#include <math.h>**  **void task2()**  **{**  **glClearColor(0.0f, 0.0f, 0.0f, 0.0f); // Set background color to black and opaque**  **glClear(GL\_COLOR\_BUFFER\_BIT); // Clear the color buffer (background)**  **glLineWidth(1);**  **glBegin(GL\_POLYGON);**  **glColor3f(0.35f, 0.0f, 0.0f);**  **glVertex2f(-50.0f, -10.0f);**  **glVertex2f(-54.0f, -10.0f);**  **glVertex2f(-54.0f, 2.0f);**  **glVertex2f(-50.0f, 2.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **for(int i=0;i<200;i++)**  **{**  **glColor3f(0.0,1.0,0.0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=8.6659815004197;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x-52,y+6);**  **}**  **glEnd();**  **glBegin(GL\_POLYGON);**  **for(int i=0;i<200;i++)**  **{**  **glColor3f(0.0,1.0,0.0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=5.830845944313;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x-58,y+2);**  **}**  **glEnd();**  **glBegin(GL\_POLYGON);**  **for(int i=0;i<200;i++)**  **{**  **glColor3f(0.0,1.0,0.0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=5.4226234335593;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x-56,y+10);**  **}**  **glEnd();**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3f(0.0,1.0,0.0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=6.4799888240209;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x-52,y+12);**  **}**  **glEnd();**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3f(0.0,1.0,0.0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=5.2014196599334;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x-48,y+10);**  **}**  **glEnd();**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3f(0.0,1.0,0.0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=5.9123382529913;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x-46,y+2);**  **}**  **glEnd();**  **glFlush(); // Render now**  **}**  **/\* Main function: GLUT runs as a console application starting at main() \*/**  **int main(int argc, char\*\* argv) {**  **glutInit(&argc, argv); // Initialize GLUT**  **glutCreateWindow("OpenGL Setup Test"); // Create a window with the given title**  **glutInitWindowSize(320, 320);// Set the window's initial width & height**  **glutReshapeWindow (1024,720);**  **glutDisplayFunc(task2); // Register display callback handler for window re-paint**  **gluOrtho2D(-90,-15,-25,30);**  **glutMainLoop(); // Enter the event-processing loop**  **return 0;**  **}** |
| **Output Screenshot (Full Screen)-** |

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| **Question- 3**  Draw a lamppost with black background |
| **Graph Plot (Picture)-** |
| **Code-**  **#include <windows.h> // for MS Windows**  **#include <GL/glut.h> // GLUT, include glu.h and gl.h**  **#include <math.h>**  **void task3()**  **{**  **glClearColor(0.0f, 0.0f, 0.0f, 0.0f); // Set background color to black and opaque**  **glClear(GL\_COLOR\_BUFFER\_BIT); // Clear the color buffer (background)**  **glLineWidth(1);**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 0.5f, 0.5f);**  **glVertex2f(3.5f, -10.0f);**  **glVertex2f(2.0f, -10.0f);**  **glVertex2f(2.3f, -9.5f);**  **glVertex2f(3.2f, -9.5f);**  **glEnd();**  **// OUTLINE**  **glBegin(GL\_LINES);**  **glColor3f(1.f, 1.0f, 1.0f);**  **glVertex2f(3.5f, -10.0f);**  **glVertex2f(2.0f, -10.0f);**  **glVertex2f(2.0f, -10.0f);**  **glVertex2f(2.3f, -9.5f);**  **glVertex2f(2.3f, -9.5f);**  **glVertex2f(3.2f, -9.5f);**  **glVertex2f(3.2f, -9.5f);**  **glVertex2f(3.5f, -10.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 0.5f, 0.5f);**  **glVertex2f(3.1f, -9.5f);**  **glVertex2f(2.4f, -9.5f);**  **glVertex2f(2.5f, -9.3f);**  **glVertex2f(3.0f, -9.3f);**  **glEnd();**  **// OUTLINE**  **glBegin(GL\_LINES);**  **glColor3f(1.0f, 1.0f, 1.0f);**  **glVertex2f(3.1f, -9.5f);**  **glVertex2f(2.4f, -9.5f);**  **glVertex2f(2.4f, -9.5f);**  **glVertex2f(2.5f, -9.3f);**  **glVertex2f(2.5f, -9.3f);**  **glVertex2f(3.0f, -9.3f);**  **glVertex2f(3.0f, -9.3f);**  **glVertex2f(3.1f, -9.5f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 0.5f, 0.5f);**  **glVertex2f(2.9f, -9.3f);**  **glVertex2f(2.6f, -9.3f);**  **glVertex2f(2.6f, 0.0f);**  **glVertex2f(2.9f, 0.0f);**  **glEnd();**  **// OUTLINE**  **glBegin(GL\_LINES);**  **glColor3f(1.0f, 1.0f, 1.0f);**  **glVertex2f(2.9f, -9.3f);**  **glVertex2f(2.6f, -9.3f);**  **glVertex2f(2.6f, -9.3f);**  **glVertex2f(2.6f, 0.0f);**  **glVertex2f(2.6f, 0.0f);**  **glVertex2f(2.9f, 0.0f);**  **glVertex2f(2.9f, 0.0f);**  **glVertex2f(2.9f, -9.3f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(1.0f, 0.0f, 0.0f); //RED**  **glVertex2f(3.0f, 0.0f);**  **glVertex2f(2.5f, 0.0f);**  **glVertex2f(2.5f, 0.2f);**  **glVertex2f(3.0f, 0.2f);**  **glEnd();**  **// OUTLINE**  **glBegin(GL\_LINES);**  **glColor3f(1.0f, 1.0f, 1.0f);**  **glVertex2f(3.0f, 0.0f);**  **glVertex2f(2.5f, 0.0f);**  **glVertex2f(2.5f, 0.0f);**  **glVertex2f(2.5f, 0.2f);**  **glVertex2f(2.5f, 0.2f);**  **glVertex2f(3.0f, 0.2f);**  **glVertex2f(3.0f, 0.2f);**  **glVertex2f(3.0f, 0.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(1.0f, 0.0, 0.0f); // RED**  **glVertex2f(3.2f, 0.2f);**  **glVertex2f(2.3f, 0.2f);**  **glVertex2f(2.3f, 0.4f);**  **glVertex2f(3.2f, 0.4f);**  **glEnd();**  **// OUTLINE**  **glBegin(GL\_LINES);**  **glColor3f(1.0f, 1.0f, 1.0f);**  **glVertex2f(3.2f, 0.2f);**  **glVertex2f(2.3f, 0.2f);**  **glVertex2f(2.3f, 0.2f);**  **glVertex2f(2.3f, 0.4f);**  **glVertex2f(2.3f, 0.4f);**  **glVertex2f(3.2f, 0.4f);**  **glVertex2f(3.2f, 0.4f);**  **glVertex2f(3.2f, 0.2f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 1.0f, 1.0f);**  **glVertex2f(3.2f, 0.4f);**  **glVertex2f(2.3f, 0.4f);**  **glVertex2f(1.7f, 1.8f);**  **glVertex2f(3.8f, 1.8f);**  **glEnd();**  **// TRIANGLE**  **glBegin(GL\_POLYGON);**  **glColor3f(0.8f, 0.0f, 0.0f);**  **glVertex2f(4.0f, 1.8f);**  **glVertex2f(1.5f, 1.8f);**  **glVertex2f(2.75f, 3.0f);**  **glEnd();**  **// L1**  **glBegin(GL\_POLYGON);**  **glColor3f(1.f, 1.0f, 0.0f);**  **glVertex2f(2.695f, 0.45f);**  **glVertex2f(2.32, 0.45f);**  **glVertex2f(2.0429f, 1.105f);**  **glVertex2f(2.695f, 1.105f);**  **glEnd();**  **// L2**  **glBegin(GL\_POLYGON);**  **glColor3f(1.f, 1.0f, 0.0f);**  **glVertex2f(2.695f, 1.205f);**  **glVertex2f(2.0006, 1.205f);**  **glVertex2f(1.77f, 1.75f);**  **glVertex2f(2.695f, 1.75f);**  **glEnd();**  **// L3**  **glBegin(GL\_POLYGON);**  **glColor3f(1.f, 1.0f, 0.0f);**  **glVertex2f(3.4778077f, 1.205f);**  **glVertex2f(2.795, 1.205f);**  **glVertex2f(2.795f, 1.75f);**  **glVertex2f(3.7f, 1.75f);**  **glEnd();**  **// L4**  **glBegin(GL\_POLYGON);**  **glColor3f(1.f, 1.0f, 0.0f);**  **glVertex2f(3.17f, 0.45f);**  **glVertex2f(2.795, 0.45f);**  **glVertex2f(2.795f, 1.105f);**  **glVertex2f(3.437f, 1.105f);**  **glEnd();**  **glFlush(); // Render now**  **}**  **/\* Main function: GLUT runs as a console application starting at main() \*/**  **int main(int argc, char\*\* argv) {**  **glutInit(&argc, argv); // Initialize GLUT**  **glutCreateWindow("OpenGL Setup Test"); // Create a window with the given title**  **glutInitWindowSize(320, 320);// Set the window's initial width & height**  **glutReshapeWindow (1024,720);**  **glutDisplayFunc(task3); // Register display callback handler for window re-paint**  **gluOrtho2D(0,5,-10,5);**  **glutMainLoop(); // Enter the event-processing loop**  **return 0;**  **}** |
| **Output Screenshot (Full Screen)-**  **A computer screen shot of a lamp post  Description automatically generated** |

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| **Question- 4**  Draw a bench |
| **Graph Plot (Picture)-** |
| **Code-**  **#include <windows.h> // for MS Windows**  **#include <GL/glut.h> // GLUT, include glu.h and gl.h**  **#include <math.h>**  **void task4()**  **{**  **glClearColor(0.0f, 0.0f, 0.0f, 0.0f); // Set background color to black and opaque**  **glClear(GL\_COLOR\_BUFFER\_BIT); // Clear the color buffer (background)**  **glLineWidth(1);**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 0.5f, 0.5f);**  **glVertex2f(8.0f, -10.0f);**  **glVertex2f(7.6f, -10.0f);**  **glVertex2f(7.6f, -8.2f);**  **glVertex2f(8.0f, -8.2f);**  **glEnd();**  **// BAR2**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 0.5f, 0.5f);**  **glVertex2f(9.3f, -10.0f);**  **glVertex2f(9.0f, -10.0f);**  **glVertex2f(9.0f, -8.2f);**  **glVertex2f(9.3f, -8.2f);**  **glEnd();**  **// BAR3**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 0.5f, 0.5f);**  **glVertex2f(15.0f, -10.0f);**  **glVertex2f(14.7f, -10.0f);**  **glVertex2f(14.7f, -8.2f);**  **glVertex2f(15.0f, -8.2f);**  **glEnd();**  **// BAR4**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 0.5f, 0.5f);**  **glVertex2f(16.4f, -10.0f);**  **glVertex2f(16.0f, -10.0f);**  **glVertex2f(16.0f, -8.2f);**  **glVertex2f(16.4f, -8.2f);**  **glEnd();**  **// BAR5**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 0.5f, 0.5f);**  **glVertex2f(9.3f, -6.0f);**  **glVertex2f(9.0f, -6.0f);**  **glVertex2f(9.0f, -2.5f);**  **glVertex2f(9.3f, -2.5f);**  **glEnd();**  **// BAR6**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 0.5f, 0.5f);**  **glVertex2f(15, -6.0f);**  **glVertex2f(14.7f, -6.0f);**  **glVertex2f(14.7f, -2.5f);**  **glVertex2f(15.0f, -2.5f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 0.5f, 0.5f);**  **glVertex2f(17.0f, -8.2f);**  **glVertex2f(7.0f, -8.2f);**  **glVertex2f(7.0f, -8.0f);**  **glVertex2f(17.0f, -8.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.8f, 0.5f, 0.0);**  **glVertex2f(17.0f, -8.0f);**  **glVertex2f(16.0f, -6.0f);**  **glVertex2f(8.0f, -6.0f);**  **glVertex2f(7.0f, -8.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.8f, 0.5f, 0.0f);**  **glVertex2f(8.0f, -5.5f);**  **glVertex2f(8.0f, -5.0f);**  **glVertex2f(16.0f, -5.0f);**  **glVertex2f(16.0f, -5.5f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.8f, 0.5f, 0.0f);**  **glVertex2f(16.0f, -4.8f);**  **glVertex2f(16.0f, -4.3f);**  **glVertex2f(8.0f, -4.3f);**  **glVertex2f(8.0f, -4.8);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.8f, 0.5f, 0.0f);**  **glVertex2f(8.0f, -4.1f);**  **glVertex2f(8.0f, -3.6f);**  **glVertex2f(16.0f, -3.6f);**  **glVertex2f(16.0f, -4.1f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.8f, 0.5f, 0.0f);**  **glVertex2f(16.0f, -3.4f);**  **glVertex2f(16.0f, -2.9f);**  **glVertex2f(8.0f, -2.9f);**  **glVertex2f(8.0f, -3.4f);**  **glEnd();**  **glFlush(); // Render now**  **}**  **/\* Main function: GLUT runs as a console application starting at main() \*/**  **int main(int argc, char\*\* argv) {**  **glutInit(&argc, argv); // Initialize GLUT**  **glutCreateWindow("OpenGL Setup Test"); // Create a window with the given title**  **glutInitWindowSize(320, 320);// Set the window's initial width & height**  **glutReshapeWindow (1024,720);**  **glutDisplayFunc(task4); // Register display callback handler for window re-paint**  **gluOrtho2D(-5,30,-15,5);**  **glutMainLoop(); // Enter the event-processing loop**  **return 0;**  **}** |
| **Output Screenshot (Full Screen)-** |

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| **Question- 5**  Use the building, tree, lamppost and bench to create a scenario |
| **Graph Plot (Picture)-** |
| **Code-**  **#include <windows.h> // for MS Windows**  **#include <GL/glut.h> // GLUT, include glu.h and gl.h**  **#include <math.h>**  **building()**  **{**  **// ################################**  **// ## ##**  **// ## L E F T PORTION ##**  **// ## ##**  **// ################################**  **//**  **// LOWER RECTANGLE**  **//**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 1.0f, 0.0f);**  **glVertex2f(-26.0f, -10.0f);**  **glVertex2f(-35.0f, -10.0f);**  **glVertex2f(-35.0f, -9.5f);**  **glVertex2f(-26.0f, -9.5f);**  **glEnd();**  **// OUTLINE**  **glBegin(GL\_LINES);**  **glColor3f(1.0f, 1.0f, 1.0f);**  **glVertex2f(-35.0f, -9.5f);**  **glVertex2f(-35.0f, -10.0f);**  **glVertex2f(-35.0f, -10.0f);**  **glVertex2f(-26.0f, -10.0f);**  **glVertex2f(-26.0f, -10.0f);**  **glVertex2f(-26.0f, -9.5f);**  **glEnd();**  **//**  **// UPPER RECTANGLE**  **//**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 1.0f, 0.0f);**  **glVertex2f(-26.0f, 35.0f);**  **glVertex2f(-35.0f, 35.0f);**  **glVertex2f(-35.0f, 36.0f);**  **glVertex2f(-26.0f, 36.0f);**  **glEnd();**  **// OUTLINE**  **glBegin(GL\_LINES);**  **glColor3f(1.0f, 1.0f, 1.0f);**  **glVertex2f(-35.0f, 35.0f);**  **glVertex2f(-35.0f, 36.0f);**  **glVertex2f(-35.0f, 36.0f);**  **glVertex2f(-26.0f, 36.0f);**  **glEnd();**  **//**  **// LEFT BODY**  **//**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 0.0f, 0.0f);**  **glVertex2f(-26.0f, -9.5f);**  **glVertex2f(-35.0f, -9.5f);**  **glVertex2f(-35.0f, 35.0f);**  **glVertex2f(-26.0f, 35.0f);**  **glEnd();**  **//**  **// LEFT BODY OUTLINE**  **//**  **glBegin(GL\_LINES);**  **glColor3f(1.0f, 1.0f, 1.0f);**  **glVertex2f(-26.0f, -9.5f);**  **glVertex2f(-35.0f, -9.5f);**  **glVertex2f(-35.0f, -9.5f);**  **glVertex2f(-35.0f, 35.0f);**  **glVertex2f(-35.0f, 35.0f);**  **glVertex2f(-26.0f, 35.0f);**  **glVertex2f(-26.0f, 35.0f);**  **glVertex2f(-26.0f, -9.5f);**  **glEnd();**  **//**  **// WINDOW1**  **//**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 1.0f, 1.0f); //CYAN**  **glVertex2f(-29.0f, -7.0f);**  **glVertex2f(-32.0f, -7.0f);**  **glVertex2f(-32.0f, -3.0f);**  **glVertex2f(-29.0f, -3.0f);**  **glEnd();**  **//**  **// WINDOW1 BORDER**  **//**  **glBegin(GL\_LINES);**  **glColor3f(0.0f, 0.0f, 0.0f); //BLACK**  **glVertex2f(-29.0f, -7.0f);**  **glVertex2f(-32.0f, -7.0f);**  **glVertex2f(-32.0f, -7.0f);**  **glVertex2f(-32.0f, -3.0f);**  **glVertex2f(-32.0f, -3.0f);**  **glVertex2f(-29.0f, -3.0f);**  **glVertex2f(-29.0f, -3.0f);**  **glVertex2f(-29.0f, -7.0f);**  **glVertex2f(-30.5f, -3.0f); // DIVIDER**  **glVertex2f(-30.5f, -7.0f); // DIVIDER**  **glEnd();**  **//**  **// WINDOW2**  **//**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 1.0f, 1.0f); //CYAN**  **glVertex2f(-29.0f, 2.0f);**  **glVertex2f(-32.0f, 2.0f);**  **glVertex2f(-32.0f, 6.0f);**  **glVertex2f(-29.0f, 6.0f);**  **glEnd();**  **//**  **// WINDOW2 BORDER**  **//**  **glBegin(GL\_LINES);**  **glColor3f(0.0f, 0.0f, 0.0f); //BLACK**  **glVertex2f(-29.0f, 2.0f);**  **glVertex2f(-32.0f, 2.0f);**  **glVertex2f(-32.0f, 2.0f);**  **glVertex2f(-32.0f, 6.0f);**  **glVertex2f(-32.0f, 6.0f);**  **glVertex2f(-29.0f, 6.0f);**  **glVertex2f(-29.0f, 6.0f);**  **glVertex2f(-29.0f, 2.0f);**  **glVertex2f(-30.5f, 6.0f); // DIVIDER**  **glVertex2f(-30.5f, 2.0f); // DIVIDER**  **glEnd();**  **//**  **// WINDOW3**  **//**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 1.0f, 1.0f); //CYAN**  **glVertex2f(-29.0f, 11.0f);**  **glVertex2f(-32.0f, 11.0f);**  **glVertex2f(-32.0f, 15.0f);**  **glVertex2f(-29.0f, 15.0f);**  **glEnd();**  **//**  **// WINDOW3 BORDER**  **//**  **glBegin(GL\_LINES);**  **glColor3f(0.0f, 0.0f, 0.0f); //BLACK**  **glVertex2f(-29.0f, 11.0f);**  **glVertex2f(-32.0f, 11.0f);**  **glVertex2f(-32.0f, 11.0f);**  **glVertex2f(-32.0f, 15.0f);**  **glVertex2f(-32.0f, 15.0f);**  **glVertex2f(-29.0f, 15.0f);**  **glVertex2f(-29.0f, 15.0f);**  **glVertex2f(-29.0f, 11.0f);**  **glVertex2f(-30.5f, 15.0f); // DIVIDER**  **glVertex2f(-30.5f, 11.0f); // DIVIDER**  **glEnd();**  **//**  **// WINDOW4**  **//**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 1.0f, 1.0f); //CYAN**  **glVertex2f(-29.0f, 20.0f);**  **glVertex2f(-32.0f, 20.0f);**  **glVertex2f(-32.0f, 24.0f);**  **glVertex2f(-29.0f, 24.0f);**  **glEnd();**  **//**  **// WINDOW4 BORDER**  **//**  **glBegin(GL\_LINES);**  **glColor3f(0.0f, 0.0f, 0.0f); //BLACK**  **glVertex2f(-29.0f, 20.0f);**  **glVertex2f(-32.0f, 20.0f);**  **glVertex2f(-32.0f, 20.0f);**  **glVertex2f(-32.0f, 24.0f);**  **glVertex2f(-32.0f, 24.0f);**  **glVertex2f(-29.0f, 24.0f);**  **glVertex2f(-29.0f, 24.0f);**  **glVertex2f(-29.0f, 20.0f);**  **glVertex2f(-30.5f, 24.0f); // DIVIDER**  **glVertex2f(-30.5f, 20.0f); // DIVIDER**  **glEnd();**  **//**  **// WINDOW5**  **//**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 1.0f, 1.0f); //CYAN**  **glVertex2f(-29.0f, 29.0f);**  **glVertex2f(-32.0f, 29.0f);**  **glVertex2f(-32.0f, 33.0f);**  **glVertex2f(-29.0f, 33.0f);**  **glEnd();**  **//**  **// WINDOW5 BORDER**  **//**  **glBegin(GL\_LINES);**  **glColor3f(0.0f, 0.0f, 0.0f); //BLACK**  **glVertex2f(-29.0f, 29.0f);**  **glVertex2f(-32.0f, 29.0f);**  **glVertex2f(-32.0f, 29.0f);**  **glVertex2f(-32.0f, 33.0f);**  **glVertex2f(-32.0f, 33.0f);**  **glVertex2f(-29.0f, 33.0f);**  **glVertex2f(-29.0f, 33.0f);**  **glVertex2f(-29.0f, 29.0f);**  **glVertex2f(-30.5f, 33.0f); // DIVIDER**  **glVertex2f(-30.5f, 29.0f); // DIVIDER**  **glEnd();**  **// ################################**  **// ## ##**  **// ## MIDDLE PORTION ##**  **// ## ##**  **// ################################**  **//**  **// UPPER RECTANGLE**  **//**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 1.0f, 0.0f);**  **glVertex2f(-14.0f, 37.0f);**  **glVertex2f(-26.0f, 37.0f);**  **glVertex2f(-26.0f, 38.0f);**  **glVertex2f(-14.0f, 38.0f);**  **glEnd();**  **// OUTLINE**  **glBegin(GL\_LINES);**  **glColor3f(1.0f, 1.0f, 1.0f);**  **glVertex2f(-26.0f, 36.0f);**  **glVertex2f(-26.0f, 38.0f);**  **glVertex2f(-26.0f, 38.0f);**  **glVertex2f(-14.0f, 38.0f);**  **glVertex2f(-14.0f, 38.0f);**  **glVertex2f(-14.0f, 36.0f);**  **glVertex2f(-14.0f, 37.0f);**  **glVertex2f(-26.0f, 37.0f);**  **glEnd();**  **//**  **// MIDDLE BODY**  **//**  **glBegin(GL\_POLYGON);**  **glColor3f(0.7f, 0.0f, 0.0f);**  **glVertex2f(-14.0f, -10.0f);**  **glVertex2f(-26.0f, -10.0f);**  **glVertex2f(-26.0f, 37.0f);**  **glVertex2f(-14.0f, 37.0f);**  **glEnd();**  **// OUTLINE**  **glBegin(GL\_LINES);**  **glColor3f(1.0f, 1.0f, 1.0f);**  **glVertex2f(-14.0f, 37.0f);**  **glVertex2f(-14.0f, -10.0f);**  **glEnd();**  **//**  **// WINDOW11**  **//**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 0.5f, 0.5f); //Gray**  **glVertex2f(-16.0f, -1.0f);**  **glVertex2f(-24.0f, -1.0f);**  **glVertex2f(-24.0f, 0.0f);**  **glVertex2f(-16.0f, 0.0f);**  **glEnd();**  **//**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 1.0f, 1.0f); //CYAN**  **glVertex2f(-18.0f, 0.0f);**  **glVertex2f(-22.0f, 0.0f);**  **glVertex2f(-22.0f, 5.0f);**  **glVertex2f(-18.0f, 5.0f);**  **glEnd();**  **//**  **// WINDOW11 BORDER**  **//**  **glBegin(GL\_LINES);**  **glColor3f(0.0f, 0.0f, 0.0f); //BLACK**  **glVertex2f(-18.0f, 0.0f);**  **glVertex2f(-22.0f, 0.0f);**  **glVertex2f(-22.0f, 0.0f);**  **glVertex2f(-22.0f, 5.0f);**  **glVertex2f(-22.0f, 5.0f);**  **glVertex2f(-18.0f, 5.0f);**  **glVertex2f(-18.0f, 5.0f);**  **glVertex2f(-18.0f, 0.0f);**  **glVertex2f(-20.0f, 0.0f); // DIVIDER**  **glVertex2f(-20.0f, 5.0f); // DIVIDER**  **glEnd();**  **//**  **// WINDOW12**  **//**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 0.5f, 0.5f); //Gray**  **glVertex2f(-16.0f, 8.0f);**  **glVertex2f(-24.0f, 8.0f);**  **glVertex2f(-24.0f, 9.0f);**  **glVertex2f(-16.0f, 9.0f);**  **glEnd();**  **//**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 1.0f, 1.0f); //CYAN**  **glVertex2f(-18.0f, 9.0f);**  **glVertex2f(-22.0f, 9.0f);**  **glVertex2f(-22.0f, 14.0f);**  **glVertex2f(-18.0f, 14.0f);**  **glEnd();**  **//**  **// WINDOW12 BORDER**  **//**  **glBegin(GL\_LINES);**  **glColor3f(0.0f, 0.0f, 0.0f); //BLACK**  **glVertex2f(-18.0f, 9.0f);**  **glVertex2f(-22.0f, 9.0f);**  **glVertex2f(-22.0f, 9.0f);**  **glVertex2f(-22.0f, 14.0f);**  **glVertex2f(-22.0f, 14.0f);**  **glVertex2f(-18.0f, 14.0f);**  **glVertex2f(-18.0f, 14.0f);**  **glVertex2f(-18.0f, 9.0f);**  **glVertex2f(-20.0f, 14.0f); // DIVIDER**  **glVertex2f(-20.0f, 9.0f); // DIVIDER**  **glEnd();**  **//**  **// WINDOW13**  **//**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 0.5f, 0.5f); //Gray**  **glVertex2f(-16.0f, 17.0f);**  **glVertex2f(-24.0f, 17.0f);**  **glVertex2f(-24.0f, 18.0f);**  **glVertex2f(-16.0f, 18.0f);**  **glEnd();**  **//**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 1.0f, 1.0f); //CYAN**  **glVertex2f(-18.0f, 18.0f);**  **glVertex2f(-22.0f, 18.0f);**  **glVertex2f(-22.0f, 23.0f);**  **glVertex2f(-18.0f, 23.0f);**  **glEnd();**  **//**  **// WINDOW13 BORDER**  **//**  **glBegin(GL\_LINES);**  **glColor3f(0.0f, 0.0f, 0.0f); //BLACK**  **glVertex2f(-18.0f, 18.0f);**  **glVertex2f(-22.0f, 18.0f);**  **glVertex2f(-22.0f, 18.0f);**  **glVertex2f(-22.0f, 23.0f);**  **glVertex2f(-22.0f, 23.0f);**  **glVertex2f(-18.0f, 23.0f);**  **glVertex2f(-18.0f, 23.0f);**  **glVertex2f(-18.0f, 18.0f);**  **glVertex2f(-20.0f, 18.0f); // DIVIDER**  **glVertex2f(-20.0f, 23.0f); // DIVIDER**  **glEnd();**  **//**  **// WINDOW14**  **//**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 0.5f, 0.5f); //Gray**  **glVertex2f(-16.0f, 26.0f);**  **glVertex2f(-24.0f, 26.0f);**  **glVertex2f(-24.0f, 27.0f);**  **glVertex2f(-16.0f, 27.0f);**  **glEnd();**  **//**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 1.0f, 1.0f); //CYAN**  **glVertex2f(-18.0f, 27.0f);**  **glVertex2f(-22.0f, 27.0f);**  **glVertex2f(-22.0f, 32.0f);**  **glVertex2f(-18.0f, 32.0f);**  **glEnd();**  **//**  **// WINDOW14 BORDER**  **//**  **glBegin(GL\_LINES);**  **glColor3f(0.0f, 0.0f, 0.0f); //BLACK**  **glVertex2f(-18.0f, 27.0f);**  **glVertex2f(-22.0f, 27.0f);**  **glVertex2f(-22.0f, 27.0f);**  **glVertex2f(-22.0f, 32.0f);**  **glVertex2f(-22.0f, 32.0f);**  **glVertex2f(-18.0f, 32.0f);**  **glVertex2f(-18.0f, 32.0f);**  **glVertex2f(-18.0f, 27.0f);**  **glVertex2f(-20.0f, 27.0f); // DIVIDER**  **glVertex2f(-20.0f, 32.0f); // DIVIDER**  **glEnd();**  **// ################################**  **// ## ##**  **// ## R I G H T PORTION ##**  **// ## ##**  **// ################################**  **//**  **// UPPER RECTANGLE**  **//**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 1.0f, 0.0f);**  **glVertex2f(-5.0f, 35.0f);**  **glVertex2f(-14.0f, 35.0f);**  **glVertex2f(-14.0f, 36.0f);**  **glVertex2f(-5.0f, 36.0f);**  **glEnd();**  **// OUTLINE**  **glBegin(GL\_LINES);**  **glColor3f(1.0f, 1.0f, 1.0f);**  **glVertex2f(-5.0f, 35.0);**  **glVertex2f(-14.0f, 35.0);**  **glVertex2f(-14.0f, 35.0);**  **glVertex2f(-14.0f, 36.0);**  **glVertex2f(-14.0f, 36.0);**  **glVertex2f(-5.0f, 36.0);**  **glVertex2f(-5.0f, 36.0);**  **glVertex2f(-5.0f, 35.0);**  **glEnd();**  **//**  **// RGHT BODY**  **//**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 0.0f, 0.0f);**  **glVertex2f(-14.0f, 35.0f);**  **glVertex2f(-5.0f, 35.0f);**  **glVertex2f(-5.0f, -9.5f);**  **glVertex2f(-14.0f, -9.5f);**  **glEnd();**  **// OUTLINE**  **glBegin(GL\_LINES);**  **glColor3f(1.0f, 1.0f, 1.0f);**  **glVertex2f(-14.0f, 35.0f);**  **glVertex2f(-5.0f, 35.0f);**  **glVertex2f(-5.0f, 35.0f);**  **glVertex2f(-5.0f, 35.0f);**  **glVertex2f(-5.0f, 35.0f);**  **glVertex2f(-5.0f, -9.5f);**  **glVertex2f(-5.0f, -9.5f);**  **glVertex2f(-14.0f, -9.5f);**  **glVertex2f(-14.0f, -9.5f);**  **glVertex2f(-14.0f, 35.0f);**  **glEnd();**  **//**  **// RIGHT LOWER RECTANGLE**  **//**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 1.0f, 0.0f);**  **glVertex2f(-5.0f, -10.0f);**  **glVertex2f(-14.0f, -10.0f);**  **glVertex2f(-14.0f, -9.5f);**  **glVertex2f(-5.0f, -9.5f);**  **glEnd();**  **// OUTLINE**  **glBegin(GL\_LINES);**  **glColor3f(1.0f, 1.0f, 1.0f);**  **glVertex2f(-5.0f, -10.0f);**  **glVertex2f(-14.0f, -10.0f);**  **glVertex2f(-14.0f, -10.0f);**  **glVertex2f(-14.0f, -9.5f);**  **glVertex2f(-14.0f, -9.5f);**  **glVertex2f(-5.0f, -9.5f);**  **glVertex2f(-5.0f, -9.5f);**  **glVertex2f(-5.0f, -10.0f);**  **glEnd();**  **//**  **// WINDOW6**  **//**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 1.0f, 1.0f); //CYAN**  **glVertex2f(-8.0f, -7.0f);**  **glVertex2f(-11.0f, -7.0f);**  **glVertex2f(-11.0f, -3.0f);**  **glVertex2f(-8.0f, -3.0f);**  **glEnd();**  **//**  **// WINDOW6 BORDER**  **//**  **glBegin(GL\_LINES);**  **glColor3f(0.0f, 0.0f, 0.0f); //BLACK**  **glVertex2f(-8.0f, -7.0f);**  **glVertex2f(-11.0f, -7.0f);**  **glVertex2f(-11.0f, -7.0f);**  **glVertex2f(-11.0f, -3.0f);**  **glVertex2f(-11.0f, -3.0f);**  **glVertex2f(-8.0f, -3.0f);**  **glVertex2f(-8.0f, -3.0f);**  **glVertex2f(-8.0f, -7.0f);**  **glVertex2f(-9.5f, -3.0f); // DIVIDER**  **glVertex2f(-9.5f, -7.0f); // DIVIDER**  **glEnd();**  **//**  **// WINDOW7**  **//**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 1.0f, 1.0f); //CYAN**  **glVertex2f(-8.0f, 2.0f);**  **glVertex2f(-11.0f, 2.0f);**  **glVertex2f(-11.0f, 6.0f);**  **glVertex2f(-8.0f, 6.0f);**  **glEnd();**  **//**  **// WINDOW7 BORDER**  **//**  **glBegin(GL\_LINES);**  **glColor3f(0.0f, 0.0f, 0.0f); //BLACK**  **glVertex2f(-8.0f, 2.0f);**  **glVertex2f(-11.0f, 2.0f);**  **glVertex2f(-11.0f, 2.0f);**  **glVertex2f(-11.0f, 6.0f);**  **glVertex2f(-11.0f, 6.0f);**  **glVertex2f(-8.0f, 6.0f);**  **glVertex2f(-8.0f, 6.0f);**  **glVertex2f(-8.0f, 2.0f);**  **glVertex2f(-9.5f, 6.0f); // DIVIDER**  **glVertex2f(-9.5f, 2.0f); // DIVIDER**  **glEnd();**  **//**  **// WINDOW8**  **//**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 1.0f, 1.0f); //CYAN**  **glVertex2f(-8.0f, 11.0f);**  **glVertex2f(-11.0f, 11.0f);**  **glVertex2f(-11.0f, 15.0f);**  **glVertex2f(-8.0f, 15.0f);**  **glEnd();**  **//**  **// WINDOW8 BORDER**  **//**  **glBegin(GL\_LINES);**  **glColor3f(0.0f, 0.0f, 0.0f); //BLACK**  **glVertex2f(-8.0f, 11.0f);**  **glVertex2f(-11.0f, 11.0f);**  **glVertex2f(-11.0f, 11.0f);**  **glVertex2f(-11.0f, 15.0f);**  **glVertex2f(-11.0f, 15.0f);**  **glVertex2f(-8.0f, 15.0f);**  **glVertex2f(-8.0f, 15.0f);**  **glVertex2f(-8.0f, 11.0f);**  **glVertex2f(-9.5f, 11.0f); // DIVIDER**  **glVertex2f(-9.5f, 15.0f); // DIVIDER**  **glEnd();**  **//**  **// WINDOW9**  **//**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 1.0f, 1.0f); //CYAN**  **glVertex2f(-8.0f, 20.0f);**  **glVertex2f(-11.0f, 20.0f);**  **glVertex2f(-11.0f, 24.0f);**  **glVertex2f(-8.0f, 24.0f);**  **glEnd();**  **//**  **// WINDOW9 BORDER**  **//**  **glBegin(GL\_LINES);**  **glColor3f(0.0f, 0.0f, 0.0f); //BLACK**  **glVertex2f(-8.0f, 20.0f);**  **glVertex2f(-11.0f, 20.0f);**  **glVertex2f(-11.0f, 20.0f);**  **glVertex2f(-11.0f, 24.0f);**  **glVertex2f(-11.0f, 24.0f);**  **glVertex2f(-8.0f, 24.0f);**  **glVertex2f(-8.0f, 24.0f);**  **glVertex2f(-8.0f, 20.0f);**  **glVertex2f(-9.5f, 20.0f); // DIVIDER**  **glVertex2f(-9.5f, 24.0f); // DIVIDER**  **glEnd();**  **//**  **// WINDOW10**  **//**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 1.0f, 1.0f); //CYAN**  **glVertex2f(-8.0f, 29.0f);**  **glVertex2f(-11.0f, 29.0f);**  **glVertex2f(-11.0f, 33.0f);**  **glVertex2f(-8.0f, 33.0f);**  **glEnd();**  **//**  **// WINDOW10 BORDER**  **//**  **glBegin(GL\_LINES);**  **glColor3f(0.0f, 0.0f, 0.0f); //BLACK**  **glVertex2f(-8.0f, 29.0f);**  **glVertex2f(-11.0f, 29.0f);**  **glVertex2f(-11.0f, 29.0f);**  **glVertex2f(-11.0f, 33.0f);**  **glVertex2f(-11.0f, 33.0f);**  **glVertex2f(-8.0f, 33.0f);**  **glVertex2f(-8.0f, 33.0f);**  **glVertex2f(-8.0f, 29.0f);**  **glVertex2f(-9.5f, 33.0f); // DIVIDER**  **glVertex2f(-9.5f, 29.0f); // DIVIDER**  **glEnd();**  **// ################################**  **// ## ##**  **// ## D O O R ##**  **// ## ##**  **// ################################**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 1.0f, 0.0f);**  **glVertex2f(-22.0f, -10.0f);**  **glVertex2f(-22.2f, -10.0f);**  **glVertex2f(-22.2f, -3.8f);**  **glVertex2f(-22.0f, -4.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 1.0f, 0.0f);**  **glVertex2f(-22.0f, -4.0f);**  **glVertex2f(-22.2f, -3.8f);**  **glVertex2f(-17.8f, -3.8f);**  **glVertex2f(-18.0f, -4.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 1.0f, 0.0f);**  **glVertex2f(-18.0f, -10.0f);**  **glVertex2f(-17.8f, -10.0f);**  **glVertex2f(-17.8f, -3.8f);**  **glVertex2f(-18.0f, -4.0f);**  **glEnd();**  **// DOOR FILL**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 0.35f, 0.05f);**  **glVertex2f(-22.0f, -4.0f);**  **glVertex2f(-18.0f, -4.0f);**  **glVertex2f(-18.0f, -10.0f);**  **glVertex2f(-22.0f, -10.0f);**  **glEnd();**  **//DOOR DIVIDER LINE**  **glBegin(GL\_LINES);**  **glColor3f(1.0f, 1.0f, 1.0f);**  **glVertex2f(-20.0f, -4.0f);**  **glVertex2f(-20.0f, -10.0f);**  **glEnd();**  **// LOWER OUTLINE**  **glBegin(GL\_LINES);**  **glColor3f(1.0f, 1.0f, 1.0f); //WHITE**  **glVertex2f(-14.0f, -10.0f);**  **glVertex2f(-26.0f, -10.0f);**  **glEnd();**  **}**  **// ########################################################**  **// ########################################################**  **// T R E E**  **// ########################################################**  **// ########################################################**  **tree()**  **{**  **// ################################**  **// ## ##**  **// ## Perpendicular Portion ##**  **// ## ##**  **// ################################**  **glBegin(GL\_POLYGON);**  **glColor3f(0.35f, 0.0f, 0.0f);**  **glVertex2f(-50.0f, -10.0f);**  **glVertex2f(-54.0f, -10.0f);**  **glVertex2f(-54.0f, 2.0f);**  **glVertex2f(-50.0f, 2.0f);**  **glEnd();**  **// ################################**  **// ## ##**  **// ## Leaf CIRCLE ##**  **// ## ##**  **// ################################**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3f(0.0,1.0,0.0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=8.6659815004197;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x-52,y+6);**  **}**  **glEnd();**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3f(0.0,1.0,0.0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=5.830845944313;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x-58,y+2);**  **}**  **glEnd();**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3f(0.0,1.0,0.0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=5.4226234335593;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x-56,y+10);**  **}**  **glEnd();**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3f(0.0,1.0,0.0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=6.4799888240209;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x-52,y+12);**  **}**  **glEnd();**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3f(0.0,1.0,0.0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=5.2014196599334;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x-48,y+10);**  **}**  **glEnd();**  **glBegin(GL\_POLYGON);// Draw a Red 1x1 Square centered at origin**  **for(int i=0;i<200;i++)**  **{**  **glColor3f(0.0,1.0,0.0);**  **float pi=3.1416;**  **float A=(i\*2\*pi)/200;**  **float r=5.9123382529913;**  **float x = r \* cos(A);**  **float y = r \* sin(A);**  **glVertex2f(x-46,y+2);**  **}**  **glEnd();**  **}**  **// ########################################################**  **// ########################################################**  **// L A M P P O S T**  **// ########################################################**  **// ########################################################**  **lampPost()**  **{**  **// ################################**  **// ## ##**  **// ## LOWER PORTION ##**  **// ## ##**  **// ################################**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 0.5f, 0.5f);**  **glVertex2f(3.5f, -10.0f);**  **glVertex2f(2.0f, -10.0f);**  **glVertex2f(2.3f, -9.5f);**  **glVertex2f(3.2f, -9.5f);**  **glEnd();**  **// OUTLINE**  **glBegin(GL\_LINES);**  **glColor3f(1.f, 1.0f, 1.0f);**  **glVertex2f(3.5f, -10.0f);**  **glVertex2f(2.0f, -10.0f);**  **glVertex2f(2.0f, -10.0f);**  **glVertex2f(2.3f, -9.5f);**  **glVertex2f(2.3f, -9.5f);**  **glVertex2f(3.2f, -9.5f);**  **glVertex2f(3.2f, -9.5f);**  **glVertex2f(3.5f, -10.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 0.5f, 0.5f);**  **glVertex2f(3.1f, -9.5f);**  **glVertex2f(2.4f, -9.5f);**  **glVertex2f(2.5f, -9.3f);**  **glVertex2f(3.0f, -9.3f);**  **glEnd();**  **// OUTLINE**  **glBegin(GL\_LINES);**  **glColor3f(1.0f, 1.0f, 1.0f);**  **glVertex2f(3.1f, -9.5f);**  **glVertex2f(2.4f, -9.5f);**  **glVertex2f(2.4f, -9.5f);**  **glVertex2f(2.5f, -9.3f);**  **glVertex2f(2.5f, -9.3f);**  **glVertex2f(3.0f, -9.3f);**  **glVertex2f(3.0f, -9.3f);**  **glVertex2f(3.1f, -9.5f);**  **glEnd();**  **// ################################**  **// ## ##**  **// ## STAND PORTION ##**  **// ## ##**  **// ################################**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 0.5f, 0.5f);**  **glVertex2f(2.9f, -9.3f);**  **glVertex2f(2.6f, -9.3f);**  **glVertex2f(2.6f, 0.0f);**  **glVertex2f(2.9f, 0.0f);**  **glEnd();**  **// OUTLINE**  **glBegin(GL\_LINES);**  **glColor3f(1.0f, 1.0f, 1.0f);**  **glVertex2f(2.9f, -9.3f);**  **glVertex2f(2.6f, -9.3f);**  **glVertex2f(2.6f, -9.3f);**  **glVertex2f(2.6f, 0.0f);**  **glVertex2f(2.6f, 0.0f);**  **glVertex2f(2.9f, 0.0f);**  **glVertex2f(2.9f, 0.0f);**  **glVertex2f(2.9f, -9.3f);**  **glEnd();**  **// ################################**  **// ## ##**  **// ## UPPER PORTION ##**  **// ## ##**  **// ################################**  **glBegin(GL\_POLYGON);**  **glColor3f(1.0f, 0.0f, 0.0f); //RED**  **glVertex2f(3.0f, 0.0f);**  **glVertex2f(2.5f, 0.0f);**  **glVertex2f(2.5f, 0.2f);**  **glVertex2f(3.0f, 0.2f);**  **glEnd();**  **// OUTLINE**  **glBegin(GL\_LINES);**  **glColor3f(1.0f, 1.0f, 1.0f);**  **glVertex2f(3.0f, 0.0f);**  **glVertex2f(2.5f, 0.0f);**  **glVertex2f(2.5f, 0.0f);**  **glVertex2f(2.5f, 0.2f);**  **glVertex2f(2.5f, 0.2f);**  **glVertex2f(3.0f, 0.2f);**  **glVertex2f(3.0f, 0.2f);**  **glVertex2f(3.0f, 0.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(1.0f, 0.0, 0.0f); // RED**  **glVertex2f(3.2f, 0.2f);**  **glVertex2f(2.3f, 0.2f);**  **glVertex2f(2.3f, 0.4f);**  **glVertex2f(3.2f, 0.4f);**  **glEnd();**  **// OUTLINE**  **glBegin(GL\_LINES);**  **glColor3f(1.0f, 1.0f, 1.0f);**  **glVertex2f(3.2f, 0.2f);**  **glVertex2f(2.3f, 0.2f);**  **glVertex2f(2.3f, 0.2f);**  **glVertex2f(2.3f, 0.4f);**  **glVertex2f(2.3f, 0.4f);**  **glVertex2f(3.2f, 0.4f);**  **glVertex2f(3.2f, 0.4f);**  **glVertex2f(3.2f, 0.2f);**  **glEnd();**  **// ################################**  **// ## ##**  **// ## LAMP PORTION ##**  **// ## ##**  **// ################################**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 1.0f, 1.0f);**  **glVertex2f(3.2f, 0.4f);**  **glVertex2f(2.3f, 0.4f);**  **glVertex2f(1.7f, 1.8f);**  **glVertex2f(3.8f, 1.8f);**  **glEnd();**  **// TRIANGLE**  **glBegin(GL\_POLYGON);**  **glColor3f(0.8f, 0.0f, 0.0f);**  **glVertex2f(4.0f, 1.8f);**  **glVertex2f(1.5f, 1.8f);**  **glVertex2f(2.75f, 3.0f);**  **glEnd();**  **// L1**  **glBegin(GL\_POLYGON);**  **glColor3f(1.f, 1.0f, 0.0f);**  **glVertex2f(2.695f, 0.45f);**  **glVertex2f(2.32, 0.45f);**  **glVertex2f(2.0429f, 1.105f);**  **glVertex2f(2.695f, 1.105f);**  **glEnd();**  **// L2**  **glBegin(GL\_POLYGON);**  **glColor3f(1.f, 1.0f, 0.0f);**  **glVertex2f(2.695f, 1.205f);**  **glVertex2f(2.0006, 1.205f);**  **glVertex2f(1.77f, 1.75f);**  **glVertex2f(2.695f, 1.75f);**  **glEnd();**  **// L3**  **glBegin(GL\_POLYGON);**  **glColor3f(1.f, 1.0f, 0.0f);**  **glVertex2f(3.4778077f, 1.205f);**  **glVertex2f(2.795, 1.205f);**  **glVertex2f(2.795f, 1.75f);**  **glVertex2f(3.7f, 1.75f);**  **glEnd();**  **// L4**  **glBegin(GL\_POLYGON);**  **glColor3f(1.f, 1.0f, 0.0f);**  **glVertex2f(3.17f, 0.45f);**  **glVertex2f(2.795, 0.45f);**  **glVertex2f(2.795f, 1.105f);**  **glVertex2f(3.437f, 1.105f);**  **glEnd();**  **}**  **// ########################################################**  **// ########################################################**  **// B E N C H**  **// ########################################################**  **// ########################################################**  **bench()**  **{**  **// ################################**  **// ## ##**  **// ## ALL BAR ##**  **// ## ##**  **// ################################**  **// BAR1**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 0.5f, 0.5f);**  **glVertex2f(8.0f, -10.0f);**  **glVertex2f(7.6f, -10.0f);**  **glVertex2f(7.6f, -8.2f);**  **glVertex2f(8.0f, -8.2f);**  **glEnd();**  **// BAR2**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 0.5f, 0.5f);**  **glVertex2f(9.3f, -10.0f);**  **glVertex2f(9.0f, -10.0f);**  **glVertex2f(9.0f, -8.2f);**  **glVertex2f(9.3f, -8.2f);**  **glEnd();**  **// BAR3**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 0.5f, 0.5f);**  **glVertex2f(15.0f, -10.0f);**  **glVertex2f(14.7f, -10.0f);**  **glVertex2f(14.7f, -8.2f);**  **glVertex2f(15.0f, -8.2f);**  **glEnd();**  **// BAR4**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 0.5f, 0.5f);**  **glVertex2f(16.4f, -10.0f);**  **glVertex2f(16.0f, -10.0f);**  **glVertex2f(16.0f, -8.2f);**  **glVertex2f(16.4f, -8.2f);**  **glEnd();**  **// BAR5**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 0.5f, 0.5f);**  **glVertex2f(9.3f, -6.0f);**  **glVertex2f(9.0f, -6.0f);**  **glVertex2f(9.0f, -2.5f);**  **glVertex2f(9.3f, -2.5f);**  **glEnd();**  **// BAR6**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 0.5f, 0.5f);**  **glVertex2f(15, -6.0f);**  **glVertex2f(14.7f, -6.0f);**  **glVertex2f(14.7f, -2.5f);**  **glVertex2f(15.0f, -2.5f);**  **glEnd();**  **// ################################**  **// ## ##**  **// ## SITING AREA ##**  **// ## ##**  **// ################################**  **// small portion**  **glBegin(GL\_POLYGON);**  **glColor3f(0.5f, 0.5f, 0.5f);**  **glVertex2f(17.0f, -8.2f);**  **glVertex2f(7.0f, -8.2f);**  **glVertex2f(7.0f, -8.0f);**  **glVertex2f(17.0f, -8.0f);**  **glEnd();**  **// large portion**  **glBegin(GL\_POLYGON);**  **glColor3f(0.8f, 0.5f, 0.0);**  **glVertex2f(17.0f, -8.0f);**  **glVertex2f(16.0f, -6.0f);**  **glVertex2f(8.0f, -6.0f);**  **glVertex2f(7.0f, -8.0f);**  **glEnd();**  **// ################################**  **// ## ##**  **// ## BACKREST AREA ##**  **// ## ##**  **// ################################**  **// it's from bottom to top**  **glBegin(GL\_POLYGON);**  **glColor3f(0.8f, 0.5f, 0.0f);**  **glVertex2f(8.0f, -5.5f);**  **glVertex2f(8.0f, -5.0f);**  **glVertex2f(16.0f, -5.0f);**  **glVertex2f(16.0f, -5.5f);**  **glEnd();**  **//**  **glBegin(GL\_POLYGON);**  **glColor3f(0.8f, 0.5f, 0.0f);**  **glVertex2f(16.0f, -4.8f);**  **glVertex2f(16.0f, -4.3f);**  **glVertex2f(8.0f, -4.3f);**  **glVertex2f(8.0f, -4.8);**  **glEnd();**  **//**  **glBegin(GL\_POLYGON);**  **glColor3f(0.8f, 0.5f, 0.0f);**  **glVertex2f(8.0f, -4.1f);**  **glVertex2f(8.0f, -3.6f);**  **glVertex2f(16.0f, -3.6f);**  **glVertex2f(16.0f, -4.1f);**  **glEnd();**  **//**  **glBegin(GL\_POLYGON);**  **glColor3f(0.8f, 0.5f, 0.0f);**  **glVertex2f(16.0f, -3.4f);**  **glVertex2f(16.0f, -2.9f);**  **glVertex2f(8.0f, -2.9f);**  **glVertex2f(8.0f, -3.4f);**  **glEnd();**  **}**  **void display() {**  **glClearColor(0.0f, 0.0f, 0.0f, 0.0f); // Set background color to black and opaque**  **glClear(GL\_COLOR\_BUFFER\_BIT); // Clear the color buffer (background)**  **glLineWidth(1);**  **building();**  **tree();**  **lampPost();**  **bench();**  **glFlush(); // Render now**  **}**  **/\* Main function: GLUT runs as a console application starting at main() \*/**  **int main(int argc, char\*\* argv) {**  **glutInit(&argc, argv); // Initialize GLUT**  **glutCreateWindow("OpenGL Setup Test"); // Create a window with the given title**  **glutInitWindowSize(320, 320);// Set the window's initial width & height**  **glutReshapeWindow (1024,720);**  **glutDisplayFunc(display); // Register display callback handler for window re-paint**  **gluOrtho2D(-65,25,-15,40);**  **glutMainLoop(); // Enter the event-processing loop**  **return 0;**  **}** |
| **Output Screenshot (Full Screen)-** |