**Lab Taks-3**

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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**  **/\* Handler for window-repaint event. Call back when the window first appears and**  **whenever the window needs to be re-painted. \*/**  **void display() {**  **glClearColor(1.0f, 1.0f, 1.0f, 1.0f); // Set background color to white and opaque**  **glClear(GL\_COLOR\_BUFFER\_BIT); // Clear the color buffer (background)**  **//level 1**  **glBegin(GL\_POLYGON);**  **glColor3f(0.8f, 1.0f, 0.8f);//light green**  **glVertex2f(-0.4f, 0.0f);**  **glVertex2f(-0.4f, -0.2f);**  **glVertex2f(0.4f, -0.2f);**  **glVertex2f(0.4f, 0.0f);**  **glEnd();**  **//level 2**  **glBegin(GL\_POLYGON);**  **glColor3f(0.8f, 1.0f, 0.8f);//light green**  **glVertex2f(-0.4f, 0.2f);**  **glVertex2f(-0.4f, 0.0f);**  **glVertex2f(0.4f, 0.0f);**  **glVertex2f(0.4f, 0.2f);**  **glEnd();**  **//level 3**  **glBegin(GL\_POLYGON);**  **glColor3f(0.8f, 1.0f, 0.8f);//light green**  **glVertex2f(-0.4f, 0.4f);**  **glVertex2f(-0.4f, 0.2f);**  **glVertex2f(0.4f, 0.2f);**  **glVertex2f(0.4f, 0.4f);**  **glEnd();**  **//level 4**  **glBegin(GL\_POLYGON);**  **glColor3f(0.8f, 1.0f, 0.8f);//light green**  **glVertex2f(-0.4f, 0.6f);**  **glVertex2f(-0.4f, 0.4f);**  **glVertex2f(0.4f, 0.4f);**  **glVertex2f(0.4f, 0.6f);**  **glEnd();**  **//level 5**  **glBegin(GL\_POLYGON);**  **glColor3f(0.8f, 1.0f, 0.8f);//light green**  **glVertex2f(-0.4f, 0.8f);**  **glVertex2f(-0.4f, 0.6f);**  **glVertex2f(0.4f, 0.6f);**  **glVertex2f(0.4f, 0.8f);**  **glEnd();**  **//entrance of level 1**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 1.0f, 0.0f);//green**  **glVertex2f(-0.05f, -0.2f);**  **glVertex2f(-0.05f, -0.05f);**  **glVertex2f(0.05f, -0.05f);**  **glVertex2f(0.05f, -0.2f);**  **glEnd();**  **//window 1 of level 1**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 1.0f, 0.0f);//green**  **glVertex2f(-0.3f, -0.05f);**  **glVertex2f(-0.3f, -0.15f);**  **glVertex2f(-0.2f, -0.15f);**  **glVertex2f(-0.2f, -0.05f);**  **glEnd();**  **//window 2 of level 1**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 1.0f, 0.0f);//green**  **glVertex2f(0.3f, -0.05f);**  **glVertex2f(0.3f, -0.15f);**  **glVertex2f(0.2f, -0.15f);**  **glVertex2f(0.2f, -0.05f);**  **glEnd();**  **//window 1 of level 2**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 1.0f, 0.0f);//green**  **glVertex2f(-0.3f, 0.05f);**  **glVertex2f(-0.3f, 0.15f);**  **glVertex2f(-0.2f, 0.15f);**  **glVertex2f(-0.2f, 0.05f);**  **glEnd();**  **//window 2 of level 2**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 1.0f, 0.0f);//green**  **glVertex2f(0.3f, 0.05f);**  **glVertex2f(0.3f, 0.15f);**  **glVertex2f(0.2f, 0.15f);**  **glVertex2f(0.2f, 0.05f);**  **glEnd();**  **//window 1 of level 3**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 1.0f, 0.0f);//green**  **glVertex2f(-0.3f, 0.35f);**  **glVertex2f(-0.3f, 0.25f);**  **glVertex2f(-0.2f, 0.25f);**  **glVertex2f(-0.2f, 0.35f);**  **glEnd();**  **//window 2 of level 3**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 1.0f, 0.0f);//green**  **glVertex2f(0.3f, 0.35f);**  **glVertex2f(0.3f, 0.25f);**  **glVertex2f(0.2f, 0.25f);**  **glVertex2f(0.2f, 0.35f);**  **glEnd();**  **//window 1 of level 4**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 1.0f, 0.0f);//green**  **glVertex2f(-0.3f, 0.55f);**  **glVertex2f(-0.3f, 0.45f);**  **glVertex2f(-0.2f, 0.45f);**  **glVertex2f(-0.2f, 0.55f);**  **glEnd();**  **//window 2 of level 4**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 1.0f, 0.0f);//green**  **glVertex2f(0.3f, 0.55f);**  **glVertex2f(0.3f, 0.45f);**  **glVertex2f(0.2f, 0.45f);**  **glVertex2f(0.2f, 0.55f);**  **glEnd();**  **//window 1 of level 5**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 1.0f, 0.0f);//green**  **glVertex2f(-0.3f, 0.75f);**  **glVertex2f(-0.3f, 0.65f);**  **glVertex2f(-0.2f, 0.65f);**  **glVertex2f(-0.2f, 0.75f);**  **glEnd();**  **//window 2 of level 5**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 1.0f, 0.0f);//green**  **glVertex2f(0.3f, 0.75f);**  **glVertex2f(0.3f, 0.65f);**  **glVertex2f(0.2f, 0.65f);**  **glVertex2f(0.2f, 0.75f);**  **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"); // Create a window with the given title**  **glutInitWindowSize(420, 420); // Set the window's initial width & height**  **glutDisplayFunc(display); // Register display callback handler for window re-paint**  **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**  **/\* Handler for window-repaint event. Call back when the window first appears and**  **whenever the window needs to be re-painted. \*/**  **void display() {**  **glClearColor(1.0f, 1.0f, 1.0f, 1.0f); // Set background color to white and opaque**  **glClear(GL\_COLOR\_BUFFER\_BIT); // Clear the color buffer (background)**  **glBegin(GL\_TRIANGLES);**  **glColor3f(0.0f, 1.0f, 0.0f);//green**  **glVertex2f(0.0f, 0.2f);**  **glVertex2f(-0.3f, 0.0f);**  **glVertex2f(0.3f, 0.0f);**  **glEnd();**  **glBegin(GL\_TRIANGLES);**  **glColor3f(0.0f, 1.0f, 0.0f);//green**  **glVertex2f(0.0f, 0.3f);**  **glVertex2f(-0.25f, 0.1f);**  **glVertex2f(0.25f, 0.1f);**  **glEnd();**  **glBegin(GL\_TRIANGLES);**  **glColor3f(0.0f, 1.0f, 0.0f);//green**  **glVertex2f(0.0f, 0.4f);**  **glVertex2f(-0.15f, 0.2f);**  **glVertex2f(0.15f, 0.2f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.60f, 0.40f, 0.12f);//brown**  **glVertex2f(-0.05f, 0.02f);**  **glVertex2f(-0.05f, -0.3f);**  **glVertex2f(0.05f, -0.3f);**  **glVertex2f(0.05f, 0.02f);**  **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"); // Create a window with the given title**  **glutInitWindowSize(420, 420); // Set the window's initial width & height**  **glutDisplayFunc(display); // Register display callback handler for window re-paint**  **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**  **/\* Handler for window-repaint event. Call back when the window first appears and**  **whenever the window needs to be re-painted. \*/**  **void display() {**  **glClearColor(0.0f, 0.0f, 0.0f, 0.0f); // Set background color to white and opaque**  **glClear(GL\_COLOR\_BUFFER\_BIT); // Clear the color buffer (background)**  **glBegin(GL\_QUADS);**  **glColor3f(1.0f, 0.5f, 0.0f);//Orange**  **glVertex2f(-0.01f, 0.4f);**  **glVertex2f(-0.01f, -0.3f);**  **glVertex2f(0.01f, -0.3f);**  **glVertex2f(0.01f, 0.4f);**  **glEnd();**  **glBegin(GL\_QUADS);**  **glColor3f(0.0f, 0.0f, 1.0f);//Blue**  **glVertex2f(-0.04f, -0.3f);**  **glVertex2f(-0.04f, -0.35f);**  **glVertex2f(0.04f, -0.35f);**  **glVertex2f(0.04f, -0.3f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.1f, 0.1f);//Dark blue**  **glVertex2f(-0.06f, -0.35f);**  **glVertex2f(-0.07f, -0.38f);**  **glVertex2f(0.07f, -0.38f);**  **glVertex2f(0.06f, -0.35f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(0.0f, 0.99f, 0.0f);**  **glVertex2f(-0.04f, 0.4f);**  **glVertex2f(0.0f, 0.38f);**  **glVertex2f(0.04f, 0.4f);**  **glVertex2f(0.05f, 0.5f);**  **glVertex2f(0.0f, 0.55f);**  **glVertex2f(-0.05f,0.5f);**  **glEnd();**  **glBegin(GL\_TRIANGLES);**  **glColor3f(1.0f, 1.0f, 0.0f);//yellow**  **glVertex2f(0.0f, 0.55f);**  **glVertex2f(0.05f, 0.5f);**  **glVertex2f(0.025f, 0.6f);**  **glEnd();**  **glBegin(GL\_TRIANGLES);**  **glColor3f(1.0f, 1.0f, 0.0f);//yellow**  **glVertex2f(0.0f, 0.55f);**  **glVertex2f(-0.05f,0.5f);**  **glVertex2f(-0.025f, 0.6f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3f(1.0f, 0.0f, 0.0f);//red**  **glVertex2f(0.025f, 0.6f);**  **glVertex2f(0.0f, 0.55f);**  **glVertex2f(-0.025f, 0.6f);**  **glVertex2f(0.0f, 0.65f);**  **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"); // Create a window with the given title**  **glutInitWindowSize(420, 420); // Set the window's initial width & height**  **glutDisplayFunc(display); // Register display callback handler for window re-paint**  **glutMainLoop(); // Enter the event-processing loop**  **return 0;**  **}** |
| **Output Screenshot (Full Screen)-** |

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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**  **/\* Handler for window-repaint event. Call back when the window first appears and**  **whenever the window needs to be re-painted. \*/**  **void display() {**  **glClearColor(1.0f, 1.0f, 1.0f, 1.0f); // Set background color to white and opaque**  **glClear(GL\_COLOR\_BUFFER\_BIT); // Clear the color buffer (background)**  **glBegin(GL\_QUADS);**  **glColor3f(0.60f, 0.40f, 0.12f);//brown**  **glVertex2f(-0.25f, 0.15f);**  **glVertex2f(-0.25f, 0.0f);**  **glVertex2f(0.25f, 0.0f);**  **glVertex2f(0.25f, 0.15f);**  **glEnd();**  **glBegin(GL\_QUADS);**  **glColor3f(0.0f, 0.0f, 0.0f);//black**  **glVertex2f(-0.25f, 0.0f);**  **glVertex2f(-0.35f, -0.1f);**  **glVertex2f(0.35f, -0.1f);**  **glVertex2f(0.25f, 0.0f);**  **glEnd();**  **glBegin(GL\_QUADS);**  **glColor3f(0.60f, 0.40f, 0.12f);//brown**  **glVertex2f(-0.35f, -0.1f);**  **glVertex2f(-0.35f, -0.15f);**  **glVertex2f(0.35f, -0.15f);**  **glVertex2f(0.35f, -0.1f);**  **glEnd();**  **glBegin(GL\_QUADS);**  **glColor3f(0.0f, 0.0f, 0.0f);//black**  **glVertex2f(-0.35f, -0.15f);**  **glVertex2f(-0.35f, -0.25f);**  **glVertex2f(-0.33f, -0.25f);**  **glVertex2f(-0.33f, -0.15f);**  **glEnd();**  **glBegin(GL\_QUADS);**  **glColor3f(0.0f, 0.0f, 0.0f);//black**  **glVertex2f(0.35f, -0.15f);**  **glVertex2f(0.35f, -0.25f);**  **glVertex2f(0.33f, -0.25f);**  **glVertex2f(0.33f, -0.15f);**  **glEnd();**  **glBegin(GL\_QUADS);**  **glColor3f(0.0f, 0.0f, 0.0f);//black**  **glVertex2f(-0.25f, -0.15f);**  **glVertex2f(-0.25f, -0.2f);**  **glVertex2f(-0.23f, -0.2f);**  **glVertex2f(-0.23f, -0.15f);**  **glEnd();**  **glBegin(GL\_QUADS);**  **glColor3f(0.0f, 0.0f, 0.0f);//black**  **glVertex2f(0.25f, -0.15f);**  **glVertex2f(0.25f, -0.2f);**  **glVertex2f(0.23f, -0.2f);**  **glVertex2f(0.23f, -0.15f);**  **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"); // Create a window with the given title**  **glutInitWindowSize(420, 420); // Set the window's initial width & height**  **glutDisplayFunc(display); // Register display callback handler for window re-paint**  **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-** |
| **Output Screenshot (Full Screen)-** |