**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**  **void initGL() {**  **glClearColor(0.0f, 0.0f, 0.0f, 1.0f); // Black and opaque**  **}**  **void display() {**  **glClear(GL\_COLOR\_BUFFER\_BIT);**  **glBegin(GL\_POLYGON);**  **glColor3ub(189.0f, 86.0f, 64.0f);**  **glVertex2f(3.0f, 0.0f);**  **glVertex2f(14.0f, 0.0f);**  **glVertex2f(14.0f, 5.0f);**  **glVertex2f(3.0f, 5.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3ub(189.0f, 86.0f, 64.0f);**  **glVertex2f(3.0f, 5.0f);**  **glVertex2f(14.0f, 5.0f);**  **glVertex2f(14.0f, 10.0f);**  **glVertex2f(3.0f, 10.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3ub(189.0f, 86.0f, 64.0f);**  **glVertex2f(3.0f, 10.0f);**  **glVertex2f(14.0f, 10.0f);**  **glVertex2f(14.0f, 15.0f);**  **glVertex2f(3.0f, 15.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3ub(189.0f, 86.0f, 64.0f);**  **glVertex2f(3.0f, 15.0f);**  **glVertex2f(14.0f, 15.0f);**  **glVertex2f(14.0f, 20.0f);**  **glVertex2f(3.0f, 20.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3ub(189.0f, 86.0f, 64.0f);**  **glVertex2f(3.0f, 20.0f);**  **glVertex2f(14.0f, 20.0f);**  **glVertex2f(14.0f, 25.0f);**  **glVertex2f(3.0f, 25.0f);**  **glEnd();**  **glBegin(GL\_POLYGON); //FRONT DOOR**  **glColor3ub(0.0f, 0.0f, 0.0f );**  **glVertex2f(6.0f, 0.0f);**  **glVertex2f(10.0f, 0.0f);**  **glVertex2f(10.0f, 2.0f);**  **glVertex2f(6.0f, 2.0f);**  **glEnd();**  **glBegin(GL\_POLYGON); //WINDOW 1**  **glColor3ub(38.0f, 206.0f, 225.0f );**  **glVertex2f(10.0f, 8.0f);**  **glVertex2f(14.0f, 8.0f);**  **glVertex2f(14.0f, 10.0f);**  **glVertex2f(10.0f, 10.0f);**  **glEnd();**  **glBegin(GL\_POLYGON); //WINDOW 2**  **glColor3ub(38.0f, 206.0f, 225.0f );**  **glVertex2f(10.0f, 13.0f);**  **glVertex2f(14.0f, 13.0f);**  **glVertex2f(14.0f, 15.0f);**  **glVertex2f(10.0f, 15.0f);**  **glEnd();**  **glBegin(GL\_POLYGON); //WINDOW 3**  **glColor3ub(38.0f, 206.0f, 225.0f );**  **glVertex2f(10.0f, 18.0f);**  **glVertex2f(14.0f, 18.0f);**  **glVertex2f(14.0f, 20.0f);**  **glVertex2f(10.0f, 20.0f);**  **glEnd();**  **glBegin(GL\_POLYGON); //WINDOW 4**  **glColor3ub(38.0f, 206.0f, 225.0f );**  **glVertex2f(10.0f, 23.0f);**  **glVertex2f(14.0f, 23.0f);**  **glVertex2f(14.0f, 25.0f);**  **glVertex2f(10.0f, 25.0f);**  **glEnd();**  **glFlush(); // Render now**  **}**  **int main(int argc, char\*\* argv) {**  **glutInit(&argc, argv); // Initialize GLUT**  **glutCreateWindow("BUILDING"); // Create window with the given title**  **glutInitWindowSize(320, 320);**  **glutInitWindowPosition(50, 50);**  **gluOrtho2D(0,30,0,30);**  **glutDisplayFunc(display);**  **initGL();**  **glutMainLoop();**  **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 initGL() {**  **glClearColor(0.0f, 0.0f, 0.0f, 1.0f); // Black and opaque**  **}**  **void display() {**  **glClear(GL\_COLOR\_BUFFER\_BIT);**  **glBegin(GL\_POLYGON);**  **glColor3ub(117.0f, 49.0f, 49.0f);**  **glVertex2f(18.0f, 0.0f);**  **glVertex2f(20.0f, 0.0f);**  **glVertex2f(20.0f, 20.0f);**  **glVertex2f(18.0f, 20.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3ub(31.0f, 212.0f, 28.0f);**  **glVertex2f(15.0f, 19.0f);**  **glVertex2f(23.0f, 19.0f);**  **glVertex2f(19.0f, 22.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);//tree 2**  **glColor3ub(31.0f, 212.0f, 28.0f);**  **glVertex2f(15.0f, 21.0f);**  **glVertex2f(23.0f, 21.0f);**  **glVertex2f(19.0f, 25.0f);**  **glEnd();**  **glFlush(); // Render now**  **}**  **int main(int argc, char\*\* argv) {**  **glutInit(&argc, argv); // Initialize GLUT**  **glutCreateWindow("TREE"); // Create window with the given title**  **glutInitWindowSize(320, 320);**  **glutInitWindowPosition(50, 50);**  **gluOrtho2D(0,30,0,30);**  **glutDisplayFunc(display);**  **initGL();**  **glutMainLoop();**  **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 initGL() {**  **glClearColor(0.0f, 0.0f, 0.0f, 1.0f); // Black and opaque**  **}**  **void display() {**  **glClear(GL\_COLOR\_BUFFER\_BIT);**  **glBegin(GL\_POLYGON);**  **glColor3ub(206, 102, 25 );**  **glVertex2f(25.0f, 0.0f);**  **glVertex2f(27.0f, 0.0f);**  **glVertex2f(27.0f, 19.0f);**  **glVertex2f(25.0f, 19.0f);**  **glEnd();**  **glBegin(GL\_LINES);//LINE 1**  **glColor3ub(99.0f, 231.0f, 23.0f );**  **glVertex2f(24.0f, 19.0f);**  **glVertex2f(28.0f, 19.0f);**  **glEnd();**  **glBegin(GL\_LINES);//LINE 2**  **glColor3ub(99.0f, 231.0f, 23.0f );**  **glVertex2f(28.0f, 19.0f);**  **glVertex2f(30.0f, 22.0f);**  **glEnd();**  **glBegin(GL\_LINES);//LINE 3**  **glColor3ub(99.0f, 231.0f, 23.0f );**  **glVertex2f(30.0f, 22.0f);**  **glVertex2f(28.0f, 25.0f);**  **glEnd();**  **glBegin(GL\_LINES);//LINE 4**  **glColor3ub(99.0f, 231.0f, 23.0f );**  **glVertex2f(28.0f, 25.0f);**  **glVertex2f(24.0f, 25.0f);**  **glEnd();**  **glBegin(GL\_LINES);//LINE 5**  **glColor3ub(99.0f, 231.0f, 23.0f );**  **glVertex2f(24.0f, 25.0f);**  **glVertex2f(22.0f, 22.0f);**  **glEnd();**  **glBegin(GL\_LINES);//LINE 6**  **glColor3ub(99.0f, 231.0f, 23.0f );**  **glVertex2f(22.0f, 22.0f);**  **glVertex2f(24.0f, 19.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);//INSIDE LAMP**  **glColor3ub(249.0f, 242.0f, 19.0f );**  **glVertex2f(25.0f, 19.0f);**  **glVertex2f(27.0f, 19.0f);**  **glVertex2f(26.0f, 22.0f);**  **glEnd();**  **glFlush(); // Render now**  **}**  **int main(int argc, char\*\* argv) {**  **glutInit(&argc, argv); // Initialize GLUT**  **glutCreateWindow("LAMP"); // Create window with the given title**  **glutInitWindowSize(320, 320);**  **glutInitWindowPosition(50, 50);**  **gluOrtho2D(0,30,0,30);**  **glutDisplayFunc(display);**  **initGL();**  **glutMainLoop();**  **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**  **#include <math.h>**  **void initGL() {**  **glClearColor(0.0f, 0.0f, 0.0f, 1.0f); // Black and opaque**  **}**  **void display() {**  **glClear(GL\_COLOR\_BUFFER\_BIT);**  **glBegin(GL\_POLYGON);//1**  **glColor3ub(29, 29, 193 );**  **glVertex2f(30.0f, 0.0f);**  **glVertex2f(31.0f, 0.0f);**  **glVertex2f(31.0f, 6.0f);**  **glVertex2f(30.0f, 6.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);//2**  **glColor3ub(29, 29, 193 );**  **glVertex2f(35.0f, 0.0f);**  **glVertex2f(36.0f, 0.0f);**  **glVertex2f(36.0f, 6.0f);**  **glVertex2f(35.0f, 6.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);//3**  **glColor3ub(245, 94, 7 );**  **glVertex2f(28.0f, 6.0f);**  **glVertex2f(37.0f, 6.0f);**  **glVertex2f(38.0f, 8.0f);**  **glVertex2f(29.0f, 8.0f);**  **glEnd();**  **glFlush(); // Render now**  **}**  **int main(int argc, char\*\* argv) {**  **glutInit(&argc, argv); // Initialize GLUT**  **glutCreateWindow("BENCH"); // Create window with the given title**  **glutInitWindowSize(320, 320);**  **glutInitWindowPosition(50, 50);**  **gluOrtho2D(0,45,0,45);**  **glutDisplayFunc(display);**  **initGL();**  **glutMainLoop();**  **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**  **void initGL() {**  **glClearColor(0.0f, 0.0f, 0.0f, 1.0f); // Black and opaque**  **}**  **void display() {**  **glClear(GL\_COLOR\_BUFFER\_BIT);**  **glBegin(GL\_POLYGON);**  **glColor3ub(189.0f, 86.0f, 64.0f);**  **glVertex2f(3.0f, 0.0f);**  **glVertex2f(14.0f, 0.0f);**  **glVertex2f(14.0f, 5.0f);**  **glVertex2f(3.0f, 5.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3ub(189.0f, 86.0f, 64.0f);**  **glVertex2f(3.0f, 5.0f);**  **glVertex2f(14.0f, 5.0f);**  **glVertex2f(14.0f, 10.0f);**  **glVertex2f(3.0f, 10.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3ub(189.0f, 86.0f, 64.0f);**  **glVertex2f(3.0f, 10.0f);**  **glVertex2f(14.0f, 10.0f);**  **glVertex2f(14.0f, 15.0f);**  **glVertex2f(3.0f, 15.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3ub(189.0f, 86.0f, 64.0f);**  **glVertex2f(3.0f, 15.0f);**  **glVertex2f(14.0f, 15.0f);**  **glVertex2f(14.0f, 20.0f);**  **glVertex2f(3.0f, 20.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3ub(189.0f, 86.0f, 64.0f);**  **glVertex2f(3.0f, 20.0f);**  **glVertex2f(14.0f, 20.0f);**  **glVertex2f(14.0f, 25.0f);**  **glVertex2f(3.0f, 25.0f);**  **glEnd();**  **glBegin(GL\_POLYGON); //FRONT DOOR**  **glColor3ub(0.0f, 0.0f, 0.0f );**  **glVertex2f(6.0f, 0.0f);**  **glVertex2f(10.0f, 0.0f);**  **glVertex2f(10.0f, 2.0f);**  **glVertex2f(6.0f, 2.0f);**  **glEnd();**  **glBegin(GL\_POLYGON); //WINDOW 1**  **glColor3ub(38.0f, 206.0f, 225.0f );**  **glVertex2f(10.0f, 8.0f);**  **glVertex2f(14.0f, 8.0f);**  **glVertex2f(14.0f, 10.0f);**  **glVertex2f(10.0f, 10.0f);**  **glEnd();**  **glBegin(GL\_POLYGON); //WINDOW 2**  **glColor3ub(38.0f, 206.0f, 225.0f );**  **glVertex2f(10.0f, 13.0f);**  **glVertex2f(14.0f, 13.0f);**  **glVertex2f(14.0f, 15.0f);**  **glVertex2f(10.0f, 15.0f);**  **glEnd();**  **glBegin(GL\_POLYGON); //WINDOW 3**  **glColor3ub(38.0f, 206.0f, 225.0f );**  **glVertex2f(10.0f, 18.0f);**  **glVertex2f(14.0f, 18.0f);**  **glVertex2f(14.0f, 20.0f);**  **glVertex2f(10.0f, 20.0f);**  **glEnd();**  **glBegin(GL\_POLYGON); //WINDOW 4**  **glColor3ub(38.0f, 206.0f, 225.0f );**  **glVertex2f(10.0f, 23.0f);**  **glVertex2f(14.0f, 23.0f);**  **glVertex2f(14.0f, 25.0f);**  **glVertex2f(10.0f, 25.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3ub(117.0f, 49.0f, 49.0f);**  **glVertex2f(18.0f, 0.0f);**  **glVertex2f(20.0f, 0.0f);**  **glVertex2f(20.0f, 20.0f);**  **glVertex2f(18.0f, 20.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3ub(31.0f, 212.0f, 28.0f);**  **glVertex2f(15.0f, 19.0f);**  **glVertex2f(23.0f, 19.0f);**  **glVertex2f(19.0f, 22.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);//tree 2**  **glColor3ub(31.0f, 212.0f, 28.0f);**  **glVertex2f(15.0f, 21.0f);**  **glVertex2f(23.0f, 21.0f);**  **glVertex2f(19.0f, 25.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);**  **glColor3ub(206, 102, 25 );**  **glVertex2f(25.0f, 0.0f);**  **glVertex2f(27.0f, 0.0f);**  **glVertex2f(27.0f, 19.0f);**  **glVertex2f(25.0f, 19.0f);**  **glEnd();**  **glBegin(GL\_LINES);//LINE 1**  **glColor3ub(99.0f, 231.0f, 23.0f );**  **glVertex2f(24.0f, 19.0f);**  **glVertex2f(28.0f, 19.0f);**  **glEnd();**  **glBegin(GL\_LINES);//LINE 2**  **glColor3ub(99.0f, 231.0f, 23.0f );**  **glVertex2f(28.0f, 19.0f);**  **glVertex2f(30.0f, 22.0f);**  **glEnd();**  **glBegin(GL\_LINES);//LINE 3**  **glColor3ub(99.0f, 231.0f, 23.0f );**  **glVertex2f(30.0f, 22.0f);**  **glVertex2f(28.0f, 25.0f);**  **glEnd();**  **glBegin(GL\_LINES);//LINE 4**  **glColor3ub(99.0f, 231.0f, 23.0f );**  **glVertex2f(28.0f, 25.0f);**  **glVertex2f(24.0f, 25.0f);**  **glEnd();**  **glBegin(GL\_LINES);//LINE 5**  **glColor3ub(99.0f, 231.0f, 23.0f );**  **glVertex2f(24.0f, 25.0f);**  **glVertex2f(22.0f, 22.0f);**  **glEnd();**  **glBegin(GL\_LINES);//LINE 6**  **glColor3ub(99.0f, 231.0f, 23.0f );**  **glVertex2f(22.0f, 22.0f);**  **glVertex2f(24.0f, 19.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);//INSIDE LAMP**  **glColor3ub(249.0f, 242.0f, 19.0f );**  **glVertex2f(25.0f, 19.0f);**  **glVertex2f(27.0f, 19.0f);**  **glVertex2f(26.0f, 22.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);//1**  **glColor3ub(29, 29, 193 );**  **glVertex2f(30.0f, 0.0f);**  **glVertex2f(31.0f, 0.0f);**  **glVertex2f(31.0f, 6.0f);**  **glVertex2f(30.0f, 6.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);//2**  **glColor3ub(29, 29, 193 );**  **glVertex2f(35.0f, 0.0f);**  **glVertex2f(36.0f, 0.0f);**  **glVertex2f(36.0f, 6.0f);**  **glVertex2f(35.0f, 6.0f);**  **glEnd();**  **glBegin(GL\_POLYGON);//3**  **glColor3ub(245, 94, 7 );**  **glVertex2f(28.0f, 6.0f);**  **glVertex2f(37.0f, 6.0f);**  **glVertex2f(38.0f, 8.0f);**  **glVertex2f(29.0f, 8.0f);**  **glEnd();**  **glFlush(); // Render now**  **}**  **int main(int argc, char\*\* argv) {**  **glutInit(&argc, argv); // Initialize GLUT**  **glutCreateWindow("SCENE"); // Create window with the given title**  **glutInitWindowSize(320, 320);**  **glutInitWindowPosition(50, 50);**  **gluOrtho2D(0,42,0,42);**  **glutDisplayFunc(display);**  **initGL();**  **glutMainLoop();**  **return 0;**  **}** |
| **Output Screenshot (Full Screen)-** |