12) Write a program to construct Bezier curve. Control points are supplied through keyboard/ mouse.

|  |
| --- |
| #include<iostream> |
|  | #include<math.h> |
|  | #include<gl/glut.h> |
|  |  |
|  | using namespace std; |
|  | float f, g, r, x1[4], yc[4]; |
|  | int flag = 0; |
|  | void myInit() { |
|  |  |
|  | glClearColor(1, 1, 1, 1); |
|  | glColor3f(1, 1, 1); |
|  | glPointSize(5); |
|  | gluOrtho2D(0, 500, 0, 500); |
|  | } |
|  |  |
|  | void drawPixel(float x, float y) { |
|  | glBegin(GL\_POINTS); |
|  | glVertex2f(x, y); |
|  | glEnd(); |
|  | } |
|  |  |
|  | void display() { |
|  |  |
|  | glClear(GL\_COLOR\_BUFFER\_BIT); |
|  | int i; |
|  | double t; |
|  | glColor3f(0, 0, 0); |
|  | glBegin(GL\_POINTS); |
|  | for (t = 0; t < 1; t = t + 0.005) { |
|  | double xt = pow(1 - t, 3) \* x1[0] + 3 \* t \* pow(1 - t, 2) \* x1[1] + 3 \* pow(t, 2) \* (1 - t) \* x1[2] + pow(t, 3) \* x1[3]; |
|  | double yt = pow(1 - t, 3) \* yc[0] + 3 \* t \* pow(1 - t, 2) \* yc[1] + 3 \* pow(t, 2) \* (1 - t) \* yc[2] + pow(t, 3) \* yc[3]; |
|  | glVertex2f(xt, yt); |
|  |  |
|  | } |
|  | glColor3f(1, 1, 0); |
|  | for (i = 0; i < 4; i++) { |
|  | glVertex2f(x1[i], yc[i]); |
|  | glEnd(); |
|  | glFlush(); |
|  | } |
|  |  |
|  |  |
|  | } |
|  | void mymouse(int btn, int state, int x, int y) |
|  | { |
|  | if (btn == GLUT\_LEFT\_BUTTON && state == GLUT\_DOWN && flag < 4) |
|  | { |
|  | x1[flag] = x; |
|  | yc[flag] = 500 - y; |
|  | cout << " X: " << x << " Y" << 500 - y; |
|  | glPointSize(3); |
|  | glColor3f(1, 1, 0); |
|  | glBegin(GL\_POINTS); |
|  | glVertex2i(x, 500 - y); |
|  | glEnd(); |
|  | glFlush(); |
|  | flag++; |
|  | } |
|  | if (flag >= 4 && btn == GLUT\_LEFT\_BUTTON) |
|  | { |
|  | glColor3f(0, 0, 1); |
|  | display(); |
|  | flag = 0; |
|  |  |
|  |  |
|  | } |
|  | } |
|  | int main(int argc, char\* argv[]) { |
|  | glutInit(&argc, argv); |
|  |  |
|  | /\* |
|  | //USE KEYBOARD |
|  | cout << "Enter the x co-ordinates"; |
|  | cin >> x1[0] >> x1[1] >> x1[2] >> x1[3]; |
|  | cout << "Enter y co-ordinates"; |
|  | cin >> yc[0] >> yc[1] >> yc[2] >> yc[3]; |
|  | //END KEYBOARD |
|  | \*/ |
|  | glutInitDisplayMode(GLUT\_SINGLE | GLUT\_RGB); |
|  | glutInitWindowSize(500, 500); |
|  | glutInitWindowPosition(0, 0); |
|  | glutCreateWindow("BZ"); |
|  | glutDisplayFunc(display); |
|  | glutMouseFunc(mymouse); //INCLUDE FOR MOUSE, REMOVE FOR KEYBOARD |
|  | myInit(); |
|  | glutMainLoop(); |
|  | } |

