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#include <iostream>
#include <math.h>
#include <GL/glut.h>

using namespace std;
void init()
{
    glClearColor(0.0,0.0,0.0,0.0);
    gluOrtho2D(0,640,0,480);
}

void flood_it(int x, int y, float* fillColor, float* ic)
{
    float color[3];
    glReadPixels(x,y,1.0,1.0,GL_RGB,GL_FLOAT,color);
    if(color[0]==ic[0] && color[1]==ic[1] && color[2]==ic[2])
    {
        glColor3f(fillColor[0],fillColor[1],fillColor[2]);
        glBegin(GL_POINTS);
            glVertex2i(x,y);
        glEnd();
        glFlush();
        flood_it(x-2,y,fillColor,ic);
        flood_it(x+1,y,fillColor,ic);
        flood_it(x,y+1,fillColor,ic);
        flood_it(x,y-2,fillColor,ic);
    }
}

void polygon()
{
    glLineWidth(3);
    glPointSize(2);
    glClear(GL_COLOR_BUFFER_BIT);
    glColor3f(1,0,0);
    glBegin(GL_LINES);
        glColor3f(1,0,0);
        glVertex2i(150,100);
        glVertex2i(300,300);
        glColor3f(0,1,0);

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    glVertex2i(300,300);
    glVertex2i(450,100);
    glColor3f(0,0,1);
    glVertex2i(150,100);
    glVertex2i(450,100);
glEnd();
glFlush();
}

void mouse(int btn, int state, int x, int y){
    y = 480-y;
    if(btn==GLUT_LEFT_BUTTON)
    {
        if(state==GLUT_DOWN)
        {
            float intCol[] = {1,0,0};
            float color[] = {0,0,1};
            glReadPixels(x,y,1.0,1.0,GL_RGB,GL_FLOAT,intCol);
            flood_it(x,y,color,intCol);
        }
    }
}

int main(int argc, char** argv)
{
    glutInit(&argc, argv);
    glutInitDisplayMode(GLUT_SINGLE|GLUT_RGB);
    glutInitWindowSize(640,480);
    glutInitWindowPosition(200,200);
    glutCreateWindow("Polygon Filling - Flood Fill");
    glutDisplayFunc(polygon);
    glutMouseFunc(mouse);
    init();
    glutMainLoop();
    return 0;
}

```