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1  #include<bits/stdc++.h>
2
3  using namespace std;
4
5  struct Point{
6      double x,y;
7      Point(double x=0,double y=0):x(x),y(y){}
8  };
9
10 typedef Point Vector;
11
12 const double eps = 1e-10;
13
14 Vector operator + (Vector A,Vector B){ return Vector(A.x+B.x,A.y+B.y); }
15 Vector operator - (Point A,Point B){ return Vector(A.x-B.x,A.y-B.y); }
16 Vector operator * (Vector A,double p){ return Vector(A.x*p,A.y*p); }
17 Vector operator / (Vector A,double p){ return Vector(A.x/p,A.y/p); }
18
19 bool operator < (const Point &a,const Point &b){
20     return a.x < b.x || (a.x == b.x && a.y < b.y);
21 }
22
23 int dcmp(double x){
24     if( fabs(x) < eps ) return 0;
25     else return x < 0 ? -1 : 1;
26 }
27
28 bool operator == (const Point &a,const Point &b){
29     return dcmp(a.x-b.x) == 0 && dcmp(a.y-b.y) == 0;
30 }
31
32 double Dot(Vector A,Vector B){ return A.x*B.x + A.y*B.y; }
33
34 double Cross(Vector A,Vector B){ return A.x*B.y - A.y*B.x; }
35
36 bool OnSegment(Point p,Point a1,Point a2){
37     return dcmp(Cross(a1-p,a2-p)) == 0 && dcmp(Dot(a1-p,a2-p)) < 0;
38 }
39
40 typedef vector<Point> Polygon;
41
42 int n = 3,tol;
43
44 int isPointInpolygon(Point p,Polygon poly){
45     int wn = 0;
46     int n = poly.size();
47     for(int i=0;i<n;i++){
48         {
49             if( p == poly[i] ) return 4; //顶点上
50             if( OnSegment(p,poly[i],poly[(i+1)%n]) ) return 3; //边上
51             int k = dcmp(Cross(poly[(i+1)%n] - poly[i],p-poly[i]));
52             int d1 = dcmp(poly[i].y - p.y);
53             int d2 = dcmp(poly[(i+1)%n].y - p.y);
54             if( k > 0 && d1 <= 0 && d2 > 0 ) wn++;
55             if( k < 0 && d2 <= 0 && d1 > 0 ) wn--;

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56     }
57     if( wn != 0 ) return 1; // 在多边形内
58     return 2; //多边形外
59 }
60
61 void read(int &p){
62     int t=0;
63     char c;
64     c=getchar();
65     while( c < '0' || c > '9' )
66         c=getchar();
67     while( c >= '0' && c <= '9' )
68     {
69         t=t*10+c-'0';
70         c=getchar();
71     }
72     p = t;
73 }
74
75 int main(int argc,char ** argv){
76     int x,y;
77     Polygon poly;
78     read(x),read(y);
79     poly.push_back(Point(x,y));
80     read(x),read(y);
81     poly.push_back(Point(x,y));
82     read(x),read(y);
83     poly.push_back(Point(x,y));
84     read(x),read(y);
85     Point PP(x,y);
86     cout<<isPointInpolygon(PP,poly)<<endl;
87     return 0;
88 }
89

```