**Check if the given point lies inside or outside a polygon?**

**class** Point:  
 **def** \_\_init\_\_(self, x, y):  
 self.x = x  
 self.y = y  
  
  
**def** Polygon\_Point\_Lies(polygon, point):  
 A = []  
 B = []  
 C = []  
 **for** i **in** range(len(polygon)):  
 p1 = polygon[i]  
 p2 = polygon[(i + 1) % len(polygon)]  
  
 *# calculate A, B and C* a = -(p2.y - p1.y)  
 b = p2.x - p1.x  
 c = -(a \* p1.x + b \* p1.y)  
  
 A.append(a)  
 B.append(b)  
 C.append(c)  
  
 D = []  
 **for** i **in** range(len(A)):  
 d = A[i] \* point.x + B[i] \* point.y + C[i]  
 D.append(d)  
  
 t1 = all(d >= 0 **for** d **in** D)  
 t2 = all(d <= 0 **for** d **in** D)  
 **return** t1 **or** t2  
  
  
**if** \_\_name\_\_ == **'\_\_main\_\_'**:  
 polygon1 = [Point(1, 0), Point(8, 3), Point(8, 8), Point(1, 5)]  
 p1 = Point(3, 5)  
 print(Polygon\_Point\_Lies(polygon1, p1)) *# returns True* polygon2= [Point(-3, 2), Point(-2, -0.8), Point(0, 1.2), Point(2.2, 0), Point(2,4.5)]  
 p2 = Point(0, 0)  
 print(Polygon\_Point\_Lies(polygon2, p2)) *# returns False*

**Output**:

True

False