How to find way to stop while loop when 1 first point meet last in polygon in python?

Asked 8 years, 9 months ago Modified 8 years, 9 months ago Viewed 238 times

3

I need to calculate the perimeter of a polygon by using only coordinates.

My function:

```
def definePerimeter(xCoords, yCoords):

i = 0
sum = 0
while xCoords[i] != xCoords[i+1] and yCoords[i] != yCoords[i+1]:
    dx = xCoords[i] - xCoords[i+1]
    dy = yCoords[i] - yCoords[i+1]
    dsquared = dx**2 + dy**2
    result = math.sqrt(dsquared)
    print "The list of segments:"
    print "The segment: ", result
    i += 1
    sum = sum + result
print  "Total 2D Perimeter is " , sum ,"m" *
```

gives wrong Perimeter (compared to ArcGIS).

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python

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asked Mar 3, 2016 at 4:26

asdqwery

73 ● 1 ● 1 ● 8

Instead of presenting this as a function with two parameters, can you just give us a couple of hardwired values for `xCoords` and `yCoords` and a picture of their output, and the text of any errors? When you say wrong Perimeter do you mean a tiny rounding error, something that looks like projection could be involved or more like a square truncated to a triangle due to too few cords being used? – PolyGeo Mar 3, 2016 at 4:53

Try dx=float(...), dy=float(..) and replace *2 by dxdx+dy*dy. Also I'd use for i,x in enumerate(xCoords) for your loop – FelixIP Mar 3, 2016 at 5:18

I don't see where the problem is.. all lists are finite, they start at element 0 and then go to element 'n'. A polygon in Esri has its last point coincident (right on top of and identical to) its first. When you get the array from the part for the polygon you only need iterate by range(len(Array)-1) to iterate through the polygon once. Can you explain how you're getting your arrays please, perhaps the problem is there. – Michael Stimson Mar 3, 2016 at 5:35

Shouldn't the test be against coord[0]? – mdsumner Mar 3, 2016 at 6:49

I see it migrated from gis stack, so I assume it is gis related. Are you using GDAL, shapely or another module to read the coords? What format is the polygon data in(shp, csv)? – PyMapr Mar 3, 2016 at 9:28

3 Answers

Sorted by: Highest score (default)

1

You don't really need a `while` loop here. You can do it with a `for` loop since you are going through all of the polygon's vertices:

```
sum = 0
for i in xrange(len(xCoords) - 1):
   sum += np.sqrt((xCoords[i] - xCoords[i + 1]) ** 2) + (yCoords[i] - yCoords[i + 1]) ** 2))
sum+=np.sqrt((xCoords[0] - xCoords[-1]) ** 2) + (yCoords[0] -yCoords[-1]) ** 2))
```

If you insist on doing so with a `while` loop you can do so in this way:

```
sum = 0
i = 0
while (i < len(xCoords) - 1):
     sum += np.sqrt((xCoords[i] - xCoords[i + 1]) ** 2) + (yCoords[i] - yCoords[i + 1]) ** 2))
     i += 1
sum+=np.sqrt((xCoords[0] - xCoords[-1]) ** 2) + (yCoords[0] -yCoords[-1]) ** 2))
```

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answered Mar 3, 2016 at 10:53

Zachi Shtain
836 ● 1 ● 13 ● 32

0

Your algorithm is not correct. You need to first sort your coordinates based on the arctangent of the angle they create with the centroid of your polygon. (In order to get the correct order of your coordinates in your shape)

```
from math import atan

def sort_coordinates(centroid, shuffled_coordinates):
    Cx, Cy = centroid
    return sorted(shuffled_coordinates, key=lambda p: math.atan2(p[1]-Cy,p[0]-Cx))
```

Then you can calculate the length of the sides of shape using pair coordinates and sum up all them to get the perimeter:

```
def perimeter(coordinates):
    return sum(math.sqrt(pow(y2-y1,2)+pow(x2-x1,2)) for (x1,y1),(x2,y2) in
zip(coordinates, coordinates[1:]))
```

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answered Mar 3, 2016 at 9:30

Mazdak

107k ● 19 ● 165 ● 193

0

Seeing your while loop condition, I am guessing your last and first coordinates are the same.

```
x = [0,1,2,3,0]

y = [0,2,4,5,0]
```

I don't see any other way in which that while loop condition makes sense. If it is so, then you should try.

```
i = math.fmod((i+1),len(xCoords))
```

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edited Mar 3, 2016 at 11:21

user5547025

answered Mar 3, 2016 at 10:35

learn_code

47 ● 6