12.7 - Python Turtle

Your Task

You are given a list of points named shape.

Draw the corresponding piecewise-straight line!

Hints:

- Pop the first item in the list shape: p = shape.pop(0).
- Spawn a Turtle at the initial position X = p[0], Y = p[1].
- Use the for-loop to parse the list shape one point p at a time:
  - for p in shape:
  - Access the X and Y coordinates of p as p[0], p[1].
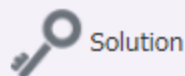
🔑 Solution

Lines: 10 (5 p), 5 (10 p)   Use: **for, goto**

```
1  # Pop (REMOVE) the first item from the list 'shape':
2  p = shape.pop(0)
3  # Spawn a Turtle at X = p[0], Y = p[1]:
4  tina = NCLabTurtle(p[0], p[1])
5  # Parse the rest of 'shape' one point 'p' at a time:
6  for p in shape: #Use the for-loop to parse the list shape one point p at a time:
7      # Go to coordinates p[0], p[1]:
8      tina.goto(p[0], p[1])
9  # Hide the Turtle:
10 tina.hide()
11 # Show the Turtle:
12 tina.show()
```

```python
 1  # Calculate the area of an oriented trapezoid:
 2  def trapezoid(a, b):
 3      return 0.5 * (a[1] + b[1]) * (a[0] - b[0]) #GIVEN THIS ABOVE
 4
 5  # Calculate the area of a positively oriented polygon:
 6  def getarea(shape):
 7      # Create counter i and set to zero:
 8      i = 0
 9      # Create variable 'area' and set to zero:
10      area = 0
11      # While shape[i] differs from shape[i+1]: IN HINTS ABOVE
12      while shape[i] != shape[i+1]: # Calculate the area of the T with points a=shape[i] and b= shape[i+1], multiply by minus 1
    Area
13          # Add the area of oriented trapezoid beneath line shape[i], shape[i+1]:
14          area += trapezoid(shape[i], shape[i+1])
15          # Increase counter i by one:
16          i += 1
17      # Return area:
18      return area
19
20  # Main program:GIVEN ALL OF THIS CODE
21  # Duplicate last point in list 'shape' for easy stopping:
22  # Pop the last item:
23  last = shape.pop()
24  # Add it back twice:
25  shape.append(last)
26  shape.append(last)
27  # Call the function getarea() and display result:
28  print("Area of this object is", getarea(shape))
29
30  # Let's also draw it:
31  p = shape.pop(0)
32  tina = NCLabTurtle(p[0], p[1])
33  # Loop over all remaining points in list 'shape':
34  for p in shape:
35      # Go to point X = p[0], Y = p[1]:
36      tina.goto(p[0], p[1])
37  # Hide the turtle
38  tina.hide()
39  # Show the drawing:
```