Writing a Sorting Algorithm

TOTAL POINTS 4

1. Assignment overview

   1 point

   This assignment is an opportunity for you to develop an algorithm of your own and have someone else execute it to give you feedback on its correctness and specificity.

   You will write an algorithm that sorts temperature data from least to greatest. To do this, you will work through the first four of the Seven Steps.

   Introduction to the data

   NOAA's National Centers for Environmental Information collects global climate data and aggregates this data to provide information on climate trends and variability. One product they offer is a monthly regional analysis. The following table gives "anomaly" data by continent for January 2017. "Anomaly" means the value is the temperature difference from the average temperature from years 1910–2000.

Continent	Anomaly (C)
North America	3.18
South America	1.36
Europe	-0.12
Africa	0.53
Asia	1.92
Oceania	0.98

   Source: https://www.ncdc.noaa.gov/sotc/global-regions/201701

   Assignment task

   Your task is to develop an algorithm that would sort data such as these from least to greatest. Specifically, given an unsorted set of N decimal values, your algorithm should sort them to give an answer of the sorted data. For this set of N = 6, your algorithm should produce:

-0.12
0.53
0.98
1.36
1.92
3.18

   Step 1: Work an example by hand

   Take the list of values, and sort them by hand. Sort them the way that comes most naturally to you. Do not research sorting algorithms or try to figure out the most efficient method—that is not the point of this assignment.

   Step 2: Write down exactly what you did

   Think carefully about how you performed the sort by hand. What values did you compare? In what order? How did you know when you were done? Write down these steps exactly.

   Step 3: Generalize

   Look for patterns in the steps you wrote down for Step 2. If you repeated sets of steps, how could you count repetitions? If you swapped certain values under certain conditions, what were they? Are there variables you need to name in order to reuse? Write down your step-by-step generalized algorithm.

   Step 4: Test your algorithm

   Execute your algorithm for a different set of data, such as a subset of the given data, data you make up, or another month's climate data, such as February 2017: https://www.ncdc.noaa.gov/sotc/global-regions/201702

   Does your algorithm work for any N? Have you thought of corner cases it might need to handle, such as N = 0 or N = 1?

   How to submit:

   Enter your algorithm in the text box. You can work in another program and copy/paste into the box, or you can type your algorithm directly.

   Your algorithm should be written in **clear English, not C code.**

```
if leftElement > rightElement
    swap leftElement and rightElement
    swapped <-true
end bubblesort
```

Your answer cannot be more than 10000 characters.

2. Did your friend get the correct answer?   1 point

◉ Yes
◯ No

3. Did your friend confirm that your algorithm was specific enough to follow?   1 point

◉ Yes
◯ No

4. Did your friend have any ideas for ways to improve the specificity of your algorithm? Did they think of any corner cases   1 point
your algorithm missed?

```
Yes
```

Your answer cannot be more than 10000 characters.

Save   Submit