CST 205 Project 1 Help

Writing a Median Function

For a list of odd length

To find the median, we must first sort the list. In Python, we can use the built-in `sorted` function.

Here is an example:

```
values = [2, 5, 6, 1, 9]
sortedValues = sorted(values)
print(sortedValues)
```

We get back `[1, 2, 5, 6, 9]`. This is what we want.

For more on the Python `sorted` function, refer to the Sorting Mini-HOW TO on the Python Wiki. For more on sorting in general, refer to the Sorting algorithm Wikipedia page.

Now that our list is sorted, for a list with an odd number of items, the middle value is our median. If our list is of length n, we can find the location of the middle value by calculating $\frac{(n+1)}{2}$. Python provides the `len` function for finding the length of a list. In our previous example, we had five items, so our middle value is located at:

$$\frac{5+1}{2} = 3$$

Python lists begin with index 0. This means our the items are numbered $0, 1, 2, 3, ...$, so if we want the third value of our list, we use:

```
median = sortedValues[2]
```

We can package code that we will reuse in a *function*. Above, we described the procedure to calculate the median if a list is comprised of an odd number of elements. We can call this function `medianOdd` (It makes sense to include the case of an even list and that is a good exercise to try on your own.)

In Python, we define a function with the keyword *def* and input to the function is placed within the neighboring parentheses. For more on Python functions, refer to What Good are Functions? on Codecademy.

Our median function for lists of odd length, might look like this:

```
def medianOdd(myList):
  # Store list length in the variable listLength
  listLength = len(myList)
  # Sort the list
  sortedValues = sorted(myList)
  # Location of middle value. Subtract one because of zero index
  middleIndex = ((listLength + 1)/2) - 1
  # Return the object located at that index
  return sortedValues[middleIndex]
```

Note: In Python, whitespace (i.e., indentation) is important. You will get an error or your code will not work as expected without proper white space.