

MORE PRACTICE WITH LISTS

CS 125

Working with a partner/group, use the following steps to solve each of the following problems.

- Plan your code on the white board (either on the classroom wall or on Zoom). Write out your entire program. Think about what errors might occur and how to fix them.
- Plan multiple test cases. What input will you send to your function? For each input, what value should be returned?
- Only after you have completed steps (a) and (b) should you type your code in Python.*
- After you have typed your code, run your test cases. Does your code work? If not, how can you fix it?

- Write a list comprehension to solve each of the following problems. (Your solution to each of the following problems should be a single line of code.)
 - Make a list of all integers between 1 and 1000 that are divisible by 11.
 - Remove all of the vowels from a string.
 - Make a list of all integers between 1 and 1000 that include the digit 5.

- Write a function `letterFrequencies(text)` that counts the number of times each letter occurs in a string. Your function should return a list of 26 counts, one count for each letter of the alphabet.

For example: `letterFrequencies("Hat Cap Sat")` returns
[3,0,1,0,0,0,0,1,0,0,0,0,0,0,0,1,0,0,1,2,0,0,0,0,0,0]

Hint: one way to convert an uppercase or lowercase character `c` to its position in the alphabet is:

`ord(c.lower()) - 97`

- Write a function `meanSD(nums)` that accepts a list of numbers and returns a tuple containing the mean and standard deviation of the numbers. If the numbers are x_1, x_2, \dots, x_N , then the mean and standard deviation are computed as follows:

• mean: $\bar{x} = \frac{x_1 + x_2 + \dots + x_N}{N}$ (this is the average of the numbers)

• standard deviation: $s = \sqrt{\frac{1}{N-1} \sum_{i=1}^N (x_i - \bar{x})^2}$

For example, `meanSD([2, 5, 7, 8, 12, 15])` returns (8.16667, 4.70815).

4. A string is said to be *complete* if it contains all of the letters from *a* to *z*. Write a function `isComplete(text)` that accepts a string of text and determines whether the string is complete. If the string is complete, the function returns `True`, otherwise it returns `False`. As part of your solution, you may wish to call your `letterFrequencies` function from #2.