

# Exercises: Python Class

- (1) Write a file that asks the user for input. If the input is "STOP", then the program stops.
- (2) Expand on the previous exercise by writing all user input (except "STOP") to a file called 'input.txt'. Close the file and end the program if 'STOP' is entered.
- (3) Open the file 'input.txt' and determine the following:
  - (1) The total number of characters in the file.
  - (2) The total number of lines in the file.
  - (3) The total number of words in the file.
  - (4) The number of vowels and the number of consonants in the file.
- (4) Repetition:
  - (1) Write a function that displays a triangle in the interactive IDLE shell. The height is a parameter of the function. (This is quite involved since you will have to calculate the distance from the left margin to the first asterisk and the number of asterisk.)
  - (2) Add-on to this problem by making it into a fur tree (with a stump below).
  - (3) Determine the sum of all integers between 1 and 100 (included) that are divisible by 7 or have remainder 2 when divided by 3. You should use a for-loop and an accumulator.
  - (4) Write a function that takes a word and returns the same word, but all vowels replaced by an asterisk '\*'.
  - (5) Write a function that uses a dictionary to count all letters in a file. The trick with using a dictionary is that you need to start with counts zero for all letters. We get the letters from `string.ascii_letters`, needing to import `string`.
  - (6) Use list comprehension to generate the list of all integers between 1 and 100 (included) that are divisible by 7 or have remainder 2 when divided by 3. Then use `sum` on the list and thereby obtain a better solution to Problem 4.(3).
  - (7) Write a function that differentiates numerically another function. Then write a program that displays the exponential function and the numerical derivative with an accuracy of exactly 6 digits after the decimal point in a nice table.

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    *****
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