Introduction to Python Programming – Week2

by AIMS Cameroon Tutors 2019-2020

Instructions: For each of the questions, use **a separate python file**

1 Reverse your String

Write a function called **ReveX** that takes a string as input, and return a new string with the same letters in reverse order.

Don't use the .reverse() method, that would be too simple.

Example:

- **Input:** banana
- **Output:** ananab

2 Solve the Factorial

Write a method called **FactorX** that takes an integer **n** a input and returns its factorial. Remember the formula of a factorial of a number

$$n! = n * (n-1) * (n-2) * (n-3) * ... * 1$$

Example:

- **Input:** 5
- **Output:** 120

3 The Longest word

Write a function called **longest** that takes a string (preferably a sentence) as input and returns the longest word in the string. You may assume that the string contains

only letters and spaces.

Example:

- **Input:** "today is my birthday"
- **Output:** "birthday"

4 Sum over my predecessors

Write a function called **SumOverX** that takes an integer as input and returns the sum over all the integers between zero and that integer, including it.

Example:

- **Input:** 5
- **Output:** 5+4+3+2+1=15

5 Four Digits Magic

Take any four-digit number,x. Rearrange the digits to make the largest possible number called x_{max} . Also rearrange the digits to make the smallest possible number, x_{min} . There is only one four-digit number for which

$$x_{max} - x_{min} = x$$

Find it.

6 From minutes to Conventional Time

Write a function called **ClockX** that takes as input a certain number of minutes, and returns a string that formats the number into 'hours:minutes'.

Example:

- **Input:** 65
- **Output:** '01:05'
- **Input:** 137
- **Output:** '02:17'

7 Vowel Digger

Write a function called **VoweX** that takes a string as input and returns the number of vowels in the string. You may assume that all the letters are lower cased. You can treat **"y"** as a consonant.

Example:

- **Input:** 'banana'
- **Output:** 3
- **Input:** cinematography'
- **Output:** 5

8 Military Time

Write a function called **Military** that takes the time as string in AM/PM format and convert it to military (24-hour) time.

Note: Midnight is 12:00:00AM on a 12-hour clock, and 00:00:00 on a 24-hour clock. Noon is 12:00:00PM on a 12-hour clock, and 12:00:00 on a 24-hour clock.

Example:

- **Input:** '04:52PM'
- **Output:** '16:52'
- **Input:** '02:34AM'
- **Output:** '02:34'

9 Plot over a summation

Plot the following function:

$$y = f(x) = \sum_{k=1}^{k_{max}} \frac{4}{k\pi} sin(k\pi x/2), \quad x \in [-2, 2],$$

where the summation is restricted over odd integers only: k = 1, 3 , 5.....

Select a small step value, such as 0.1.

First use $k_{max} = 6$, and then $k_{max} = 26$. What do you notice about the plot of the shape as you change k_{max}?

Remember always to comment your codes and write documentation for your functions, it's good practice!!!

Happy Pythoning!