

Homework #5

The below exercises are based on the *Coding the Matrix* book by Philip Klein.

Due: Friday, November 9 at 11:59 pm PDT.

Submission instructions:

- Read the below problems, then fill out Homework 5.py with your solution.
 - You can download Homework 5.py from BeachBoard.
- Submit your Homework 5.py file via BeachBoard.
- All problems must be done using Python 3.
- Failure to follow the above instructions will result in a deduction of points, up to and including you receiving 0 credit.

(5 points)

Problem 1: shift_cipher(L, key)

input:

- L - list of numbers, representing the numbers associated to letters in the English alphabet. The number values will range between 0 and 25.
- key - a positive integer representing a key

output: list of numbers after being encrypted using a shift cipher with the inputted key.

example: L = [7, 4, 11, 11, 14] and key = 18, return [25, 22, 3, 3, 6]

(5 points)

Problem 2: my_lists(L,num)

input: list L of non-negative integers and an integer num

output: a list of lists: for every element x in L, create a list containing 1, 2, ..., x and each number subtracted by num.

examples:

- L=[1,2,4] and num=5, return [[-4], [-4, -3], [-4, -3, -2, -1]].
- L=[0] and num=5, return [[]]

(5 points)

Problem 3: Using the following format:

def myAvg(L)

 current = ...

 for x in L:

 current = ...

 return ...

input: list of numbers

output: average of the numbers from the list.

example: myAvg([2,5,3,2]) will return 3.0

(5 points)

Problem 4: Translating, Rotating, and Scaling

- Using the below coordinates, create a comprehension:
 - Translate the coordinates down by 2 and to the left by 3.
 - Rotate the plot 60 degrees counter-clockwise.
 - Scale the plot down to $1/3$.
- Coordinates are $2+2j$, $3+2j$, $1.75+1j$, $2+1j$, $2.25+1j$, $2.5+1j$, $2.75+1j$, $3+1j$, $3.25+1j$
- Plot the coordinates

(10 points)

Problem 5: isPrime(L)

input:

- L - list of numbers greater than 1.

output: numbers from that list that are prime

example: isPrime([2, 5, 8, 10, 13]) will return [2, 5, 13]