广东以色列理工学院

Guangdong Technion-Israel Institute of Technology

234128 – Introduction To Computing With Python

Winter Semester 2020-2021

HW3

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Due date : Thursday, 2021-01-14 23:59

Mission 1 : (hw3q1.py)

Write a <u>recursive</u> function

def show(n):

n is any non negative int number greater or equal to 0.

The function shows the numbers n , n-2, n-4, n-6, … till we get the most small number still big than 0. Then the function continues and displays the numbers 0 , 1, 2, 3, 4, … , n.

Each number is displayed in a new line. No spaces are displayed.

Write a main code that will get a non negative int number as input, Then will call to show(n).

The format of output MUST be EXACTLY as given examples. Use input/output redirection and cmp_files.py to check this.

Mission 2 : (hw3q2.py)

Let s be a string. Let d be a digit character that appears in s. d is called <u>special</u> if there exit in left and in right of d also digit characters such that these 2 digits in left and right to d are both more small than d or more big than d.

Example: s='!!cf354h^%j768^h*&'

The digit character '5' is special because we have '3' in left and '4' in right and they are both more small than '5'. Also '6' is special because we have '7' in left and '8' in right and they are both more big than '6'.

A special character in s different than 0 is called <u>unique</u> if it divides the index of its location in s.

Example : regarding the previous example, '5' is <u>unique</u> becaucan it is special and its index in s is 5 and we can do index/digit without a remainder, in our case 5/5. Also '6' is unique because '6' is special and we can do index/digit without a remainder, in our case 12/6.

We have the following function f :

def f(s): # '0' does not appear in s

    return g(s,0)

The function f gets s as a parameter. s is any string that does NOT include the digit character '0'.

The function f returns the number of <u>unique</u> characters that appear in s.

Example :   f('!!cf354h^%j768^h*&')==2

Write in a file hw3q2.py the function f EXACTLY as described. Then complete and write also the function g. This function g MUST be <u>recursive</u>.

Write a main code that will get any string s as input. The the program shows how many <u>unique</u> character exist in s.

The format of output MUST be EXACTLY as given examples. Use input/output redirection and cmp_files.py to check this.

Mission 3 : (hw3q3.py)

Let n b a positive int number greater than 0. Let d be a digit in n. if d appears in n even number of times then we say that the parity of d in n is even. Otherwise we say that the parity of d in n is odd.

Example : n==354234345434

4 appears 5 times. Therefore the parity of 4 is odd. 5 appears 2 times, therefore the parity of 5 is even.

Write a <u>recursive</u> function

def check(n):

n is a positive int number greater than 0. The digit 0 does NOT appear in n.

The function returns True if the parity of all even digits in n (all together) is odd, and the parity

of all odd digits in n (all together) is even.

Examples:

check(4)==True # no odd digits, therefore the parity of all odd digits is even (==0).

check(56348)==True # There are 2 odd digits altogether – even parity for odd digits.

　　　　　　　　# 3 even digits altogether – odd parity for even digits.

Write a main code that will get a number n as input and will show the result of check(n).

n is a positive int number greater than 0. The digit 0 does NOT appear in n.

The format of output MUST be EXACTLY as given examples. Use input/output redirection and cmp_files.py to check this.

Submission :

Make a zip file whose name is <id>.zip whereas <id> is your id (9 digits exactly).
Example – 999003645.zip

Please verify – ONLY zip file. NOT rar file or any other format.

The zip file should contain the following files :

hw3q1.py   hw3q2.py   hw3q3.py   student.txt

NOTHING ELSE should be included in the zip file. NO any sub folder should appear in the zip file.

student.txt should contain your personal details – ENGLISH ONLY. Fill in the file that is given.

DO NOT CHANGE WHAT IS ALREADY WRITTEN. DO NOT CHANGE THE NAME OF THE FILE. Just

complete the missing details.

Submit the zip file in Moodle.

Good Luck !