**ADVANCED PROGRAMMING ASSIGNMENT\_1 -SUBMITTED BY SAMUEL DEVDAS**

1. Write a function that takes a list of lists and returns the value of all of the symbols in it, where each symbol adds or takes something from the total score. Symbol values:

# = 5

O = 3

X = 1

! = -1

!! = -3

!!! = -5

A list of lists containing 2 #s, a O, and a !!! would equal (0 + 5 + 5 + 3 - 5) 8.

If the final score is negative, return 0 (e.g. 3 #s, 3 !!s, 2 !!!s and a X would be (0 + 5 + 5 + 5 - 3 - 3 - 3 - 5 - 5 + 1) -3, so return 0.

Examples

check\_score([

["#", "!"],

["!!", "X"]

]) ➞ 2

check\_score([

["!!!", "O", "!"],

["X", "#", "!!!"],

["!!", "X", "O"]

]) ➞ 0

Ans.

def check\_score(list\_input):

score\_dict={'#':5,'O':3,'X':1,'!':-1,'!!':-3,'!!!':-5}

calc=[]

for i in range(len(list\_input)):

for j in range(len(list\_input[i])):

calc.append(score\_dict[list\_input[i][j]])

if sum(calc)>0:

return (sum(calc))

else:

return(0)

list\_input=[["#", "!"],["!!", "X"]]

check\_score(list\_input)

2. Create a function that takes a variable number of arguments, each argument representing the number of items in a group, and returns the number of permutations (combinations) of items that you could get by taking one item from each group.

Examples

combinations(2, 3) ➞ 6

combinations(3, 7, 4) ➞ 84

combinations(2, 3, 4, 5) ➞ 120

Ans.

def combinations(\*args):

comb=1

for num in args:

comb\*=num

return comb

combinations(3, 7, 4)

3. Create a function that takes a string as an argument and returns the Morse code equivalent.

Examples

encode\_morse("EDABBIT CHALLENGE") ➞ ". -.. .- -... -... .. - -.-. .... .- .-.. .-.. . -. --. ."

encode\_morse("HELP ME !") ➞ ".... . .-.. .--. -- . -.-.--"

This dictionary can be used for coding:

char\_to\_dots = {

'A': '.-', 'B': '-...', 'C': '-.-.', 'D': '-..', 'E': '.', 'F': '..-.',

'G': '--.', 'H': '....', 'I': '..', 'J': '.---', 'K': '-.-', 'L': '.-..',

'M': '--', 'N': '-.', 'O': '---', 'P': '.--.', 'Q': '--.-', 'R': '.-.',

'S': '...', 'T': '-', 'U': '..-', 'V': '...-', 'W': '.--', 'X': '-..-',

'Y': '-.--', 'Z': '--..', ' ': ' ', '0': '-----',

'1': '.----', '2': '..---', '3': '...--', '4': '....-', '5': '.....',

'6': '-....', '7': '--...', '8': '---..', '9': '----.',

'&': '.-...', "'": '.----.', '@': '.--.-.', ')': '-.--.-', '(': '-.--.',

':': '---...', ',': '--..--', '=': '-...-', '!': '-.-.--', '.': '.-.-.-',

'-': '-....-', '+': '.-.-.', '"': '.-..-.', '?': '..--..', '/': '-..-.'

}

Ans.

def encode\_morse(string):

char\_to\_dots = {'A': '.-', 'B': '-...', 'C': '-.-.', 'D': '-..', 'E': '.', 'F': '..-.',

'G': '--.', 'H': '....', 'I': '..', 'J': '.---', 'K': '-.-', 'L': '.-..',

'M': '--', 'N': '-.', 'O': '---', 'P': '.--.', 'Q': '--.-', 'R': '.-.',

'S': '...', 'T': '-', 'U': '..-', 'V': '...-', 'W': '.--', 'X': '-..-',

'Y': '-.--', 'Z': '--..', ' ': ' ', '0': '-----',

'1': '.----', '2': '..---', '3': '...--', '4': '....-', '5': '.....',

'6': '-....', '7': '--...', '8': '---..', '9': '----.',

'&': '.-...', "'": '.----.', '@': '.--.-.', ')': '-.--.-', '(': '-.--.',

':': '---...', ',': '--..--', '=': '-...-', '!': '-.-.--', '.': '.-.-.-',

'-': '-....-', '+': '.-.-.', '"': '.-..-.', '?': '..--..', '/': '-..-.'}

morse=''

for char in string:

morse+=char\_to\_dots[char]

return morse

encode\_morse("EDABBIT CHALLENGE")

4. Write a function that takes a number and returns True if it's a prime; False otherwise. The number can be 2^64-1 (2 to the power of 63, not XOR). With the standard technique it would be O(2^64-1), which is much too large for the 10 second time limit.

Examples

prime(7) ➞ True

prime(56963) ➞ True

prime(5151512515524) ➞ False

Ans.

def prime(upper):

for num in range(2,upper+1):

if num<upper:

if upper%num==0:

print(False)

break

else:

continue

else:

print(True)

prime(56963)

5. Create a function that converts a word to a bitstring and then to a boolean list based on the following criteria:

1. Locate the position of the letter in the English alphabet (from 1 to 26).

2. Odd positions will be represented as 1 and 0 otherwise.

3. Convert the represented positions to boolean values, 1 for True and 0 for False.

4. Store the conversions into an array.

Examples

to\_boolean\_list("deep") ➞ [False, True, True, False]

# deep converts to 0110

# d is the 4th alphabet - 0

# e is the 5th alphabet - 1

# e is the 5th alphabet - 1

# p is the 16th alphabet - 0

to\_boolean\_list("loves") ➞ [False, True, False, True, True]

to\_boolean\_list("tesh") ➞ [False, True, True, False]

Ans.

def to\_boolean\_list(string):

blist=[]

for char in string:

if ord(char)%2==0:

blist.append(False)

else:

blist.append(True)

return (blist)

to\_boolean\_list("tesh")