PSG COLLEGE OF TECHNOLOGY, COIMBATORE – 641004

DEPARTMENT OF INFORMATION TECHNOLOGY

SET – 1:

1. Given a string S, consisting of only '*' and '|' where '*' means existence of an item and a '|' means compartment. The number of asterisk between a pair of '|' is the number of items in the compartment. Write a program to receive the start and end index from the user and identify the number of compartments within the indices [inclusive of start and end index] and the number of items in each compartment.

   Example:

   S = |***|*|**|*

   Start index: 0

   End Index: 7

   Output:

   Number of Compartments: 2

   Number of Items 1st Compartment: 3

   Number of Items in 2nd Compartment: 1

SET- 2

Given 'n' number of persons in a park, one of them is having a virus and it remains unknown. Also the position of all persons is also given. A contaminated person can spread upto 'd' distance. Write a program to find the maximum spread and minimum spread.

Example:

Number of persons = 5

positions = [1, 3, 5, 9, 14]

distance = 5

SET – 3

Given an array of numbers. You have to give the range in which each number is the maximum element.

Example, If array is 1, 5, 4, 3, 6. The output would be

1 [1, 1]

5 [1, 4]

4 [3, 4]

3 [4, 4]

6 [1, 5]

SET – 4

Given an array of positive and negative integers {-1,6,9,-4,-10,-9,8,8,4} (repetition allowed) sort the array in a way such that the starting from a positive number, the elements should be arranged as one positive and one negative element maintaining insertion order. First element should be starting from positive integer and the resultant array should look like {6,-1,9,-4,8,-10,8,-9,4}

SET -5

Given a binary array {0,1,1,0,0,1,0,0,1} , sort the array in a way that all zeros come to the left and all the one's come to the right side of the array.

SET – 6

Given a dictionary that contains the words in English language as key and Spanish words as value. Write a program to convert the given text in English to Spanish.

Example:

Input: Hello Good Morning!. Nice day. Education is the best

Output: Hola Buenos dias!. Simpatico dia. Educacion es la major

SET- 7

Write a function that accepts an encoded string as a parameter. This string will contain a first name, last name, and an id. Values in the string can be separated by any number of zeros. The id is a numeric value but will contain no zeros. The function should parse the string and return a Python dictionary that contains the first name, last name, and id values.

Example:

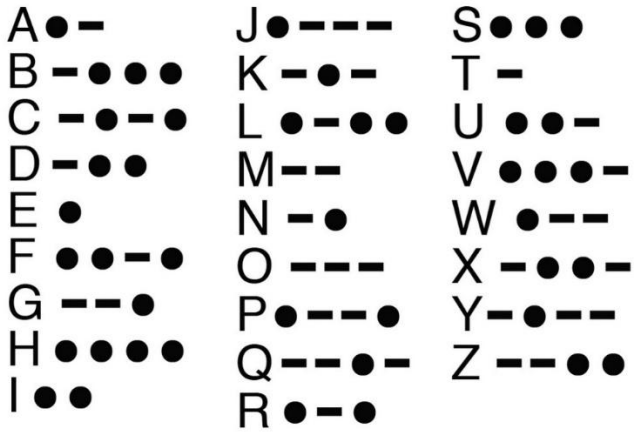
Input: "Robert000Smith000123".

Output:

{ "first_name": "Robert", "last_name": "Smith", "id": "123" }

SET-7:

Given the Morse code for each letter, write a function to convert the given string into its corresponding morse code.



SET- 8:

Define a function named zap. The function takes two parameters, a and b. These are lists. Your function should return a list of tuples. Each tuple should contain one item from the a list and one from b such that their sum of elements is 7. You may assume a and b have equal lengths.

Example:

Input:

[0, 1, 8, 3],

[5, 6, 7, 8]

Output:

[(0, 7), (1, 6)]

SET – 9

A number is said to be Disarium if the **sum** of its *digits raised to their respective positions* is the number itself.

Create a function that determines whether a number is a Disarium or not.

Examples:

is_disarium(75) ➞ False

7^1 + 5^2 = 7 + 25 = 32

is_disarium(135) ➞ True

1^1 + 3^2 + 5^3 = 1 + 9 + 125 = 135

SET – 10

Write a function that uses The Karaca's Encryption Algorithm to encrypts a given input. The steps for encryption are as follows:

Input: `"apple"`

Step 1: Reverse the input: `"elppa"`

Step 2: Replace all vowels using the following chart:

a => 0

e => 1

i => 2

o => 2

u => 3

"1lpp0"

Step 3: Add "aca" to the end of the word: `"1lpp0aca"`

Output: `"1lpp0aca"`

SET -10

A city skyline can be represented as a 2-D list with 1s representing buildings. In the example below, the height of the tallest building is **4** (second-most right column).

```
[[0, 0, 0, 0, 0, 0],
[0, 0, 0, 0, 1, 0],
[0, 0, 1, 0, 1, 0],
[0, 1, 1, 1, 1, 0],
[1, 1, 1, 1, 1, 1]]
```

Create a function that takes a **skyline** (2-D list of 0's and 1's) and returns the height of the tallest skyscraper.

Examples

```
tallest_skyscraper([
  [0, 0, 0, 0],
  [0, 1, 0, 0],
  [0, 1, 1, 0],
  [1, 1, 1, 1]
]) ➞ 3

tallest_skyscraper([
  [0, 1, 0, 0],
  [0, 1, 0, 0],
  [0, 1, 1, 0],
  [1, 1, 1, 1]
]) ➞ 4
```