Python Practice Problems - 1

Shiuli Subhra Ghosh

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1. Permutation Divisible by 8

Given an integer string, create all integer permutations of its digits. Determine if there is a permutation whose integer value is evenly divisible by 8, i.e, (Permutation value) mod 8 = 0.

For example, the possible permutations of 123 are p = 123, 132, 213, 231, 312, 321, of these values, p[4] = 312 is divisible by 8.

Function Description:

Write a code for checking the divisibility. The function must return an array of result strings, either YES or NO, where each result[i]denotes whether a permutation of arr[i] is divisible by 8.

Input Format

The function has the following parameters(s):
arr[arr[0],arr[1],....,arr[n-1]] : an array of integer strings.

Sample Input:

def divisibility([65,71,123])

Sample Output:

['YES', 'NO', 'YES']

Explanation

arr[0] = 61. The permutation p = 16 is divisible by 8 so store 'YES' in index 0 of the return array.
arr[1] = 75. The permutations are 57 and 75. Neither of them are divisible by 8. So store 'NO' in index 1 of the return array.
arr[2] : I think you can understand it.

Think how can you optimize the algorithm you have developed.

2. All about Sigmoid and Activation

Write a function for sigmoid function.

$$\sigma(z) = \frac{1}{1 + \exp(-z)}$$

Then convert it to a piecewise activation function with following threshold values. 0.1,0.2,0.3,0.5,0.7,0.9 .

Example For threshold 0.2,

$$activation(z) = \begin{cases} 1 & \sigma(z) > 0.2 \\ 0 & \sigma(z) <= 0.2 \end{cases}$$

Compare the sigmoid and the activation function using a single plot. Use proper legend, color and necessary visual aids. You can use matplotlib.pyplot package.

3. Exponent Modulus

Write a program to compute the 4 right most digits of $2^{10105} + 2^{123456}$.

4. What is the difference between loc and iloc?

5. From Codechef

Solve the problem, https://www.codechef.com/problems/ODDBITS