Python Programming for Engineers

Assignment # 2

Due date: Wednesday, Nov. 17th, 2021

IMPORTANT!

1. Submit your HWs **ONLINE** before the due date
2. HW reports should contain:
    a. The description of the problem and proposed solution
    b. The program code
    c. Any program outputs
3. Submitted codes should be well-commented.

Problem 1:

Write a function (*BinaryToDecimal*) that converts a binary number into a decimal number.

Write a test program that asks the user to enter a binary number and displays the corresponding decimal value. Check whether the user enters only 0s and 1s, and warn the user to enter a correct binary number if he/she makes a mistake.

Example: input: "1101" → output: 13
input: "210" → "Not a binary number!"

Problem 2:

A permutation of a list is a list that has all the same elements but possibly in a different order. Write a Python function that takes two lists as input arguments and checks whether the two lists are permutations of each other. If they are permutations, the function returns True; otherwise, the function returns the total number of different elements in the lists (repetitions are treated as separate elements).

Ex: [10, 9, 11, 1] and [9,1,11,10] are permutations
[10, 9, 1, 10] and [8,1,11,10] are NOT permutations; no. of differences = 4

Problem 3:

Write a **recursive** Python function entitled "*combinations*" that accepts integer value *n* as input, and prints all combinations of numbers from 1 to *n* having sum equal to *n*.

Example : *combinations*(4) → output: [4], [1,3], [2,2], [1,1,2], [1,1,1,1]