Python Programming for Engineers

Assignment # 1

Due date: Wednesday, Nov. 3rd, 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 Python function that finds and prints all the prime numbers, *pn,* that satisfy the following equation:

$$pn = 2^k + 3^l$$

for some non-negative integers *k,l,* such that $k \leq 16$, $l \leq 16$.

Problem 2:

Write Python code that uses nested loops to display the following pattern:

```
                    1
                1   2   1
            1   2   4   2   1
        1   2   4   8   4   2   1
    1   2   4   8   16  8   4   2   1
1   2   4   8   16  32  16  8   4   2   1
1   2   4   8   16  32  64  32  16  8   4   2   1
1   2   4   8   16  32  64  128 64  32  16  8   4   2   1
```

Problem 3:

Write a Python function, named "find_fibonacci", which accepts a list as input. The function will find and return the elements that satisfy the Fibonacci property:

$$a_{k+2} = a_k + a_{k+1}$$

Example : Input list : [2, 8, 4, 6, 1, 7, 8, 4, 7, 9, 4, 13]
Returned list : [[6,1,7], [1,7,8], [9,4,13]]