

Programming Assignment Week 4:

1. (30pts) Write a Python program to display a string's index 0, 1, 2, 6, 7, 8, 12, 13, 14, 18, 19, 20, ... (3 on and 3 off pattern) location characters for any string given.

Sample Input String: "abcdefghijklmnopqrstuvwxyz"

Sample Output :

abcghimnostuzy

2. (30pts) Write a Python program to find out all index locations that has a certain pattern a string. (return a list, return [] if no such pattern in the string.)

Sample String : "abaaababbbbbaabbabababababbbbaaaabababababbbb"

Pattern: "abb"

Sample Output :

[6, 13, 24, 40]

3. (30pts) Check if an expression is balanced by its parentheses or not.

Sample expression: ((a+b)

Sample Output: False

Sample expression: (((a+b)+c)+d)+e

Sample Output: True

4. (30pts) Write a program to print out tower(n),

Sample Output:

```
tower(1)
 /\
**
**
```

```
tower(2)
 /\
**
 /\
**
 /\
**
**
```

```
tower(3)
 /\
**
 /\
**
 /\
**
 /\
**
**
```

5. (30pts) Given a list of number from 1 to N. The list has only one missing number. (within 1 to N). Please find out which number is missing. (Sorting not allowed. O(n) algorithm required)

Sample Input Sequence: [3, 5, 2, 1] # missing 4

Sample Output: 4