Problems based on Recursion - 3

Assignment Solutions

PW SKILLS

Q1 - Given a number n, print the following pattern without using any loop. (Easy)

n, n-5, n-10, ..., 0, 5, 10, ..., n-5, n

Input: n = 16
Expected Output: 16, 11, 6, 1, -4, 1, 6, 11, 16

Explanation:

- Create a recursive function with parameters as n, m set as n and flag variable set as true
- Print m and if the flag is false and the value of m is equal to n then return from the function
- If the flag is true then check
    - If m-5 is greater than zero then recur for m-5
    - Else recur for m-5 and set the flag to false, as now we will be moving backward
- Else recur for m+5

Code:
https://pastebin.com/g84rtkSL

```
/Library/Java/JavaVirtualMachines/jdk-19.
Enter the number n:
16
16 11 6 1 -4 1 6 11 16
Process finished with exit code 0
```

Q2 - Find m-th summation of first n natural numbers where m-th summation of first n natural numbers is defined as following:
If m > 1: SUM(n, m) = SUM(SUM(n, m - 1), 1)
Else :SUM(n, 1) = Sum of first n natural numbers.

(Medium)

Input: n = 3, m = 2
Expected Output : 21

Explanation:

- We first write the recursive function for sum of first n natural numbers.
- Next we create our main recursive function where we pass n and m as arguments.
- We use the question defined equations, if m=1, we directly call sum of n function.
- Else we recursively call our function for n and m-1 and then calculate sum of first n natural numbers for this sum.

Code:
https://pastebin.com/P7JXkCky

```
/Library/Java/JavaVirtualMachines/jdk-19.jd
Enter the number n and m:
3
2
21

Process finished with exit code 0
```