

P3 E1

The Problem

In mathematics, a *hofstadter* sequence is a member of a family of related integer sequences. The Hofstadter Female(F) and Male(M) sequences are defined for an index x as iterative sequences as follows.

$$F(0) = 1, \quad M(0) = 0$$

$$F(n) = n - M(F(n-1)), \quad n > 0$$

$$M(n) = n - F(M(n-1)), \quad n > 0$$

You are given a file containing a set of indexes (positive integers) where each index is on a separate line. Develop a python program to read the file and output (to the screen and to a file named 'Output.txt') the Hofstadter Female and Male sequence values for the given indexes.

Special requirement: You must define at least 2 functions and use them in your code.

Format:

Input : name of the input file

(the file contains the index numbers, each in a separate line)

Output : Display on screen and write to the output file 'Output.txt' the results in the following format.

For each index n, output "n: F = F(n) M = M(n)" where F(n) and M(n) are the Hofstadter Female and Male sequence values, respectively.

Sample :

Case 1

Input : test_data1.txt (file contains the following)

2

3

5

3

6

Output : In file 'Output.txt' and on screen, as follows:

2: F=2 M=1

3: F=2 M=2

5: F=3 M=3

3: F=2 M=2

6: F=4 M=4