

Hands-on Experiment # 10 : Worksheet

Section _____ Date _____

No more than 3 students per one submission of this worksheet.

Student ID _____ Name _____

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Part A: Getting Familiar with Writing Recursive Methods

- 1) Consider the following recursive definition.

$$f(n) = \begin{cases} f(n-1) + f(n-2) + f(n-3) & n = 3, 4, 5, \dots \\ 1 & n = 0, 1, 2 \end{cases}$$

Find the value of $f(n)$ for all values of n listed in the table below.

n	$f(n)$
0	
1	
2	
3	
4	
5	
6	

- 2) Write a Java method called `computeF(int n)` which returns the value of $f(n)$. Assume that n is a non-negative integer. Test your method in a program in which the values of $f(n)$ according to the following table are computed. Complete the table.

n	$f(n)$	n	$f(n)$
0		7	
1		8	
2		9	
3		10	
4		100	
5		200	
6		500	

List all your source code below.

- 3) (Optional) Based on your code, how many times *computeF()* is called in order to compute *computeF(500)*? You may modify the signature of the method so that you have a way to track the number of times it is called.

The number of times is :

Explain how you obtained the answer. Show all relevant code.

Part B: Thinking Recursively

- 1) Write a recursive method that checks whether the input *String* is a palindrome (<http://en.wikipedia.org/wiki/Palindrome>). Assume that the input *String* only contains English alphabets. You can design the method signature by yourself.

List your source code here.

- 2) Implement the sequential search in a recursive method. The method returns the index of the target value in the input array. You can design the method signature by yourself.

List your source code here.

Submit this worksheet (by only one member of the group) via <http://www.myCourseVille.com> (Assignments > Hands-on Experiment # 10) before noon of the day after your lecture.