Discipline of Computing and IT
University of Newcastle

SENG1120/6120 – Semester 1, 2018
Lab 7 (Week 8)

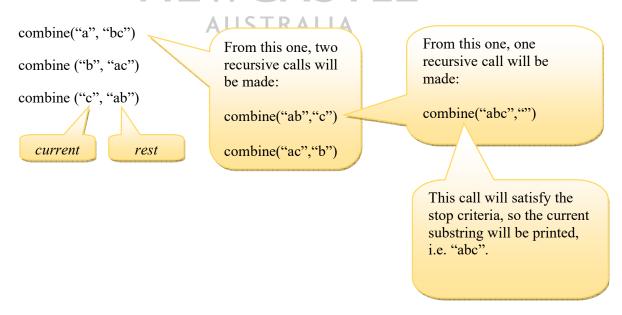Video guide: https://www.youtube.com/watch?v=GJhgIf3Q_M4

This week's laboratory provides practice in creation of recursive functions.

1) Create a recursive function `fibo(n)` which returns the n-th element in the Fibonacci sequence.

> • The Fibonacci sequence created such that the next element is the sum of the two previous ones: 0 1 1 2 3 5 8 13 21 34 55 …

Test your code with a user inputted argument.

2) Consider the situation where you have to generate all combinations of characters inputted by the user. Write a function using recursion that, given a string of n chars, generates and prints all possible combinations of those chars.

• Hint: create a recursive function `combine` that receives two `string` parameters and recursively calls itself. At each step a "current" substring should be passed, accounting for the portion of the original string that has already been combined; plus a second substring with what remains to be combined. The termination criteria is that the rest has length zero. Once that happens, just print the first substring.

Ex: if the input is "abc", the first level of recursive calls will be:

combine("a", "bc")

combine ("b", "ac")

combine ("c", "ab")

current   *rest*

From this one, two recursive calls will be made:

combine("ab","c")

combine("ac","b")

From this one, one recursive call will be made:

combine("abc","")

This call will satisfy the stop criteria, so the current substring will be printed, i.e. "abc".

Good Luck!