Homework 1

(7/25 due)

Homework 1 (10/16 due)

Problem 1:

Ackermann's function $A(m,n)$ is defined as follows:

$$A(m,n) = \begin{cases} n+1 & \text{, if } m = 0 \\ A(m-1,\ 1) & \text{, if } n = 0 \\ A(m-1,\ A(m,n-1)) & \text{, otherwise} \end{cases}$$

This function is studied because it grows very fast for small values of m and n. Write a recursive function for computing this function. Then write a nonrecursive algorithm for computing Ackermann's function.

Problem 2:

If S is a set of n elements, the *powerset* of S is the set of all possible subsets of S. For example, if $S = (a,b,c)$, then *powerset* $(S) = \{(\ ), (a), (b), (c), (a,b), (a,c), (b,c), (a,b,c)\}$. Write a recursive function to compute *powerset* (S).

作業繳交規範

- 解題說明 10%
  - 想法(How to do?)陳述，並舉例說明。
- Algorithm Design & Programming 30%
  - Source code + Comment
- 效能分析(Performance Analysis) 20%
  - Time complexity & Space complexity
- 測試與驗證(Testing and Proving) 15%
- 效能量測 (Measuring) 15%
- 心得討論 10%