ESC101 : Fundamental of Computing

Lab 10 for 27 October 2008

Maximum Marks = 10

1. (2 marks) Design a recursive method to compute nth Fibonacci number. Use it in a program to compute first n Fibonacci numbers. The value of n is provided from command line.

2. (4 marks) Stirling numbers: A stirling number of the first kind is defined as follows

   - s(n,0) = 0, for all n > 0
   - s(n+1,k) = s(n,k-1) - n*s(n,k), for all n≥ 0 and k>0.
   - s(0,0) = 1

   Write a recursive method to compute stirling number of first kind. Use it in a program which reads integers n and k from command line and print the corresponding stirling number.

3. (4 marks) Consider the following formulations for GCD of two numbers. Use this formulation **carefully** to design a compact recursive code for computing GCD of two numbers. The value of n and m is provided from the command line.

   - GCD(2m, 2n) = 2 * GCD(m, n)
   - GCD(2m, 2n+1) = GCD(m, 2n+1)
   - GCD(2m+1, 2n+1) = GCD(n-m, 2m+1) if m < n
   - GCD(m, m) = m