Assignment 1 - due March 9th

Send answers to dcc030ufmg@gmail.com.

Exercise 1. Let $f_0 = 1$ and $f_1 = 1$, and $f_k = f_{k-1} + f_{k-2}$. Aka: Fibonacci numbers. Show how to derive a formula for f_k that does not depend on previous terms using what you learned about formal power series.

Exercise 2. Let C_n be the Catalan numbers defined in class (that is, C_{n-1} is the number of complete binary rooted trees with n leaves). Let $C(x)$ be the corresponding generating function. Find the coefficients of $C(x)^k$ for a given k.

Exercise 3. Find a recurrence, a generating function and a closed formula for the number of rooted complete m-ary trees with n non-leaves, that is, those rooted trees in which each node has either 0 or m children.