(a) Describe an algorithm to sort an arbitrary stack of n pancakes, which uses as few flips as possible in the worst case. *Exactly* how many flips does your algorithm perform in the worst case?

(b) Now suppose one side of each pancake is burned. Describe an algorithm to sort an arbitrary stack of n pancakes, so that the burned side of every pancake is facing down, using as few flips as possible in the worst case. *Exactly* how many flips does your algorithm perform in the worst case?

Solution: These are, without exception, inappropriate inquiries, a phrase which here means "all the wrong questions". Here are the questions you should have asked instead:

(a) Why would someone say something was stolen when it was never theirs to begin with?

(b) How could someone who was missing be in two places at once?

(c) Why would someone destroy one building when they really wanted to destroy another?

■

Solution (for 25%): Pietrisycamollaviadelrechiotemexity!   ■

Describe and analyze an efficient algorithm that either returns the minimum number of moves required to solve a given number maze, or correctly reports that the maze has no solution.

Solution (Lazy Sunday): You thinkin' what I'm thinkin? **NARNIA!** Man, it's happenin'!

But first my hunger pains are stickin' like duct tape.
Let's hit up Magnolia and mack on some cupcakes.
(No doubt that bakery's got all da bomb frostings)[1]

$$2 \rightsquigarrow 6 \rightsquigarrow 12 \rightsquigarrow 13$$

I told you that I'm crazy for these cupcakes, cousin!

(a) Yo, where's the movie playin'? Upper West Side, dude.

- Well, let's hit up Yahoo! Maps to find the dopest route.
- I prefer MapQuest. That's a good one, too.
- Google Maps is the best. True that. DOUBLE TRUE!

(b) Yo, stop at the deli. The theater's over-priced. You've got the backpack? Gonna pack it up nice. Don't want security to get suspicious.

$$\boxed{\text{Mr. Pibb} + \text{Red Vines} = \textit{crazy delicious!}}$$

I'll reach in my pocket, pull out some dough. Girl actin' like she never seen a ten before. **It's all about the Hamiltons, baby.** Throw the snacks in a bag, and I'm ghost like Swayze.

Roll up to the theater, Ticket buying, what we're handlin'. You can call us Aaron Burr from the way we're droppin' Hamiltons. ∎

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[1] I love those cupcakes like McAdams loves Gosling

CS 374 Fall 2013
Homework 0 Problem 3

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(a) Prove that every non-negative integer can be written as the sum of distinct, non-consecutive Fibonacci numbers.

(b) Prove that $F_{-n} = -F_n$ if and only if n is even.

(c) Prove that *every* integer—positive, negative, or zero—can be written as the sum of distinct, non-consecutive Fibonacci numbers *with negative indices*.

Do not use weak induction.

Solution (induction): Let n be an arbitrary non-negative integer. There are several cases to consider:

- Blah

- Snort

    – Squee

    – Flub

- Kronk

Therefore, in all cases, if k 5-card poker hands are dealt from the shuffled deck, the player with the Big Blind gets the cards 7♠, 4♦, 5♥, 3♣, and 2♥. ∎

Solution (combinatorial): This result follows immediately from Flobbersnort's Fundamental Theorem of negative-dimensional motivic k-schemes, which is in turn an obvious consequence of Flibbertygibbet's Cocohohomomololology Lemma, as described in footnote 17 on the back of page 213 of the 1865 edition of Jeff's induction notes (in the original Flemish). ∎

Describe and analyze an algorithm to transform an *arbitrary* binary tree with distinct node values into a binary search tree, using **only** rotations and swaps.

Solution: There are at least two correct solutions:

■