CSC 263 Problem Set 7

Due: Friday March 23rd unmarked, Marked quiz in tutorial

1. A flip clock is a digital clock which represents the time by flipping cards each displaying some digit or digits of the time. At the site linked from the assignments page, you can see a picture of a flip clock that uses one card for both hour digits together and one card for the minutes. It is also possible to have a flip clock that has four cards in total. It uses separate cards for each digit. The time 2:13 is represented by a blank card, a “2” card, a ‘1” card and a “3” card in that order. We are interested in the 4-card clock.

We want to analyze the load on the clock motor as the digits are flipped. Consider that flipping a single card exerts 1 unit of load. Flipping 2 cards simultaneously exerts 2 units of load.

(a) Perform a worst case analysis on motor load.
(b) Using the aggregate method, calculate the amortized load on the motor.

2. Question R 1.28 from G&T text page 49

3. Questions about Disjoint Set ADT from CLRS

(a) 21.1-1 page 501
(b) 21.2-2 page 505
(c) 21.3-1 page 509