Assignment # 3:
Due September 19
Please keep a copy of the solution with you!!!!!!

1. An array $A[1, 2, ..., n]$ contains all the integers from 0 to $n$ except one. It would be easy to determine the missing integer in $O(n)$ time by using an auxiliary array $B[0, ..., n]$ to record which numbers appear in $A[1, 2, ..., n]$. In this problem, however, we cannot access an entire integer in $A[1, 2, ..., n]$ with a single operation. The elements of $A[1, 2, ..., n]$ are represented in binary, and the only operation we can use to access them is "fetch the $j^{th}$ bit of $A[i]"$, which takes constant time. Show that by using only this operation, we can still determine the missing integer in $O(n)$ time.

2. Problem 4-5

3. 9.3-8

4. In SELECT algorithm, we grouped elements into sets of 5 each (except possibly the last one which may contain fewer). Analyse the algorithm if we made the following changes (one at a time)
   
   (a) We grouped them into sets of 7
   (b) We group them into sets of 3

Justify your answer.

5. Problem 9-2 (a),(b),(c).

6. Show switch settings for the following using the algorithm described in
7. Challenge Problem 1: Problem 9.3-4

8. Challenge Problem #2: You are to organize a tournament involving $n$ competitors. Each competitor must play each other competitor exactly one match. Although many matches can be scheduled on a given day, no competitor can play more than one game per day. We want the schedule to have minimum number of days. How do you schedule such a tournament?