

# Homework#3 Induction

Textbook:

- 1.38. Let  $S$  be a set of  $n$  positive integers, where  $n$  is even. Give an efficient algorithm to partition  $S$  into two subsets  $S_1$  and  $S_2$  of  $n/2$  elements each with the property that the difference between the sum of the elements in  $S_1$  and the sum of the elements in  $S_2$  is maximum. What is the time complexity of your algorithm?
- 1.39. Suppose we change the word “maximum” to “minimum” in Exercise 1.38. Give an algorithm to solve the modified problem. Compare the time complexity of your algorithm with that obtained in Exercise 1.38.
- 5.4. Use induction to develop a recursive algorithm for finding the average of  $n$  real numbers  $A[1..n]$ .
- 5.7. Illustrate the operation of Algorithm RADIXSORT on the following sequence of eight numbers:
  - (a) 4567, 2463, 6523, 7461, 4251, 3241, 6492, 7563.
  - (b) 16543, 25895, 18674, 98256, 91428, 73234, 16597, 73195.

## Sorting variable-length items

Show how to sort  $n$  integers in the range 0 to  $n^3 - 1$  in  $O(n)$  time.