**Test 2**

1. A complete binary tree of N elements uses array positions 1 to N.
   1. How large the array must be for a binary tree that has 2 extra levels?
   2. What would be the array size for a binary tree that has a deepest node at depth 2log N and what would be the worst case binary tree?
   3. Show that the expected depth of the kth smallest element in a large heap is bounded by log k.
2. Write a program:
   1. To merge two leftist heaps.
   2. Give an example of input that generate the best leftist heap.
   3. Show the result of inserting keys 1 to 15 in order into an initially empty leftist heap.
3. Implement a spell checker by using a hash table.
4. Assume that dictionary comes from two source, an existing large dictionary and a second file containing a personal dictionary.
5. Output all misspelled words and the line number in which they occur.
6. Also, for any misspelled word list any words in the dictionary that are obtainable by adding/removing one character or exchanging adjacent characters.

Make sure to include the documentation, including a UML design and few sample runs with the source code for all the programming projects.

Also include the summary of chapters 5,6 along with the test in a separate file than the test.