CSci2111: Assignment and Project Set # 4
Handed Out on: Tuesday March 21, 2000
Due Date: Tuesday April 4, 2000
This is a long assignment. Start it early!!

1 Written Exercises

Question 1: Problems 2, 3, and 6 p. 420 (Chapter 9).

Question 2: Problem 3, 9, 11, 13 and 14 pp. 458-459 (Chapter 10).

2 Programming Project, Part IV (of IV)

If Using Java:

1. Write an insertion procedure for a B-Tree implementing the cases where a) the new key is inserted in a node that is not completely full; b) the new key is inserted in a node that is completely full but whose keys can be re-distributed to a sibling; and c) the new key is inserted in a node that is completely full, resulting in a split (i.e., redistribution does not help).

2. Build a B-Tree of order 5 by inserting, one by one, the record keys of the court-case file used in Assignment 3 (URL: http://borg.cs.dal.ca/˜nat/Courses/DFS-Course/court-cases). Do not sort the file prior to building the tree. [To make your job easier, keep the tree in memory rather than saving it onto disk].

3. Write a procedure to print your B-Tree level by level. Print the first 4 levels of your tree.

4. Demonstrate that your insertion procedure works correctly by printing a tree before and after a key insertion in each of cases a), b) and c) of question 1.

5. Write a search procedure that locates a key at the leaves of your B-Tree. Demonstrate that this procedure works well by searching for a key and showing, the path followed by your procedure from the tree root to the searched key (i.e., print all the intermediate nodes it traverses).

If Using C++

1. Problems 13, 15 and 18 p. 421. [Use the code of Appendix I as a starting point; Demonstrate the functionning of your programs on examples of your choice].