CS3095D DBMS Lab

Exercise No: 07

B+ Tree

Total Marks – 05   **Due Date:** 26/10/2021

Consider a database for storing the details of students currently pursuing courses in National Institute of Technology Calicut. The database maintains the lists of students opting for each elective course. The details of students taking an elective are recorded in a **B+ Tree with student roll number as the index.** The B+ Tree has the following functionalities:

1. **INSERT** – A new record (i.e., roll number) should be inserted.
2. **DELETE** – The specified record should be deleted. If the specified record is not present in the tree, return ERROR.
3. **SEARCH** – If the record is present in the tree, return the level in which it is present. Else, return FALSE.
4. **PRINT** – All the records currently present in the tree should be displayed.

Considering the order of the tree to be 4, implement the B+ Tree with above functionalities. Note that you may use **C/C++** for implementing the B+ Tree. The following should be included in a **single zip file** for submission:

1. Source code for implementing the B+ Tree in C/C++ (**pdf file**)
2. A document (**pdf file**) consisting of:
   a. **Screenshots of the output terminal** obtained on running the program. Note that the run should have insertion of 15 elements in the B+ Tree. After all the required insertions have been performed, display the current records present in the resultant B+ Tree. The run should involve two deletions, with one for deleting an element present in the B+ tree, and the other for deleting an element that is not present in the B+ tree. After each deletion, the records currently present in the B+ Tree should be displayed. Also, two search operations should be there in the run, with one for searching an item already present in the B+ Tree, and the other for searching an item that is not present in the B+ Tree.
   b. **Pictorial representations** of the B+ Trees obtained after all the required insertions (i.e., 15 insertions) and each deletion in the run.

Note

- The pictorial representations of the trees after each individual insertion are not needed. Only the final B+ tree after all the insertions is required.
- The key values in the B+ Tree may be considered to be integers.