CS3095D DBMS Lab

Exercise No: 06

B-Tree

Total Marks – 05 **Date:** 12/10/2021

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 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
3. **SEARCH** – If the record is present in the tree, return TRUE. 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 (.c/.cpp file)
2. A document (.pdf) consisting of:
   a. **Screenshots of the output terminal** obtained on running the program. Note that three runs of the implementation should be performed, with the first run having insertion of 10 records, the second run having insertion of 15 records, and the third run having insertion of 20 records. After all the required insertions have been performed, display the current records present in the resultant B-Tree. Each run should involve two deletions. After each deletion, the records currently present in the B-Tree should be displayed. Also, two search operations should be there in each 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 the required insertions (i.e., after 10 insertions in the first run, 15 insertions in the second run, and 20 insertions in the third run) and each deletion in all the three runs.

If any doubts on the exercises, please mail us

(prabum@nitc.ac.in).

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Topic: B- Tree

Marks: 5

Evaluation Plan

Sl. No.	Task	Details	Marks
1.	Evaluation – I: **Implementation by coding.** (On 12.10.2021, Tuesday.)	i. The lab team will post the questions on 12.10.2021 at **1.00 PM**. ii. Duration of Evaluation I is **one and a half** hours. iii. Upload the solution scripts as pdf files in Eduserver before **2.30 PM** on 12.10.2021. iv. Evaluation- II will **not** be conducted for those who did not submit their solutions on time. v. Late submissions are also not allowed to participate in viva.	3
2.	Evaluation – II: **Viva** (On 12.10. 2021, Tuesday.)	Based on the submissions, viva will be conducted for those students who have submitted Evaluation I. The schedule will be circulated later.	2

Exam Pattern

Sl. No.	Evaluation Name	Details
1.	Implementation by coding	i. Students need to submit two answer scripts; **the code file and the output file** (i.e., the tree structure implemented using the coding script.). ii. **Code file:** This answer script should contain the (strictly in) **C/C++** code used for implementing the tree **and** coding done for answering the exam questions. iii. Both the document needs to be **well prepared**, and comments **should** be present. iv. **Output file**: This file **should** contain the assumptions made (If any). It **must** contain justifications for the outputs.
2.	Viva	1. Evaluators will ask questions based on the topic and the answer scripts submitted for Evaluation I. 2. The candidate should be prepared to answer **both** descriptive and coding questions for this evaluation.

General Instruction:

1. Both the files should be in pdf format.
2. Both the files should strictly follow the file name format.
3. Both the scripts should strictly contain the name, roll number, and Question set details (as comments in **'code file'**).
4. The scripts that fail to follow the rules **will not be evaluated**.

-DBMS Lab Team