**STUDENTS MARKS SYSTEM DOC**

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YEAR: IV

COLLEGE: CVR COLLEGE OF ENGINEERING

TASKS COMPLETED : TASK III

**DATA STRUCTURE**

DOUBLE POINTER ARRAY OF STRUCTURES - To store pointers to Student Structures

DYNAMIC STRUCTURE – To store a Student Details

**TIME COMPLEXITIES**

INSERTION :

* Time Complexity – O(1)
* Inserts new data at last pointer
* During Reallocation O(n) as the previous pointers need to be copied to new Double Pointer Array

SEARCHING :

* Best Case : O(n)
* Worst Case : O(n)

DELETION:

* Takes O(n) as the pointers need to be shifted back and structure that need to be deleted is deallocated using free

RETRIVAL:

* Takes O(n)
* data can be by indices on any attribute

**MODIFICATIONS OF DATA STRUCTURES:**

-Use of Linked List :

* Deletions become O(k) where k is position placed
* Reallocation of Structures can be avoided
* Dynamically grows and shrinks

-Use of B trees:

* Searching becomes O(logN)
* Insertion becomes O(logN)
* Deletion becomes O(logN)

If I had an option to Re-Design the Format of the Text file/Structure provided –

The structure of file would be name along with marks in a single line. As my data structure requires updating a single structure twice. Once during allocating name and other during entering marks

**FUNCTIONALITIES PROVIDED IN THIS PROJECT**

* Only Valid Data will be fetched like name without marks or only marks will be ignored
* Marks missing are denoted by -1 so that they can be updated in future
* As real data bases are case insensitive My Student Marks System is also case insensitive
* Supports various Queries
* Highly Modular
* Supports AND/OR in queries
* Prints Leaderboard in a sorted way
* Only valid data will be loaded in main memory
* Simple operators like ‘=’,’<’,’<=’,’>=’,’>’ are supported

**Other Developments that can be brought** :

* If a primary Key is already present .It should prompt whether the marks need to be updated or remain unchanged
* If three more attributes like College , Branch and Section. Just add three more fields in my structure .