**Assignment 1**

**File System Storage and Manipulation**

**Purpose of this assignment is to understand the complexity of file system storage and the manipulation of data using various search queries.**

**Requirements:** This assignment requires the knowledge of File I/O and Structure concepts of C programming.

The assignment should be implemented using C/C++ language. The details of the assignment are as follows:

1. Create a file students (.txt or .dat) to store information of students of a university. The file should store student ID, NAME, and BRANCH. The following constraints should be satisfied to store the information in student table

* Each student should have a unique student ID.
* Insertion of a student with existing student ID should not be allowed.

Perform the following operation on the created student records. (NOTE: Create a menu driven program for better understanding)

1. Insert 10 students in the student database.
2. Modify the NAME or BRANCH (CSE, EE, and ECE) of the student. Note that the modification of Student ID should not be allowed.
3. Delete the student using the Student ID.
4. Search the list of students using BRANCH.
5. Search the student by their NAME.
6. Create a file marks (.txt or .dat) to store marks (assuming same subjects for all branch students) of registered students of a university. The file should store student ID, marks of DBMS, DS, C, TOTAL, and PERCENTAGE The following constraints should be satisfied to store the information in student table

* Marks of only the registered students are allowed to store in the table.
* The maximum marks of each subject cannot exceed 100.

Perform the following query operation using the student and marks information. (NOTE: Create a menu driven program for better understanding)

1. Insert marks of all the registered students.
2. Updating marks of one subject should also update TOTAL and PERCENTAGE marks.
3. Deletion of a student record from the student file should also delete his marks records from the marks file as the student is no longer a registered student.
4. Show the marks list (Marks of all subjects, TOTAL, and PERCENTAGE) of a student using his student ID.
5. Search the students with PERCENTAGE above a threshold.
6. Search the students of a particular BRANCH with PERCENTAGE above a threshold.

Reference Material:-

1. <https://www.geeksforgeeks.org/readwrite-structure-file-c/>
2. <https://www.tutorialspoint.com/read-write-structure-to-a-file-using-c>
3. <http://findnerd.com/list/view/Read-and-Write-the-Structure-in-File-using-C--File-Handling-/3784/>
4. <https://www.dreamincode.net/forums/topic/189646-readwrite-structures-to-dat-file/>