Student Record Management System (C, DSA + File Handling)

The Student Record Management System is a console-based application built in C that efficiently manages academic records using fundamental Data Structures and File Handling techniques. The program provides a complete CRUD (Create, Read, Update, Delete) workflow and ensures persistent storage by saving all student records in a structured text file.

The system allows users to store and retrieve essential student information such as roll number, full name, marks of six subjects, total marks, percentage, and performance category (Below Average, Average, Good, Very Good, Excellent). A search mechanism is built using linear traversal to quickly locate students by roll number or name, displaying all details in a clean, formatted manner.

To ensure data consistency, the program includes roll number validation—preventing duplicate entries—and offers features such as updating existing student records, deleting records, and displaying all stored data in tabular format. File operations ensure that changes are permanently saved, allowing the system to function as a lightweight database.

Key Features

• Add students with full name, roll number, and marks of 6 predefined subjects.

• Duplicate roll number protection.

• Automatic calculation of Total Marks, Percentage, and Performance Category.

• Search students by roll number or name (case-insensitive).

• Update student records.

• Delete student records.

• Display all students in a formatted table.

• Persistent storage using text file (.txt).

• Clean menu-driven interface with input validation.

What This Project Demonstrates

• Strong grasp of C fundamentals and DSA concepts.

• Ability to work with structures, arrays, file pointers, searching & validation.

• Practical understanding of real-world data management.

• Clean coding style and modular approach.

• Knowledge of building persistent console applications.

Output Images :-

```
=== Student Record Management System ==
1. Add Student
2. Display All Students
3. Search Student
4. Update Student
5. Delete Student
6. Sort Students
7. Performance Statistics
8. Exit
Enter choice: 1

--- Add New Student ---
Enter Roll Number: 101
Enter Full Name: Dhaval Dhrangadhariya
Mathematics marks (0-100): 87
Physics marks (0-100): 92
Chemistry marks (0-100): 95
English marks (0-100): 84
Computer marks (0-100): 92
Biology marks (0-100): 96
Student added successfully and saved.

Press Enter to continue...
```

```
=== Student Record Management System ===
1. Add Student
2. Display All Students
3. Search Student
4. Update Student
5. Delete Student
6. Sort Students
7. Performance Statistics
8. Exit
Enter choice: 1

--- Add New Student ---
Enter Roll Number: 102
Enter Full Name: Naitik Patel
Mathematics marks (0-100): 89
Physics marks (0-100): 91
Chemistry marks (0-100): 79
English marks (0-100): 71
Computer marks (0-100): 92
Biology marks (0-100): 88
Student added successfully and saved.

Press Enter to continue...
```

```
=== Student Record Management System ===
1. Add Student
2. Display All Students
3. Search Student
4. Update Student
5. Delete Student
6. Sort Students
7. Performance Statistics
8. Exit
Enter choice: 1

--- Add New Student ---
Enter Roll Number: 103
Enter Full Name: Harmit Soni
Mathematics marks (0-100): 84
Physics marks (0-100): 79
Chemistry marks (0-100): 94
English marks (0-100): 87
Computer marks (0-100): 82
Biology marks (0-100): 97
Student added successfully and saved.

Press Enter to continue...
```

```
=== Student Record Management System ===
1. Add Student
2. Display All Students
3. Search Student
4. Update Student
5. Delete Student
6. Sort Students
7. Performance Statistics
8. Exit
Enter choice: 1

--- Add New Student ---
Enter Roll Number: 105
Enter Full Name: Saloni Shah
Mathematics marks (0-100): 87
Physics marks (0-100): 98
Chemistry marks (0-100): 76
English marks (0-100): 65
Computer marks (0-100): 69
Biology marks (0-100): 75
Student added successfully and saved.

Press Enter to continue...
```

```
=== Student Record Management System ===
1. Add Student
2. Display All Students
3. Search Student
4. Update Student
5. Delete Student
6. Sort Students
7. Performance Statistics
8. Exit
Enter choice: 1

--- Add New Student ---
Enter Roll Number: 105
A student already exists with Roll No 105

Press Enter to continue...

=== Student Record Management System ===
1. Add Student
2. Display All Students
3. Search Student
4. Update Student
5. Delete Student
6. Sort Students
7. Performance Statistics
8. Exit
Enter choice: 1

--- Add New Student ---
Enter Roll Number: 104
Enter Full Name: Rency Shah
Mathematics marks (0-100): 96
Physics marks (0-100): 87
Chemistry marks (0-100): 81
English marks (0-100): 79
Computer marks (0-100): 82
Biology marks (0-100): 93
Student added successfully and saved.

Press Enter to continue...
```

```
=== Student Record Management System ===
1. Add Student
2. Display All Students
3. Search Student
4. Update Student
5. Delete Student
6. Sort Students
7. Performance Statistics
8. Exit
Enter choice: 2

===== All Student Records (5) =====

Roll: 101  |  Name: Dhaval Dhrangadhariya
Marks: Mathematics:87 , Physics:92 , Chemistry:95 , English:84 , Computer:92 , Biology:96
Total: 546  |  Perc: 91.0%  |  Grade: Excellent
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Roll: 102  |  Name: Naitik Patel
Marks: Mathematics:89 , Physics:91 , Chemistry:79 , English:71 , Computer:92 , Biology:88
Total: 510  |  Perc: 85.0%  |  Grade: Very Good
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Roll: 103  |  Name: Harmit Soni
Marks: Mathematics:84 , Physics:79 , Chemistry:94 , English:87 , Computer:82 , Biology:97
Total: 523  |  Perc: 87.2%  |  Grade: Very Good
-------------------------------
Roll: 105  |  Name: Saloni Shah
Marks: Mathematics:87 , Physics:98 , Chemistry:76 , English:65 , Computer:69 , Biology:75
Total: 470  |  Perc: 78.3%  |  Grade: Very Good
-------------------------------
Roll: 104  |  Name: Rency Shah
Marks: Mathematics:96 , Physics:87 , Chemistry:81 , English:79 , Computer:82 , Biology:93
Total: 518  |  Perc: 86.3%  |  Grade: Very Good
-------------------------------

Press Enter to continue...
```

```
=== Student Record Management System ===
1. Add Student
2. Display All Students
3. Search Student
4. Update Student
5. Delete Student
6. Sort Students
7. Performance Statistics
8. Exit
Enter choice: 3

Search by: 1) Roll  2) Name (partial)
Enter choice: 1
Enter Roll Number: 105

Student Found:
Roll: 105
Name: Saloni Shah
Marks: Mathematics:87 , Physics:98 , Chemistry:76 , English:65 , Computer:69 , Biology:75
Total: 470  |  Perc: 78.3%  |  Grade: Very Good

Press Enter to continue...
```

```
=== Student Record Management System ===
1. Add Student
2. Display All Students
3. Search Student
4. Update Student
5. Delete Student
6. Sort Students
7. Performance Statistics
8. Exit
Enter choice: 4
Enter Roll Number to update: 105
Current Details:
Roll: 105
Name: Saloni Shah
Marks: Mathematics:87 Physics:98 Chemistry:76 English:65 Computer:69 Biology:75
Total: 470 | Perc: 78.3% | Grade: Very Good

What to update?
1) Name
2) All Marks
3) Single Subject Mark
4) Cancel
Choice: 4
Update cancelled.

Press Enter to continue...
```

```
=== Student Record Management System ===
1. Add Student
2. Display All Students
3. Search Student
4. Update Student
5. Delete Student
6. Sort Students
7. Performance Statistics
8. Exit
Enter choice: 5
Enter Roll Number to delete: 105
Deleting record:
Roll: 105 | Name: Saloni Shah | Perc: 78.3% | Grade: Very Good
Are you sure? (y/n): y
Record deleted and file updated.

Press Enter to continue...
```

```
=== Student Record Management System ===
1. Add Student
2. Display All Students
3. Search Student
4. Update Student
5. Delete Student
6. Sort Students
7. Performance Statistics
8. Exit
Enter choice: 6

Sort by:
1) Roll
2) Name
3) Percentage
Choice: 1
Order: 1) Ascending  2) Descending
Choice: 1

Sorted Records:
Roll:101 | Name:Dhaval Dhrangadhariya | Perc:91.0% | Grade:Excellent
Roll:102 | Name:Naitik Patel | Perc:85.0% | Grade:Very Good
Roll:103 | Name:Harmit Soni | Perc:87.2% | Grade:Very Good
Roll:104 | Name:Rency Shah | Perc:86.3% | Grade:Very Good

Save this sorted order to file? (y/n): y
Sorted order saved to file.

Press Enter to continue...
```

```
=== Student Record Management System ===
1. Add Student
2. Display All Students
3. Search Student
4. Update Student
5. Delete Student
6. Sort Students
7. Performance Statistics
8. Exit
Enter choice: 7

=== Performance Statistics ===
Total Students      : 4
Excellent (>=90%)   : 1
Very Good (75-89)   : 3
Good (60-74)        : 0
Average (50-59)     : 0
Below Average (<50) : 0

Top Student: Roll 101 | Dhaval Dhrangadhariya | 91.0%
Lowest : Roll 102 | Naitik Patel | 85.0%

Press Enter to continue...

=== Student Record Management System ===
1. Add Student
2. Display All Students
3. Search Student
4. Update Student
5. Delete Student
6. Sort Students
7. Performance Statistics
8. Exit
Enter choice: 8
Exiting... Goodbye!
```