**School Management System Project Report**

**Project Overview**

**Project Name:** School Management System  
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**Course:** Second Semester, University of Central Punjab  
**Programming Language:** C++

**Project Description**

The School Management System is a console-based application designed to manage student data efficiently. The system allows for adding, updating, searching, and removing student records. Key features include:

1. **Add New Student:** Enter student details such as name, father's name, class, city, and grades.
2. **Show All Students:** Display the list of all students along with their details.
3. **Search Student:** Find students using their roll number or name.
4. **Update Student Data:** Modify existing student details.
5. **Remove Student:** Delete student records from the system.
6. **Exit:** Exit the application.

**Key Features and Implementation**

**1. Adding New Student**

* **Validation:** The system validates each input to ensure correct data entry. For example, names are checked to contain only alphabets, and grades are entered in capital letters (A, B, C, etc.).

**2. Displaying All Students**

* The application lists all student records, showing details such as roll number, name, father's name, class, city, and grades.

**3. Searching Student**

* **By Roll Number:** Users can search for students using their unique roll numbers.
* **By Name:** Alternatively, students can be found by their names, with validation to ensure correct input.

**4. Updating Student Data**

* Users can update specific details or all information for a student. The system again validates the new inputs to maintain data integrity.

**5. Removing Student**

* This feature allows for the deletion of student records, with confirmation to prevent accidental deletions.

**User Interface**

The user interface is simple and text-based, prompting the user for input and providing clear instructions for each operation. The interface includes:

* A menu with numbered options for different actions.
* Input prompts with instructions and validation feedback.

**Challenges and Solutions**

* **Input Validation:** Ensuring that all user inputs are correct and appropriate was a key challenge. The solution involved implementing checks for each type of input.
* **Data Management:** Handling multiple records and ensuring the integrity of data during operations like updating and deletion required careful design.

**Conclusion**

The School Management System project successfully met its objectives, providing a functional and user-friendly tool for managing student data. Future improvements could include adding more fields for student records, enhancing the user interface, and implementing data storage to retain information between sessions.