📄 Project Documentation: Contact Management System (C++)

🧠 Overview:

The **Contact Management System** is a **C++ terminal-based application** designed to store, manage, and retrieve contact information efficiently. It supports basic functionalities like adding contacts, searching, and viewing help—all through a simple CLI (Command Line Interface). This project showcases practical use of C++ file handling, input validation, and exception safety in a real-world application scenario.

👨‍💻 Developer:

Mohd Meraaz
Role: Solo Developer
Timeline: May 2025

🛠️ Technologies Used:

- **C++**
- **File Handling (`fstream`)**
- **Standard Library (`iostream`, `string`, `vector`)**
- **Basic Exception Handling**
- **Input Validation Techniques**

🎯 Key Features:

1. **Add Contact**
   - Prompts user for contact name and phone number.
   - Validates phone number format (e.g., 10-digit numeric check).
   - Stores data in a file (e.g., `contacts.txt`) for persistence.
2. **Search Contact**
   - Allows user to enter a name or part of a name.

    - Searches existing file records and displays matches.

3. **Help Option**
    - Displays usage instructions and menu options for user guidance.
4. **Exit Option**
    - Ensures clean termination of the program with all resources closed.

💡 Project Goals:

- Apply file I/O concepts using `ifstream` and `ofstream`.
- Build user-friendly CLI applications using `switch-case`, loops, and conditionals.
- Practice input sanitization to avoid corrupt or invalid entries.
- Develop confidence in exception-safe programming with C++.

🧪 Challenges Faced:

Challenge	Solution
Input validation for phone numbers	Implemented character-wise checks to ensure numeric and fixed-length input.
File reading/writing safely	Added checks for file open/close status and handled errors
Avoiding application crashes	Used try-catch blocks and default cases in switch statements.

📁 Sample Files:

- `contacts.txt` — stores contact data in a readable format.
- `main.cpp` — contains the complete application logic.

📸 Output Example (Terminal Preview):

pgsql

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```
=========== Contact Management System ===========
1. Add New Contact
2. Search Contact
3. Help
```

```
4. Exit
Enter your choice: 1

Enter Name: John Doe
Enter Phone Number: 9876543210
Contact added successfully!
```

🔗 Repository:

GitHub: Contact Management System (C++)

🚀 Future Enhancements:

- Add contact deletion and update functionality.
- Encrypt stored contact data.
- Switch to a binary file for better performance.
- Add multi-field search (email, address, etc.).

📚 Learning Outcomes:

- Mastered practical use of file handling in C++.
- Strengthened control flow, loops, and exception management.
- Improved CLI design and user interaction in console apps.