

**Ds Project Proposal**

**Phone Book with Call Log System**

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**PROBLEM STATEMENT**

In today's fast-paced world, efficient communication is paramount. However, the manual management of contact information and call histories poses a significant challenge for individuals and businesses alike. Remembering phone numbers, updating contact details, and tracking call activities manually can be time-consuming and prone to errors.

**User Pain Points:**

- Difficulty in remembering and organizing numerous phone numbers.

- Tedious process of manually updating contact information.

- Lack of a centralized system for tracking incoming and outgoing calls.

**User Benefits:**

The Phone Book with Call Log System aims to alleviate these pain points by providing users with a user-friendly and integrated solution. Users will benefit from:

* Effortless contact management: Add, update, and delete contacts with ease.
* Seamless call initiation: Place calls directly from the application.
* Comprehensive call logging: Automatically capture and organize call details, including date, time, duration, and the involved contact.
* Convenient access to call history: View and analyze detailed call histories in a chronological order.

**Target Audience:**

This system is designed to cater to the needs of both individual users and businesses who seek a streamlined and efficient way to manage contacts and monitor call activities.

**DATA STRUCTURE CONCEPTS USED:**

* **Doubly Linked List**
* **Hashing**
* **Vectors**
* **Sorting algorithm (merge sort)**

**Time complexity:**

1. **Linked list:**

Accessing an Element (by index):

Time Complexity: O(n)

Insertion or Deletion at the End:

Time Complexity: O(1)

1. **Hashing:**

The average complexity to search, insert, and delete data in a hash table is O(1).

1. **Merge sort:**

For sorting it takes time complexity of O(nlogn).

**CONCLUSION:**

The Phone Book with Call Log System is poised to revolutionize the way we handle communication tasks, providing users with a centralized and user-friendly platform to enhance their communication experience.