**PTCL PHONE BOOK PROPOSAL**

**Overview:**

The PTCL Phone Book is a simple console-based phone book directory implemented in C++. The program allows users to create and manage a phone book with contacts. It provides functionalities such as inserting new contacts, updating contact details, deleting contacts, searching for contacts, and removing duplicate entries.

**Modules:**

**1. Node Class:**

* Represents a contact with attributes like name, phone number, and Gmail.
* Contains pointers to the next and previous nodes, enabling the creation of a doubly linked list.

**2. D-LinkedList Class:**

* Manages the doubly linked list of contacts.
* Provides functions for accepting, displaying, sorting, deleting, and searching contacts.
* Implements methods to handle duplicate entries for name, number, and Gmail.
* Supports updating contact details.

**3. Insert Functionality:**

* Accepts user input for contact details (name, number, and Gmail).
* Creates a new node and inserts it into the sorted doubly linked list.
* Sorts the list alphabetically by names.

**4. Display Functionality:**

* Traverses the linked list and prints details of each contact (name, number, Gmail).

**5. Update Functionality:**

* Prompts the user to enter the name of the contact to be updated.
* Allows updating of contact details such as name, number, and Gmail.

**6. Delete Functionality:**

* Provides options to delete a specific contact by name.
* Deletes contacts with the same name, number, or Gmail to remove duplicates.

**7. Search Functionality:**

* Enables users to search for contacts by name, number, or Gmail.
* Displays contact details if found.

**8. Delete Same Name/Number/Gmail:**

* Removes duplicate entries for names, numbers, and Gmail in the phone book.

**9. Main Function:**

* Initiates the program, welcomes the user, and accepts the initial contact details.
* Presents a menu-driven interface for users to perform various operations.
* Loops until the user decides to exit, allowing continuous interaction.

**Usage Instructions:**

1. **Initial Setup:**
   * Enter your name when prompted.
   * Start by creating the phone book by adding contacts.
2. **Main Menu:**
   * Choose from options like displaying contacts, inserting new contacts, updating details, deleting contacts, searching, and removing duplicates.
3. **Inserting Contacts:**
   * Input contact details like name, number, and Gmail.
   * Contacts are automatically sorted alphabetically.
4. **Updating Contacts:**
   * Enter the name of the contact to be updated.
   * Choose which information to update (name, number, or Gmail).
5. **Deleting Contacts:**
   * Provide the name of the contact to delete it from the phone book.
   * Option to delete contacts with the same name, number, or Gmail.
6. **Searching Contacts:**
   * Choose from searching by name, number, or Gmail.
   * Input the respective information to find a contact.
7. **Exiting the Program:**
   * Choose to continue or exit after each operation.

**Conclusion:**

The PTCL Phone Book provides a simple yet effective way to manage contacts with functionalities such as insertion, deletion, updating, and searching. The doubly linked list ensures efficient sorting and manipulation of contacts.

Feel free to explore the features of the PTCL Phone Book and enjoy a user-friendly phone book management experience!