Contact Management System Documentation

The Contact Management System is a C++ application designed to manage contacts efficiently. It allows users to store, retrieve, update, and delete contact information. The system is implemented using a Binary Search Tree (BST) data structure to organize contacts for quick retrieval and manipulation.

Features

- **Add Contact:** Users can add new contacts by providing their first name, last name, phone numbers, and email address.
- **Search Contact:** Users can search for contacts by their first name or last name.
- **Update Contact:** Existing contacts can be updated with new information such as phone numbers and email addresses.
- **Delete Contact:** Contacts can be removed from the system.
- **Display Contacts:** Users can view all contacts stored in the phone book.
- **Favorites:** Users can mark certain contacts as favorites for quick access.
- **Display Favorites:** View all contacts marked as favorites.
- **Clear Phone Book:** Clear all contacts from the phone book.

Implementation Details

Data Structure

The system utilizes a Binary Search Tree (BST) to store and manage contacts efficiently. Each node of the BST contains contact information such as first name, last name, phone numbers, and email address.

Classes

- **contactNode**: Represents a node in the BST. It stores information about a single contact.
- **contactBST**: Manages the BST operations such as insertion, deletion, search, and traversal.

- o **PhoneBook**: Acts as an interface for interacting with the contact management system. It provides methods to add, remove, search, and update contacts.

Functionality

- o **Insertion:** Contacts are added to the BST based on their first name. If a contact with the same first name already exists, a message is displayed.
- o **Deletion:** Contacts can be deleted by providing their first name. If the contact is found, it is removed from the system.
- o **Search:** Users can search for contacts by first name or last name. If the contact is found, its details are displayed.
- o **Update:** Existing contacts can be updated with new phone numbers and email addresses.
- o **Favorites:** Users can mark certain contacts as favorites for quick access.
- o **Display:** Contacts can be displayed either as a simple list or with detailed information.
- o **Menu:** The system provides a menu-driven interface for users to perform various operations.

Usage

- o Compile the source code using a C++ compiler.
- o Run the compiled executable.
- o Follow the on-screen menu instructions to perform desired operations such as adding, searching, updating, or deleting contacts.