2. Application: "Simple Contact Manager"

Introduction

The Simple Contact Manager is a Java console-based application that uses a tree structure to manage a list of contacts organized by groups. It allows users to create contact groups (like "Family", "Friends", "Work", etc.) and add individual contacts within each group. The application uses a tree structure where each node can represent either a group (parent node) or a contact (leaf node).

What It Can Do

The Simple Contact Manager enables the user to:

1. Create a Contact Group - Users can create a new contact group under any existing group.

2. Add a Contact - Users can add a contact with a name and phone number to any existing group.

3. Remove a Group or Contact - Users can delete a specific group or a contact.

4. List Groups and Contacts - Users can list all groups and contacts within a specific group.

5. Navigate Between Groups - Users can move between groups to add or manage contacts

6. Print Group Path - Display the full path of the current group for easy navigation.

Why This Application?

The purpose of this application is to demonstrate the use of a tree data structure in a practical context: managing contacts in a hierarchical way. Many real-world scenarios involve hierarchical data (like contact categories), and using a tree is an efficient way to represent and manipulate that data.

Contribution to the Community

This application is beneficial for beginners learning about tree structures in data structures and algorithms. It showcases how trees can be applied to solve everyday problems like managing categorized information, providing a foundation for more complex applications such as customer management systems or content organizers.