**REPORT**

**Overview**

The Mobile-Based C Program is a versatile application designed to simulate various functionalities typically found in mobile applications. The program is a console-based interface that allows users to access features such as calendar management, games, utilities, and productivity tools. The program uses text-based navigation to provide a simple yet effective user experience.

**Key Features**

**1. Calendar**

* **Purpose**: Allows users to view a calendar for the current month and navigate to other months or years.
* **Functionalities**:
  + Displays a formatted calendar.
  + Highlights today's date for reference.
* **Potential Use Case**: Helps users manage dates and plan schedules.

**2. Digital Clock**

* **Purpose**: Displays the current time in real-time.
* **Functionalities**:
  + Updates dynamically every second to simulate a clock.
  + Can display time in 12-hour or 24-hour formats.
* **Potential Use Case**: Provides a quick view of the time for users without leaving the application.

**3. TODO App**

* **Purpose**: Allows users to create, manage, and organize their task lists.
* **Functionalities**:
  + Add, delete, and update tasks.
  + Save tasks persistently to maintain records.
* **Potential Use Case**: Enhances user productivity by helping them track their daily or long-term goals.

**4. Contacts Management System**

* **Purpose**: Acts as a digital phonebook for storing and accessing contact details.
* **Functionalities**:
  + Store names, phone numbers, and email addresses.
  + Search, edit, and delete contact entries.
* **Potential Use Case**: Organizes and retrieves user contact information efficiently.

**5. TicTacToe**

* **Purpose**: A recreational game for entertainment.
* **Functionalities**:
  + Two-player gameplay with a 3x3 grid.
  + Determines win, loss, or draw based on the game rules.
* **Potential Use Case**: Provides a casual gaming option to users during free time.

**6. Calculator**

* **Purpose**: Performs basic and advanced mathematical calculations.
* **Functionalities**:
  + Handles addition, subtraction, multiplication, and division.
  + Includes advanced operations (e.g., square roots, trigonometry).
* **Potential Use Case**: Serves as a utility tool for quick calculations.

**7. Lucky Trivia**

* **Purpose**: A knowledge-based game with random trivia questions.
* **Functionalities**:
  + Displays questions with multiple-choice options.
  + Tracks correct and incorrect answers.
* **Potential Use Case**: Tests the user's general knowledge in a fun, interactive way.

**8. Scrambled Jumbled**

* **Purpose**: A word puzzle game that challenges the user's vocabulary and problem-solving skills.
* **Functionalities**:
  + Displays scrambled words for the user to unscramble.
  + Tracks scores for correct answers.
* **Potential Use Case**: Improves the user's language skills and provides mental stimulation.

**9. Switch Off**

* **Purpose**: Safely terminates the application.
* **Functionalities**:
  + Exits the program upon confirmation.
  + Saves user data and settings before exiting.
* **Potential Use Case**: Ensures a clean exit from the program while maintaining data integrity.

**Files Used**

* The program uses file handling to manage data persistence. Example file operations include:
  + **calendar\_data.txt**: Stores custom user events for specific dates.
  + **todo\_tasks.txt**: Saves the user's TODO list tasks.
  + **contacts.txt**: Maintains a database of user contacts.

**Functions Created**

* **Menu Navigation**: Uses a switch-case construct to provide user options and direct them to the selected feature.
* **File Handling**:
  + fopen and fclose to open and close files.
  + fprintf and fscanf for reading and writing data.
* **Utility Functions**:
  + String manipulation for tasks like validation and sorting contacts.
  + Date and time functions using libraries like time.h.

**Problem Being Solved**

The program combines utility, productivity, and entertainment features into a single platform, addressing the following:

1. **Utility Needs**: Features like the calendar, clock, and calculator are essential tools for daily use.
2. **Data Organization**: The TODO app and contact management system help users manage their information effectively.
3. **Entertainment**: Games like TicTacToe, Lucky Trivia, and Scrambled Jumbled provide leisure activities.
4. **Accessibility**: The simple, text-based interface ensures the program is lightweight and easy to use.

**Conclusion**

The Mobile-Based C Program is an all-in-one console application suitable for users looking for both utility and entertainment. Its modular structure and role-specific functionalities make it a practical tool for everyday tasks. With potential enhancements like a graphical user interface, cloud integration, and advanced gaming options, the program could become a more versatile and robust system for personal and professional use.