Smart Journaling Project Technical Report

Introduction

Journaling has long been recognized as a tool for self-expression and personal reflection. However, in today's busy world people often struggle to maintain a consistent journaling habit. The **Smart Journaling** project addresses this gap by providing a smart platform that uses weather and sentiment data to enrich users' entries. The project mission is to empower users to improve emotional awareness and foster personal reflection by leveraging API-driven data enrichment, aligning with Sustainable Development Goal 3 (good health and well-being).

Project Requirements

Core features:

- **User account, registration and login system** – each user has an email, password and display name stored in a local file.
- **Persistent data storage** – user accounts and journal entries are saved using file I/O so data is retained after the program closes.
- **Welcome page with a time-sensitive greeting** – after login the program greets the user with "Good Morning", "Good Afternoon" or "Good Evening" based on the current time (GMT+8).
- **Journal page** – users can list past journal dates, create a new entry for the current day and view or edit existing entries.
- **Automatic weather recording** – the program calls Malaysia's open-data API via a GET request and extracts the `summary_forecast` for the current date; this value is attached to the day's journal entry.
- **Sentiment analysis** – the project integrates the DistilBERT SST-2 model hosted on Hugging Face via a POST request; the JSON response contains labels and scores, and the label with the highest score (e.g. POSITIVE or NEGATIVE) is stored as the user's mood.
- **Weekly summary page** – displays an overview of the weather and mood recorded over the past seven days.

Extra features (Phase 2) may include password hashing and additional functionality such as mapping weather forecasts to simpler English terms.

Approach and Design

The application is implemented in Java and designed around a modular **Command-Line Interface** (CLI). Users launch the program via a JAR file. After successful login or registration, the system greets the user and displays a menu from which all functions are accessible. Each feature is encapsulated in its own class to encourage maintainability and allow team members to work independently.

Solution Modules

1. **User Management** – Handles registration and login. A `User` class encapsulates the email, hashed password and display name. Credentials are stored in a text file; hashing may be implemented in Phase 2 to improve security.

2. **Data Storage** – Implements file I/O to read and write user accounts and journal entries. Each user has a dedicated journal file that persists after program termination.

3. **CLI Interface** – Presents the welcome message and main menu. It routes user actions to the correct module and ensures that only appropriate options are offered (e.g., you can only create or edit today's entry).

4. **Journal Module** – Lists existing journal dates, allows creation of a new entry for the current date, and supports viewing or editing past entries. The module appends the weather and mood results to each entry.

5. **Weather API Integration** – Uses a GET request to Malaysia's open data portal to fetch the day's weather. Only the `summary_forecast` field is extracted and saved with the journal entry.

6. **Sentiment Analysis Integration** – Uses a POST request to the DistilBERT base uncased SST-2 model hosted on Hugging Face. The program parses the JSON response and chooses the label with the highest score (POSITIVE or NEGATIVE).

7. **Weekly Summary** – Collects the past seven days of journal entries and summarises weather and mood trends for the user.

Program Flowchart

The following flowchart summarises the overall program logic:
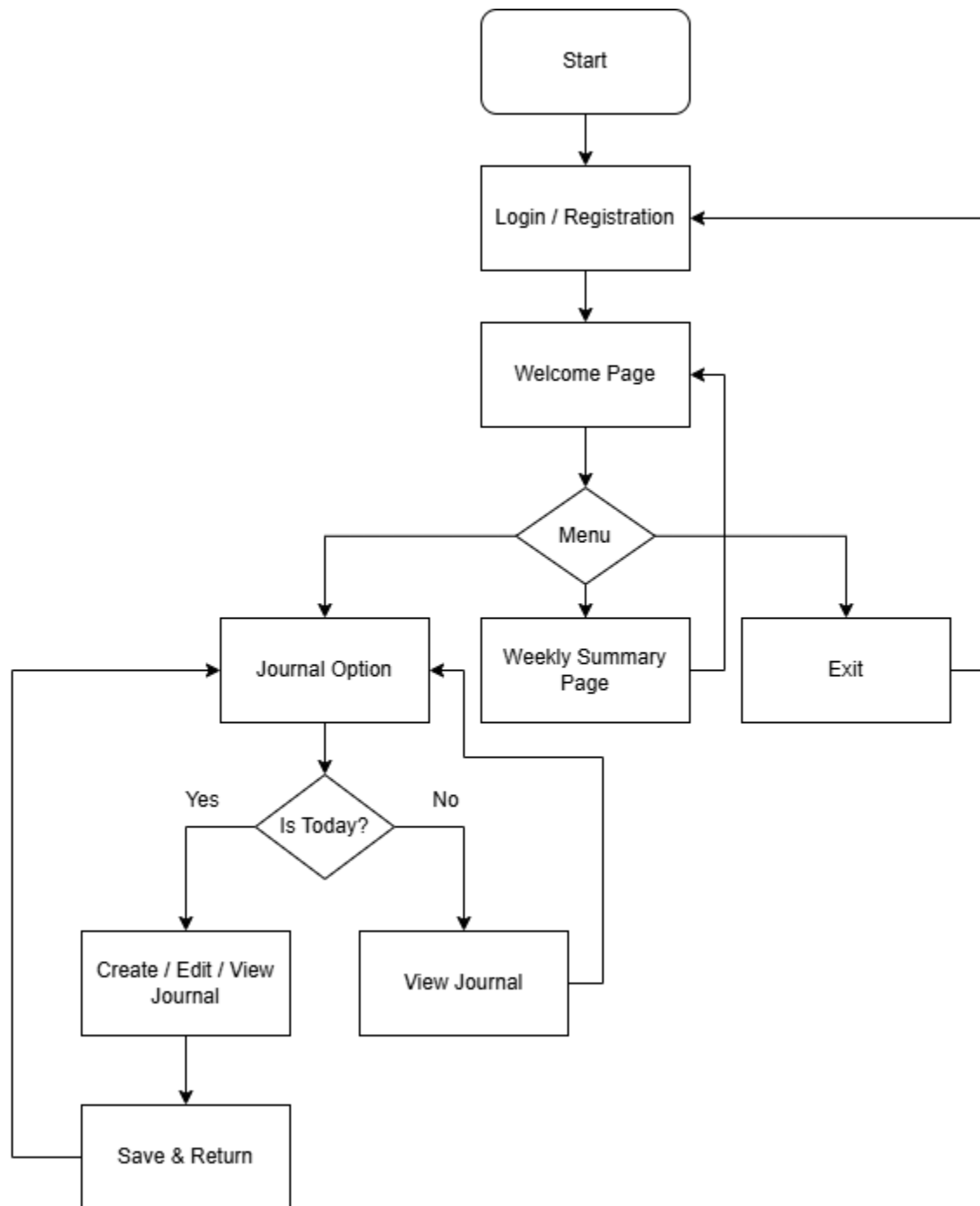
Program flowchart

Sample Program Output

The screenshot below illustrates the CLI interaction when creating a journal entry:

```
=== Welcome to Smart Journal ===
1. Register
2. Login
3. Exit

> 2
Enter email: s100201@student.fop
Enter password: pw-Stud#1
Login successful!

Good Evening, Foo Bar!
=== Main Menu ===
1. Create, Edit & View Journals
2. View Weekly Mood Summary
3. Log out

Please select an option:
> 1
```

```
Good Evening, Foo Bar!
=== Main Menu ===
1. Create, Edit & View Journals
2. View Weekly Mood Summary
3. Log out

Please select an option:
> 2
====================================
          WEEKLY MOOD SUMMARY
====================================

  Date          |  Your Mood
  --------------------------
  2026-01-12    |  POSITIVE
  2026-01-13    |  POSITIVE
  2026-01-14    |  POSITIVE
  2026-01-15    |  POSITIVE
  2026-01-16    |  POSITIVE
  2026-01-17    |  POSITIVE
  2026-01-18    |  NEGATIVE


====================================
Press Enter to return to Main Menu.
>
```

Sample program output

Conclusion

The Smart Journaling application demonstrates how a simple journaling tool can be augmented with external data to provide users with meaningful insights about their emotions and the environment around them. By integrating public APIs for weather and sentiment analysis, users gain a better understanding of their mood patterns and can reflect more deeply on their experiences.