Habit Tracking Application: A Python-Based Personal Development Tool

Project Overview

This project delivers a comprehensive command-line Habit Tracker built with Python, integrating Object-Oriented Programming for core functionality and Functional Programming for data analytics. The application enables users to define, track, and analyse daily and weekly habits with persistent data storage and streak monitoring.

Methodology & Implementation

Developed in Python 3.7+, the system employs a modular architecture featuring:

- **Habit Class**: Core entity managing habit attributes and streak calculations
- **HabitTracker Class**: Central manager for habit operations and JSON persistence
- **Analytics Module**: Functional programming components for streak analysis and filtering
- **CLI Interface**: Interactive menu system for seamless user interaction
  Testing was conducted via unittest framework, with version control managed through GitHub.

Key Features & Results

The application successfully provides:

- Habit creation and management (daily/weekly periodicity)
- Completion tracking with timestamp recording
- Comprehensive analytics: longest streaks (overall and per-habit)
- Periodicity-based filtering (daily vs. weekly habits)
- Persistent data storage across sessions via JSON
- Preloaded dataset with 5 habits and 4 weeks of tracking data

Technical Achievements

The project overcame challenges including datetime serialization for JSON persistence and optimized streak calculation algorithms. The solution demonstrates effective integration of OOP principles for data management and FP approaches for analytical operations.

Future Enhancements

Potential extensions include graphical user interface development, database integration for scalability, advanced analytics with data visualization, and multi-user support with cloud synchronization.

Repository & Deliverables

- GitHub: https://github.com/DAENAWILLIAMS/Williams-Daena_92124764_OOFPP_Habit_Tracker.git
- Complete Python source code with documentation
- Preloaded habit dataset with comprehensive tracking history
- UML design diagrams and test suite
- Project documentation across all development phases