Habit Tracking Application

Object-Oriented and Functional Programming with Python

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Project Goal

- Develop backend habit tracking application
- Apply Object-Oriented Programming (OOP)
- Apply Functional Programming for analytics
- Use SQLite for persistent storage
- Implement unit tests

System Architecture

- CLI Layer (argparse)
- Repository Layer (Database operations)
- SQLite Database (Persistence)
- Analytics Module (Functional programming)

Data Model

Habit

- id
- name
- task
- periodicity (daily / weekly)
- created_at

Completion

- habit_id
- completed_at

Core Features

- Create and delete habits
- Check off completions
- View completion history
- Seed predefined habits
- Insert 4 weeks of tracking data

Analytics Features

- List all habits
- List by periodicity
- Longest streak per habit
- Longest streak overall

Streak Logic

- Daily habits use calendar days
- Weekly habits use ISO calendar weeks
- Consecutive completed periods form a streak
- Missing a period breaks the streak

Persistence

- SQLite database
- Two tables: habits and completions
- Foreign key relationship
- Data persists across sessions

Testing

- Unit tests using pytest
- Tests for daily streak logic
- Tests for weekly streak logic
- Edge cases with gaps

Conclusion

- Successfully implemented required features
- Combined OOP and functional programming
- Designed modular architecture
- Application is fully tested and persistent