SpaceX Launch Tracker

Overview:
Create a Python application that tracks and analyzes SpaceX launches using their public API. The application should help users understand launch history, track statistics, and monitor mission details.

Core Requirements:

1. Data Management
   - Fetch and store launch data from SpaceX API v4
   - Implement local caching to minimize API calls
   - Handle API errors gracefully

2. Technical Requirements
   - Use Python 3.8+
   - Implement proper error handling
   - Write comprehensive unit tests to verify functionality.
   - Use type hints
   - Provide clear and concise documentation (e.g., README).

API Details
- Base URL: https://api.spacexdata.com/v4
- No authentication required
- Key endpoints:
  - `/launches` - Fetch details about all SpaceX launches.
  - `/rockets` - Retrieve rocket specifications.
  - `/launchpads` - Get launch sites information

Required Features

1. Launch Tracking

   - Display a list of all launches with key details.
   - Allow users to filter launches based on:
     - Date range
     - Rocket name
     - Launch success/failure
     - Launch site

2. Statistics Generation

   - Calculate success rates by rocket name
   - Track the total number of launches for each launch site.
   - Monitor launch frequency on a monthly and yearly basis.

Testing Requirements

1- Write **unit tests** covering core functionalities, including:
  - Fetching data from the SpaceX API.
  - Filtering launches by specified criteria.
  - Calculating statistics such as success rates or launch frequencies.

Submission Guidelines

Provide GitHub repository with:
  - Source code
  - A README file with setup instructions and an explanation of key features.

Bonus Features (Optional)
- A simple web-based interface to view launch details and statistics.
- Export data to CSV/JSON
- Webhook notifications for new launches
- Implement a cache invalidation strategy for outdated or stale data.