Analysis and Design Document
UV Index Exposure Tracker Tool (Prototype)

Introduction

Southern Skin Cancer Treatment Centers of America commissioned the development of a UV Index Exposure Tracker Tool prototype to help patients monitor UV exposure. Excessive UV exposure contributes to skin cancer risk, and this system will provide a user-friendly way for patients to track past and forecasted UV levels. This Analysis and Design Document outlines the requirements, design, and validation plan for the prototype being developed by Aric Allen Inc.

System Overview

The UV Index Exposure Tracker Tool is a web-based application that retrieves hourly UV index data from the Open-Meteo API for the past five days and the next five days. It displays this data in a graphical format, allowing users to enter a city name to view UV exposure history and forecasts. The system aims to enhance patient awareness and support preventive healthcare strategies.

System Requirements

Functional Requirements

• Users can input a city name to retrieve UV index data.
• The system retrieves hourly UV index data for the past 5 and next 5 days using the Open-Meteo API.
• The system visualizes the UV index data on an interactive chart.
• Users can view summary statistics such as daily averages or maximum exposure levels.
• The system provides clear error messages if data retrieval fails.
• The prototype will be hosted on a public web server for testing and demonstration.

Non-Functional Requirements

• Reliability: The tool must maintain at least 95% data accuracy compared to Open-Meteo reference data.
• Performance: The system should load UV data within 3 seconds of user input.
• Usability: Interface must be clear and accessible, with responsive chart design.
• Compatibility: Compatible with major browsers (Chrome, Edge, Firefox).
• Security: Use HTTPS for data requests to ensure secure communication.

System Design

The UV Index Exposure Tracker follows a modular web application design consisting of three main layers: (1) Presentation Layer (Front-End UI), (2) Logic Layer (API and Data Processing), and (3) Data Layer (External API Source).

• **Presentation Layer**: The user interface is built using HTML, CSS, and JavaScript frameworks such as Chart.js for data visualization.
• **Logic Layer**: JavaScript scripts handle API requests, parse JSON responses, and prepare data for chart rendering.
• **Data Layer**: The Open-Meteo API serves as the external data source for UV index information.

Technology Stack and Integration
• Front-End: HTML5, CSS3, JavaScript, Chart.js
• Back-End: None (client-side API integration only)
• API: Open-Meteo (public weather API)
• Hosting: Public web server or GitHub Pages
• Version Control: Git/GitHub for code management

Testing and Validation Plan
Testing will be conducted at multiple stages to ensure system stability and accuracy:

• Unit Testing: Validation of data retrieval and JSON parsing logic.
• Integration Testing: Ensure proper interaction between user input, API, and chart display.
• Performance Testing: Verify that data loads and renders within 3 seconds.
• User Acceptance Testing (UAT): Conducted with the project sponsor to confirm usability and data accuracy before deployment.

Conclusion
The UV Index Exposure Tracker Tool prototype will serve as a functional proof-of-concept to demonstrate how patients can monitor UV exposure trends. Its design emphasizes usability, accuracy, and efficiency while aligning with the client's goal of promoting preventive skin health. Following successful testing and sponsor approval, the tool can be expanded into a full-scale integrated platform.