

# Software Requirements Specification (SRS) for WeatherSG

Tan Jing Han - NTU CCDS Y4

Contents

[Software Requirements Specification (SRS) for WeatherSG 1](#_Toc176796069)

[1. Introduction 3](#_Toc176796070)

[1.1 Purpose 3](#_Toc176796071)

[1.2 Scope 3](#_Toc176796072)

[1.3 Definitions, Acronyms, and Abbreviations 3](#_Toc176796073)

[1.4 References 3](#_Toc176796074)

[2. Functional Requirements 4](#_Toc176796075)

[2.1 User Management 4](#_Toc176796076)

[2.2 Weather Data Visualization 4](#_Toc176796077)

[2.3 Predictive Analytics 4](#_Toc176796078)

[2.4 Data Management 4](#_Toc176796079)

[2.5 User Interface 4](#_Toc176796080)

[2.6 Notifications 5](#_Toc176796081)

[3. Non-Functional Requirements 6](#_Toc176796082)

[3.1 Performance 6](#_Toc176796083)

[3.2 Scalability 6](#_Toc176796084)

[3.3 Security 6](#_Toc176796085)

[3.4 Usability 6](#_Toc176796086)

[3.5 Reliability 6](#_Toc176796087)

[4. Use Cases 7](#_Toc176796088)

[4.1 Use Case 1: User Registration 7](#_Toc176796089)

[4.2 Use Case 2: User Login 7](#_Toc176796090)

[4.3 Use Case 3: View Real-Time Weather Data 7](#_Toc176796091)

[4.4 Use Case 4: Receive Weather Alerts 7](#_Toc176796092)

[4.5 Use Case 5: View Predicted Weather Data 7](#_Toc176796093)

# Introduction

## Purpose

Define the requirements for WeatherSG, a web-based application for real-time weather visualization and prediction in Singapore.

## Scope

The application will visualize weather data including rainfall, temperature, and PSI in real-time and provide predictive analytics using machine learning techniques.

## Definitions, Acronyms, and Abbreviations

WeatherSG: The weather prediction web app.

API: Application Programming Interface.

ML: Machine Learning.

PSI: Pollutant Standards Index.

## References

Singapore Government Data Services

Geospatial Visualization Libraries Documentation

Machine Learning Framework Documentation

# Functional Requirements

## User Management

|  |  |
| --- | --- |
| FR # | Requirement |
| FR1 | Users must be able to create an account and log in. |
| FR2 | Users should have different roles (e.g., admin, general user) with varying levels of access. |

## Weather Data Visualization

|  |  |
| --- | --- |
| FR # | Requirement |
| FR3 | The application must display real-time weather data on a map. |
| FR4 | Data includes rainfall, temperature, and PSI. |

## Predictive Analytics

|  |  |
| --- | --- |
| FR # | Requirement |
| FR5 | The app should provide weather forecasts using machine learning models. |
| FR6 | Forecasts should be displayed for up to 7 days in advance. |

## Data Management

|  |  |
| --- | --- |
| FR # | Requirement |
| FR7 | Integrate with Singapore Government's weather data APIs. |
| FR8 | Fetch and update weather data at regular intervals. |
| FR9 | Database must be free for students to use. |

## User Interface

|  |  |
| --- | --- |
| FR # | Requirement |
| FR10 | The interface must be user-friendly and responsive. |
| FR11 | Include interactive maps and charts for weather data. |

## Notifications

|  |  |
| --- | --- |
| FR # | Requirement |
| FR12 | Users should receive notifications for severe weather conditions. |
| FR13 | Notifications should be customizable (e.g., threshold settings) |

# Non-Functional Requirements

## Performance

|  |  |
| --- | --- |
| NFR # | Requirement |
| NFR1 | The application must handle up to 10,000 concurrent users. |
| NFR2 | Data updates and visualizations should be processed within 5 seconds. |

## Scalability

|  |  |
| --- | --- |
| NFR # | Requirement |
| NFR3 | The system should scale horizontally to handle increased load. |

## Security

|  |  |
| --- | --- |
| NFR # | Requirement |
| NFR4 | Use secure authentication methods and protect user data. |

## Usability

|  |  |
| --- | --- |
| NFR # | Requirement |
| NFR5 | The application should be accessible on desktop and mobile devices. |
| NFR6 | Ensure compliance with accessibility standards (e.g., WCAG). |

## Reliability

|  |  |
| --- | --- |
| NFR # | Requirement |
| NFR8 | The system should have 99.9% uptime. |
| NFR9 | implement backup and recovery processes. |

# Use Cases

## Use Case 1: User Registration

|  |  |
| --- | --- |
| UC1 | Details |
| Actors | New User |
| Description | A new user registers an account to access the application. |
| Preconditions | User has internet access. |
| Postconditions | User account is created and activated. |

## Use Case 2: User Login

|  |  |
| --- | --- |
| UC2 | Details |
| Actors | Existing User |
| Description | An existing user logs in to their account to access the application. |
| Preconditions | User has internet access. |
| Postconditions | User account is logged ion successfully. |

## Use Case 3: View Real-Time Weather Data

|  |  |
| --- | --- |
| UC3 | Details |
| Actors | General User |
| Description | User views current weather data on the interactive map. |
| Preconditions | User is logged in. |
| Postconditions | Real-time data is displayed. |

## Use Case 4: Receive Weather Alerts

|  |  |
| --- | --- |
| UC4 | Details |
| Actors | General User |
| Description | User receives notifications for severe weather conditions. |
| Preconditions | Severe weather condition detected. |
| Postconditions | Notification is sent to the user. |

## Use Case 5: View Predicted Weather Data

|  |  |
| --- | --- |
| UC5 | Details |
| Actors | General User |
| Description | User views predicted weather data in specified location. |
| Preconditions | User clicks on view prediction button for predicted data. |
| Postconditions | Predicted data is displayed. |