

CS-315 Project Report

Grant Hartley

University of North Alabama

Spring 2024

Project Overview

The program I will be making is a weather app. Using free API's, I will get the weather information for a given city and/or ZIP code. The app will provide users with real-time weather data including current conditions, forecasts, and other relevant information.

Objectives of the project:

- ★ Develop a user-friendly GUI for the weather app.
- ★ Integrate free weather API to fetch weather data.
- ★ Allows users to search for weather information by city and state combo. Or by entering a ZIP code
- ★ Allow for users to change units [Fahrenheit to Celsius] (hopefully will have time to implement)

Tech. Stack:

- ★ GUI Frameworks: AWT or Swing
- ★ Weather API: OpenWeatherMap or WeatherBit
- ★ JSON Parsing: such as Jackson to parse data from API

Purpose of the Project:

I wanted a program that can have a real purpose that I can use after the class is over not just a project that gets me a grade. While it is true that there are other weather apps out there that will be much better, I can always improve the UI later if I choose to do so. It will also be a good learning experience. Instead of making a basic calculator or a budgeting calculator that only uses local information such as a file or basic calculations. Using an API is what is done in most of the developing in industry so getting practice in this can prove to be extremely useful.

Defining Requirements:

Inputs:

- ★ City name: text box
- ★ ZIP code: text box
- ★ Submit Button: button

Settings form:

- ★ Temperature unit: F or C
- ★ Wind speed unit
- ★ Language (will not have time to implement but would be cool)

Outputs:

- ★ Location
- ★ Current Temp
- ★ Windspeed
- ★ Forecast Display
- ★ Error logging (regex for validating zip codes)

Design:

Main Function:

Init GUI components

Display welcome messages

Define Event Handlers:

- ★ Location input form submission handler
- ★ Get city/state OR ZIP code
- ★ Validate Input
- ★ If input is valid
 - Call function to fetch data from API
 - Display information based on given input
- ★ If input is invalid
 - Display error message with hints to user

- ★ Display GUI components

Function to Fetch Weather Information

- ★ API_URL
- ★ API_KEY
- ★ Create API request with city/state OR zip code
- ★ Make HTTP GET request based on URL with user given inputs
- ★ Parse JSON
- ★ If response is 200(successful)
 - Extract current weather data and forecast from response
 - Return weather data
- ★ If response is 300-500(unsuccesful)
 - Return error message

Function to display weather data

- ★ Display location name, current temperature, and wind speed
- ★ Display forecast for the next 24 hours and next 7 days

Function to display error message

- ★ Display error message to user

Main Loop:

- ★ Run the GUI Application