COMP3322A Modern Technologies on World Wide Web

Assignment Two

Total 10 points

Overview

You are going to design and develop a Web app that displays the current weather condition of Hong Kong together with (1) temperature data of various districts in Hong Kong and (2) 9-day weather forecast of Hong Kong. Your program retrieves weather data from the Hong Kong Observatory Open Data via its APIs. The Web app should be nicely rendered on mobile platforms and desktop computers.

Objectives

1. A learning activity to support ILO 1 and ILO 2.
2. To learn how to make use of Open Data.
3. To practice using JavaScript to (1) build a Web page from scratch, (2) carry out AJAX communication for retrieving Open Data, and (3) create dynamic contents.
4. To practice using CSS styling to design responsive Web application.

Requirements

- Retrieve real-time data from HKO using AJAX or fetch()

  HKO Open Data - https://www.hko.gov.hk/en/abouthko/opendata_intro.htm

  HKO Open Data API Documentation - https://data.weather.gov.hk/weatherAPI/doc/HKO_Open_Data_API_Documentation.pdf

  Current Weather Report API - https://data.weather.gov.hk/weatherAPI/opendata/weather.php?dataType=rhrread&lang=en

  9-day Weather Forecast API - https://data.weather.gov.hk/weatherAPI/opendata/weather.php?dataType=fnd&lang=en

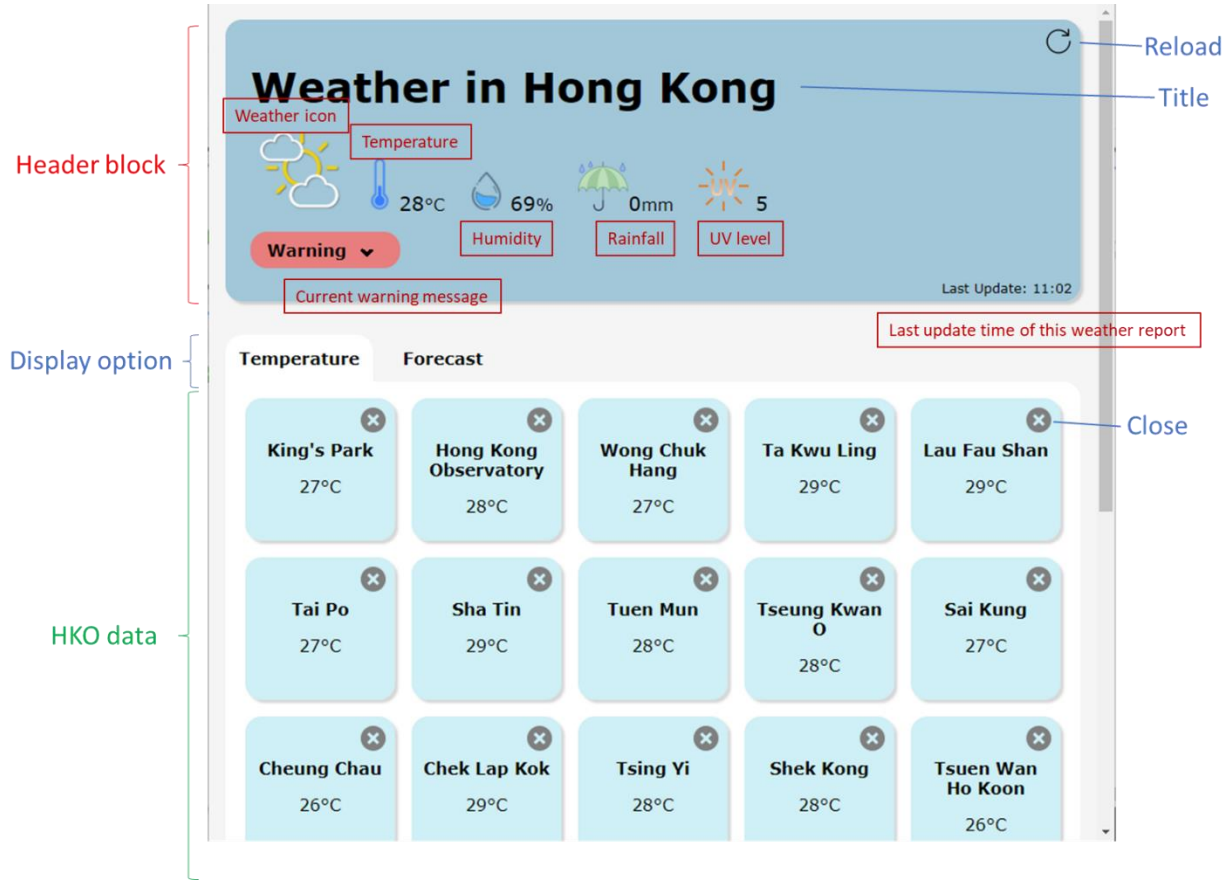
- Extract relevant data from the Current Weather Report and 9-day Weather Forecast report

Current weather	**Current Weather Report API (WR)**
Current weather icon	WR.icon[0] //show the first one
Current temperature	WR.temperature.data[1].value //Hong Kong Observatory
Current humidity	WR.humidity.data[0].value //show the first one
Current rainfall	WR.rainfall.data[13].max //Yau Tsim Mong
Current UV index	WR.uvindex.data[0].value //could be missing //show the first one
Current warning	WR.warningMessage[0] //could be missing //show the first one
Last update	WR.updateTime
District Temperatures	WR.temperature.data[0..N] //N could be changing from time to time

Temp. of each district	WR.temperature.data[i].place, WR.temperature.data[i].value
Weather forecast	**9-day Weather Forecast API (WF)**
9-Day Forecast	WF.weatherForecast[0..8]
Forecast icon	WF.weatherForecast[i].ForecastIcon
Forecast date	WF.weatherForecast[i].forecastDate
Forecast week	WF.weatherForecast[i].week
Forecast temperatures	WF.weatherForecast[i].forecastMintemp, WF.weatherForecast[i].forecastMaxtemp
Forecast humidity	WF.weatherForecast[i].forecastminrh, WF.weatherForecast[i].forecastmaxrh

Weather Icons list - https://www.hko.gov.hk/textonly/v2/explain/wxicon_e.htm
You can get another set of weather icons via the following path, e.g. icon no. 63
https://www.hko.gov.hk/images/HKOWxIconOutline/pic63.png

- Present the collected HKO data in the Web app.
  Here is the screenshot of a **recommended** implementation.



The app **should have**

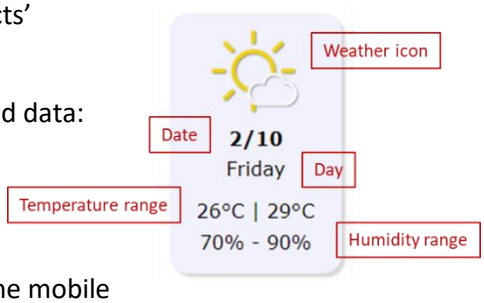
1. a header block that shows current weather data - the data includes weather icon, temperature value of HKO, humidity value of HKO, rainfall value of Yau Tsim Mong district, UVindex value of King's Park (if present), warning message (if present), and last update time of the current

weather report; if present of warning message, use suitable mechanism to dynamically display the warning message;

2. a reload button for reloading the contents of the app;
3. two option tags for selecting what to be displayed in the main body and the default is to show the temperatures of different districts.

For showing the temperature data, the app **should list** all the districts' temperatures with the location names and temperature values. Each district block **should have** a close button for removing that district from the display. Optional, you can arrange the districts' temperatures in alphabetical order or the original order.

For showing the 9-day forecast, the app **should show** the predicted data: weather icon, date and day, temperature range, and humidity range for each forecast date. The data is arranged in chronological order.



Here are some example screenshots of the Web app running on the mobile device and desktop device.

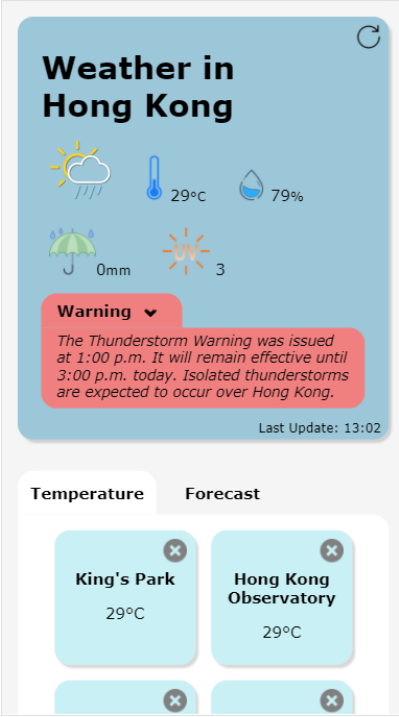


Figure 1 This view shows the Web app in a mobile setting with UVindex and Warning message (on mouseover); the default is to show all districts' temperatures

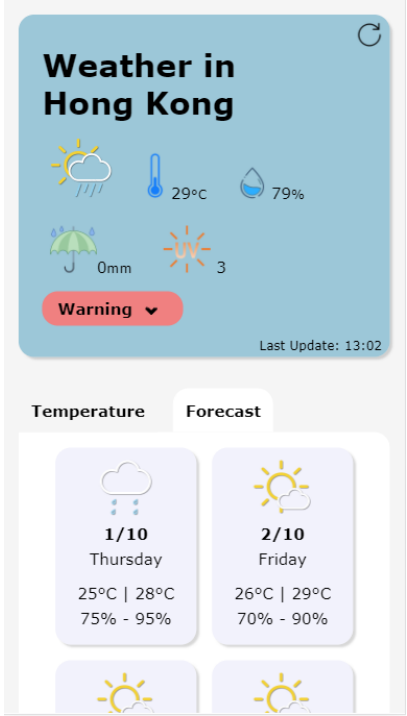


Figure 2 This view shows the Web app in a mobile setting with UVindex and Warning message (w/o mouseover); this view shows the 9-day forecast

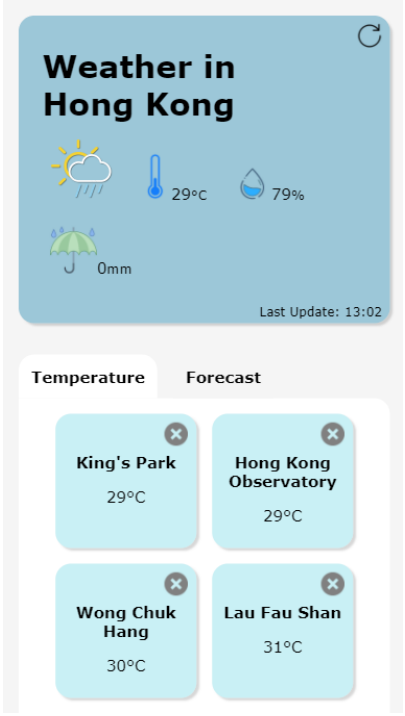


Figure 3 This view shows the look of the app when no data for UVindex and Warning message is provided

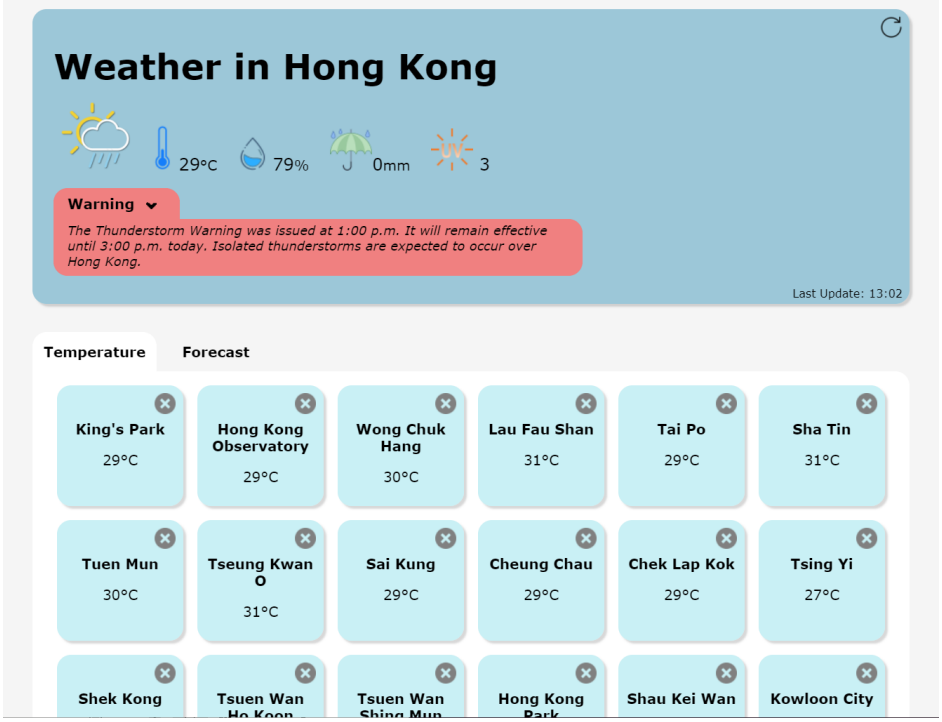


Figure 4 This view shows the Web app in a desktop setting with all districts' temperature

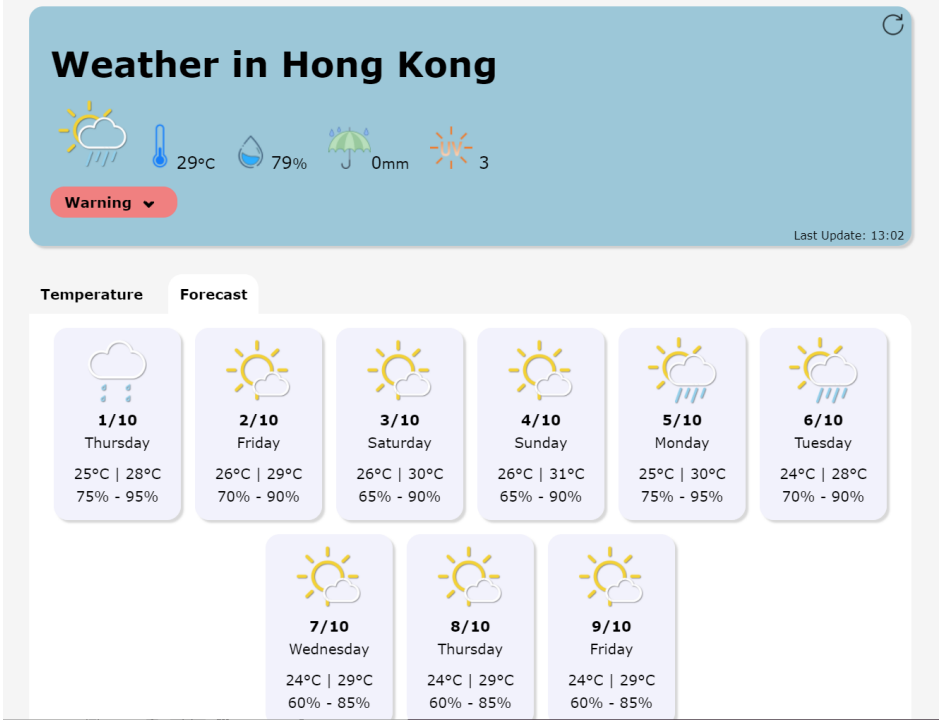


Figure 5 This view shows the Web app in a desktop setting and shows the 9-day forecast

- The base document of our Web app is the **index.html** file. You **cannot add** any HTML tags to the <body> part of the file. Instead, you use JavaScript to dynamically create all HTML elements and their contents during runtime, and use CSS to set the styling and layout. In principle, you do not

need to touch on the index.html file. Your task is to **implement the two files** - app.css and app.js. **Note:** you can have different names for the two files, and you can structure your code in multiple .js and .css files. You just have to import them to these two main files. However, you are not allowed to use external libraries for the task. If you use different filenames for the two files, please update the index.html file accordingly.

```
<!doctype html>
<html>
<head>
  <meta charset="utf-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <link rel="stylesheet" href="app.css">
  <script type="module" src="app.js"></script>
  <title>HKO Weather Info</title>
</head>
<body>
<!--
Use JavaScript to add all HTML elements
-->
</body>
</html>
```

- You **should implement** appropriate CSS settings for rendering the Web app on a mobile device (e.g., iPhone 8 / X or Pixel 2) and a desktop browser (with at least 1000px screen width).

Resources

Here are optional resources you can use for building the Web app.

- images.zip - this file contains all images used in the recommended implementation.
- data.zip - this file contains sample forecast and weather data downloaded from HKO; this would be useful for you to examine the weather data and test the Web app without getting the data from HKO.
- index.html - this is the base document of your Web app.

Testing platform

We shall test your Web app using Google Chrome. Please make sure that your Web app is using real-time data from HKO (rather than running on the provided sample data).

Submission

Please finish this assignment before Oct 30 Friday 23:59. Upload all files to the i7.cs.hku.hk server and arrange the files according to the file structure of your Web app in a preset directory under the course account (c3322a) for this assignment, i.e., /course/home/c3322a/public_html/**assign2**/[your_CSID]. We have created a folder for each student under the path for this assignment: /course/home/c3322a/public_html/**assign2**/

For example, a student with the CS account username - tmchan, would have a directory: /course/home/c3322a/public_html/**assign2**/tmchan/

We shall visit your individual webpage (https://i7.cs.hku.hk/~c3322a/**assign2**/[your_CSID]/index.html) to check your assignment.

Grading Policy

Points	Criteria
0.5	Successfully using XMLHttpRequest object or fetch() to retrieve Open Data
3.5	Correctly display header Info ▪ Missing weather icon (-0.5) ▪ Mistake in showing UV index (-0.4) ▪ Mistake in showing warning message (-0.9) ▪ Missing or incorrect reload function (-0.5) ▪ Other mistakes (-0.2/mistake)
1.5	Correctly display temperatures of different districts ▪ Mistake in displaying district's name and temperature (-0.5) ▪ Missing or incorrect close button (-0.5) ▪ Error in listing all districts' info (-0.5)
1.5	Correctly display 9-day forecast ▪ Missing or incorrect weather icon (-0.3) ▪ Missing or incorrect Date and Day (-0.3) ▪ Missing or incorrect range of temp (-0.3) ▪ Missing or incorrect humidity range (-0.3) ▪ Error in listing all 9-day forecast (-0.3)
0.5	Implementation of the selection mechanism for selecting which data set (districts' temp or 9-day forecast) to display
2.5	Styling and layout ▪ The overall look of the Web app (1.5) – color scheme, position & spacing & dimension of the contents, aesthetic design, etc. ▪ Responsive design (1.0) – adjustment of the layout and position & spacing & dimension of the contents when display the app on a mobile phone or a wide desktop browser
-1.0	Not using index.html as the Web app main page
-2.0	Not using JavaScript to build the body part of the whole web page

Plagiarism

Plagiarism is a very serious academic offence. Students should understand what constitutes plagiarism, the consequences of committing an offence of plagiarism, and how to avoid it. ***Please note that we may request you to explain to us how your program is functioning as well as we may also make use of software tools to detect software plagiarism.***