2024 Invitational Online Friendly Challenge

Mobile Applications Development

[Module3]

Module3

Introduction

The product manager has provided you with product wireframes for phone versions. As a developer of mobile applications, your task is to develop corresponding apps based on the given wireframes according to specific development needs.

Description of project and tasks

- The developer does not need to consider the aesthetics of the program interface and the position of the elements. The work can be inconsistent with the given wireframes, but the developer needs to properly consider the ease of use.
- The Test Project **MAY NOT** align with the provided wireframes.
- Competition time: 2.5 hours
- Marking emulator: Android – Pixel5 API 31, iOS – iPhone 8 Plus
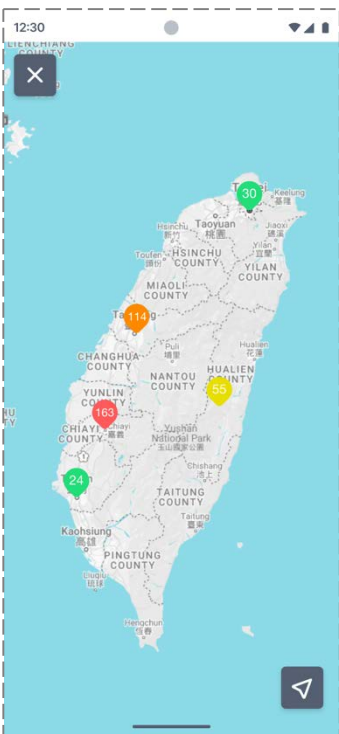
Application Wireframes

Weather Information Main Screen

City List Page

City List Page-Clicking the menu icon

AQI Map Page

1.Weather Information Main Screen

    A.   Elements include:

        a.   Current weather forecast for the city.

        b.   Temperature and weather conditions for the current city.

        c.   Highest and lowest temperatures for the current city.

        d.   Current weather background image.

        e.   Hourly weather forecast for today.

           i.   Time.

          ii.   Weather icons.

         iii.   Temperature.

        f.   Ten-day weather forecast.

           i.   Title: "10-DAY-FORECAST".

          ii.   The title on the left includes a calendar icon.

         iii.   The list includes date, weather icons, and temperature range.

        g.   Air Quality Index (AQI).

           i.   Title: "AIR-INDEX".

          ii.   The title on the left includes a chart icon.

         iii.   Dashboard graph.

          iv.   The AQI for the current city is displayed in the middle of the dashboard graph.

           v.   The text "AQI" is displayed below the AQI value.

          vi.   Current AQI status.

        h.   Footer Navigation Bar.

           i.   On the left side, there is a map icon.

          ii.   On the right side, there is a list icon.

         iii.   In the middle, there is the current page indicator.

    B.   Functional requirements:

        a.   The main weather information screen is the program's startup page.

        b.   The "current.xml" file is loaded by default to display weather information.

        c.   Depending on the XML data, if the "type" attribute is set to "current", the text "My Location" is displayed above the city name.

        d.   The current temperature and weather conditions are displayed based on the XML data and current time.

        e.   The highest and lowest temperatures are displayed according to the XML data.

        f.   The corresponding weather background image is displayed based on the XML data and current time.

        g.   Hourly weather forecast for today is provided.

           i.   The list is scrollable horizontally.

          ii.   Text for each hour is displayed in the **HH** format.

         iii.   The weather icon corresponding to each hour is displayed based on the XML data.

         iv.   The temperature for each hour is displayed based on the XML data.

          v.   According to the simulator time, the current hour should be labeled as "NOW", and past

hours will not be displayed.

h. The weather forecast for the next ten days (including today).

    i. The list is not scrollable.

    ii. Dates are displayed in the **MM/dd** format.

    iii. According to the emulator time, the current date should be labeled as "Today", and past dates will not be displayed.

    iv. Display the temperature range chart corresponding to the date according to the XML. The maximum value on the chart corresponds to the highest temperature within the past ten days, while the minimum value corresponds to the lowest temperature within the past ten days. The range is then displayed based on the highest and lowest temperatures for the corresponding date.

    v. If the highest temperature is below 15 degrees, the range is indicated with a gradient from light blue to dark blue.

    vi. If the lowest temperature is above 15 degrees, the range is indicated with a gradient from yellow to orange to red.

    vii. If the highest temperature is above 15 degrees and the lowest temperature is below 15 degrees, the range is indicated in yellow.

    viii. The left side of the temperature range chart displays the lowest temperature for the corresponding date in the XML, while the right side displays the highest temperature.

i. Air Quality Index (AQI).

    i. Utilize a gauge chart to display the AQI value of the current city from the XML data.

    ii. Display the current AQI value of the current city in the center of the gauge chart based on the XML.

    iii. Set the minimum value of the gauge chart to 0.

    iv. Set the maximum value of the gauge chart to 175.

    v. The gauge chart should display corresponding colors based on the following value ranges.

    vi. Display the current AQI status below the gauge chart based on the XML data. The background color should correspond to the colors shown in the above chart. Show "GOOD" when AQI is between 0 and 50, "MODERATE" when it's between 51 and 100, and "UNHEALTHY" when it's above 100.

j. Bottom Navigation Bar.

    i. Clicking on the map icon navigates to the "AQI Map Page" and passes the current city data.

    ii. Clicking on the list icon navigates to the "City List Page".

    iii. The number of page indicators displayed corresponds to the number of cities added to the list page.

    iv. The position (index) of the page indicator is based on the order of the current city on the "City List Page".

    v. The first item of the page indicators is a location icon, while the others are displayed as dots.

2. City List Page

    A.   Elements include:

        a.   Title "Weather".

        b.   Location search box with "Search for a city" as the input hint.

        c.   A magnifying glass icon is located to the right of the location search box.

        d.   The menu icon is located at the top right corner of the screen.

        e.   City list.

            i.   City names.

          ii.   Current temperature, weather condition, highest temperature, and lowest temperature of the current city.

         iii.   Current weather background image.

    B.   Functional requirements:

        a.   The location search box can accurately search for cities based on the XML.

        b.   After searching, the city results should display an "Add" button on the right side. Clicking this button adds the city to the city list and clears the search box, returning it to its original style.

        c.   By default, the weather information for the current location is displayed in the city list and cannot be removed or reordered.

        d.   Cities displayed in the city list are based on the XML. If the XML attribute type is "current," the text "My Location" is displayed above the city.

        e.   According to the XML, display the current temperature, weather conditions, high temperature, low temperature, and weather background image for the city list.

        f.   For cities that are not the current location, the current time should be displayed below the city based on the simulator time, in the format of **h:mm a**. The time should update every minute.

        g.   The results and order of cities in the city list should be saved so that they can still be displayed after a "**Cold Start**" of the app, including added or removed cities.

        h.   Clicking the menu icon should display the following functions.

            i.   Edit List: Clicking this option allows sorting or removing added cities.

          ii.   Settings: Clicking this option navigates to the "Settings Page."

         iii.   Celsius °C: Clicking this option converts the temperature of the current page to Celsius and saves the state for the next app launch. Refer to the diagram for the conversion formula.

         iv.   Fahrenheit °F: Clicking this option converts the temperature of the current page to Fahrenheit and saves the state for the next app launch. Refer to the diagram for the conversion formula.

$$°C = \frac{5}{9}(°F - 32)$$

3. AQI Map Page

    A.   Elements include:

        a.   Close Button.

        b.   Location Button.

        c.   Map.

    B.   Functional requirements:

        a.   Refer to the provided map import example and "osmroid.wiki" to load the map.

        b.   Click the close button to return to the "Weather Information Main Screen".

        c.   Accurately display the map of Taiwan.

        d.   Animating the movement to Taiwan when starting the page.

        e.   Set the zoom level to 8 when starting the page.

        f.   Set the minimum zoom level of the map to 7.

        g.   Set the maximum zoom level of the map to 12.

        h.   Hide the zoom control of the map.

        i.   Add a label on the map indicating the current device location.

        j.   Click the location button to move to the current location.

        k.   Display the locations of the cities already added in the "City List Page" on the map according to the XML.

        l.   Display AQI data for the cities already added in the "City List Page" on the map according to XML.

        m.   Color-code the AQI labels for each city on the map based on the color rules of the AQI dashboard chart in the "Weather Information Main Screen".

4. Settings Page

    A.   Elements include:

        a.   The title "Settings" should be included.

        b.   Design the interface yourself to allow users to switch the display language within the app. The options should include "English" and "Chinese".

    B.   Functional requirements:

        a.   The ability to switch languages, displaying the correct language on the "City List" page is sufficient (text from XML may not be displayed according to the currently selected language). The Chinese translation of "Weather" is "天氣". The Chinese translation of "Search for a city" is "輸入城市地點來搜尋." The Chinese translations for "cloudy, sunny, overcast, rain, thunder" are respectively "多雲、晴天、陰天、雨天、打雷".

        b.   The selected language should be saved so that even after a "**Cold Start**" of the app, the correct language is displayed.