# WeatherTalk – Project Report

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**Subject** :Mobile Systems
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## 1. Introduction

WeatherTalk is an **Android application** that integrates **real-time weather updates**, **smart visualizations**, and **sensor-based features** into a single user-friendly platform.
The app provides weather forecasts, live weather conditions, chatbot interaction, and sensor-driven experiences (compass + step counter), making it both practical and interactive.

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## 2. Core Features

**Weather Dashboard** – Displays city-specific forecasts using charts (Line, Bar, and Pie)
**City List Management** – Add and remove multiple cities with live weather updates
**Chatbot** – AI-powered conversational assistant for weather queries
**Settings Activity** – Manage snooze duration and preferences
**Sensors Integration** – Real-time Compass (magnetic field sensor + accelerometer) and Step Counter
**GPS & Location** – Fetch weather data based on user's live location

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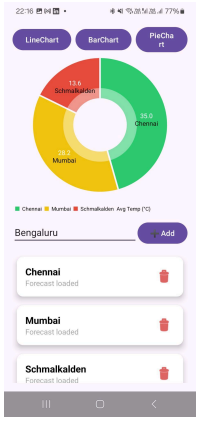
## 3. Activities Overview

### 3.1 WeatherDashboardActivity

- Displays **Line Chart** for 7-day temperature trends
- Displays **Bar Chart** for temperature vs windspeed
- Displays **Pie Chart** for average city temperatures
- Allows adding and removing multiple cities dynamically
- Fetches data from **Open-Meteo API**

📷 *Screenshot:*

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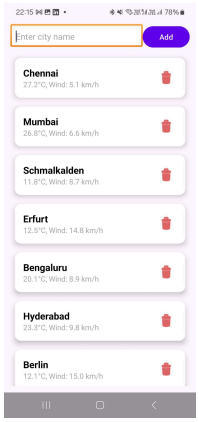
## 3.2 CityListActivity

- Allows users to **search and add cities**
- Fetches **current temperature and windspeed**
- Displays list in **RecyclerView with CardView items**
- Provides **delete option** for each city

📷 *Screenshot:*

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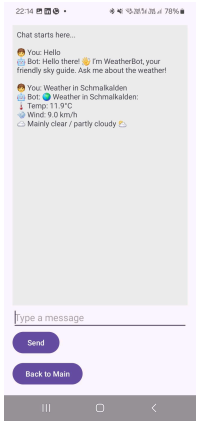
## 3.3 ChatbotActivity

- Conversational assistant (**WeatherBot**)
- Handles greetings, farewells, and weather queries (`weather in London`)
- Uses **Open-Meteo API** for city weather
- Simple scrollable chat interface

📷 *Screenshot:*

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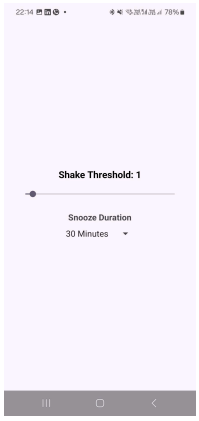
## 3.4 SettingsActivity

- Snooze duration selection via **Spinner**
- Options: `30 min`, `1 hour`, `3 hours`
- Stored in **SharedPreferences**

📷 *Screenshot:*

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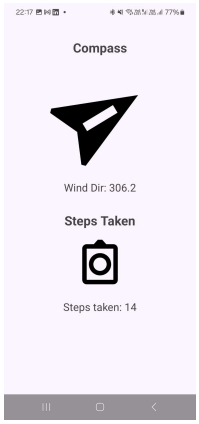
## 3.5 SensorActivity

- **Compass (Magnetic Field Sensor + Accelerometer)**
    - Displays orientation in degrees
    - Smooth animated compass rotation

- **Step Counter (TYPE_STEP_COUNTER)**
    - Animates step updates for better UI
    - Shows “Step Counter not available” if device lacks hardware

📷 *Screenshot:*

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## 4. Sensors Used

1. **Accelerometer** – Detects tilt and movement (used with compass).
2. **Magnetometer** – Detects magnetic field, helps calculate orientation.
3. **Step Counter** – Tracks physical activity.
4. **GPS/Location** – Fetches weather based on live coordinates.

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## 5. APIs Integrated

- **Open-Meteo API**
    - **Geocoding API** → Convert city name to latitude/longitude
    - **Forecast API** → Daily weather data (temperature, windspeed, weather codes)
    - **Current Weather API** → Live temperature and wind

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## 6. UI Design Enhancements

- **CardView-based City List** → Modern look
- **Material-themed buttons and inputs**
- **Colored icons (compass, footsteps, delete buttons)**
- **Smooth animations** for compass & step counter

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## 7. Limitations

**I.**Requires **internet connection** for weather API
**II.**Some devices may **not support step counter sensor**
**III.**Compass accuracy depends on **magnetometer calibration**
**IV.**Battery usage may increase with **continuous sensor tracking**
**V.**Some of the UI part might not be good as I'm a **beginner**

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## 8. Conclusion

WeatherTalk successfully combines **weather forecasting, sensor data, and chatbot interaction** into one application. By leveraging APIs, Android sensors, and intuitive UI, it provides a practical yet engaging way for users to explore weather data and activity insights.

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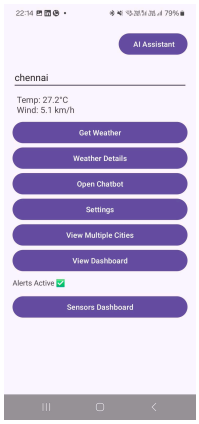
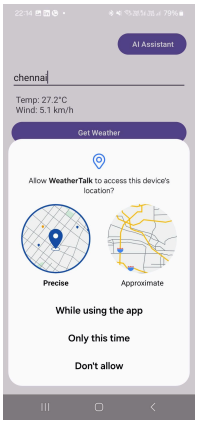
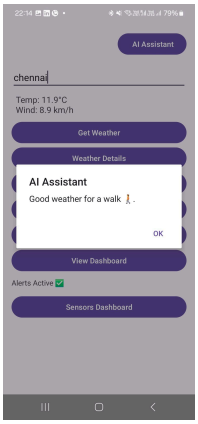
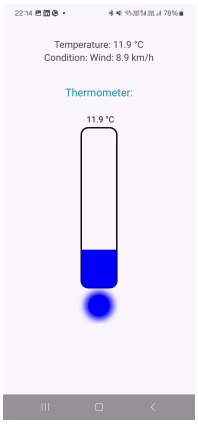
📷 *Screenshots to Attach:*

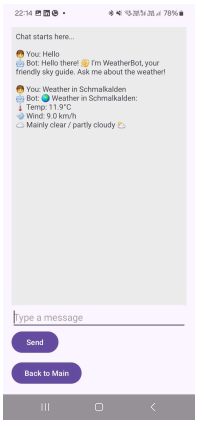
- Weather Dashboard
- City List Activity
- Chatbot Activity
- Settings Activity
- Sensor Activity (Compass + Step Counter)

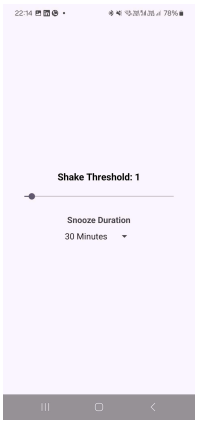

AI Assistant
chennai
Temp: 27.2°C
Wind: 5.1 km/h
Get Weather
Weather Details
Open Chatbot
Settings
View Multiple Cities
View Dashboard
Alerts Active
Sensors Dashboard

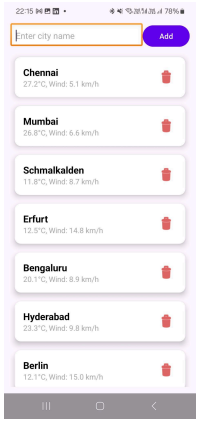

AI Assistant
chennai
Temp: 27.2°C
Wind: 5.1 km/h
Get Weather
Allow WeatherTalk to access this device's location?
Precise
Approximate
While using the app
Only this time
Don't allow

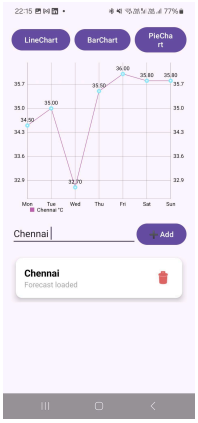

AI Assistant
chennai
Temp: 11.9°C
Wind: 8.9 km/h
Get Weather
Weather Details
AI Assistant
Good weather for a walk 🚶.
OK
View Dashboard
Alerts Active
Sensors Dashboard

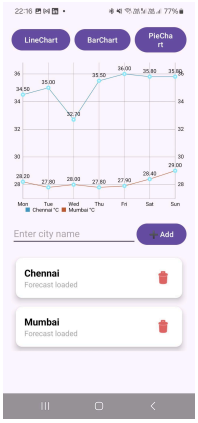

Temperature: 11.9 °C
Condition: Wind: 8.9 km/h
Thermometer:
11.9 °C

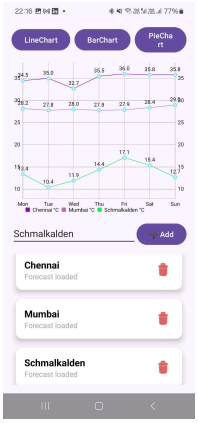

Chat starts here...
You: Hello
Bot: Hello there! 👋 I'm WeatherBot, your friendly sky guide. Ask me about the weather!
You: Weather in Schmalkalden
Bot: 🌍 Weather in Schmalkalden:
🌡 Temp: 11.9°C
💨 Wind: 9.0 km/h
☁ Mainly clear / partly cloudy ⛅
Type a message
Send
Back to Main

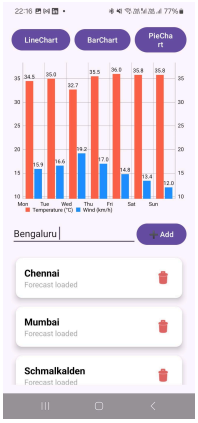

Shake Threshold: 1
Snooze Duration
30 Minutes

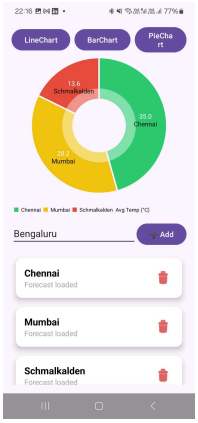

Enter city name
Add
Chennai
27.2°C, Wind: 5.1 km/h
Mumbai
26.8°C, Wind: 6.6 km/h
Schmalkalden
11.8°C, Wind: 8.7 km/h
Erfurt
12.5°C, Wind: 14.8 km/h
Bengaluru
20.1°C, Wind: 8.9 km/h
Hyderabad
23.3°C, Wind: 9.8 km/h
Berlin
12.1°C, Wind: 15.0 km/h

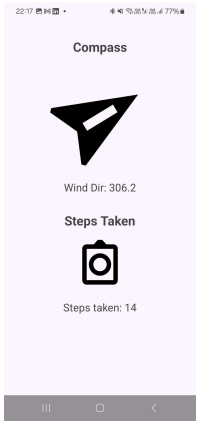

LineChart
BarChart
PieChart
Chennai
Add
Chennai
Forecast loaded


LineChart
BarChart
PieChart
Enter city name
Add
Chennai
Forecast loaded
Mumbai
Forecast loaded


LineChart
BarChart
PieChart
Schmalkalden
Add
Chennai
Forecast loaded
Mumbai
Forecast loaded
Schmalkalden
Forecast loaded


LineChart
BarChart
PieChart
Bengaluru
Add
Chennai
Forecast loaded
Mumbai
Forecast loaded
Schmalkalden
Forecast loaded


LineChart
BarChart
PieChart
13.6
Schmalkalden
35.0
Chennai
28.3
Mumbai
Bengaluru
Add
Chennai
Forecast loaded
Mumbai
Forecast loaded
Schmalkalden
Forecast loaded


Compass
Wind Dir: 306.2
Steps Taken
Steps taken: 14