NATIONAL UNIVERSITY OF COMPUTER AND EMERGING SCIENCES
PROGRAM: SOFTWARE ENGINEERING

SOFTWARE CONSTRUCTION AND DEVELOPMENT LAB

LAB TASK 12

SUBMITTED BY:

Name: Ahmed Ali

Roll No: 22P-9318

SECTION: BS(SE)-5B

INSTRUCTOR NAME: Sir Saood Sarwar

A DEPARTMENT OF COMPUTER SCIENCE

Screenshots of GUI Showing Weather data for specific city, top 10 coldest cities In Pakistan, Baar chart for temperatures

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Weather App   — □ ✕

Enter City Name:

peshawar

Get Weather

Show 10 Coldest Cities

City: Peshawar
Temperature: 23.08°C
Humidity: 35%
Pressure: 1013 hPa
Weather: Haze

Weather App   — □ ✕

Enter City Name:

karachi

Get Weather

Show 10 Coldest Cities

City: Karachi
Temperature: 30.9°C
Humidity: 35%
Pressure: 1012 hPa
Weather: Clear sky

Enter City Name:

quetta

Get Weather

Show 10 Coldest Cities

City: Quetta
Temperature: 18.83°C
Humidity: 20%
Pressure: 1016 hPa
Weather: Clear sky

Enter City Name:

Hyderabad

Get Weather

Show 10 Coldest Cities

City: Hyderabad
Temperature: 27.23°C
Humidity: 36%
Pressure: 1011 hPa
Weather: Haze

Enter City Name:

faisalabad

Get Weather

Show 10 Coldest Cities

City: Faisalabad
Temperature: 27.73°C
Humidity: 16%
Pressure: 1012 hPa
Weather: Clear sky

Enter City Name:

multan

Get Weather

Show 10 Coldest Cities

City: Multan
Temperature: 26.94°C
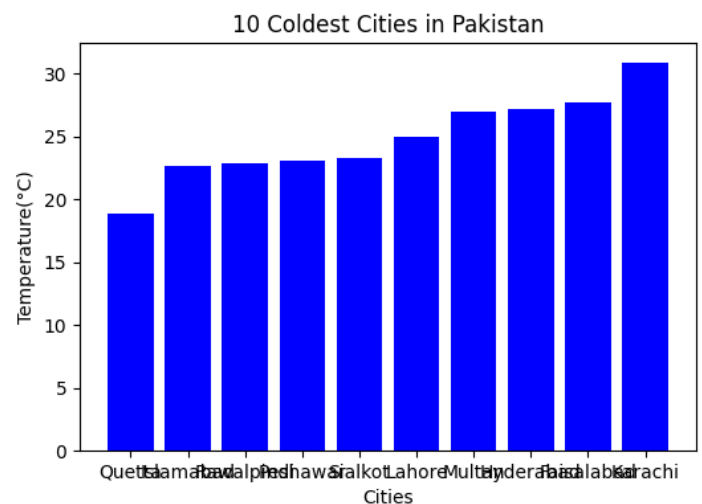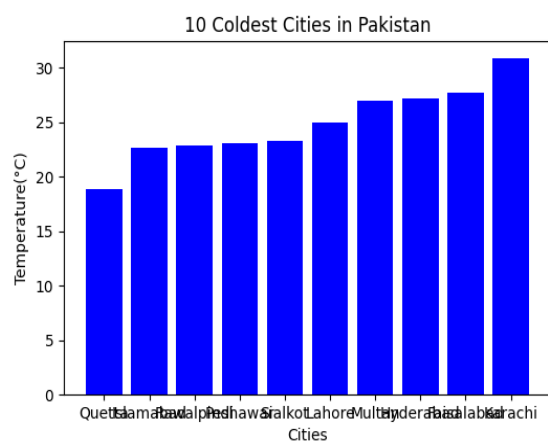Humidity: 41%
Pressure: 1012 hPa
Weather: Haze

Enter City Name:

multan

Get Weather

Show 10 Coldest Cities

City: Multan
Temperature: 26.94°C
Humidity: 41%
Pressure: 1012 hPa
Weather: Haze

A short description of implementation approach:

I first analyze the OpenWeatherMap API's documentation to understand the endpoints needed for fetching current weather and forecast data Then, I develop the backend by using the requests library to fetch weather data for a given city and retrieve the temperatures of 10 coldest cities in Pakistan

For the frontend, I design a simple GUI using Tkinter, where I create input fields, buttons, and labels to display the weather information I also integrate a Matplotlib bar chart to visualize the temperatures of the coldest cities

Lastly, I handle errors, ensuring the application works smoothly by providing error messages for invalid input or API errors, while keeping the user interface clean and easy to use

I use the **FigureCanvasTkAgg module from matplotlib.backends.backend_tkagg** to integrate Matplotlib charts into my Tkinter GUI first, I create a plot using Matplotlib, and then I use FigureCanvasTkAgg to convert that plot into a widget that can be displayed inside my Tkinter window

This allows me to add interactive visualizations, like bar charts or line graphs, directly into the GUI layout It's helpful for making the application more dynamic and visually appealing