# Weather Application with Calculator – Python + OpenWeatherMap API

## 📌 Overview

This project is a Python-based application that enables users to:  
  
- Fetch real-time weather for any city using the OpenWeatherMap API  
- Perform basic arithmetic operations (add, subtract, multiply, divide)  
- Optionally view history of operations using SQLite and generate reports with Pandas  
- Choose between a console interface or optional Tkinter GUI

## ⚙️ Technologies Used

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| --- | --- |
| Technology | Purpose |
| Python | Main programming language |
| Requests | To access weather API |
| Tkinter (optional) | GUI-based interface |
| SQLite (optional) | To store operation history |
| Pandas (optional) | To generate operation reports |
|  |  |

## 💡 Features

✅ Fetch temperature, humidity, and wind speed for any city  
✅ Perform arithmetic operations with error handling  
✅ Console and optional GUI-based user interface  
✅ Persistent operation history using SQLite (optional)  
✅ Generate CSV reports using Pandas (optional

## 🖥️ How to Run the App

```bash  
**# Step 1: Install dependencies**  
pip install requests tkinter pandas  
  
**# Step 2: Run the main script**  
python main.py  
```

## 🔐 API Key Setup

Register at <https://openweathermap.org/api>

to get your API key.  
Insert your key in the code at:  
```python  
api\_key = "YOUR\_API\_KEY\_HERE"  
```

## 🧠 Complete Source Code

**# main.py**

from weather\_api import get\_weather  
from calculator import add, subtract, multiply, divide  
  
def main():  
 api\_key = "YOUR\_API\_KEY\_HERE"  
 while True:  
 print("\nChoose an option:")  
 print("1. Get Weather")  
 print("2. Calculator")  
 print("3. Exit")  
 choice = input("Enter choice: ")  
  
 if choice == "1":  
 city = input("Enter city name: ")  
 try:  
 weather = get\_weather(city, api\_key)  
 print(f"Temperature: {weather['temperature']}°C")  
 print(f"Humidity: {weather['humidity']}%")  
 print(f"Wind Speed: {weather['wind\_speed']} m/s")  
 except Exception as e:  
 print("Error:", e)  
  
 elif choice == "2":  
 a = float(input("Enter first number: "))  
 b = float(input("Enter second number: "))  
 op = input("Enter operation (+, -, \*, /): ")  
  
 try:  
 if op == '+':  
 print("Result:", add(a, b))  
 elif op == '-':  
 print("Result:", subtract(a, b))  
 elif op == '\*':  
 print("Result:", multiply(a, b))  
 elif op == '/':  
 print("Result:", divide(a, b))  
 else:  
 print("Invalid operator.")  
 except Exception as e:  
 print("Error:", e)  
  
 elif choice == "3":  
 break  
 else:  
 print("Invalid choice.")

**# weather\_api.py**

import requests  
  
def get\_weather(city, api\_key):  
 url = f"https://api.openweathermap.org/data/2.5/weather?q={city}&appid={api\_key}&units=metric"  
 response = requests.get(url)  
 if response.status\_code == 200:  
 data = response.json()  
 return {  
 'temperature': data['main']['temp'],  
 'humidity': data['main']['humidity'],  
 'wind\_speed': data['wind']['speed']  
 }  
 else:  
 raise Exception("City not found or API error.")

**# calculator.py**

def add(a, b): return a + b  
def subtract(a, b): return a - b  
def multiply(a, b): return a \* b  
  
def divide(a, b):  
 if b == 0:  
 raise ValueError("Cannot divide by zero.")  
 return a / b