python mini project

weather app in python using tkinter and weather api

by:

Tharun BP ENG20CY0041

P Kushal ENG20CY0024

Ezra ENG20CY0009

Nainesh Dalai ENG20CY0049

introduction:

- The project consists of a simple weather app with GUI written in python using tkinter, requests and json packages.
- The tkinter package lets us to create a simple GUI using python with few lines of code
- The requests package is for accessing the weather info from weather api at weatherapi.com using an api key
- the json module converts the raw response data from the weatherapi which is in json format to a dictionary data type for easier use of data

info on libraries used:

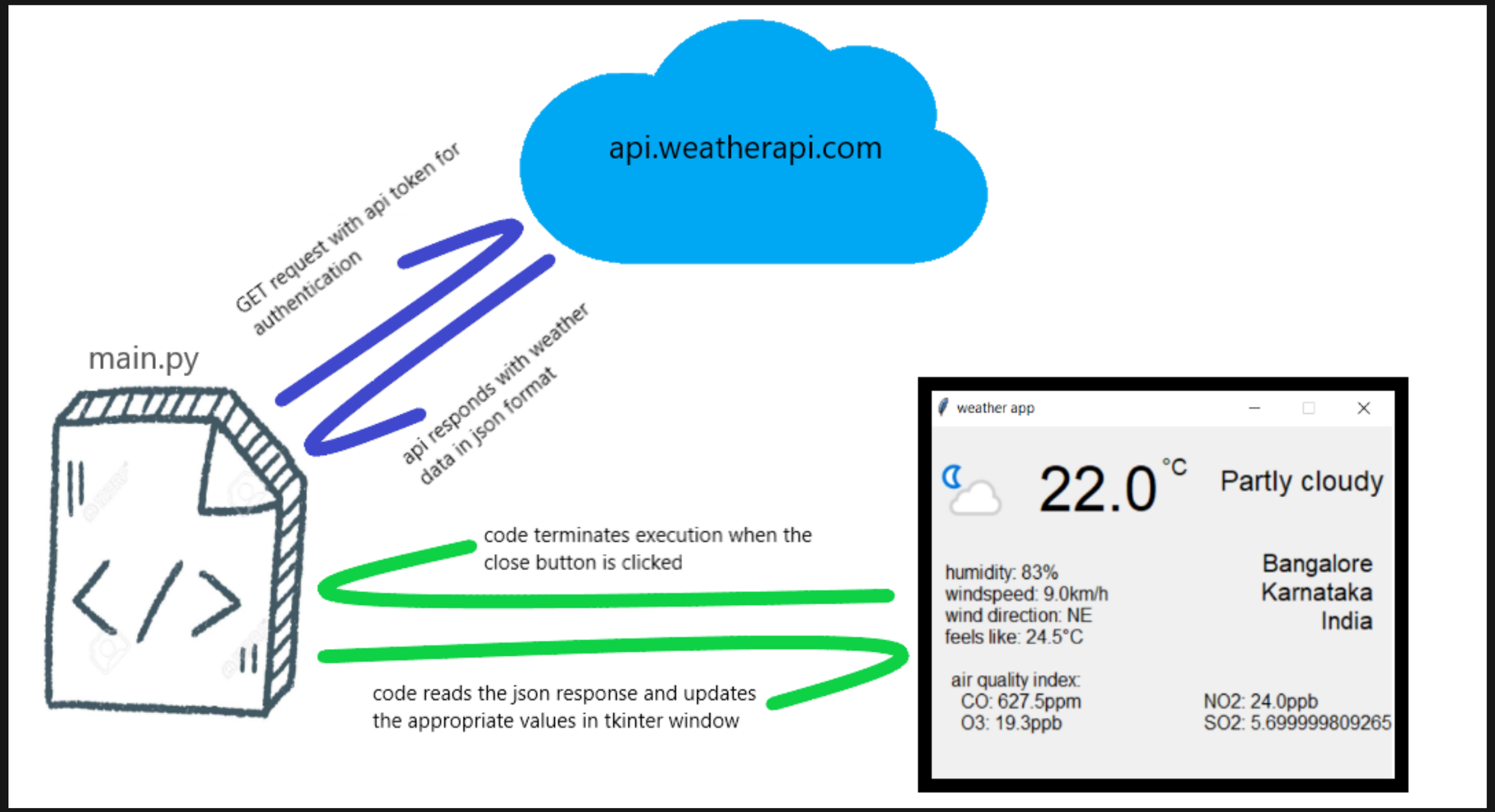
tkinter: tkinter is a python library thats included in python by default and is used to create simple GUI(graphical user interfaces) using widgets like elements that are predefined in the tkinter library

requests: requests is a python library that is used to send HTTP web requests to a specific URL, which in this case is used to make a GET request to api.weatherapi.com for getting the weather data

info on libraries used(contd):

json: json stands for javascript object notation is a light weight data interchange format that is used for exchanging data between computers or programs it is similar to that of a dictionary data type that exists in python where you can have key value pair and each can have any data type which is more efficient compared to plain text format. data that is in json format can be used in python using the built in json package

how it works:


api.weatherapi.com
GET request with api token for authentication
api responds with weather data in json format
main.py
code terminates execution when the close button is clicked
code reads the json response and updates the appropriate values in tkinter window
weather app
22.0 °C
Partly cloudy
humidity: 83%
windspeed: 9.0km/h
wind direction: NE
feels like: 24.5°C
Bangalore
Karnataka
India
air quality index:
CO: 627.5ppm
O3: 19.3ppb
NO2: 24.0ppb
SO2: 5.699999809265

requirements:

- os: any modern os(windows 7 or later, macos, linux(debian,ubuntu,rhel))
- ram:1gb and above
- processor:Processors: Intel Atom® processor or Intel® Core™ i3 processor and above
- python version 3.7.x and above
- disk space: 5gb and above

code(1):

project1 > main.py > ...

```python
import tkinter #for creating the window
import requests#for making api call and requesting the weather data
import json#for working with the raw json data from api call

api_key = "5957d1aeff3d4cc185d101803212311"
#doing a get request and storing the response
raw = requests.get(f"http://api.weatherapi.com/v1/current.json?key={api_key}&q=bangalore&aqi=yes")

#converting the raw json response to usable json
result = json.loads(raw.text)

#getting image for the weather condition

img_url = result["current"]["condition"]["icon"]
raw_img = requests.get(f"https:{img_url}")

with open("icon.png","wb") as icon:
    icon.write(raw_img.content)
    icon.close()

#data from api
cond = result["current"]["condition"]["text"]
temp_c = result["current"]["temp_c"]
location =result["location"]["name"]
state =result["location"]["region"]
country =result["location"]["country"]
humidity = result["current"]["humidity"]
wind = result["current"]["wind_kph"]
wind_direction =result["current"]["wind_dir"]
feelslike = result["current"]["feelslike_c"]
#aqi = air quality index
aqi_co=result["current"]["air_quality"]["co"]
aqi_no2=result["current"]["air_quality"]["no2"]
aqi_o3=result["current"]["air_quality"]["o3"]
aqi_so2=result["current"]["air_quality"]["so2"]
```

code(2):

project1 > main.py > ...

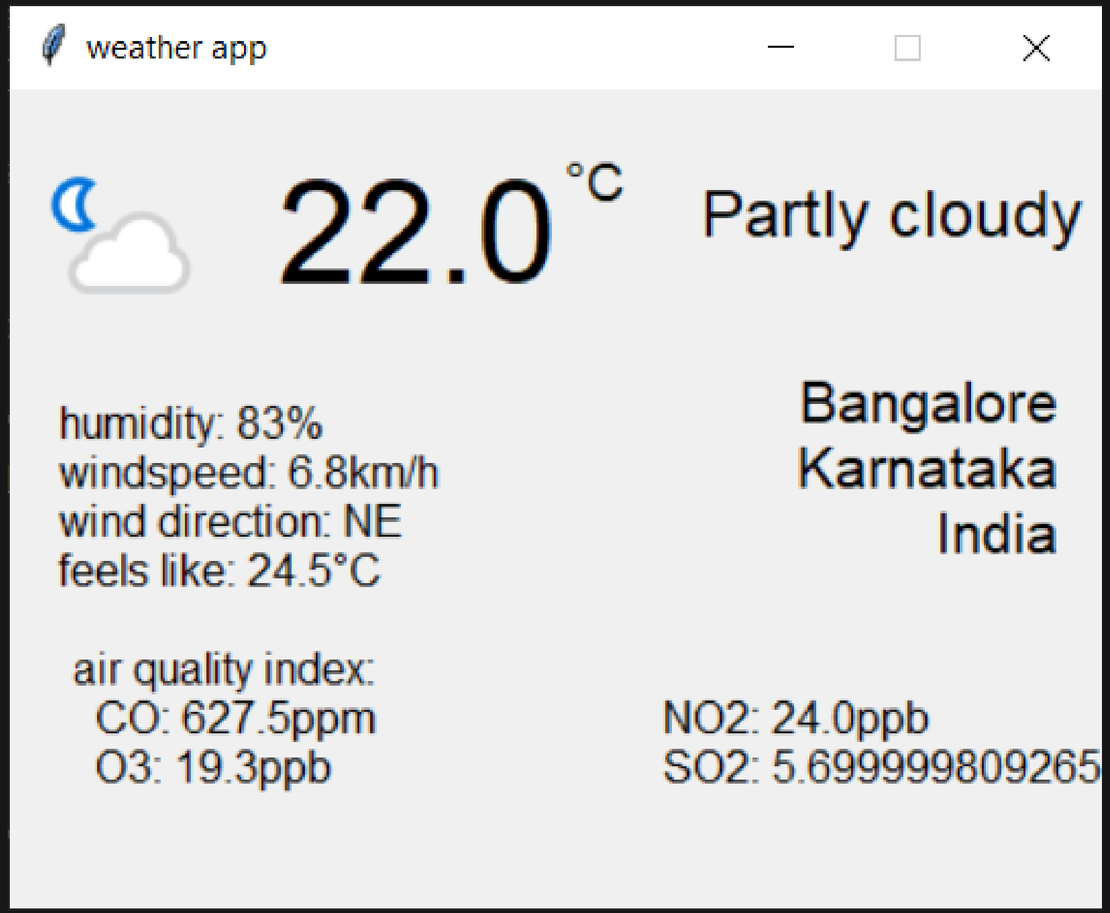
```
#tkinter code starts from here
window = tkinter.Tk()
window.title("weather app")
#window size
window.geometry("400x300")
#fixed window size
window.resizable(False, False)

#picture widget definition
pic = tkinter.Canvas(window,width=500,height=300)
pic.pack()
img = tkinter.PhotoImage(file="icon.png")
pic.create_image(40,60,image=img)

#text widget defintion
condition = tkinter.Label(window,text=cond)#,width=10)
temperature = tkinter.Label(window,text=temp_c)
location = tkinter.Label(window,justify="right",
text=f"{location}\n{state}\n{country}")

degree = tkinter.Label(window,text="°C")

extra_info=tkinter.Label(window,justify="left",
text=f"humidity: {humidity}%\nwindspeed: {wind}km/h\nwind direction: {wind_direction}\nfeels like: {feelslike}°C")

air_index = tkinter.Label(window,justify="left",
text=f"air quality index:\n  CO: {round(aqi_co,2)}ppm\t\tNO2: {aqi_no2}ppb\n  O3: {round(aqi_o3,2)}ppb\t\tSO2: {round(aqi_so2,2)}ppb")

#text configs
condition.config(font=('Sans-serif','18'))
temperature.config(font=('Sans-serif','40'))
degree.config(font=('Sans-serif','14'))
location.config(font=('Sans-serif','16'))
extra_info.config(font=('Sans-serif','12'))
air_index.config(font=('Sans-serif','12'))
```

code(3):

project1 > main.py > ...

```
74  #positions for widgets
75  condition.place(x=250,y=30)
76  temperature.place(x=95,y=20)
77  location.place(x=285,y=100)
78  degree.place(x=200,y=20)
79  extra_info.place(x=15,y=110)
80  air_index.place(x=20,y=200)
81
82
83  #inbuilt infinite loop to run the program
84  window.mainloop()
85
```

output:


weather app
22.0 °C
Partly cloudy
humidity: 83%
windspeed: 6.8km/h
wind direction: NE
feels like: 24.5°C
Bangalore
Karnataka
India
air quality index:
CO: 627.5ppm
O3: 19.3ppb
NO2: 24.0ppb
SO2: 5.699999809265

references:

https://www.tutorialspoint.com/python/python_gui_programming.htm
https://www.geeksforgeeks.org/python-requests-tutorial/
https://www.w3schools.com/python/python_json.asp

the code for the project is hosted at:

https://github.com/ctpyproject/project1

Thank you!