WEATHER FORECASTING

Using python tkinter

ATMIYA VIDYAPEETH

SESSION 2021-22

CLASS- XII SCIENCE

Weather Forecasting Application

BASED ON

PYTHON

SUBMITTED BY:

Om Prasad Behera

Nisarga Dey

Meet Bhuva

SUBMITTED TO:

Anita Lalwani

DECLARATION

I _____Student of Class XII Science ATMIYA VIDYAPEETH ,GANDHIDHAM hereby declare that this project work entitled **Weather forcasting application** is done by me and therefore I take it to be authenticated and reliable.

Place :

Date :

<Student Name>

ATMIYA VIDYAPEETH

CERTIFICATE

Ms. / Master _____

Roll No._____Student of Class XII_____

of Atmiya Vidyapeeth has undertaken the project entitled _____and has completed the same successfully under the supervision/guidance of_____ within the given time frame.

The data used in the project has been obtained from the experiments conducted in the_____Lab of Atmiya Vidyapeeth and all submission made here in by the student is authentic and reliable.

Internal Examiner Principal External Examiner

Index

Objective And Introduction Of Project:-

- **Weather Forecasting App :** It is a application that uses science and technology to predict the state of atmosphere for a given location at a given time . Weather forecasts are generally made by collecting quantitative data about the current state of the atmosphere, land, and ocean and using meteorology to project how the atmosphere will change at a given place.
- The main objective of such a application is to keep you up to date with the climate at your surroundings so that it becomes easy for you to plan your work according and face much less problems while executing it . For eg: If someone wants to plan a picnic in some open area he would need to check about the region's atmosphere whether there are chances of rain or not how's the wind etc to be able to conduct a joyful and successful picnic.
- The prime objective of any weather app is the ability to display the weather minute basis accurately, hourly, daily, weekly and even monthly. It should be reliable and user friendly so that people would use it often and should have nice visual representation according to different weather.

Language and Library used :-

In this project we have used python language, Python is currently the most widely used multi-purpose, high-level programming language.

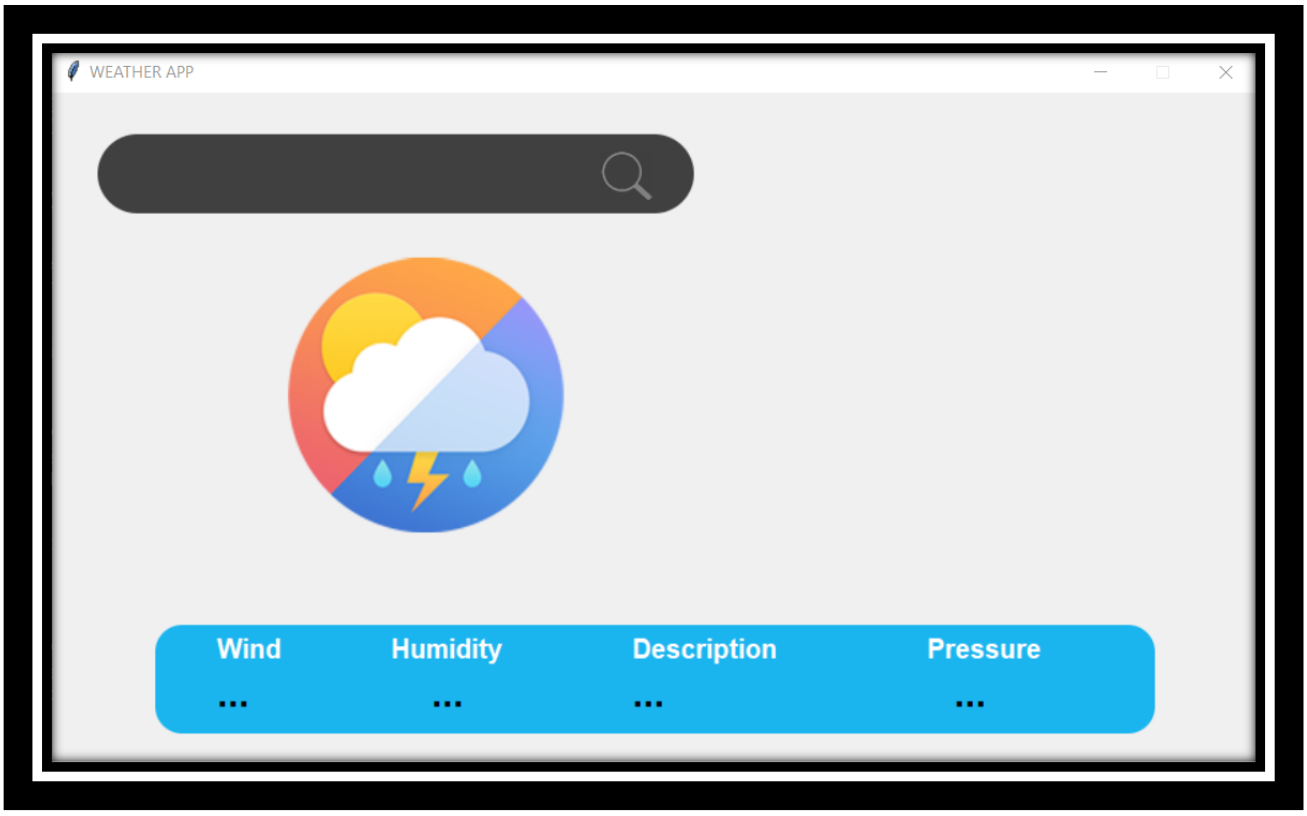
Python allows programming in Object-Oriented and Procedural paradigms.

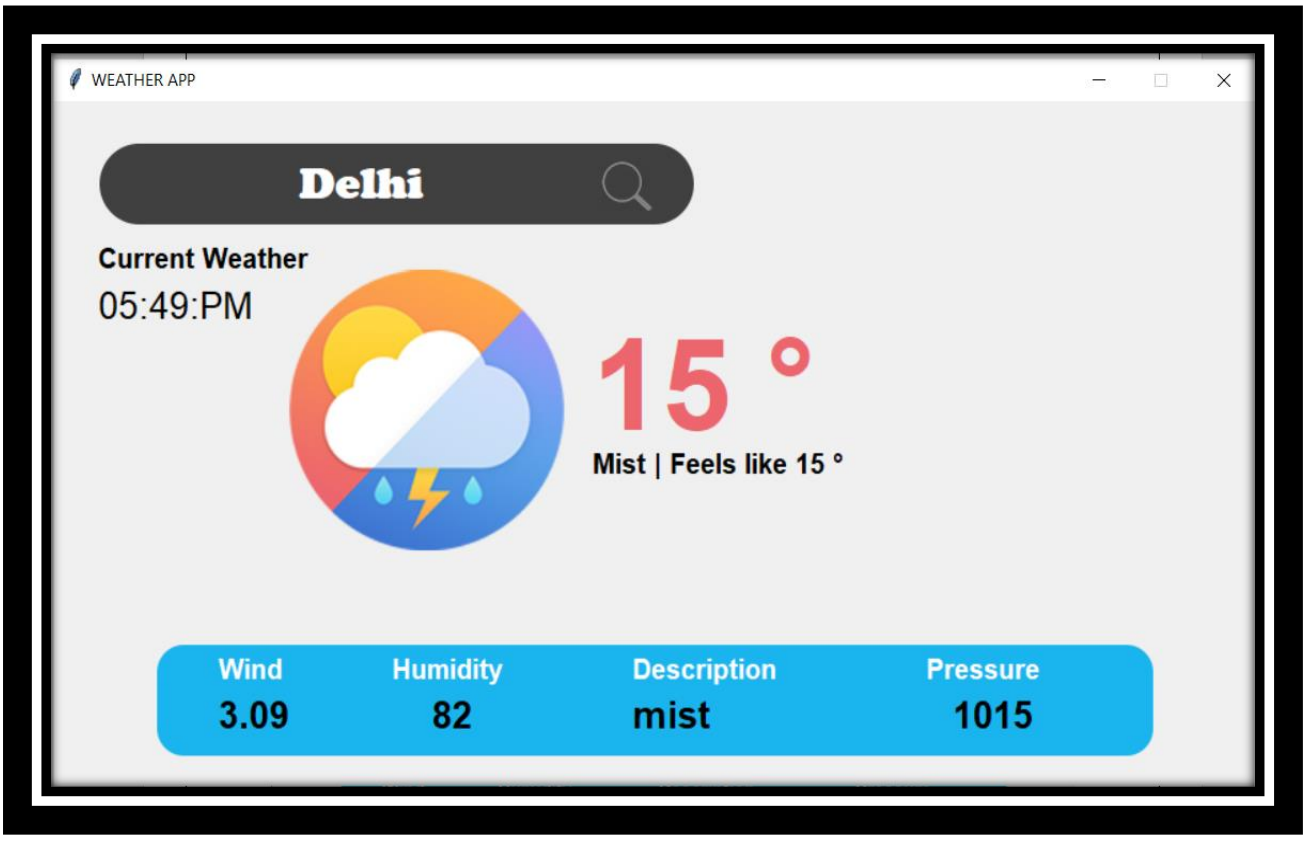
Python programs generally are smaller than other programming languages like Java. Programmers have to type relatively less and indentation requirement of the language, makes them readable all the time.

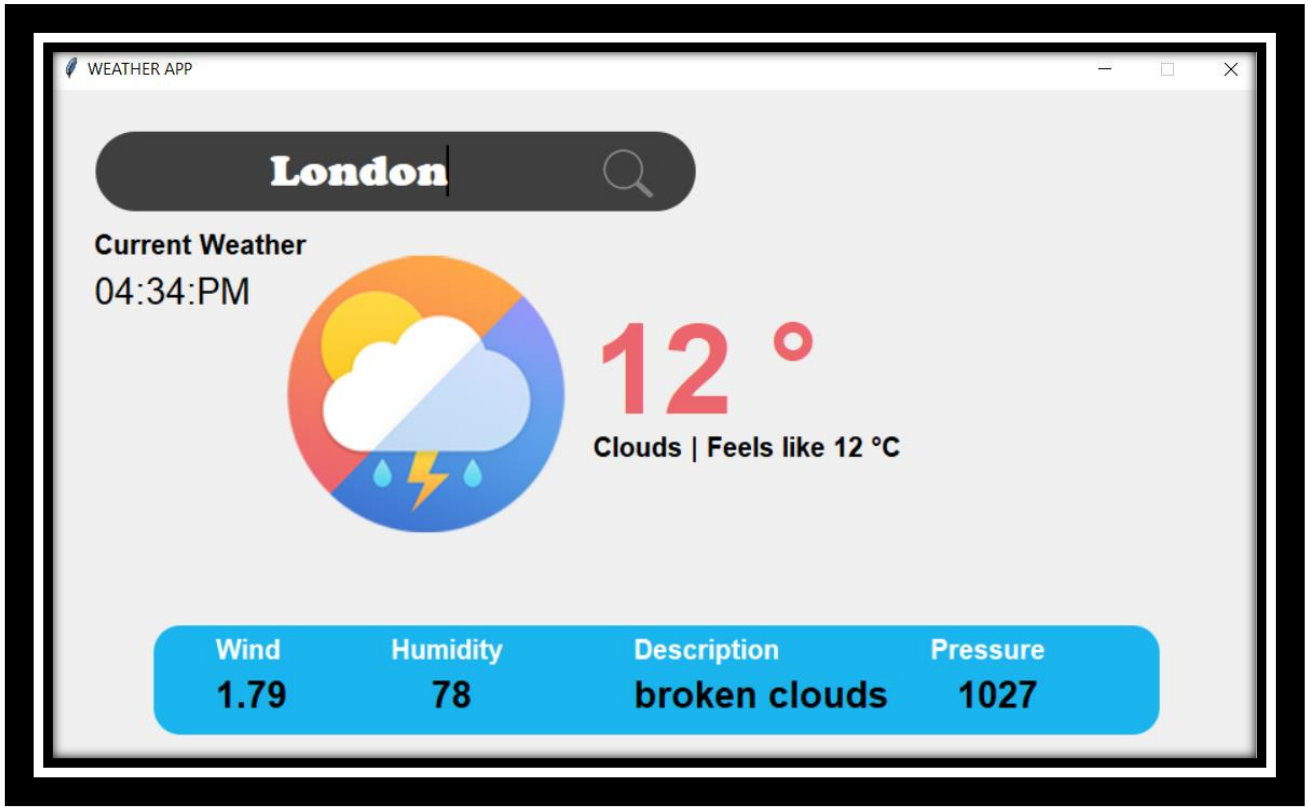
I have used tkinter library to make application interface, Tkinter is specific library used for programming of GUI interface. Tkinter relies on the Tk library, the GUI library used by Tcl/Tk and Perl, which is in turn implemented in C. Therefore, Tkinter can be said to be implemented using multiple layers.

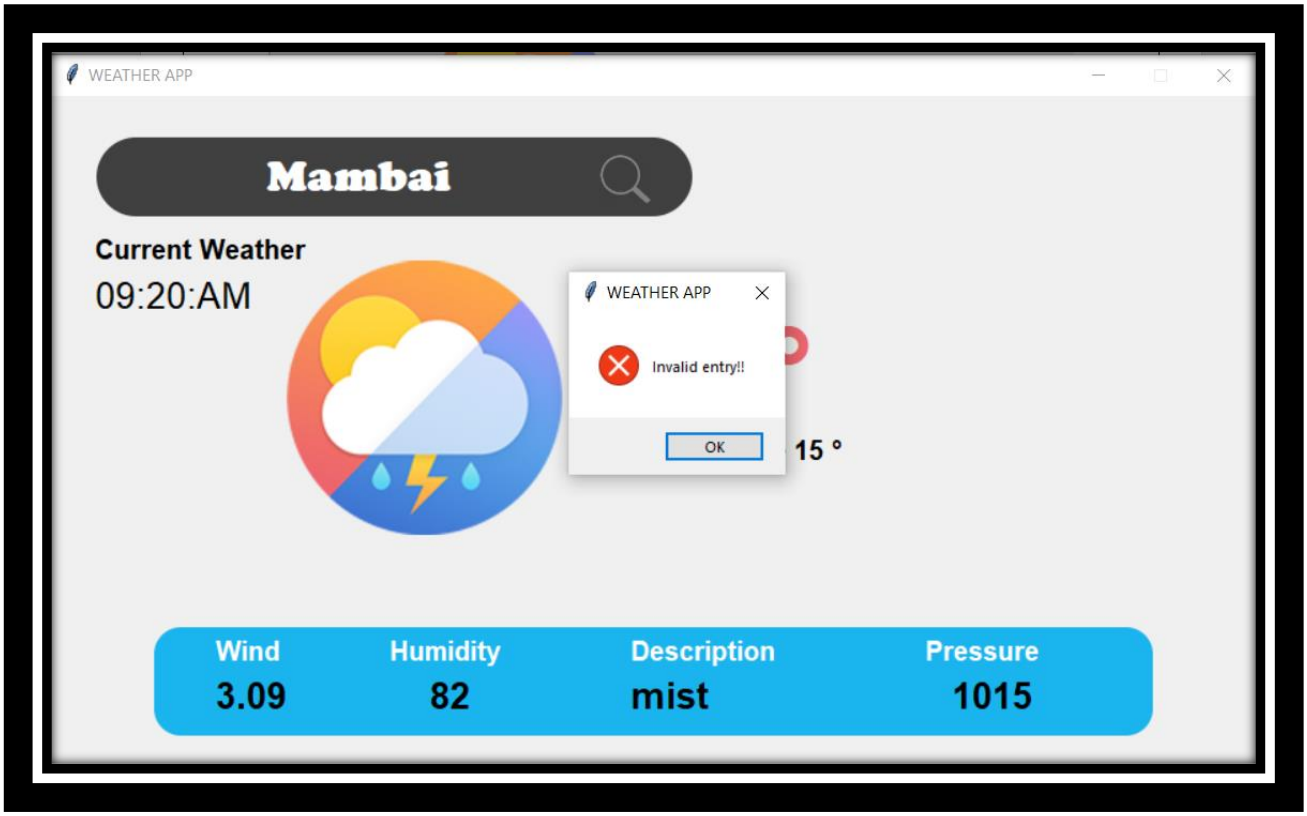
The layered approach used in designing Tkinter gives Tkinter all of the advantages of the TK library. Therefore, at the time of creation, Tkinter inherited from the benefits of a GUI toolkit that had been given time to mature. This makes early versions of Tkinter a lot more stable and reliable than if it had been rewritten from scratch. Moreover, the conversion from Tcl/Tk to Tkinter is really trivial, so that Tk programmers can learn to use Tkinter very easily.

Look of final product:-






WEATHER APP
London
Current Weather
04:34:PM
12 °
Clouds | Feels like 12 °C
Wind
1.79
Humidity
78
Description
broken clouds
Pressure
1027


WEATHER APP
Mambai
Current Weather
09:20:AM
WEATHER APP
Invalid entry!!
OK
15 °
Wind
3.09
Humidity
82
Description
mist
Pressure
1015

Project coding:-

```
#All libraries included
from tkinter import *
import tkinter as tk
from geopy.geocoders import Nominatim
from tkinter import ttk,messagebox
from timezonefinder import TimezoneFinder
from datetime import datetime
import requests
import pytz
#Application framework
root=Tk()
root.title("WEATHER APP")
root.geometry("900x500+300+200")
root.resizable(False,False)
#Weather related functioning coding
def getWeather():
  try:
    city=textfield.get()
    geolocator=Nominatim(user_agent="geoapiExercises")
    location=geolocator.geocode(city)
    obj=TimezoneFinder()
    result=obj.timezone_at(lng=location.longitude,l
    at=location.latitude)
```

```
home=pytz.timezone(result)

local_time=datetime.now(home)

current_time=local_time.strftime("%I:%M:%p")

clock.config(text=current_time)

name.config(text="Current Weather")

#WEATHER IMP CODING

api="http://api.openweathermap.org/data/2.5/wea
ther?q="+city+"&appid=708998142fc98fb01790fdd24
bccabf9"

json_data=requests.get(api).json()

condition=json_data["weather"][0]["main"]

description=json_data["weather"][0]["descriptio
n"]

temp=int(json_data["main"]["temp"]-273.15)

pressure=json_data["main"]["pressure"]

humidity=json_data["main"]["humidity"]

wind=json_data["wind"]["speed"]

t.config(text=(temp,"°")

c.config(text=(condition,"|","Feels","like",tem
p,"°C")

w.config(text=wind)

h.config(text=humidity)

d.config(text=description)

p.config(text=pressure)
```

```
 except Exception as e;
    messagebox.showerror("WEATHER APP","Invalid
    entry!!")
#SEARCH BOX RELATED CODING
search_image=PhotoImage(file="search_bar.png")
myimage=Label(image=search_image)
myimage.place(x=20,y=20)
textfield=tk.Entry(root,justify="center",width=17,f
ont=("cooper
black",25,"bold"),bg="#404040",border=0,fg="white")
textfield.place(x=50,y=40)
textfield.focus()
#SEARCH ICON AS BUTTON
search_icon=PhotoImage(file="search_icons.png")
myimage_icon=Button(image=search_icon,borderwidth=0
,cursor="hand2",bg="#404040",command=getWeather)
myimage_icon.place(x=400,y=34)
#CENTRAL LOGO
logo_image=PhotoImage(file="central_logo.png")
logo=Label(image=logo_image)
logo.place(x=150,y=100)
#BOTTOM INFORMATION BAR
Frame_image=PhotoImage(file="box.png")
frame_myimage=Label(image=Frame_image)
frame_myimage.pack(padx=5,pady=5,side=BOTTOM)
```

```
#TIME
name=Label(root,font=("playfair",15,"bold"))
name.place(x=30,y=100)
clock=Label(root,font=("Helvetica",20))
clock.place(x=30,y=130)
#Label Information
label1=Label(root,text="Wind",font=("Helvetica",15,
"bold"),fg="white",bg="#1ab5ef")
label1.place(x=120,y=400)


label2=Label(root,text="Humidity",font=("Helvetica"
,15,"bold"),fg="white",bg="#1ab5ef")
label2.place(x=250,y=400)


label3=Label(root,text="Description",font=("Helveti
ca",15,"bold"),fg="white",bg="#1ab5ef")
label3.place(x=430,y=400)


label4=Label(root,text="Pressure",font=("Helvetica"
,15,"bold"),fg="white",bg="#1ab5ef")
label4.place(x=650,y=400)


t=Label(font=("arial",70,"bold"),fg="#ee666d")
t.place(x=400,y=150)
```

```
c=Label(font=("arial",15,"bold"))
c.place(x=400,y=250)

w=Label(text="...",font=("arial",20,"bold"),bg="#1a
b5ef")
w.place(x=120,y=430)

h=Label(text="...",font=("arial",20,"bold"),bg="#1a
b5ef")
h.place(x=280,y=430)

d=Label(text="...",font=("arial",20,"bold"),bg="#1a
b5ef")
d.place(x=430,y=430)

p=Label(text="...",font=("arial",20,"bold"),bg="#1a
b5ef")
p.place(x=670,y=430)

root.mainloop()
```

Merits :

- Farmers can known when to plant or harvest their crops.
- People can choose where and when to take their holidays to take advantages of good weather.
- Surfers known when large waves are expected for safe fishing surveys.
- Regions can be evacuated if hurricanes or floods are expected which is very important to rescue people in from disasters.
- Aircraft and shipping rely heavily on accurate weather forecasting for successful transportation and trade purposes.
- Being able to forecast and plan for the future when it comes to the local climate is a major advantage when it comes to planning tourism facilities.
- The transport sector can also benefit, as infrastructure can be set up to measure road surface conditions to improve traffic safety.

Demerits:

- **Forecasts are never 100% accurate:**
  Forecasting of weather refers to probability which is correct very much but not 100% accurate but it could help us to predict the weather for some extent.

- Forecasting app requires active internet everytime to get in time forecasting of particular place.

- Some demerits of tkinter:-
  - Tkinter does not include advanced widgets.
  - It has no similar tool as Qt Designer for Tkinter.
  - It doesn't have a reliable UI.
  - Sometime, it is hard to debug in Tkinter.
  - It is not purely Pythonic.

Conclusion:-

Therefore these were all about our weather forecasting application, in summary ,weather forecasting are increasingly accurate and useful , and their benefit extend widely across the economy while much has been accomplished in improving forecast , there remains much room for improvement.

Bibliography:-

- Libraries used:-Tkinter
- API key from:- https://openweathermap.org/api
- Application used for coding:- Spyder
- Knowledge regarding all libraries from internet
- Information practices by Sumita Arora