Parshvanath Charitable Trust's
A. P. SHAH INSTITUTE OF TECHNOLOGY
(Approved by AICTE New Delhi & Govt. of Maharashtra, Affiliated to University of Mumbai)
(Religious Jain Minority)

A MINI PROJECT REPORT

On

# Live Weather Update Using GUI

Submitted in partial fulfillment of the requirement
of University of Mumbai for the Course

**In**

## Computer Engineering (IV SEM)

Submitted By
**Prathamesh Hambar (19102001)**
**Aarya Totey (19102070)**

Subject Incharge
**Subject Incharge Name**
(Merlin Priya Jacob)

Parshvanath Charitable Trust's

A. P. SHAH INSTITUTE OF TECHNOLOGY

(Approved by AICTE New Delhi & Govt. of Maharashtra, Affiliated to University of Mumbai)

(Religious Jain Minority)

# CERTIFICATE

This is to certify that the requirements for the project report entitled ' **Live Weather Update Using GUI'** have been successfully completed by the following students:

| Name | Moodle Id |
|---|---|
| Prathamesh Hambar | 19102001 |
| Aarya Totey | 19102070 |

In partial fulfillment of the course Python Programming (MEL 403) in Sem: IV of Mumbai University in the Department of Computer Engineering during academic year 2020-2021.

Sub-in-Charge
Merlin Priya Jacob

Parshvanath Charitable Trust's

A. P. SHAH INSTITUTE OF TECHNOLOGY

(Approved by AICTE New Delhi & Govt. of Maharashtra, Affiliated to University of Mumbai)

(Religious Jain Minority)

# PROJECT APPROVAL

The project entitled '**Live Weather Update using GUI**' by **Aarya Totey (19102070) and Prathamesh Hambar (19102001)** are approved for the course of Python Programming (MEL 403) in Sem: IV of Mumbai University in the Department of Computer Engineering.

Subject-in-Charge
Merlin Priya Jacob

Date: May 1, 2021

Place: Thane

# Table of Contents

Parshvanath Charitable Trust's
A. P. SHAH INSTITUTE OF TECHNOLOGY
(Approved by AICTE New Delhi & Govt. of Maharashtra, Affiliated to University of Mumbai)
(Religious Jain Minority)

## Abstract

Weather APIs are Application Programming Interfaces that allow you to connect to large databases of weather forecast and historical information.In our application, we tend to provide the user with an easy handling tool to navigate through the weather of cities across the world. Along with that the temperature, humidity and climate of that particular place. Users can compare and get an approximate forecast of the weather for the coming 5 days.We aim to build an application that will display a Bar-Graph based on the temperature of the next 5 days of that selected city. This will help in understanding the weather pattern.OpenWeatherMap, json and matplotlib and PyOWM library will be used for the same.

# Problem Definition

This project aims to provide a user-friendly application to predict weather. To create an application which will display the weather of a particular city in a GUI application. Along with the current day's temperature a bar-graph forecasting the temperature of the next five days will be displayed for the user to analyze. .Python libraries will be used extensively for this project.

# Introduction

Weather impacts nearly every area of our lives – Weather conditions such as fog, rain, and snow impact commutes to work and travels to places in other parts of the world; our health, air we breathe, the water we drink, and the food we eat. Thanks to satellites, radar, remote sensors, and other weather monitoring technologies (such as National Weather Service alerts), we now have a better understanding of weather conditions and phenomena.Thanks to APIs and smartphones with built-in GPS, we have access to mobile applications that provide hour-by-hour forecasts, severe weather alerts, and other relevant weather information for just about every place we go. The Weather API provides a simple way to import weather data and climate information into applications and back end systems. In addition, the web services allow developers to easily integrate weather data into web sites and other development projects.
Here, in our project we will be making use of such services i.e. OpenWeatherMap facilities and python modules to create an application based on displaying and manipulating weather data in pictorial form.

# Description of the modules used

**Json**

JSON is a language-independent data format. JSON -JavaScript Object Notation is an open standard file format and data interchange format that uses human-readable text to store and transmit data objects consisting of attribute–value pairs and arrays (or other serializable values). It has a diverse range of applications, one example being web applications that communicate with a server.It was derived from JavaScript, but many modern programming languages include code to generate and parse JSON-format data.Even though it closely resembles JavaScript object literal syntax, it can be used independently from JavaScript, and many programming environments feature the ability to read (parse) and generate JSON. JSON file names use the extension ".json."

**OpenWeatherMap**

OpenWeatherMap is an online service that provides global weather data via API, including current weather data, forecasts, nowcasts and historical weather data for any geographical location. It provides a minute-by-minute hyperlocal precipitation forecast for any location. The convolutional machine learning model is used to utilise meteorological broadcast services and data from airport weather stations, on-ground radar stations, weather satellites, remote sensing satellites, METAR and automated weather stations.The variety of weather APIs provided by OpenWeatherMap have found a significant popularity among the software developers, which resulted in the growing multitude of repositories on GitHub. The APIs support multiple languages, units of measurement and industry standard data formats like JSON and XML.

**Matplotlib**

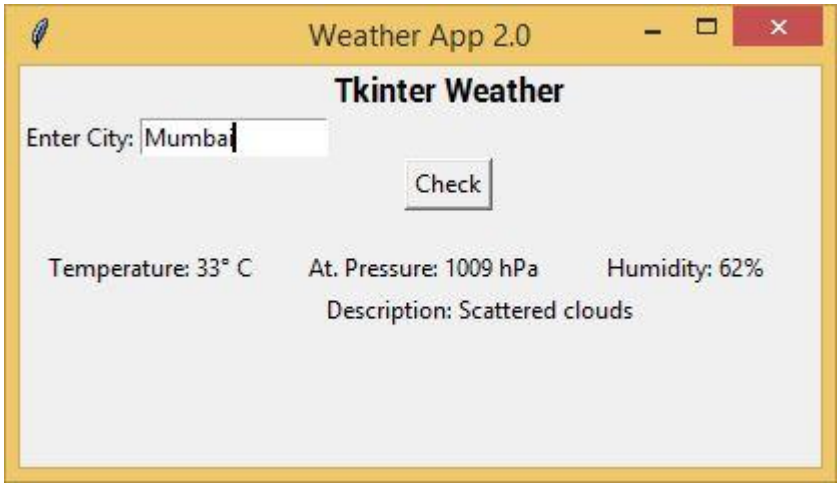
Matplotlib is a plotting library for the Python programming language and its numerical mathematics extension NumPy. It provides an object-oriented API for embedding plots into applications using general-purpose GUI toolkits like Tkinter, wxPython, Qt, or GTK. There is also a procedural "pylab" interface based on a state machine (like OpenGL), designed to closely resemble that of MATLAB. SciPy makes use of Matplotlib.We can create plots, histograms, power spectra, bar charts, error charts, scatterplots, etc.

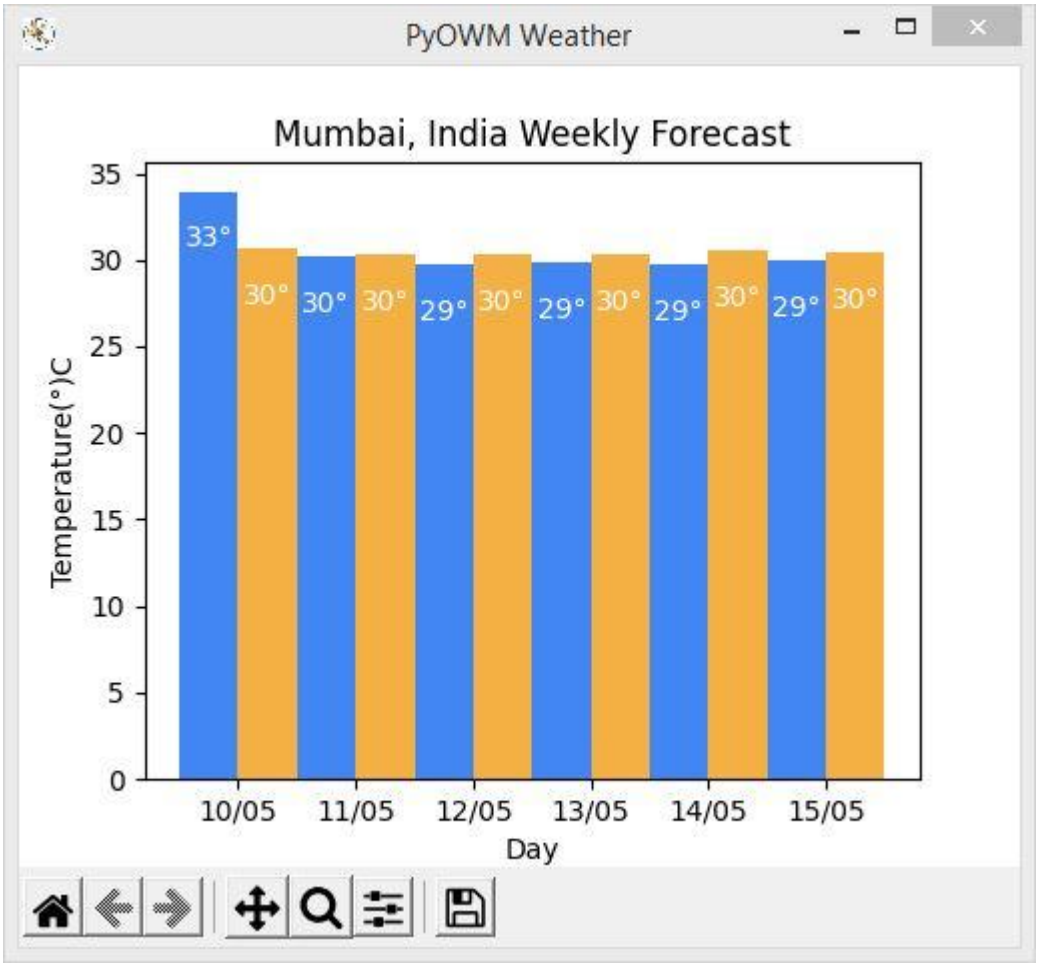
**PyOWM**

PyOWM is a client Python wrapper library for OpenWeatherMap (OWM) web APIs. It allows quick and easy consumption of OWM data from Python applications via a simple object model and in a human-friendly fashion. PyOWM runs on Python 3.7+ .

# Output


Weather App 2.0
Tkinter Weather
Enter City:
Check


Weather App 2.0
Tkinter Weather
Enter City: Mumbai
Check
Temperature: 33° C
At. Pressure: 1009 hPa
Humidity: 62%
Description: Scattered clouds


PyOWM Weather
Mumbai, India Weekly Forecast
Temperature(°)C
Day
10/05
11/05
12/05
13/05
14/05
15/05
33°
30°
30°
30°
29°
30°
29°
30°
29°
30°
29°
30°

## Conclusion

Thus, this report concludes how this project is initiated and how all the modules work accordingly one after the other. This project makes use of API and python modules and libraries to make our Live Weather Update using GUI. It is an attempt to build an application to implement the above mentioned modules and learn about the vast set of facilities provided by the developers.

## Future scope

- This application can be made more interactive and more modules can be added.
- Speech-to-text modules can be included to get the city from the user.
- Similarly, results could be received in a verbal form.
- Graphs for various other parameters could be included.
- Rather than hardcoring the cities OR making the user choose from a predefined set ; more flexibility could be provided.

## Reference


- OpenWeatherMap Weather API
  Our public github repository
- https://github.com/Prathamesh247/WeatherProject

Parshvanath Charitable Trust's

A. P. SHAH INSTITUTE OF TECHNOLOGY

(Approved by AICTE New Delhi & Govt. of Maharashtra, Affiliated to University of Mumbai)

(Religious Jain Minority)

## Acknowledgment

We have great pleasure in presenting the Python Project report on Live Weather Update Using GUI. We take this opportunity to express our sincere thanks towards our guide Prof.Merlin Priya Jacob Department of Computer Engineering, APSIT thane for providing the technical guidelines and suggestions regarding line of work. We would like to express our gratitude towards his constant encouragement, support and guidance through the development of the project.

We thank Prof.Sachin Malave, Head of Department, Computer Engineering, APSIT for his encouragement during the progress meeting and providing guidelines to write this report.

We also thank the entire staff of APSIT for their invaluable help rendered during the course of this work. We wish to express our deep gratitude towards all our colleagues of APSIT for their encouragement.

Student 1: Prathamesh Hambar (19102001)

Student 2: Aarya Totey (19102070)