# Web Services and GUI

In this class students will create a Python application that gets data from an external source via web service, and displays it in a Tkinter GUI.

Program 1 calls the OpenWeatherMap web service. Program 2 contains all the necessary GUI elements.

## Questions

1. What is a web service?
2. What is the `openweathermap` web service URL? What parameters does the service accept?
3. What UI controls are used in Program 2?

## Program 1: weather.py

```python
import urllib.request
import json

apiKey = '218f40548a1afc20604645630c5c1aac'

def getWeather(zip_code):
    url = 'http://api.openweathermap.org/data/2.5/weather?
zip='+zip_code+',us&units=imperial&appid='+apiKey
    r = urllib.request.urlopen(url)
    encoding = r.info().get_content_charset('utf-8')
    jsonObject = json.loads(r.read().decode(encoding))
    temp = str(jsonObject['main']['temp'])
    desc = str(jsonObject['weather'][0]['description'])
    out = {'temp': temp, 'desc': desc}
    return out

#print(getWeather('11733'))
```

## Program 2: weather_ui.py

```python
from tkinter import *
import weather
root = Tk()
root.title("IT102 Weather App")
def getWeather():
    global zipCodeEntry
    w.delete(0.0, 'end')
    wInfo = weather.getWeather(zipCodeEntry.get())
    out = 'Temperature: ' + wInfo['temp'] + 'F\n'
    out += 'Description: ' + wInfo['desc'] + '\n'
    w.insert(INSERT, out)
label = Label(root, fg="green", text="Zip code:")
label.pack()
zipCodeEntry = Entry(root, fg="green")
zipCodeEntry.pack()
scrollbar = Scrollbar(root)
scrollbar.pack(side=RIGHT, fill=Y)
w = Text(root, yscrollcommand = scrollbar.set)
w.pack()
scrollbar.config(command=w.yview)
```

```
button1 = Button(root, text="get weather", width=25, command=getWeather)
button1.pack()
button2 = Button(root, text="exit", width=25, command=root.destroy)
button2.pack()
root.mainloop()
```

## *Exercises*

1. Write the above two programs in IDLE;
2. When the user enters the zip code in the Entry field and clicks the "get weather" button, the weather information from OpenWeatherMap should be displayed in the Text field.
   1. How did you import one program into another?
   2. How did you call one program from another?

## *Home work*

1. Review the API specification at https://openweathermap.org/current.
2. Enhance the program such that it accepts city name, instead of the zip code. For example: New York,NY
3. Enhance the program by introducing input validation: if the user did not enter a value, or entered an incorrect value, display a user-friendly error message.