Tracking the International Space Station (ISS) with Python

In this blog post, we'll explore the process of creating a Python script that tracks the International Space Station (ISS) and sends an email notification when it's overhead at night. This project combines API requests, geolocation, and email automation.

Learning Process

To achieve this goal, I had to learn and apply the following concepts:

API requests: Understanding how to make HTTP requests to external APIs using the requests library.

JSON data parsing: Learning how to parse and extract data from JSON responses.

Geolocation: Understanding how to work with latitude and longitude coordinates.

Time and date manipulation: Learning how to work with dates and times in Python using the datetime library.

Email automation: Understanding how to send emails using the smtplib library.

The Code

Here's the code for the ISS tracker:

import requests

from datetime import datetime

import smtplib

import time

# Your email and password

MY\_EMAIL = "\_\_\_YOUR\_EMAIL\_HERE\_\_\_\_"

MY\_PASSWORD = "\_\_\_YOUR\_PASSWORD\_HERE\_\_\_"

# Your latitude and longitude

MY\_LAT = 51.507351

MY\_LONG = -0.127758

def is\_iss\_overhead():

# Get the ISS position from the API

response = requests.get(url="http://api.open-notify.org/iss-now.json")

response.raise\_for\_status()

data = response.json()

# Extract the ISS latitude and longitude

iss\_latitude = float(data["iss\_position"]["latitude"])

iss\_longitude = float(data["iss\_position"]["longitude"])

# Check if the ISS is within 5 degrees of your position

if MY\_LAT-5 <= iss\_latitude <= MY\_LAT+5 and MY\_LONG-5 <= iss\_longitude <= MY\_LONG+5:

return True

def is\_night():

# Get the sunrise and sunset times from the API

parameters = {

"lat": MY\_LAT,

"lng": MY\_LONG,

"formatted": 0,

}

response = requests.get("https://api.sunrise-sunset.org/json", params=parameters)

response.raise\_for\_status()

data = response.json()

# Extract the sunrise and sunset times

sunrise = int(data["results"]["sunrise"].split("T")[1].split(":")[0])

sunset = int(data["results"]["sunset"].split("T")[1].split(":")[0])

# Get the current time

time\_now = datetime.now().hour

# Check if it's night

if time\_now >= sunset or time\_now <= sunrise:

return True

while True:

# Wait for 60 seconds

time.sleep(60)

# Check if the ISS is overhead at night

if is\_iss\_overhead() and is\_night():

# Send an email notification

connection = smtplib.SMTP("\_\_YOUR\_SMTP\_ADDRESS\_HERE\_\_\_")

connection.starttls()

connection.login(MY\_EMAIL, MY\_PASSWORD)

connection.sendmail(

from\_addr=MY\_EMAIL,

to\_addrs=MY\_EMAIL,

msg="Subject:Look Up👆\n\nThe ISS is above you in the sky."

)

Explanation

We import the required libraries and set up our email and location variables.

We define two functions: is\_iss\_overhead() checks if the ISS is within 5 degrees of our position, and is\_night() checks if it's night based on sunrise and sunset times.

We use a while loop to continuously check the ISS position and time every 60 seconds.

If the ISS is overhead at night, we send an email notification using the smtplib library.

Conclusion

Creating this ISS tracker project helped me learn and apply various Python concepts. By following this code and explanation, you can create your own ISS tracker and receive email notifications when the ISS is overhead at night. Feel free to modify and improve the code to suit your needs!

GitHub Repository

You can find the code for this project in my GitHub repository: [insert link]