

Information Gathering Tool Project

Cyber Security_Ethical Hacking Domain Project 1

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Date: 1-11-24

1. Introduction

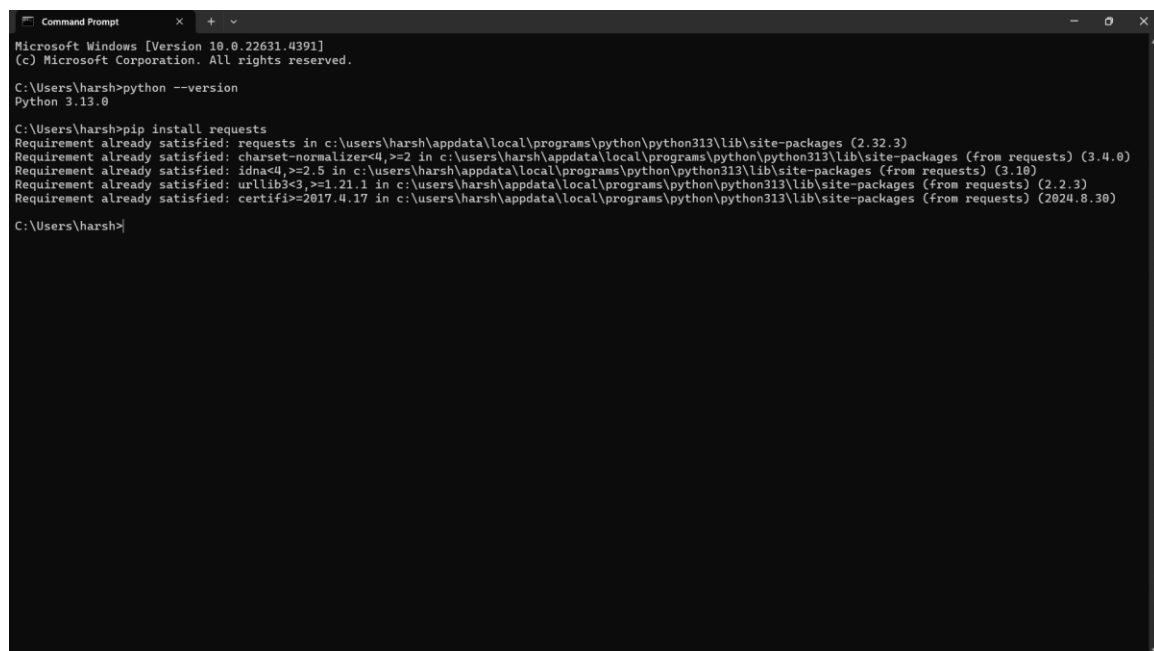
This project aims to develop a Python-based tool that retrieves and displays IP address and location data for a specified website URL. Utilizing essential Python libraries and an external IP information API, this tool processes a URL to obtain its IP address and fetches location details including city, country, and organization.

The following libraries are used in this project:

- sys: for command-line argument handling
- requests: for making HTTP requests to the ipinfo.io API
- json: for parsing data in JSON format
- socket: for retrieving the IP address of the provided website URL

2. Environment Setup

To begin, Python and the necessary libraries must be installed:



```
Command Prompt
Microsoft Windows [Version 10.0.22631.4391]
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C:\Users\harsh>python --version
Python 3.13.0

C:\Users\harsh>pip install requests
Requirement already satisfied: requests in c:\users\harsh\appdata\local\programs\python\python313\lib\site-packages (2.32.3)
Requirement already satisfied: charset-normalizer<4, >=2 in c:\users\harsh\appdata\local\programs\python\python313\lib\site-packages (from requests) (3.4.0)
Requirement already satisfied: idna<4, >=2.5 in c:\users\harsh\appdata\local\programs\python\python313\lib\site-packages (from requests) (3.10)
Requirement already satisfied: urllib3<3, >=1.21.1 in c:\users\harsh\appdata\local\programs\python\python313\lib\site-packages (from requests) (2.2.3)
Requirement already satisfied: certifi>=2017.4.17 in c:\users\harsh\appdata\local\programs\python\python313\lib\site-packages (from requests) (2024.8.30)

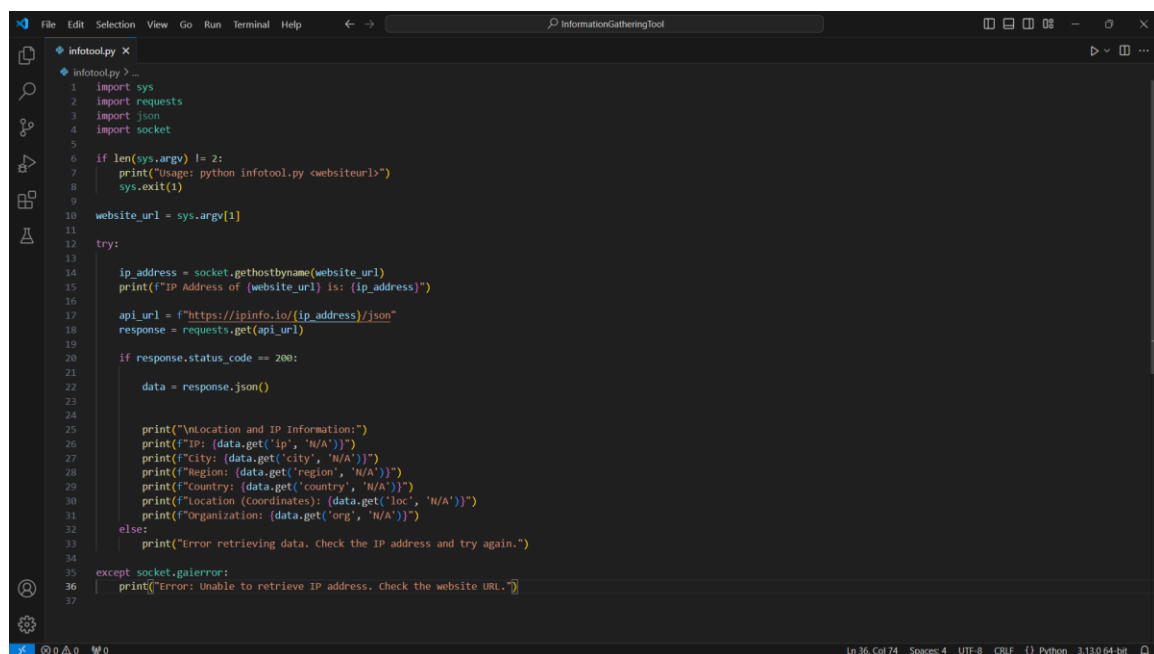
C:\Users\harsh>
```

3. Writing the Code

This section describes the code structure used in this project. The script, named `infotool.py`, is designed to:

1. Accept a website URL from the command line.
2. Retrieve the IP address of the website using the `socket` library.
3. Make an API request to ipinfo.io using the `requests` library to gather additional information about the IP address, such as location and organization.
4. Parse the JSON response from the API to extract and display relevant information.

The script includes error handling to manage incorrect URLs or network issues. Ensure each section of code is tested as it is written.

A screenshot of a code editor window titled 'infotool.py'. The editor shows a Python script that takes a website URL as input, retrieves its IP address using the socket library, and then makes an API request to ipinfo.io to get detailed information about the IP address. The script includes error handling for incorrect URLs or network issues. The code is as follows:

```
1 import sys
2 import requests
3 import json
4 import socket
5
6 if len(sys.argv) != 2:
7     print("Usage: python infotool.py <websiteurl>")
8     sys.exit(1)
9
10 website_url = sys.argv[1]
11
12 try:
13     ip_address = socket.gethostbyname(website_url)
14     print(f"IP Address of {website_url} is: {ip_address}")
15
16     api_url = f"https://ipinfo.io/{ip_address}/json"
17     response = requests.get(api_url)
18
19     if response.status_code == 200:
20         data = response.json()
21
22         print("\nLocation and IP Information:")
23         print(f"IP: {data.get('ip', 'N/A')}")
24         print(f"City: {data.get('city', 'N/A')}")
25         print(f"Region: {data.get('region', 'N/A')}")
26         print(f"Country: {data.get('country', 'N/A')}")
27         print(f"Location (coordinates): {data.get('loc', 'N/A')}")
28         print(f"Organization: {data.get('org', 'N/A')}")
29     else:
30         print("Error retrieving data. Check the IP address and try again.")
31
32 except socket.gaierror:
33     print("Error: Unable to retrieve IP address. Check the website URL.")
```

4. Running the Script

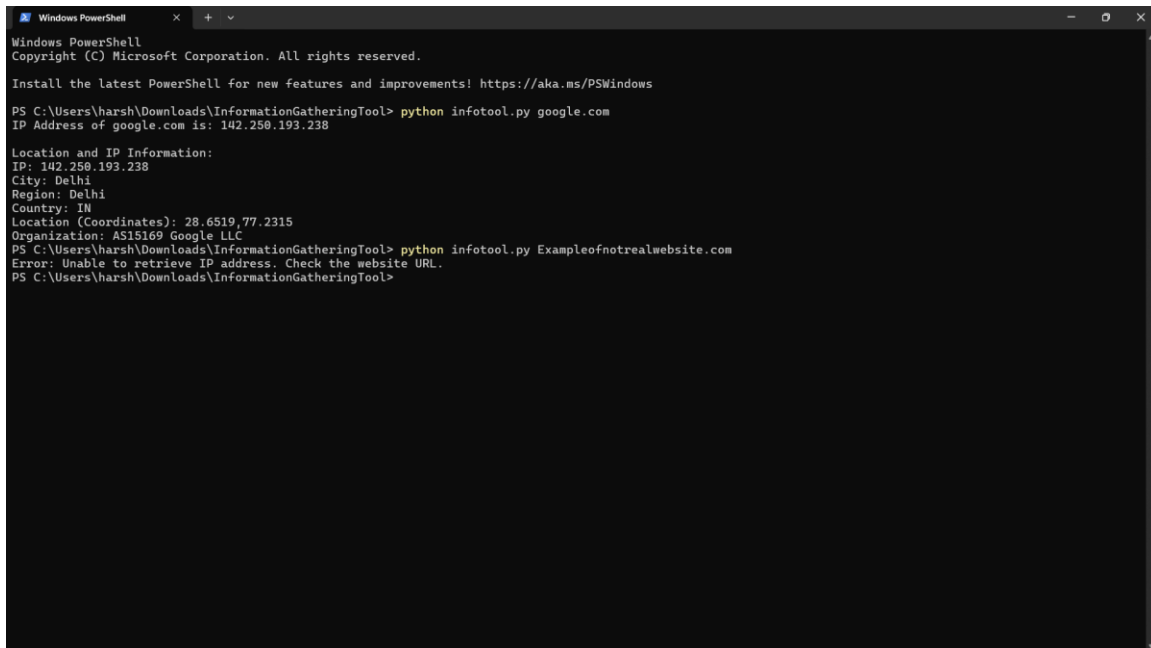
To execute the script, open a command prompt or terminal in the directory where `infotool.py` is saved. Run the script by entering the command:

```
`python infotool.py <websiteurl>`
```

For example:

```
`python infotool.py google.com`
```

This command fetches the IP address and additional information for the provided website URL.



```
Windows PowerShell
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PS C:\Users\harsh\Downloads\InformationGatheringTool> python infotool.py google.com
IP Address of google.com is: 142.250.193.238

Location and IP Information:
IP: 142.250.193.238
City: Delhi
Region: Delhi
Country: IN
Location (Coordinates): 28.6519, 77.2315
Organization: AS15169 Google LLC
PS C:\Users\harsh\Downloads\InformationGatheringTool> python infotool.py Exampleofnotrealwebsite.com
Error: Unable to retrieve IP address. Check the website URL.
PS C:\Users\harsh\Downloads\InformationGatheringTool>
```

Upon execution, the tool displays the following information:

- IP Address
- City
- Region
- Country
- Coordinates (latitude and longitude)
- Organization

The information is presented in a clear and organized format for easy reading.

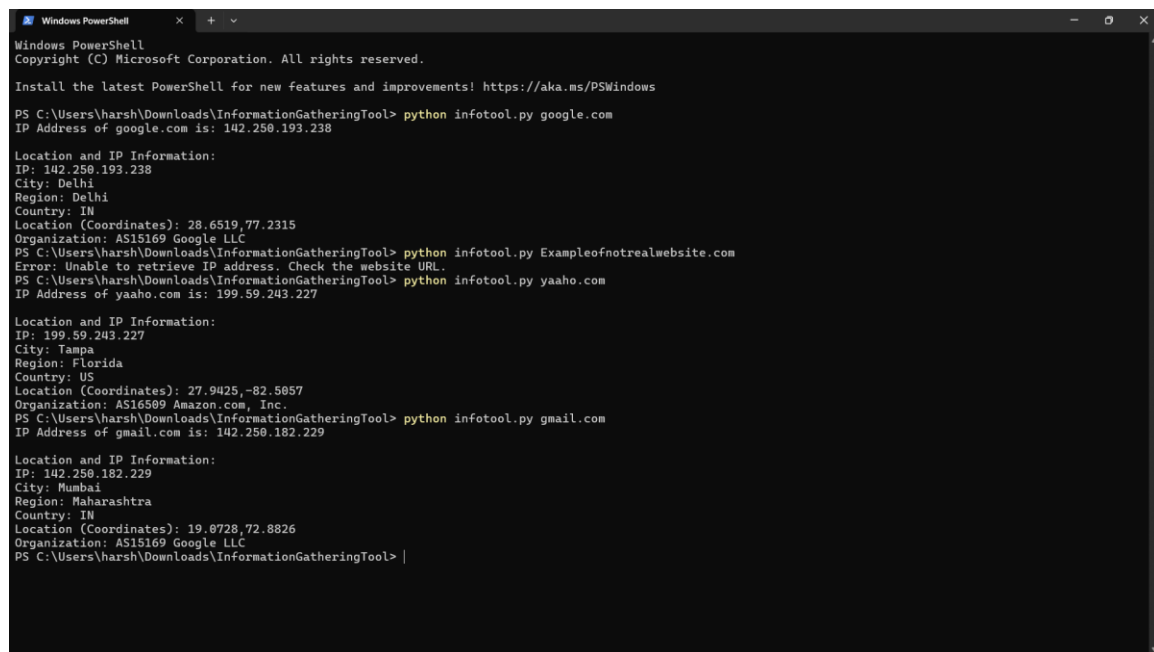
The tool also includes error handling to manage cases where the provided URL is invalid. If an incorrect or non-existent URL is entered, the tool will display an error message indicating the issue. This feature helps in guiding the user to provide valid input.

5. Additional Output Examples

To demonstrate the tool's reliability, additional tests can be run with different URLs. This shows consistent functionality and accuracy in retrieving IP and location information.

Examples:

- Running the tool for yahoo.com.
- Running the tool for example.com.



```
Windows PowerShell
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PS C:\Users\harsh\Downloads\InformationGatheringTool> python infotool.py google.com
IP Address of google.com is: 142.250.193.238

Location and IP Information:
IP: 142.250.193.238
City: Delhi
Region: Delhi
Country: IN
Location (Coordinates): 28.6519, 77.2315
Organization: AS15169 Google LLC
PS C:\Users\harsh\Downloads\InformationGatheringTool> python infotool.py Exampleofnotrealwebsite.com
Error: Unable to retrieve IP address. Check the website URL.
PS C:\Users\harsh\Downloads\InformationGatheringTool> python infotool.py yaaho.com
IP Address of yaaho.com is: 199.59.243.227

Location and IP Information:
IP: 199.59.243.227
City: Tampa
Region: Florida
Country: US
Location (Coordinates): 27.9425, -82.5857
Organization: AS16509 Amazon.com, Inc.
PS C:\Users\harsh\Downloads\InformationGatheringTool> python infotool.py gmail.com
IP Address of gmail.com is: 142.250.182.229

Location and IP Information:
IP: 142.250.182.229
City: Mumbai
Region: Maharashtra
Country: IN
Location (Coordinates): 19.0728, 72.8826
Organization: AS15169 Google LLC
PS C:\Users\harsh\Downloads\InformationGatheringTool> |
```

6. Conclusion

This project successfully demonstrates the creation of an information-gathering tool that collects IP address and location data for a given website URL. By combining Python's socket capabilities with an external API, the tool is able to deliver accurate and organized information about any accessible URL. The project was an opportunity to work with APIs, handle JSON data, and manage network error handling, all of which are essential skills in cybersecurity and ethical hacking domains.

Challenges encountered included managing potential network errors and ensuring proper data formatting. Future improvements could include expanding the tool's functionality to provide even more detailed information, such as historical IP data or ISP information.