TASK 1

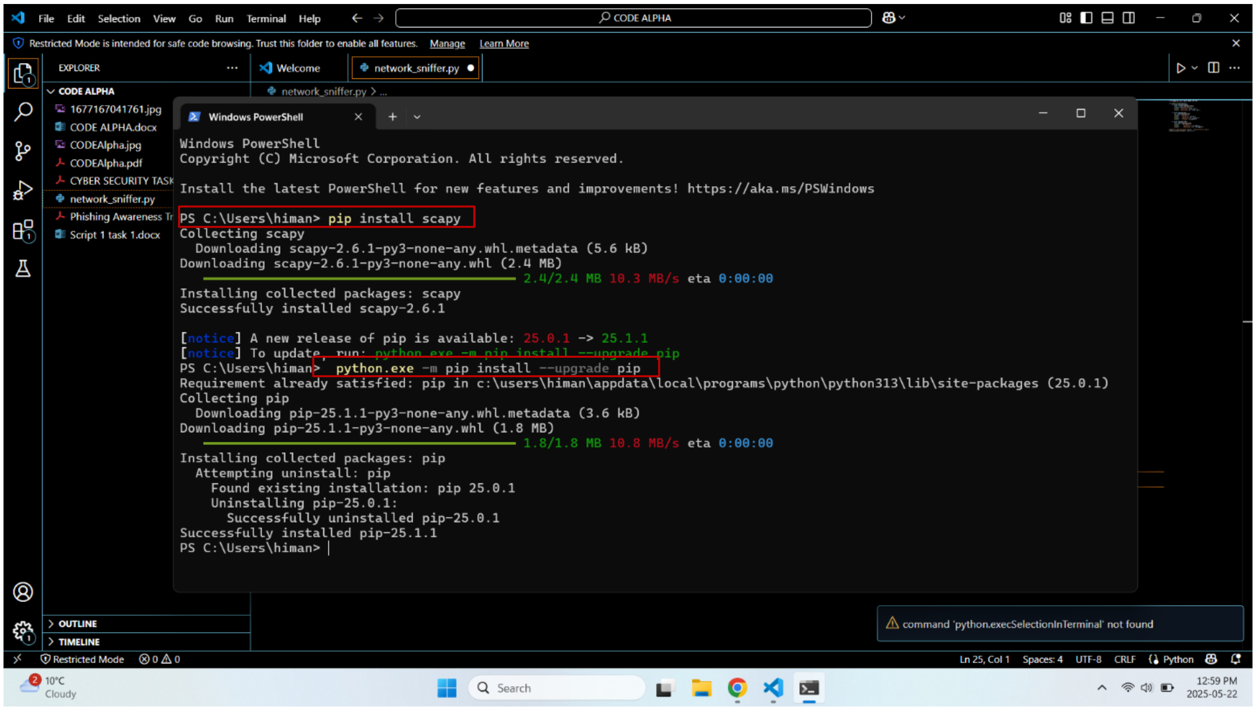
BASIC NETWORK SNIFFER ON WINDOW

Build a network sniffer in Python that captures and analyzes network traffic. This project will help you understand how data flows on a network and how network packets are structured.

➢ Build a Network Sniffer on **Windows** using **VS Code + Scapy**

1. Install Required Software

- **Python 3**: Download and install from https://www.python.org/downloads/
- **VS Code**: Download and install from https://code.visualstudio.com/
- **Scapy** library:
  Open PowerShell or VS Code terminal and run: pip install scapy



Restricted Mode is intended for safe code browsing. Trust this folder to enable all features.

```
Windows PowerShell
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Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\himan> pip install scapy
Collecting scapy
  Downloading scapy-2.6.1-py3-none-any.whl.metadata (5.6 kB)
Downloading scapy-2.6.1-py3-none-any.whl (2.4 MB)
   ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 2.4/2.4 MB 10.3 MB/s eta 0:00:00
Installing collected packages: scapy
Successfully installed scapy-2.6.1

[notice] A new release of pip is available: 25.0.1 -> 25.1.1
[notice] To update, run: python.exe -m pip install --upgrade pip
PS C:\Users\himan>  python.exe -m pip install --upgrade pip
Requirement already satisfied: pip in c:\users\himan\appdata\local\programs\python\python313\lib\site-packages (25.0.1)
Collecting pip
  Downloading pip-25.1.1-py3-none-any.whl.metadata (3.6 kB)
Downloading pip-25.1.1-py3-none-any.whl (1.8 MB)
   ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 1.8/1.8 MB 10.8 MB/s eta 0:00:00
Installing collected packages: pip
  Attempting uninstall: pip
    Found existing installation: pip 25.0.1
    Uninstalling pip-25.0.1:
      Successfully uninstalled pip-25.0.1
Successfully installed pip-25.1.1
PS C:\Users\himan> |
```
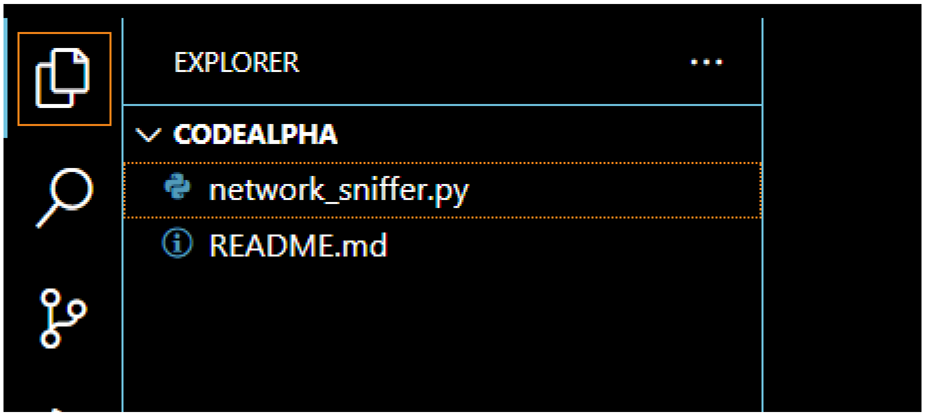

⚠ command 'python.execSelectionInTerminal' not found

2. Write the Sniffer Script

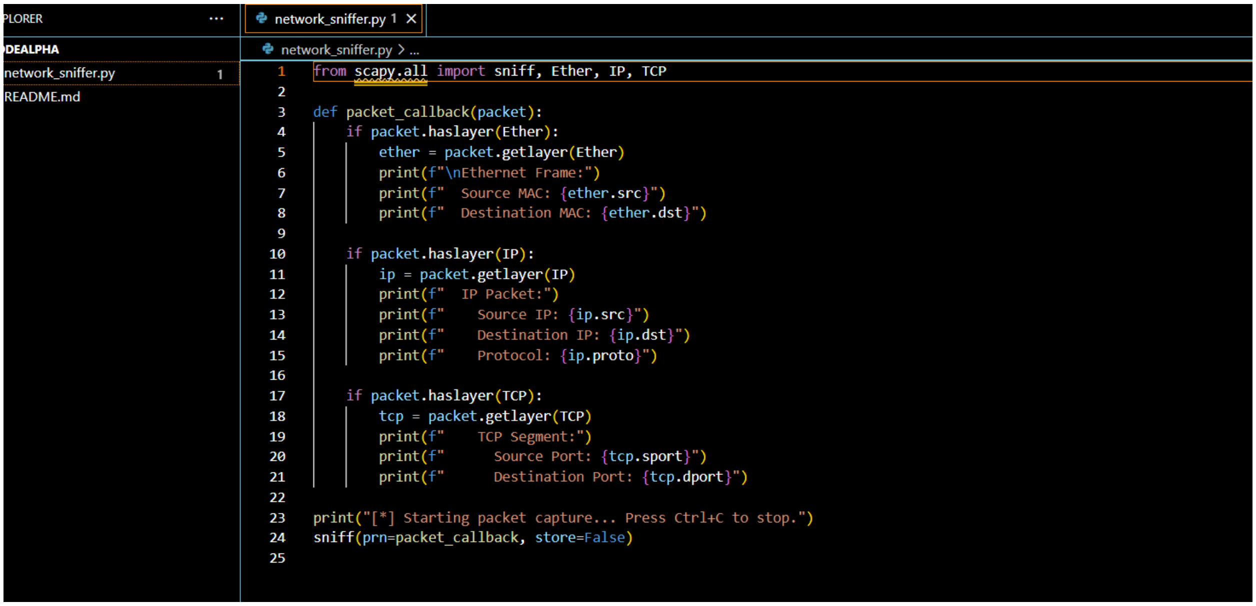
In VS Code:

1. Create a folder (e.g., codealpha_tasks)
2. Inside it, create a new file: network_sniffer.py



3. Paste this code below:

```
from scapy.all import sniff, Ether, IP, TCP

def packet_callback(packet):
    if packet.haslayer(Ether):
        ether = packet.getlayer(Ether)
        print(f"\nEthernet Frame:")
        print(f"  Source MAC: {ether.src}")
        print(f"  Destination MAC: {ether.dst}")

    if packet.haslayer(IP):
        ip = packet.getlayer(IP)
        print(f"  IP Packet:")
        print(f"    Source IP: {ip.src}")
        print(f"    Destination IP: {ip.dst}")
        print(f"    Protocol: {ip.proto}")

    if packet.haslayer(TCP):
        tcp = packet.getlayer(TCP)
        print(f"    TCP Segment:")
        print(f"      Source Port: {tcp.sport}")
        print(f"      Destination Port: {tcp.dport}")

print("[*] Starting packet capture... Press Ctrl+C to stop.")
sniff(prn=packet_callback, store=False)
```

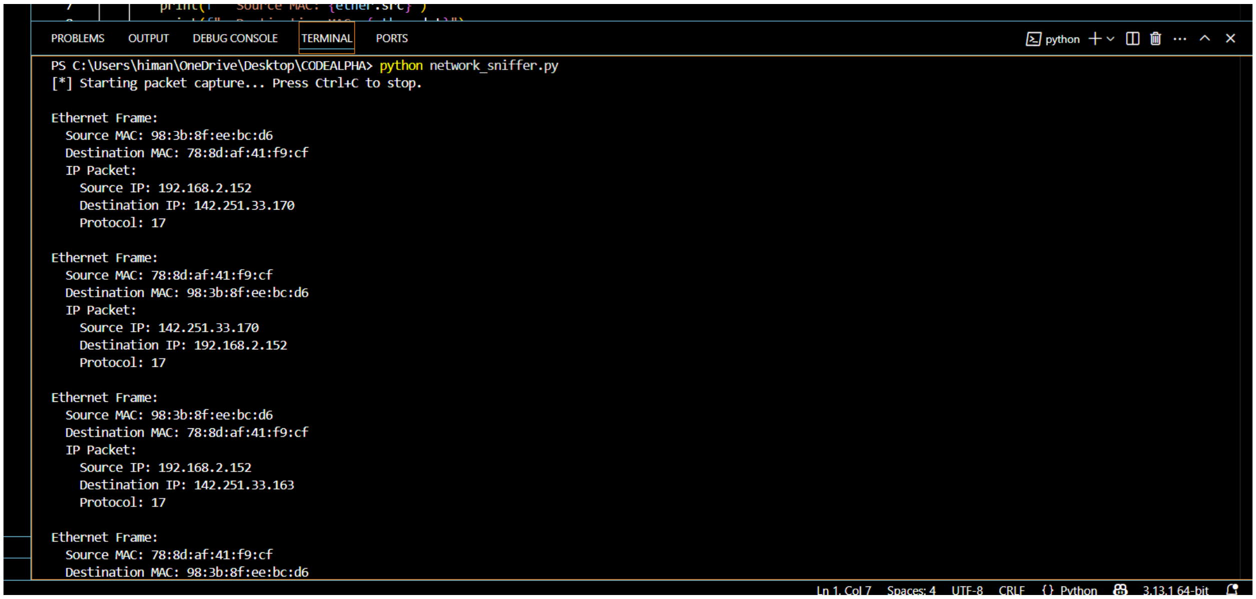


```python
from scapy.all import sniff, Ether, IP, TCP

def packet_callback(packet):
    if packet.haslayer(Ether):
        ether = packet.getlayer(Ether)
        print(f"\nEthernet Frame:")
        print(f"  Source MAC: {ether.src}")
        print(f"  Destination MAC: {ether.dst}")

    if packet.haslayer(IP):
        ip = packet.getlayer(IP)
        print(f"  IP Packet:")
        print(f"    Source IP: {ip.src}")
        print(f"    Destination IP: {ip.dst}")
        print(f"    Protocol: {ip.proto}")

    if packet.haslayer(TCP):
        tcp = packet.getlayer(TCP)
        print(f"    TCP Segment:")
        print(f"      Source Port: {tcp.sport}")
        print(f"      Destination Port: {tcp.dport}")

print("[*] Starting packet capture... Press Ctrl+C to stop.")
sniff(prn=packet_callback, store=False)
```

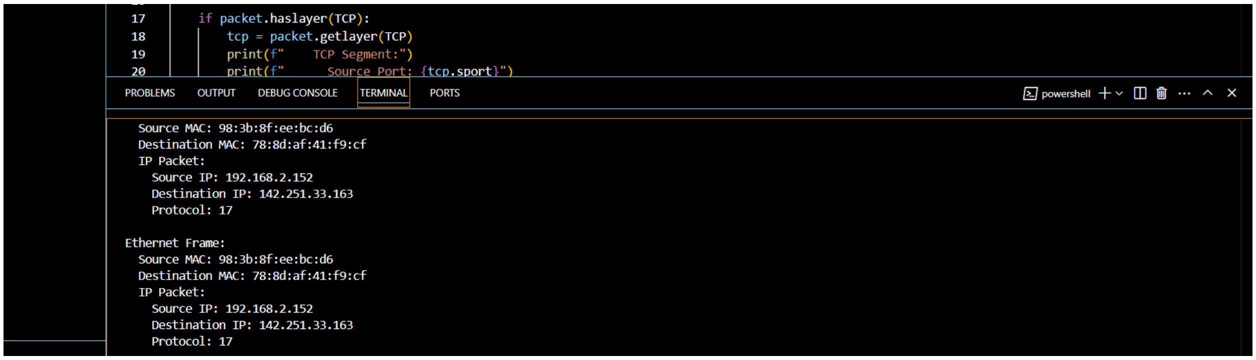
3. Run the Script

1. Open the **terminal in VS Code**: Terminal → New Terminal
2. Run it as Administrator (important for packet sniffing)
3. Type: python network_sniffer.py

You'll start seeing live traffic like:



```
PS C:\Users\himan\OneDrive\Desktop\CODEALPHA> python network_sniffer.py
[*] Starting packet capture... Press Ctrl+C to stop.

Ethernet Frame:
  Source MAC: 98:3b:8f:ee:bc:d6
  Destination MAC: 78:8d:af:41:f9:cf
  IP Packet:
    Source IP: 192.168.2.152
    Destination IP: 142.251.33.170
    Protocol: 17

Ethernet Frame:
  Source MAC: 78:8d:af:41:f9:cf
  Destination MAC: 98:3b:8f:ee:bc:d6
  IP Packet:
    Source IP: 142.251.33.170
    Destination IP: 192.168.2.152
    Protocol: 17

Ethernet Frame:
  Source MAC: 98:3b:8f:ee:bc:d6
  Destination MAC: 78:8d:af:41:f9:cf
  IP Packet:
    Source IP: 192.168.2.152
    Destination IP: 142.251.33.163
    Protocol: 17

Ethernet Frame:
  Source MAC: 78:8d:af:41:f9:cf
  Destination MAC: 98:3b:8f:ee:bc:d6
```



```python
    if packet.haslayer(TCP):
        tcp = packet.getlayer(TCP)
        print(f"    TCP Segment:")
        print(f"      Source Port: {tcp.sport}")
```

```
  Source MAC: 98:3b:8f:ee:bc:d6
  Destination MAC: 78:8d:af:41:f9:cf
  IP Packet:
    Source IP: 192.168.2.152
    Destination IP: 142.251.33.163
    Protocol: 17

Ethernet Frame:
  Source MAC: 98:3b:8f:ee:bc:d6
  Destination MAC: 78:8d:af:41:f9:cf
  IP Packet:
    Source IP: 192.168.2.152
    Destination IP: 142.251.33.163
    Protocol: 17
```

```
Starting packet capture... Press Ctrl+C to stop.

Ethernet Frame:
  Source MAC: ...
  Destination MAC: ...
  IP Packet:
    Source IP: 192.168.1.2
    Destination IP: 8.8.8.8
    Protocol: 6
    TCP Segment:
      Source Port: 56743
      Destination Port: 443
```

Here you go