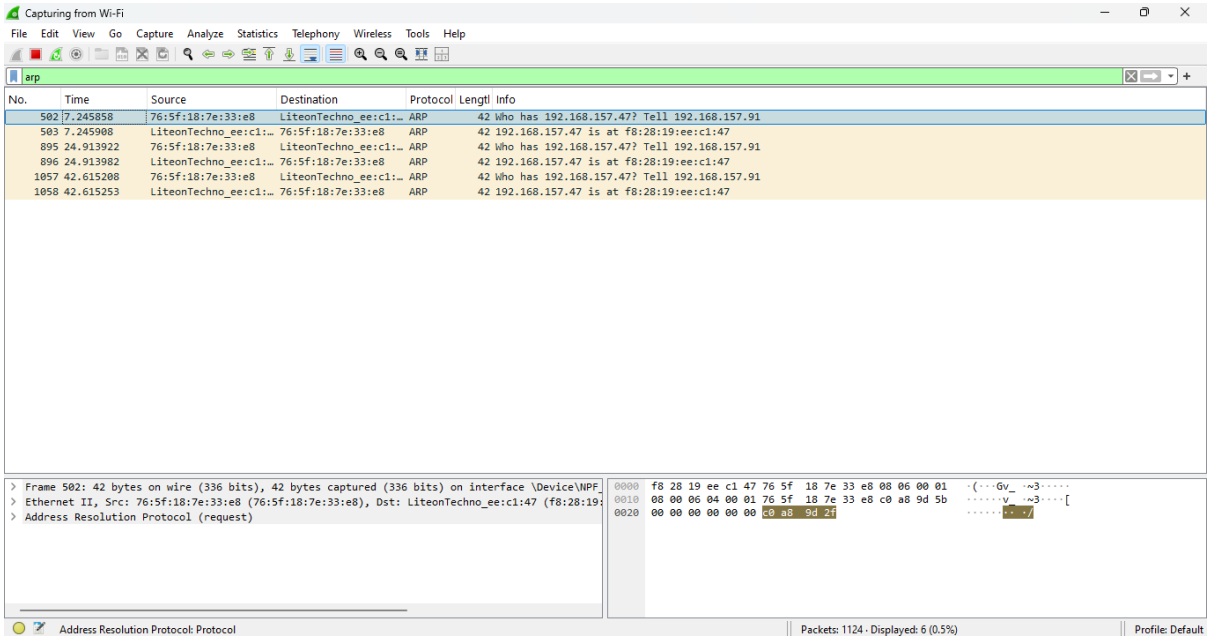
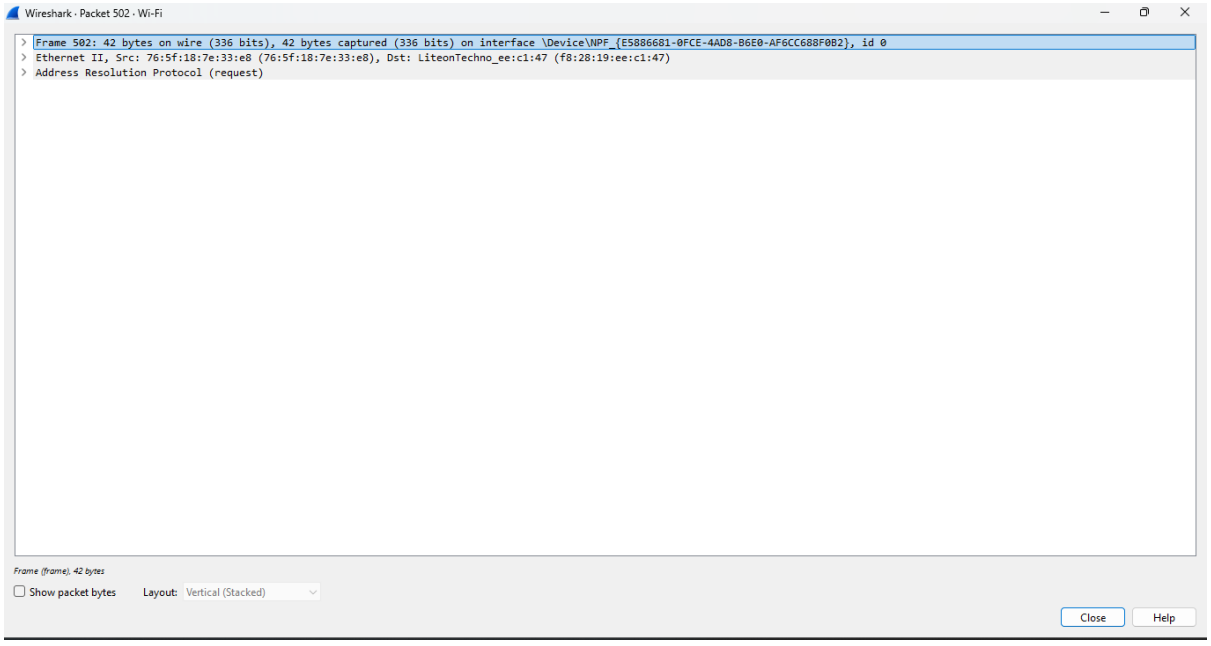
Q1)Capture and analyze ARP packets using Wireshark. Inspect the ARP request and reply frames, and discuss the role of the sender's IP and MAC address in these packets.





Inspection of ARP Request and Reply Frames

Captured ARP Request Frame Details:

Field	Value	Explanation
Source MAC	`76:5f:18:7e:33:e8`	The device at this MAC address is requesting the MAC of a specific IP.
Source IP	`192.168.157.91`	The sender wants to know the MAC address of `192.168.157.47`.
Destination MAC	`FF:FF:FF:FF:FF:FF`	ARP requests are **broadcast** to all devices on the LAN.
Target IP	`192.168.157.47`	The sender is looking for the MAC address of this IP.
Target MAC	`00:00:00:00:00:00`	Unknown at this stage, as the sender does not know it yet.
Message	**"Who has 192.168.157.47? Tell 192.168.157.91"**	The sender is asking which device owns this IP.

ARP Reply Frame Details:

Field	Value	Explanation
Source MAC	`LiteonTechno_ee:c1:47`	This is the MAC of `192.168.157.47`, responding to the request.
Source IP	`192.168.157.47`	Confirms ownership of this IP address.
Destination MAC	`76:5f:18:7e:33:e8`	Reply is unicast back to the requesting device.
Destination IP	`192.168.157.91`	The IP of the device that originally made the ARP request.
Message	**"192.168.157.47 is at LiteonTechno_ee:c1:47"**	Confirms its MAC address to the requestor.

Role of the Sender's IP and MAC in ARP

1. **In ARP Request:**
   - The sender **(192.168.157.91, MAC: 76:5f:18:7e:33:e8)** is **querying the network** to resolve the MAC of 192.168.157.47.
   - The request is **broadcasted** to all devices in the subnet.
2. **In ARP Reply:**
   - The device with 192.168.157.47 **sends back a unicast reply** containing its MAC address.
   - The sender (192.168.157.91) **updates its ARP cache** with the resolved MAC, avoiding future requests for this IP.

ARP Request is Broadcast, ARP Reply is Unicast.
Sender's IP and MAC identify the requesting device.

Target's MAC is initially unknown and learned from the ARP reply. ARP is essential for communication in local networks using Ethernet.