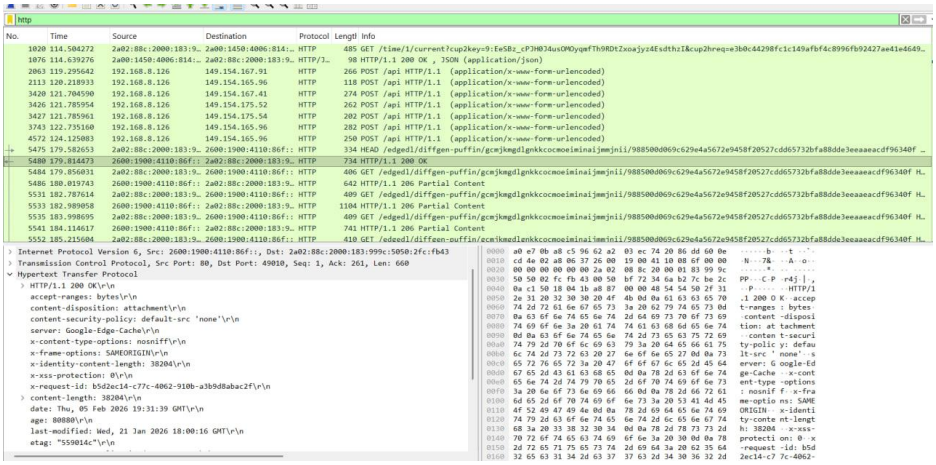
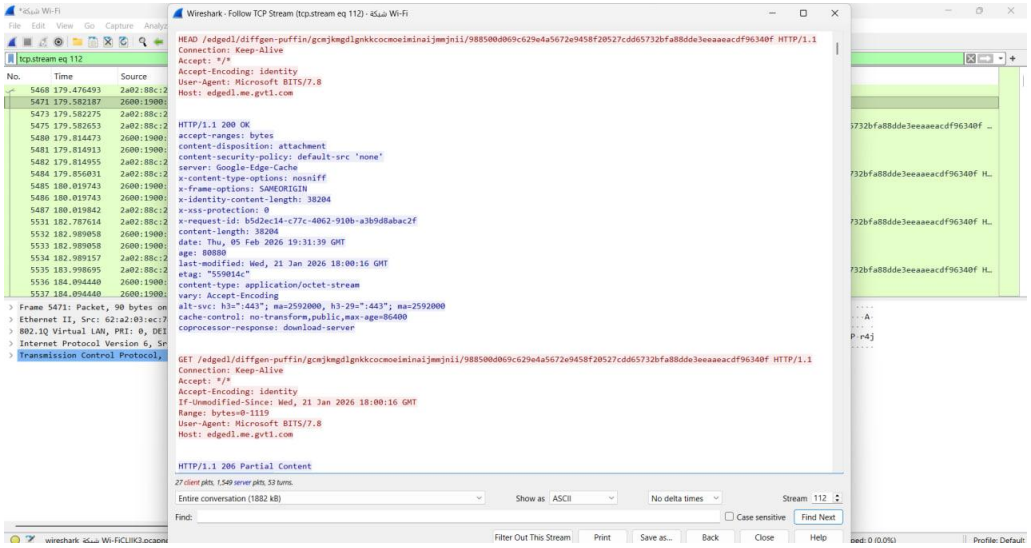
LAB 1

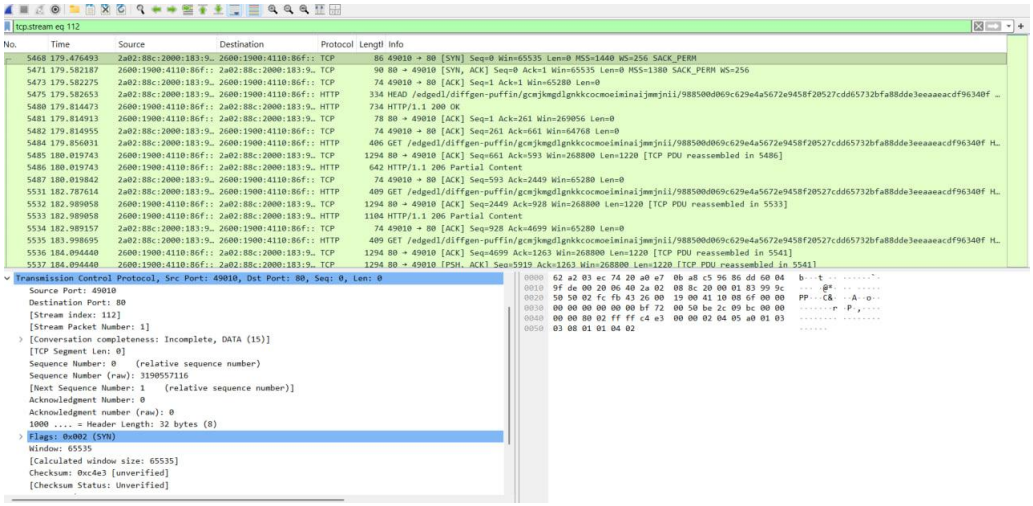
1- This screenshot shows captured HTTP traffic using Wireshark. The client sends an HTTP request and the server responds with HTTP/1.1 200 OK, indicating a successful communication between the client and the web server.



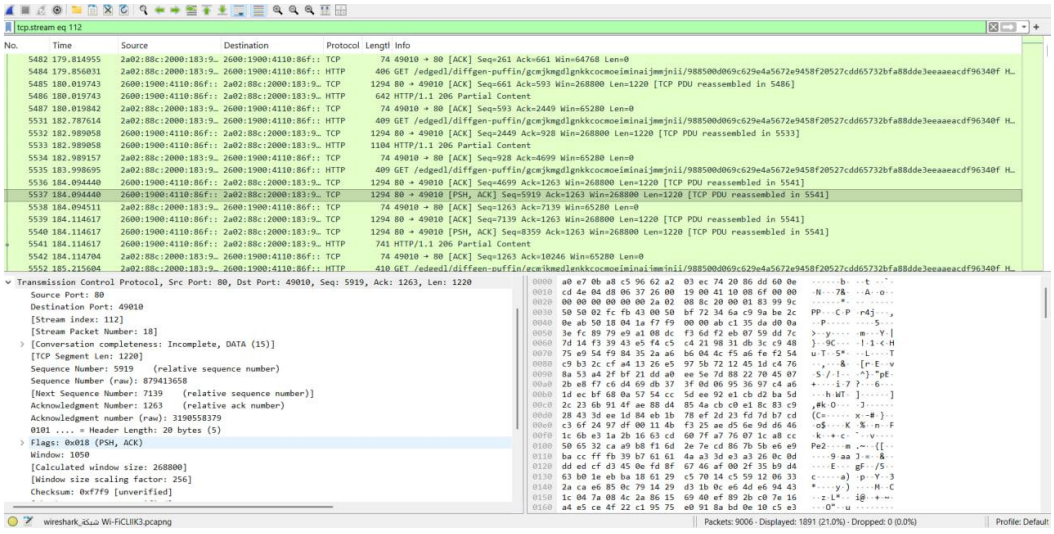
2- This figure shows the TCP stream followed in Wireshark, displaying the complete communication between the client and the server over TCP.



3- TCP establishes a connection using a three-way handshake (SYN, SYN-ACK, ACK) to ensure both sides are ready for communication.



4- This figure shows TCP data transfer between the client and the server. The PSH and ACK flags indicate that actual application data is being transmitted reliably using TCP.



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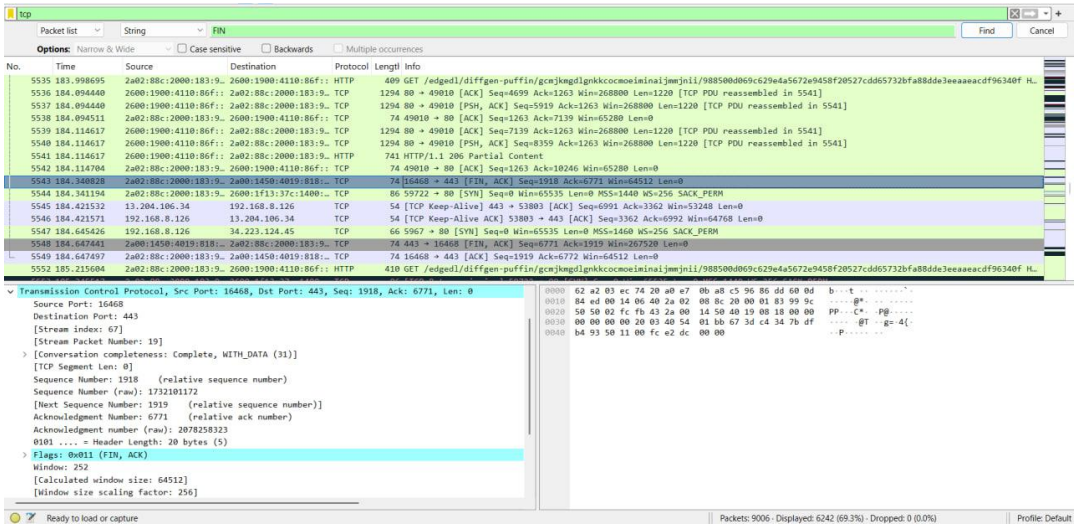
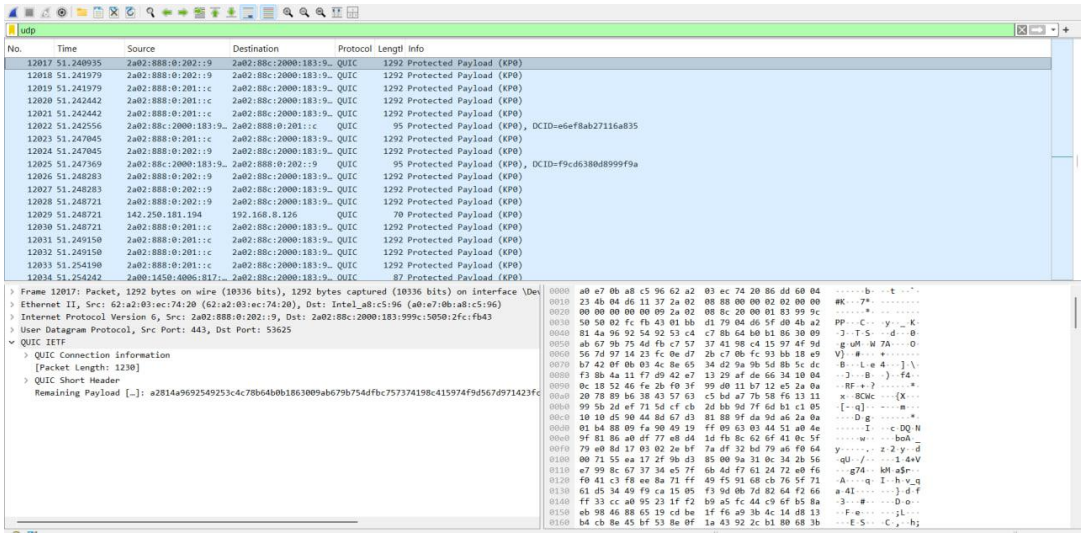
5- This figure shows TCP connection termination using FIN and ACK packets, which are used to gracefully close the connection.



6- This figure shows captured UDP traffic using the QUIC protocol. The UDP packets display source and destination ports and packet length. UDP does not establish a connection and has a simpler header compared to TCP.



LAB 1

Part 4: Comparing TCP and UDP by filling in the following tables. Save your work (e.g., in an MS Word document), and upload it to your online git repo. Task 1: Fill in the following table and provide reasons.

	TCP or UDP	reasons
Reliability and connection establishment	TCP	TCP is a reliable, connection-oriented protocol. It establishes a connection using a three-way handshake (SYN, SYN-ACK, ACK) before data transmission.
Data integrity and ordering	TCP	TCP ensures data integrity and correct ordering using sequence numbers, acknowledgments, and retransmission of lost packets.

Identify the use Cases and Performance of TCP and UDP:

	TCP	UDP
Use cases	Web browsing (HTTP/HTTPS), Email, File transfer (FTP)	Video streaming, Online gaming, VoIP, Live streaming
Performance	Slower due to connection establishment, error checking, and retransmissions	Faster with lower latency due to no connection setup and minimal overhead