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HW 3

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1) Compare TCP and UDP.

TCP and UDP are both transport layer protocols used to send data across the internet, but they operate very differently. TCP is a connection-oriented protocol, meaning it establishes a reliable connection between the sender and receiver before transmitting data using a 3-way handshake. It ensures that all data packets arrive in the correct order, but because of this reliability TCP is slower but is ideal for applications that require accurate data delivery. UDP is a connectionless protocol that sends packets, called datagrams, without establishing a connection or checking whether they arrive successfully. This makes UDP faster but less reliable as packets can be lost or received out of order.

2) Compare the 5-layer internet protocol (IP) or 4-layer TCP-IP stack to the OSI model.

The OSI model has 7 layers, while the TCP/IP model contains five. In TCP/IP, the Application layer combines the OSI Application, Presentation, and Session layers, handling data formatting, encryption, and communication between programs. The Transport layer in both models manages end-to-end communication using protocols like TCP and UDP. The Internet layer in TCP/IP corresponds to the OSI Network layer, responsible for routing and addressing with IP. Lastly, the Network Access layer in TCP/IP merges the OSI Data Link and Physical layers, handling the physical transmission of data over hardware like Ethernet or Wi-Fi.

3) Answer the following questions about SMTP:

a. What is the port number?
   SMTP Port: 25, 465, 587
   25: Between Servers, 465: Encryption for submission, 587: Submission for authenticated client.
b. What is the line ending?
   Each line in an SMTP message ends with a CRLF (carriage return and line feed) sequence written as <CR><LF>
c. Are messages transmitted in plain text or encrypted?
   In standard SMTP messages are transmitted as plain text.