Homework assignment

- A server sends 512 Mb of data to a client over a 1 Mbps link. The server sends the data in packets of 8 Mb and after sending a packet awaits to receive an acknowledgement packet of 8 bytes from the client before sending the next packet. If it takes 10 minutes to complete the transfer of data, determine the **latency** of the link.

- Explain the logic behind the phrase:
  "You can buy more bandwidth, but you cannot buy less delay."
  Exemplify and motivate your answer.
- Compare Datagram to the Virtual Circuit Networks with respect to:
  - circuit setup; addressing; routing; router failure; Quality of Service;

Explaining the phrase:

- You can pay for more bandwidth to send and receive data faster, but the time it takes for the data to travel from one place to another (called delay) is limited by physical factors, like the distance between locations. Reducing this delay is much harder and can't just be fixed by spending more money.

Comparing datagram to the Virtual Circuit Networks

Feature	Datagram Networks	Virtual Circuit Networks
Circuit Setup	No setup needed. Packets are sent independently.	A virtual path (logical circuit) is set up before data is sent.
Addressing	Each packet contains the full source and destination addresses.	Each packet contains a virtual circuit identifier.
Routing	Each packet may take a different route based on current network conditions.	All packets follow the same pre-established route.
Router Failure	Packets may still be routed through alternative paths, ensuring resilience.	A failure in the pre-established path can break the communication until a new circuit is set up.
Quality of Service	Lower QoS, as packets can experience variable delay and may arrive out of order.	Higher QoS, with more consistent delay and packet ordering since a dedicated path is used.