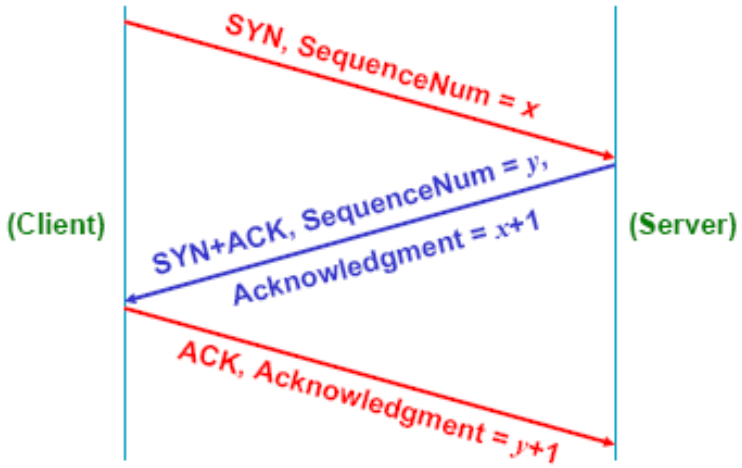
1. What is the main difference between flow control and congestion control?
   Ans: The difference between **flow control** and **congestion control:**
   - Flow control involves keeping **a fast sender** from overrunning a slow **receiver**
   - Congestion control is intended to keep **a set of senders** from sending too much data into **the network**

2. Briefly describe the three-way handshake algorithm.
   Ans: The algorithm used by TCP to establish and terminate a connection is called a **three-way handshake.** Involving **the exchange of three messages** between the client and the server:

   • The client sends a segment to the server stating the **initial sequence number**
   – Flags = **SYN**, SequenceNum = ***x***
   • The server responds with a single segment
   – To **acknowledge** the client's sequence number
   • Flags = **ACK**, Ack = ***x*+1** (next sequence number expected is *x*+1)
   – To state its own **beginning sequence number**
   • Flags = **SYN**, SequenceNum = ***y***
   • The client responds with a segment that **acknowledges** the server's sequence number
   – Flags = **ACK**, Ack = ***y*+1**



3. Briefly explain the *AIMD* .
   Ans: increment CongestionWindow by one packet per RTT(linear increase) divide CongestionWinow by two whenever a timeout occurs(multiplicative decrease)

4. Briefly explain the *Slow Start*. What is the *objective* of Slow Start?

Ans: The objective is determining the available capacity in the first.

Step 1: Begin with CongestionWindow = 1 packet,

Step 2 : double CongestionWindow each RTT until there is a packet loss

(increment by 1 packet for each ACK)

Step 3: Target congestion window (CongestionThreshold, CT).

Set to the value of CongestionWindow, that existed prior to the last packet loss, divided by 2

After CongestionWindow **has reached the target**, the additive increase (AIMD) is used beyond this point

used: when first starting connection or connection goes dead waiting for timeout

5. Why we use the *Fast Retransmit*'? Give a simple example(draw the *timeline*)

Ans: Because the coarse-grain TCP timeouts lead to idle periods. So we use duplicate ACKs to trigger retransmission