Lab 1

1. Om du har N anslutna klienter, hur många tråd objekt behövs i:

a. Server?
N + 1 threads needs to run concurrently. 1 for each client and 1 for the server

b. Klient?
At least two threads need to run concurrently. One for reading client input and one for server output.

2. Vad är runnable i Java?
Runnable is an interface and is one of the two ways in java to create threads and thus make use of concurrent programming. A thread is started by implementing the Runnable interface and then overriding the run() method.

3.Vad är nyckelordet synchronized i java?
Synchronized causes other threads to wait until another thread is finished with updating, for example, a shared variable between the threads. This solves some issues when two threads try to access a piece of the memory at the same time.

4. Beskriv de fyra skikten i TCP / IP-protokollstacken.

Application layer
Encodes the data being sent, provides applications with access to the use of network services. The application layer provides an interface between the user application above it and the communication-oriented layers below it.

Transport
Splits the data into manageable chunks, adds port number information. Oversees the end-to-end transfer of data.

Internet
Addressing and routing functions that ensures messages are delivered to their destination. Adds IP addresses stating where the data is from and where it is going.

Link
Adds MAC address information to specify which hardware device the message came from, and which hardware device the message is going to. Equates to the data-link and physical layers of the OSI 7-layer reference model, and provides the interface with the underlying network hardware.

5. Vad betyder flaggorna, ACK, SYN och SEQ och vilket protokoll hör de till?
They belong to TCP

SYN – The SYN, or Synchronisation flag, is used as a first step in establishing a 3-way handshake between two hosts

ACK – The ACK flag, which stands for "Acknowledgment", is used to acknowledge the successful receipt of a packet.

SEQ - Stands for Sequence number .TCP uses a sequence number to identify each byte of data. The sequence number identifies the order of the bytes sent from each computer so that the data can be reconstructed in order, regardless of any packet reordering, or packet loss that may occur during transmission. The sequence number of the first byte is chosen by the transmitter for the first packet, which is flagged SYN.

6. Vad är skillnaden mellan TCP och UDP?
TCP is all about this reliability — packets sent with TCP are tracked so no data is lost or corrupted in transit. File downloads etc.

UDP is used when speed is desirable and error correction is not necessary. For example, UDP is frequently used for live broadcasts and online games.

- TCP (Transmission Control Protocol)
  - Förbindelseorienterad (logiskt)
  - Säker transport (blanda inte med sekretess)
  - Data förloras inte (förlorad data skickas igen)
  - Data fördubblas inte (fördubblad data slängs)
  - Data kommer fram i rätt ordning
- UDP (User Datagram protocol)
  - Förbindelselöst
  - Data kan förloras (kommer inte heller skickas igen)
  - Data kan fördubblas (fördubblad data slängs inte)
  - Data kan komma fram i fel ordning

Lab 2