Network Programming
Exercise set 3

Exercice 6, Client-Server times

Client vs Server elapsed time

There is some clear differences seen in the client compared to those seen from the server while sending data.
I tested this with three different amounts of data: 200 KB, 1 MB and 9 MB. All tests used a 100 bytes max per read/write. The times can be seen in the table below.

	Client	Server
200 KB	0.004424 s	0.017192 s
1 MB	0.058498 s	0.088831 s
9 MB	0.664529 s	0.801609 s

The client is always faster in sending the data than the server is at receiving them. This is because the client does not need to wait for the data to reach the server in order to send more data, but the server might need to wait for more data to come through the socket before it can process it.
So, when measuring data transfer on application level, it should be done on the server side, as that takes in to account the delay in connection time better then the client. The client will most likely give a faster time then the actual time of the data transfer.

Elapsed times with different amount of times each time

This test was done with a 200 KB package and tested with two different maximums for each read/write. The first one was with a 1 byte max and the second was with 10 KB max. The results can be seen in the table below.

	Client	Server
1 B	0.050528 s	0.159495 s
10 KB	0.00404 s	0.017011 s

We can see, that the data transfer is a lot bigger when sending small packages compared to sending smaller packages.
There are two reasons for this. First, with smaller package sizes/bytes per write/read, the client and server need to make more system calls, which takes more time. The second reason is the fact that even though the time for each byte to travel from the client to the server is the same, when sending bigger packages, the buffer is less likely to be empty on the server side and we can send more data each time through the socket.