Socket assignment report

Protocol

I implemented a protocol to be as close as possible to the one specified in the assignment. The unnecessary parts of the messages are also sent to simplify parsing. For example, the command for clearing the table is “OP=CLR;IND=;DATA=;”. Throughout the assignment I assumed that integers are 32-bits. Working with TCP sockets implies that the message boundaries cannot be determined without using some higher level indicators. I had an option of prefixing each message with its length, shutdown the socket after sending data, or making the message length fixed. I chose the latter option, making the messages exactly 156 bytes, since it is the longest possible message for the PUT command with all indexes and minimum negative numbers. Shorter messages are padded with spaces. I also assumed that everybody adheres to the protocols and doesn’t send wrong messages and CLR command should initialize table to zeros.

Client

The client was implemented as specified in the assignment: it creates the socket and asks for the commands. Indexes and data should be entered space separated. The client tries to prevent the errors, so it will not allow wrong indexes or data. If the connection to proxy is broken, it will try to reestablish it.

Proxy

The proxy acts as a cache between client and server. It uses a double-ended queue for storing the pairs of indexes and data. CLR and PUT commands are always forwarded to the server. CLR also clears the cache. GET command is forwarded only if there are missing values in cache, the response is used to update the cache and send it back to the client. ADD command does not affect cache, but it is not forwarded to the server if it can be calculated using cache.

Server

Unfortunately, during this assignment I opened the MATLAB for the second time, the first being for the queuing assignment. But I tried my best to write the server. I had problems with an echo server from the METUClass, so I used an example from the MATLAB documentation instead, where the server uses a callback function. Server starts with a cleared table.