

Exercise 3

For my design, I will be extending the memoryarea used in the previous exercise by one character size. In this section the processes will write the character they have written to the shared memory. Before the process writes its own character to the memory, it will check what the last character written to the memory is. If the last character is the character of the process, it will release the lock and not write anything to the memory.

```
index = mmap(NULL, sizeof(int) + 1241*sizeof(char),
PROT_READ | PROT_WRITE, MAP_SHARED, fd, 0);

char_index = (char*)index + sizeof(int);
buf = (char*)index + sizeof(int) + sizeof(char);

if (char_index == argv[2]) {
    my_lock_release;
    continue;
}
```

Exercise 5

When the backlog is full, because retransmission is allowed in TCP, the request is ignored until a later time when a reattempt at connection succeeds.

At the client host, nothing happens, because the TCP server will be waiting until queue is empty enough to create a connection.

The client may detect the situation if the creation of the connection is taking longer than usual or if it gets the error ECONNREFUSED, but for TCP, the latter does not happen.

Exercise 6

- a) Nothing happens in the child and in the client, the connection between the child and client stays open as normal. Nothing happens in the TCP layer.
- b) The bind address is already in use, so the server cannot be restarted. The bind address is still in use, because the old child process is still using it. The server should be prepared to solve this problem by shutting down the children before it can bind the address and then re-establish the connections by sending the old clients a needed signal to recreate the connection.
- c) When the child and the master are killed, the client does not realize that the server has shutdown and gets stuck when trying to read the output from the server. At the TCP

layer, the message gets put into the send buffer, but because there is no more connection the message is never send.

- d) We still get the same error of address already in use. This is because even though the servers, that handle the client, the client is still open to the server and there is still a underlying connection open on that address.

The servers should be prepared for the problem of getting killed, and when a sigint signal is send to them they should close all open connections to them so that no hanging connections get let open.