

# System Programming

## 5<sup>th</sup> Laboratory (26 ... 29 March 2019)

### I

Examine the two provided programs (client.c and server.c).  
Compile and run them in two different terminals.

The client has two major problems:  
when executing the client repeatedly, the second time the bind system call gives the following error  
**bind: Address already in use**  
it is impossible to execute two clients at the same time

Solve these two problems.

### II

On the client, experiment commenting line with the bind  
Compile the client and run it again  
What happened?

### III

Modify the server from the last exercise to verify if the received number is prime.  
In this program the server only writes a reply on the socket if the number is prime.  
Modify the client to work accordingly.

Hint: use threads :)

### IV

Modify the previous programs so that the server also sends to the client its PID, and its name (argv[0]).  
The client will print the PID of the server.

Hint: use three sendto

### IV

Create a new client (but similar to the previous one) that instead of reading the numbers from the keyboard generates random numbers

Modify the server to allow the concurrent processing of at most 5 requests:

Hint: use the fork on the server

## REFERENCES

<https://fenix.tecnico.ulisboa.pt/downloadFile/845043405486513/06-Sun-ProgGuide-IPC.pdf> (Appendix A)  
man pages: **man sendto** **man recvfrom**