**Semaphores**

1. Write two (or more) programs that are working in parallel looped, exchange information according to the variant.
2. You have to display information about the data transmission and receipt by each of the processes (for ex.: "process 1 sent / received some information".
3. Synchronization of processes must be implemented using semaphores.
4. For access to shared resources (ex. - file) you need to use mutexes.

To illustrate program execution - run yours processes in different windows of the terminal.

**Variants**

***Variant*** 1. The first process in a loop waiting for input of the symbol from stdin stream, and then the process writes to a file random numbers. Each time you have to open and close the file. Second process gets these numbers from a file and displays to the screen.

***Variant*** 2. The first process in a loop waiting for input of the symbol from stdin stream, then it writes to the file this symbol. Each time you have to open and close the file. Second process gets this symbol from the file and displays it to the screen.

***Variant*** 3. The first process in a loop waiting for input of the symbol from stdin stream, then it writes to the file this symbol. Each time you have to open and close the file. Second process gets this symbol from the file and displays to the screen only vowels.

***Variant*** 4. The first process in a loop waiting for input of the symbol from stdin stream, and then if the symbol is consonants, it will write to the file this symbol. Each time you have to open and close the file. Second process gets this symbol from the file and displays to the screen.

***Variant*** 5. The first process in a loop waiting for input of the symbol from stdin stream, and then the process writes to a file random numbers. Each time you have to open and close the file. Second process gets these numbers from a file and displays corresponding to the number any characters to the screen.

***Variant*** 6. The first process in a loop waiting for input of the symbol from stdin stream and send it symbol to second process. Second process has to display it symbol. Attention: use only semaphores and mutex (no communication of files or pipe and so on).

***Variant*** 7. The first process writes to file the current time. Each time you have to open and close the file. Second process reads these lines and displays it.

***Variant*** 8. First process sends to second process size of cathetus. Second process has to calculate size of hypotenuse and send it value to process 1 by semaphores. Attention: do not use facilities of intercommunication such us files, pipe…, only mutex and semaphores.

***Variant*** 9. First process sends to process 2 the current time, using semaphores. The process 2 has to displays it data in understandable format. Attention: do not use facilities of intercommunication such us files, pipe…, only mutex and semaphores.

***Variant*** 10. Processes must calculate the Fibonacci numbers (the process 1 calculate first number and display it, next process 1 send it number to process 2 and process 2 calculate the next number …… and so on). Attention: do not use facilities of intercommunication such us files, pipe…, only mutex and semaphores.

**Report of the laboratory**

Write your surname and name.

1) What you have to do.

2) How you did it

3) Demonstration of your results