



## **Λειτουργικά Συστήματα Εργασία 3**

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## Files

### mainleit.c/:

First we check the number of command line arguments which needs to be equal to two. Then we set our semaphores and shared memory segments. We attach the shared memory before all the forks because every process is going to use both shm segments.

P process section:

We fork the necessary P processes. A P process will first try to get access to the in-ds shm segment and when it does it generates a random message and writes it there.

Then it tries to get access to the out-ds segment to read what the C process has written.

C process section:

The C process will wait to read from in-ds and when it does it generates the md5 value and adds it to the message. Then it waits to gain access to out-ds where it writes the message for a process P to read.

Parent process section:

Reads from C or P when they are done and calculates step count and pid\_match count and when that's done it prints statistics.

### functions.c/.h:

Functions:

- Readlinefromfile: Opens our file and reads line till a random number is reached
- printCmdlErr: Error message for cmdl arguments.

### *sem.c/.h:*

Contains 8 semaphores. 2 of them are mutexes that are used every time a process writes or reads on a shared memory segment.

Functions: Typical semaphore functions found in our lab codes. Our semaphores come in a set void getSemaphoreSet() and they are all initialized with void initializeSemaphoreSet().

### *shm.c/.h:*

The functions are typical shared memory functions, int getSharedMemory(), void attachSharedMemory(int id), void deleteSharedMemory() (deletes in bulk).

## Compilation

We compile using a makefile which has the following form:

leit:

```
gcc mainleit.c functions.c shm.c sem.c -o leit -lcrypto -lssl
```

.PHONY: leit

## Resources

<https://stackoverflow.com/questions/3501338/c-read-file-line-by-line>

<https://stackoverflow.com/questions/7627723/how-to-create-a-md5-hash-of-a-string-in-c>

[https://www.geeksforgeeks.org/strtok-strtok\\_r-functions-c-examples/](https://www.geeksforgeeks.org/strtok-strtok_r-functions-c-examples/)

<https://stackoverflow.com/questions/19461744/how-to-make-parent-wait-for-all-child-processes-to-finish>