Operating Systems Design Lab
Computer Engineering Department
Spring 2023/2024
Lab 2: IPC using shared memory

Objectives

1. To understand inter-process communication using shared memory

Prelab

1. Read the section that address shared memory in the lab manual.
2. Read the manual pages of the following systems calls and functions.

```
int shmget(key_t key, size_t size, int shmflg);
void *shmat(int shmid, const void *shmaddr,int shmflg);
int shmdt(const void *shmaddr);
```

Experiment

1. Write two programs that communicate via shared memory as described below.
   (a) The two programs communicate via shared memory. The shared memory holds a shell command with maximum length of 20 characters. It may also hold any other information you may need to use. Make sure that all the data written to the shared memory is grouped in one data structure (`struct data ...`).
   (b) Program P_1 continuously reads a command (without arguments) from standard input. If the last command that was written to the shared memory has been executed by P_2, the new command is written to the shared memory. Otherwise, the new command is ignored with an error message to the user saying `"Cannot take new commands until the old command is execute"`. If the command entered is `"exit"`, P_1 writes it to the shared memory and terminate.
   (c) Program P_2 continuously (every 1 second) reads the command written into shared memory. If the command is `"exit"`, it terminates. Otherwise, it executes the command and indicates (you should figure out how) to P_1 that the command was executed.