

CSE 344 - System Programming

Homework #3

Harun ALBAYRAK - 171044014

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1 How did I solve this problem?

Firstly, i checked number of arguments. If an argument flag is used more than one or not used at all, i printed an error and exit.

If `-b` flag consist of negative number, I printed an error and exit.

After check these situations, i handle it the arguments in `handleTheArgs()` function. It is also my important function. Firstly i open "fileWithFifoNames" file and i read line by line. While reading, I also put it into an array.

After that, i put the processes into shared memory with their pid, number of switches, total switch, and fifo path which randomly chosen.

I also increment by 1 at every creating process the named semaphore in order to check enough process to run program.

After creating enough process to run program(Enough

processes' number is number of line in the given file.), I check that whether the all processes' hands is empty. If so, i print an error and exit.

After these phases, if the potato number(in -b flag) is zero, i created a FIFO and waiting for potatoes that the another processes sent. I use named semaphore at the beginning and at the end for synchronization.

If the potato number(in -b flag) is more than one, i send the potatoes to other processes. I use named semaphore at the beginning and at the end for synchronization too.

2 My Design Decisions

I create two struct as "Process" and "Request". These structs are used by functions. Also shared memory keep pointer of "Process" struct.

If all process are created with empty hands, the program is terminated.

Similarly, If all process are created with potatoes, the program is terminated.

3 Requirements I achieved and which I have failed

I think I achieved almost all the requirements. However, I may not have been able to achieve some requirements.

4 My Files

171044014_helper_hw3.h \Rightarrow The helper functions

171044014_hw3.c \Rightarrow The Main C File

171044014_report.pdf \Rightarrow The Report PDF

171044014_report.tex \Rightarrow The Report Latex file

Makefile \Rightarrow The Makefile

5 Some screenshots from the program

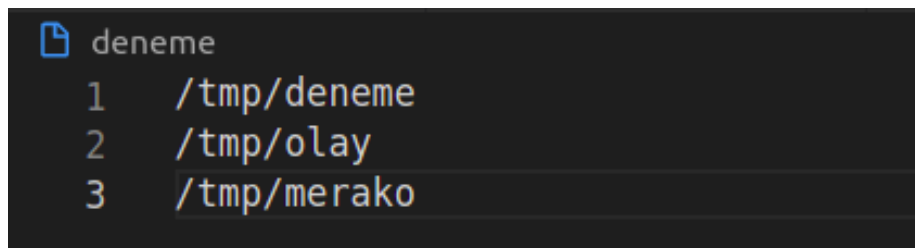


Figure 1: The file

```
harunalbayrak@harunalbayrak:~/Desktop/system/hw3$ ./player -b 3 -s bb12 -f deneme -m aa12
pid = 19571 sending potato number 19571 to /tmp/olay; this is swith num 1
harunalbayrak@harunalbayrak:~/Desktop/system/hw3$
```

Figure 2: The process 1

```
harunalbayrak@harunalbayrak:~/Desktop/system/hw3$ ./player -b 0 -s bb12 -f deneme -m aa12
pid = 19570 receiving potato number 19571 from /tmp/merako
pid = 19570 sending potato number 19571 to /tmp/deneme; this is swith num 1
pid = 19570 receiving potato number 19569 from /tmp/deneme
pid = 19570 sending potato number 19569 to /tmp/deneme; this is swith num 1
pid = 19570 receiving potato number 19571 from /tmp/deneme
pid = 19570; potato number 19571 has cooled down
pid = 19570 receiving potato number 19569 from /tmp/deneme
pid = 19570; potato number 19569 has cooled down
harunalbayrak@harunalbayrak:~/Desktop/system/hw3$
```

Figure 3: The process 2

```
harunalbayrak@harunalbayrak:~/Desktop/system/hw3$ ./player -b 3 -s bb12 -f deneme -m aa12
pid = 19569 sending potato number 19569 to /tmp/olay; this is swith num 2
pid = 19569 receiving potato number 19571 from /tmp/olay
pid = 19569 sending potato number 19571 to /tmp/olay; this is swith num 2
pid = 19569 receiving potato number 19569 from /tmp/olay
pid = 19569 sending potato number 19569 to /tmp/olay; this is swith num 2
harunalbayrak@harunalbayrak:~/Desktop/system/hw3$
```

Figure 4: The process 3

```

harunalbayrak@harunalbayrak:~/Desktop/system/hw3$ ./player -b 4 -s bb12 -f deneme -m aa12
pid = 19732 sending potato number 19732 to /tmp/deneme; this is swith num 1
pid = 19732 receiving potato number 19733 from /tmp/merako
pid = 19732 sending potato number 19733 to /tmp/deneme; this is swith num 3
pid = 19732 receiving potato number 19732 from /tmp/merako
pid = 19732 sending potato number 19732 to /tmp/deneme; this is swith num 4
harunalbayrak@harunalbayrak:~/Desktop/system/hw3$

```

Figure 5: The process 1

```

harunalbayrak@harunalbayrak:~/Desktop/system/hw3$ ./player -b 0 -s bb12 -f deneme -m aa12
pid = 19730 receiving potato number 19733 from /tmp/deneme
pid = 19730 sending potato number 19733 to /tmp/olay; this is swith num 2
pid = 19730 receiving potato number 19732 from /tmp/deneme
pid = 19730 sending potato number 19732 to /tmp/olay; this is swith num 3
pid = 19730 receiving potato number 19733 from /tmp/deneme
pid = 19730 sending potato number 19733 to /tmp/deneme; this is swith num 6
pid = 19730 receiving potato number 19733 from /tmp/deneme
pid = 19730 sending potato number 19733 to /tmp/deneme; this is swith num 8
pid = 19730 receiving potato number 19733 from /tmp/deneme
pid = 19730 sending potato number 19733 to /tmp/deneme; this is swith num 10
pid = 19730 receiving potato number 19733 from /tmp/deneme
pid = 19730; potato number 19733 has cooled down
harunalbayrak@harunalbayrak:~/Desktop/system/hw3$

```

Figure 6: The process 2

```

harunalbayrak@harunalbayrak:~/Desktop/system/hw3$ ./player -b 10 -s bb12 -f deneme -m aa12
pid = 19733 sending potato number 19733 to /tmp/merako; this is swith num 1
pid = 19733 receiving potato number 19732 from /tmp/olay
pid = 19733 sending potato number 19732 to /tmp/merako; this is swith num 2
pid = 19733 receiving potato number 19733 from /tmp/olay
pid = 19733 sending potato number 19733 to /tmp/merako; this is swith num 5
pid = 19733 receiving potato number 19732 from /tmp/olay
pid = 19733; potato number 19732 has cooled down
pid = 19733 receiving potato number 19733 from /tmp/merako
pid = 19733 sending potato number 19733 to /tmp/merako; this is swith num 7
pid = 19733 receiving potato number 19733 from /tmp/merako
pid = 19733 sending potato number 19733 to /tmp/merako; this is swith num 9
pid = 19733 receiving potato number 19733 from /tmp/merako
pid = 19733 sending potato number 19733 to /tmp/merako; this is swith num 11

```

Figure 7: The process 3

```

harunalbayrak@harunalbayrak:~/Desktop/system/hw3$ ./player -b 10 -s bb12 -f deneme -m aa12
Argument Error: You must start at least one process with empty hands.
harunalbayrak@harunalbayrak:~/Desktop/system/hw3$

```

Figure 8: The process 1: Since all processes have potatoes the program is not work.

```

harunalbayrak@harunalbayrak:~/Desktop/system/hw3$ ./player -b 4 -s bb12 -f deneme -m aa12
Argument Error: You must start at least one process with empty hands.
harunalbayrak@harunalbayrak:~/Desktop/system/hw3$

```

Figure 9: The process 1: Since all processes have potatoes the program is not work.

```

harunalbayrak@harunalbayrak:~/Desktop/system/hw3$ ./player -b 2 -s bb12 -f deneme -m aa12
Argument Error: You must start at least one process with empty hands.
harunalbayrak@harunalbayrak:~/Desktop/system/hw3$

```

Figure 10: The process 1: Since all processes have potatoes the program is not work.