

YUSUF AKGÜL

CSE 344

Homework 3

1 Requirements

I have successfully implemented all the desired features in this homework. There is no warning that comes from -Wall flag or memory leak showed by valgrind including CTRL-C interruption signal.FIFOs have been successfully created and used.

2 Design Decisions

- a.) I started my assignment by creating a potato structure, inside that struct, I kept the pid, the number of switches, and how many times it had to switch to cool.Then I created a struct called sharedstruct to use shared memory more efficiently and smoothly.In this struct, i kept number of created fifos, the total number of potatoes, number of hot potatos and array of potatos.I also kept a separate unnamed semaphore to synchronize the fifos.
- b.) I used this unnamed semaphore program to start using fifos only after all fifos have been created.I used the named semaphore to make a critical section when accessing the shared memory.
- c.) I kept a fifo count in shared memory to enable each process to choose a different fifo name. I increased this count by 1 each time a fifo is opened in read mode, so each process opens a different fifo in read mode, while the other opens all in write mode.
- d.) I created the int volatile style global variable. I am changing this variable when the ctrl-c signal arrives. I use this signal where necessary, and do the desired action. When CTRL-C is pressed, the program leaves whatever it is doing, and frees the memory created by returning to the machine as soon as possible.

3 Algorithms

Fifo and Shared Memory

If the process has potatoes, it sends the pid of the potato from a random one of the fifo that it opens in write mode. If there is no potato in hand, it is waiting for input from the fifo that it opens in read mode. If the potato pid comes from the fifo that reads, it makes the necessary arrangements by creating a critical section for shared memory by using the semaphore. If all the potatoes are cold, message "-2" is sent from the fifos. If the program is closed with ctrl c, message "-3" is sent from fifos.

4 Input Outputs

When I do ctrl + c while the program is running, then the output; "Stopped by signal 'SIGINT' and all resources to return the system"

Program running;

./main -s q1 -m w1 -b 5 -f fifonames and

./main -s q1 -m w1 -b 10 -f fifonames

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fifo1 fifo2 pid=4973 sending potato number 4973 to fifo2 ; this is switch number 1
pid=4973 receiving potato number 4982 from fifo1
pid=4973 sending potato number 4982 to fifo2 ; this is switch number 2
pid=4973 receiving potato number 4973 from fifo1
pid=4973 sending potato number 4973 to fifo2 ; this is switch number 3
pid=4973 receiving potato number 4982 from fifo1
pid=4973 sending potato number 4982 to fifo2 ; this is switch number 4
pid=4973 receiving potato number 4973 from fifo1
pid=4973 sending potato number 4973 to fifo2 ; this is switch number 5
pid=4973 receiving potato number 4982 from fifo1
pid=4973 sending potato number 4982 to fifo2 ; this is switch number 6
pid=4973 receiving potato number 4982 from fifo1
pid=4973 sending potato number 4982 to fifo2 ; this is switch number 8
pid=4973 receiving potato number 4982 from fifo1
pid=4973 sending potato number 4982 to fifo2 ; this is switch number 10
fifo1 fifo2 pid=4982 sending potato number 4982 to fifo1 ; this is switch number 1
pid=4982 receiving potato number 4973 from fifo2
pid=4982 sending potato number 4973 to fifo1 ; this is switch number 2
pid=4982 receiving potato number 4982 from fifo2
pid=4982 sending potato number 4982 to fifo1 ; this is switch number 3
pid=4982 receiving potato number 4973 from fifo2
pid=4982 sending potato number 4973 to fifo1 ; this is switch number 4
pid=4982 receiving potato number 4982 from fifo2
pid=4982 sending potato number 4982 to fifo1 ; this is switch number 5
pid=4982 receiving potato number 4973 from fifo2
pid=4982; potato number 4973 has cooled down.
pid=4982 receiving potato number 4982 from fifo2
pid=4982 sending potato number 4982 to fifo1 ; this is switch number 7
pid=4982 receiving potato number 4982 from fifo2
pid=4982 sending potato number 4982 to fifo1 ; this is switch number 9
pid=4982 receiving potato number 4982 from fifo2
pid=4982; potato number 4982 has cooled down.
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