OS Lab 3

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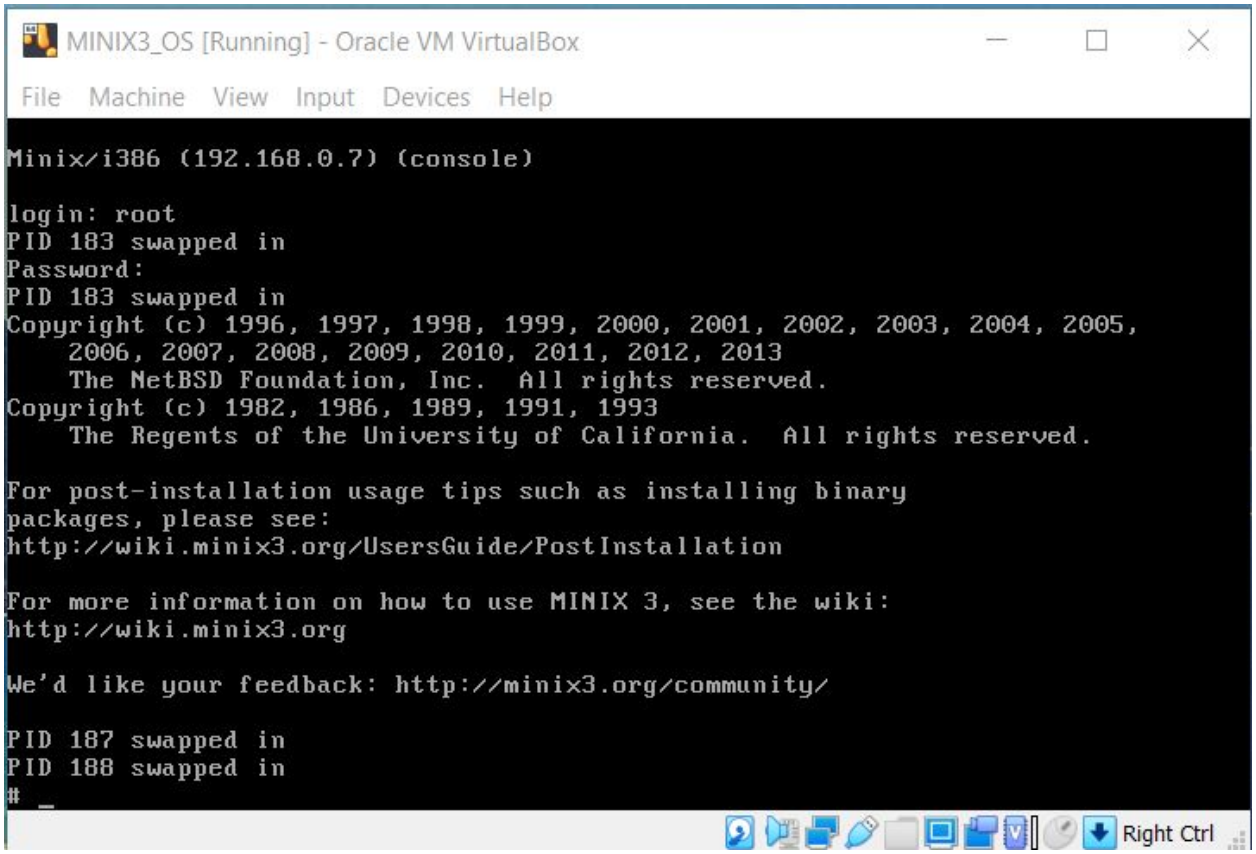
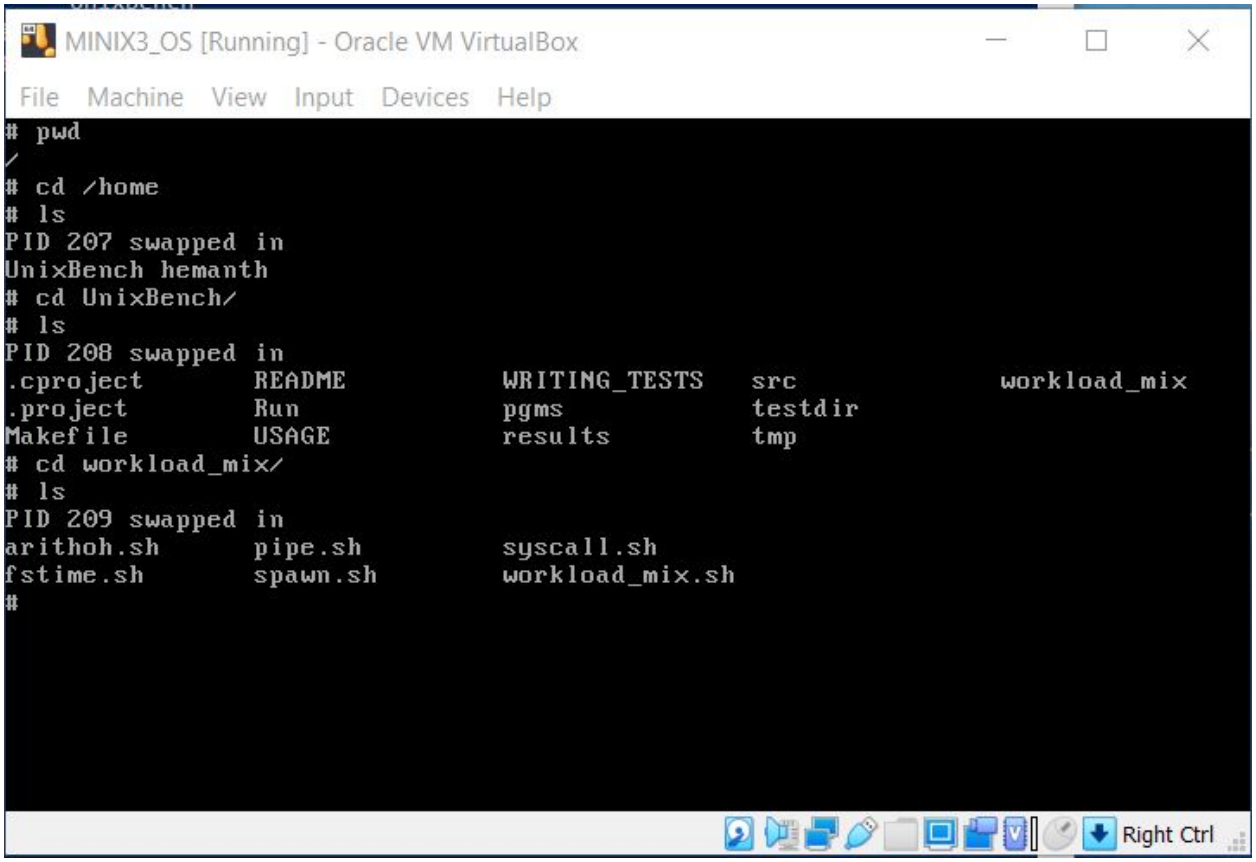
Part-1

The code modified in the file:- minix/servers/sched/schedule.c in the function schedule_process() for printing pid swapped whenever a user-level process is taken by the scheduler



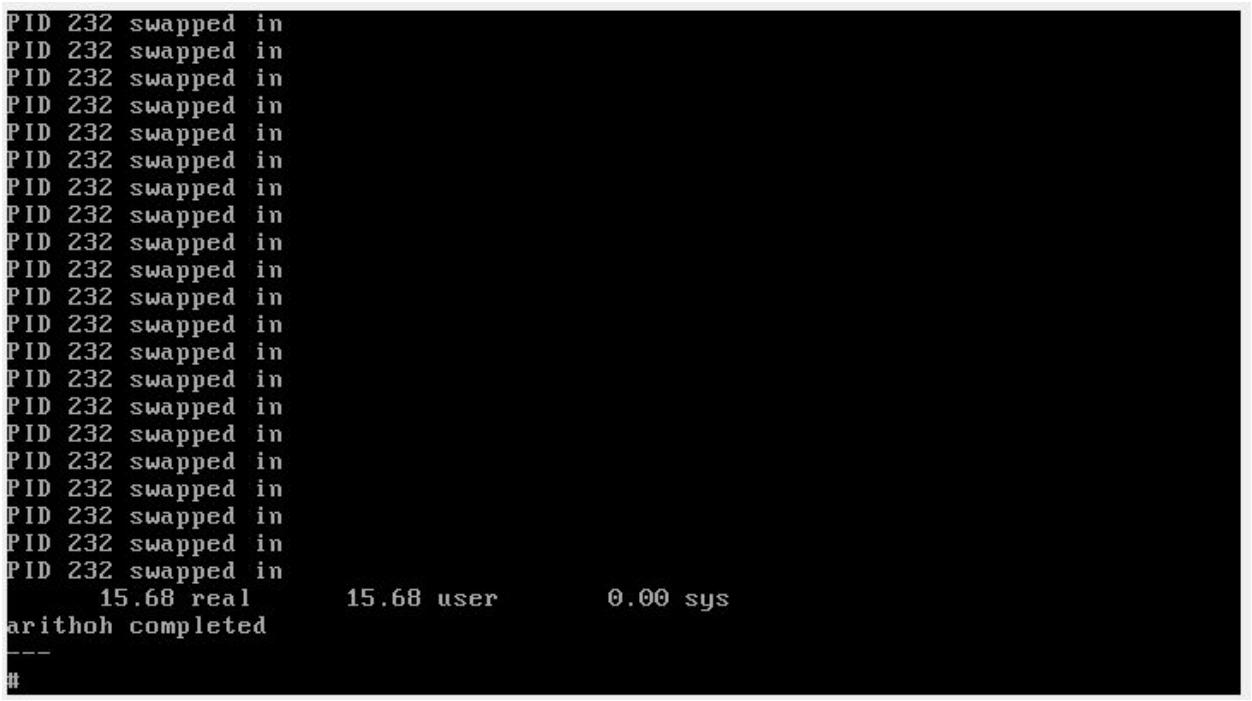


Part-2

Observations :

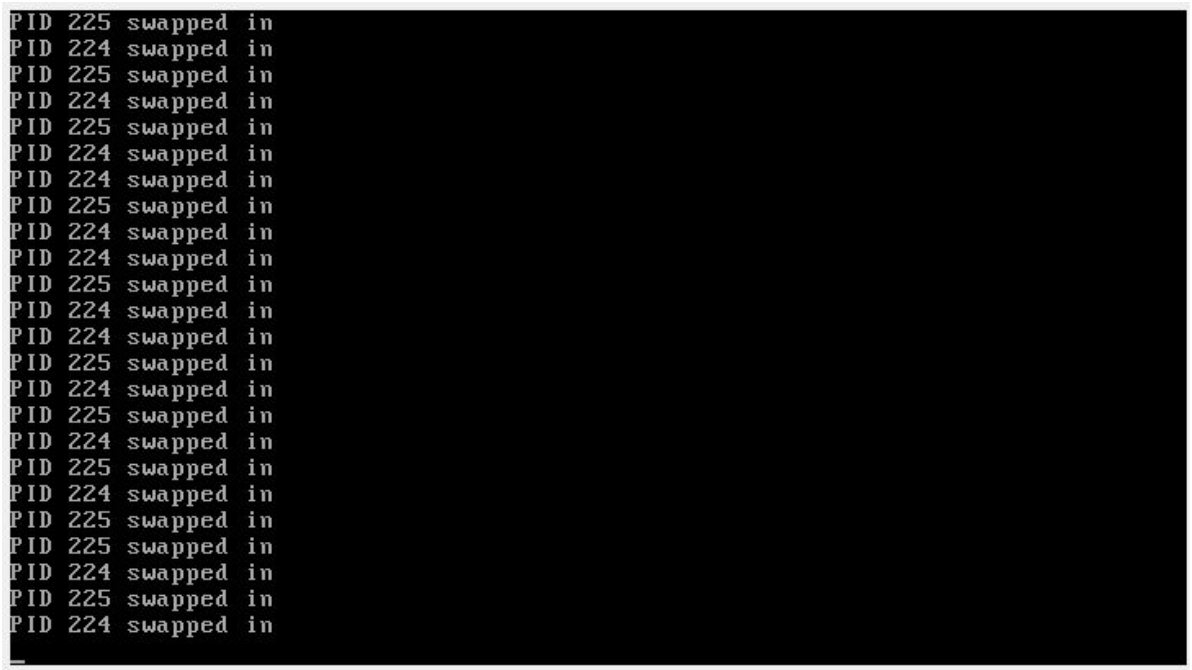
1.Arithoh

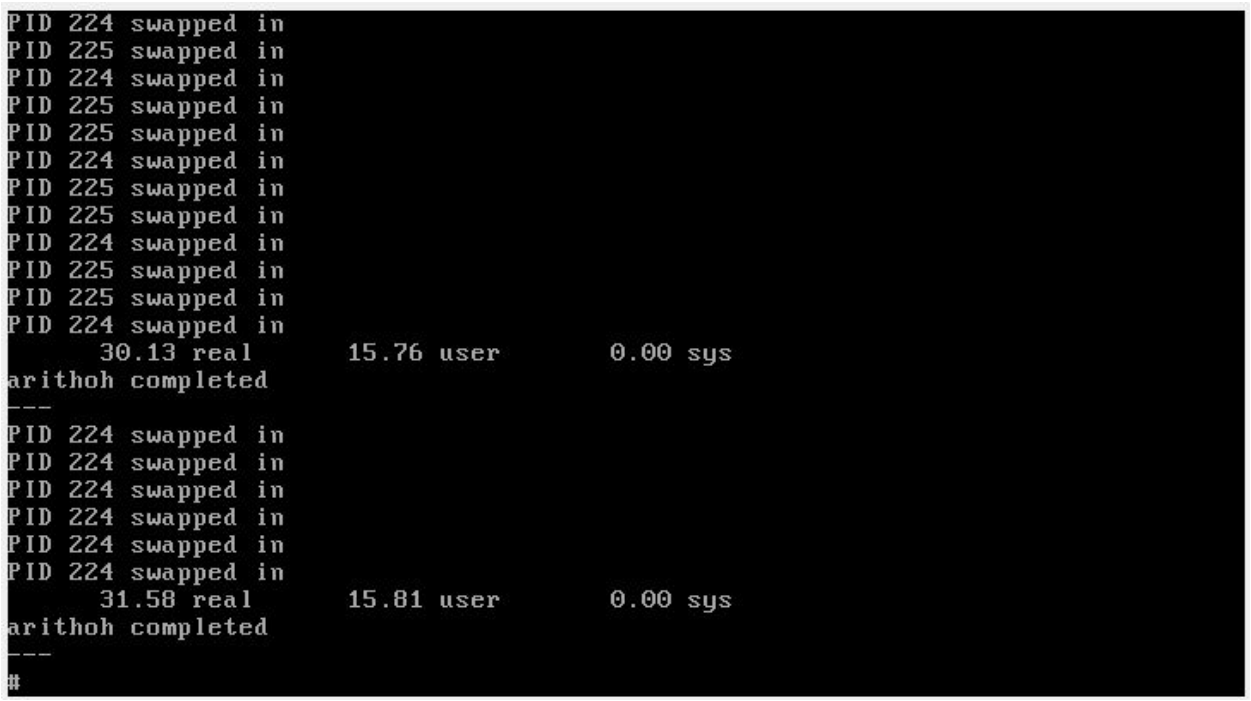
Running an arithoh.sh instance only once, the time taken by real and the user is exactly the same. Also the sys time taken is 0.



2.Arithoh vs Arithoh

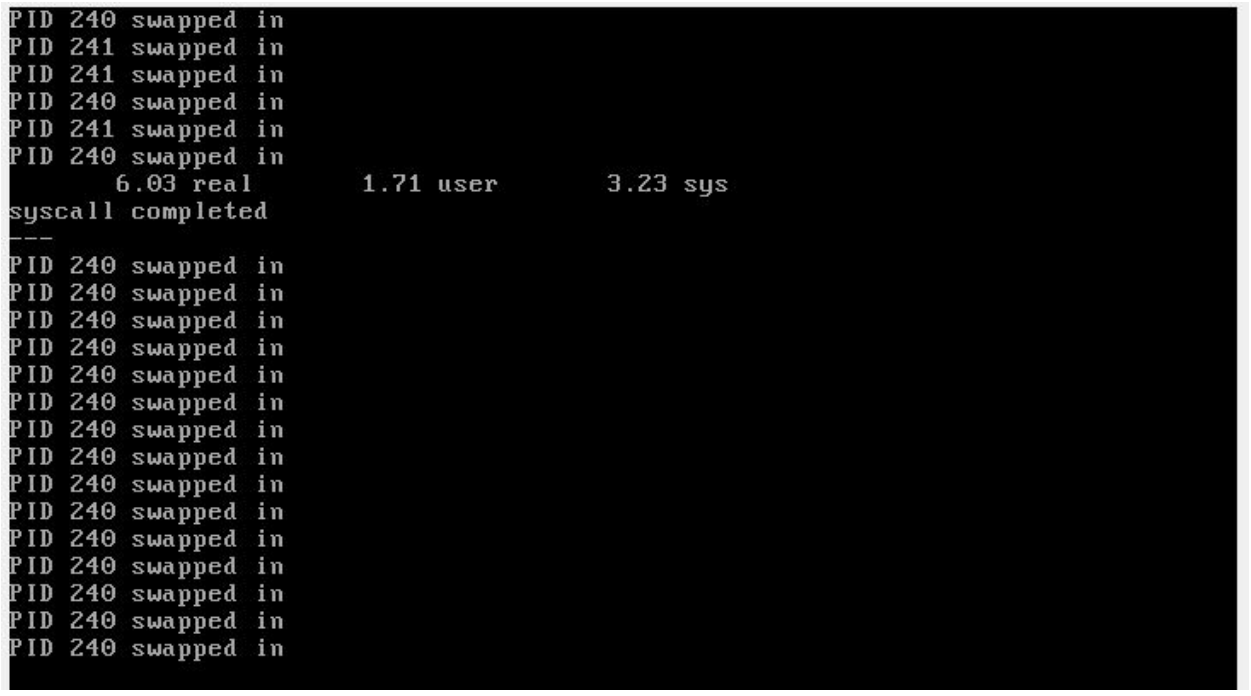
Running two instances of arithoh.sh, we see that the pid is not going sequentially rather making their movers parallely.Also we can observe though the process start at the same time but the first process ends earlier.So we can claim that it was given the most priority.





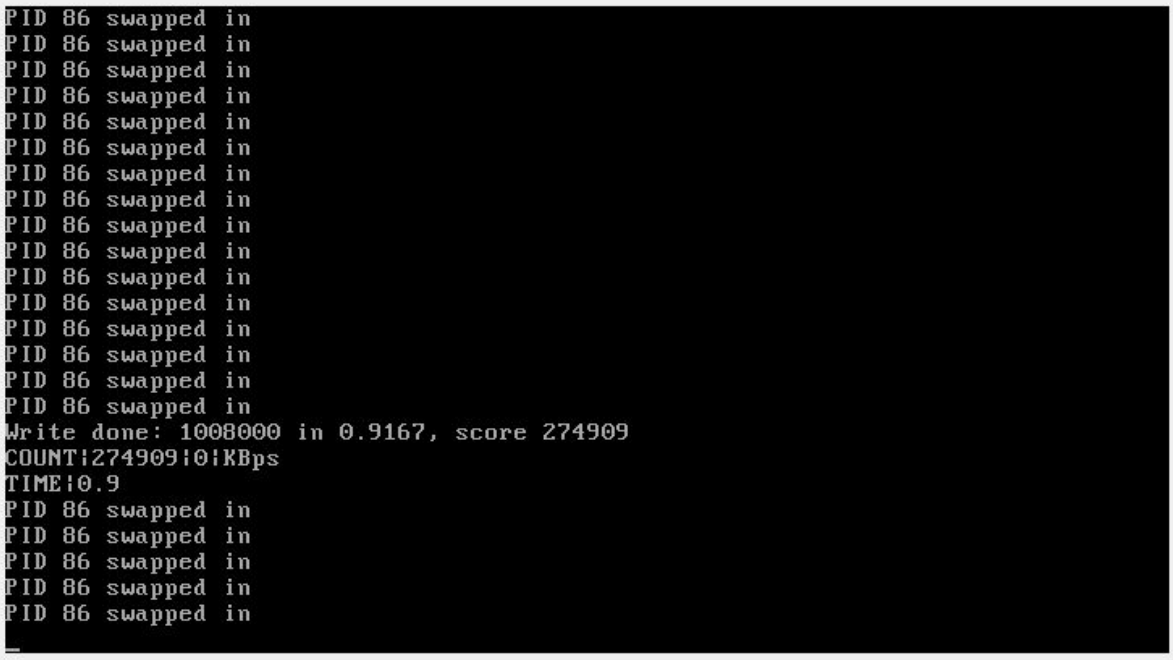
3. Arithoh vs syscall

Running arithoh.sh and syscall.sh (both of them are cpu bound benchmarks).We can observe from screenshots that the users time taken is way less than that of real due its computational(cpu) intensive tasks.We can also see round robin way of execution before completion of syscall (240,241,240,...).



4.Arithoh vs fstime

Running arithoh.sh and fstime.sh, The later one(fstime) is a special file compared to others, that is it is an I/O bound Unix Benchmark.
We see most of arithoh.sh process running in the screenshot because the I/O process waits for its I/O and then complex processing(see 87 pid just before its completion).And this is the reason for user time to be very less compared to that of arithoh.sh
Here the fstime finishes earlier followed by consecutive scheduling of arithoh until completion.


PID 86 swapped in
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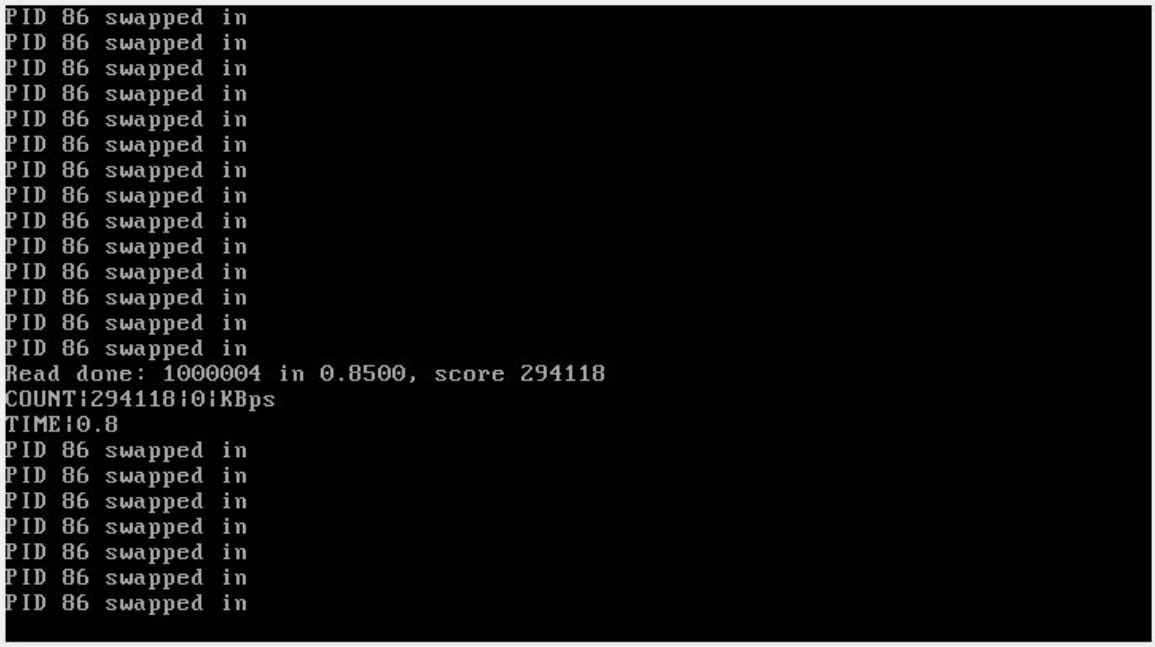
PID 86 swapped in
Write done: 1008000 in 0.9167, score 274909
COUNT¦274909¦0¦KBps
TIME¦0.9
PID 86 swapped in
PID 86 swapped in
PID 86 swapped in
PID 86 swapped in
PID 86 swapped in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PID 86 swapped in
Read done: 1000004 in 0.8500, score 294118
COUNT¦294118¦0¦KBps
TIME¦0.8
PID 86 swapped in
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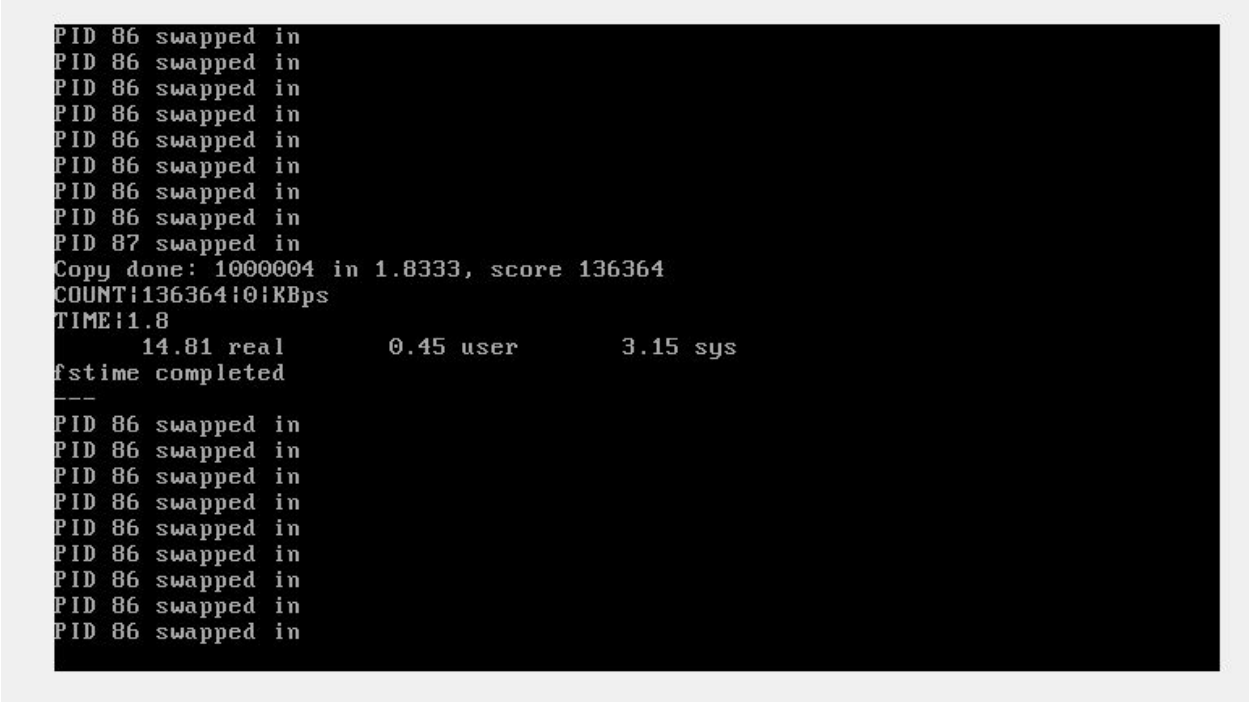
PID 86 swapped in



5. Arithoh vs pipe

Running arithoh.sh and pipe.sh(both of them are cpu bound benchmarks).A huge amount of time spent by Pipe is in sys mode. This is because the Inter-Process Communication protocols are highly based on the system. The user-mode time spent is very less.
Here the pipe finishes earlier followed by consecutive scheduling of arithoh until completion.

6.spawn vs arithoh

Running arithoh.sh and spawn.sh(both of them are cpu bound benchmarks).
We can see there are many processes running down in the screenshot(descendants of spawn.sh).Here the time spent by the system is large compared to that of the user.

Here the pipe finishes earlier followed by consecutive scheduling of arithoh until completion.

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PID 224 swapped in
PID 225 swapped in
PID 226 swapped in
PID 227 swapped in
PID 228 swapped in
PID 229 swapped in
PID 230 swapped in
PID 231 swapped in
PID 232 swapped in
PID 233 swapped in
       5.76 real       0.28 user       4.06 sys
spawn completed
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PID 109 swapped in
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PID 109 swapped in
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PID 109 swapped in
      20.93 real      15.60 user       0.00 sys
arithoh completed
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#
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