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Σύντομες Πληροφορίες:

- Έχουν υλοποιηθεί όλα τα ζητούμενα της εκφώνησης.
- Το `usertests` περνάει όλα τα `test`, για τον default αριθμό CPUs και για ένα CPU, στα οποία δοκιμάστηκε.
- Το `priotest` έχει φυσιολογικά αποτελέσματα, για τον default αριθμό CPUs και για ένα CPU, στα οποία δοκιμάστηκε.

1. `Int setpriority(int num):`

- Υλοποιήθηκε όπως αναφέρει η εκφώνηση, στο αρχείο `proc.c` και στο `sysproc.c`, και δηλώθηκε όπως χρειάζεται στα υπόλοιπα αρχεία.
- Έγινε comment out, η default συνάρτηση `setpriority` που υπάρχει στο αρχείο `priotest.c`.

2. `Int getpinfo(struct pstat *):`

- Υλοποιήθηκε όπως αναφέρει η εκφώνηση, στο αρχείο `proc.c` και στο `sysproc.c`, και δηλώθηκε όπως χρειάζεται στα υπόλοιπα αρχεία.
- Το `struct pstat`, έχει οριστεί στο αρχείο `types.h`

3. `Struct proc:`

- Προστέθηκε η μεταβλητή `int priority`, για να καθορίζει τις προτεραιότητες.
- Η παραπάνω μεταβλητή αρχικοποιείται με τιμή 10, στη συνάρτηση `allocproc` του αρχείου `proc.c`.

4. Αρχείο `ps.c:`

- Υλοποιήθηκε όπως αναφέρει η εκφώνηση.
- Η ζητούμενη διαδικασία γίνεται στην `main`, ενώ χρειάστηκε και μία βοηθητική συνάρτηση η `print_enum2string`, για την εκτύπωση του `enum procstate` ως string.
- Για την σωστή λειτουργία του αρχείου `ps.c`, χρειάστηκε το `struct pstat`, να δημιουργηθεί μέσα στο αρχείο `types.h` και να μεταφερθεί επίσης για τον ίδιο λόγο, το `enum procstate` στο τελευταίο αρχείο.
- Αποτελέσματα:

```

dimitris@dimitris-Lenovo-Legion-5-15ARH05H:~/Documents/LeitourgikaSistimata/project2/xv6-project-2023$ make qemu
qemu-system-riscv64 -machine virt -bios none -kernel kernel/kernel -m 128M -smp 3 -nographic -global virtio-mmio.
o-bus.0

xv6 kernel is booting

hart 1 starting
hart 2 starting
init: starting sh
$ ps
PID = 1 || PPID = 1 || NAME = init || PRIORITY = 10 || STATE = SLEEPING || SIZE = 16384u
PID = 2 || PPID = 1 || NAME = sh || PRIORITY = 10 || STATE = SLEEPING || SIZE = 20480u
PID = 3 || PPID = 2 || NAME = ps || PRIORITY = 10 || STATE = RUNNING || SIZE = 16384u
$ █

```

5. Scheduler:

- Υλοποιήθηκε όπως αναφέρει η εκφώνηση.
- Τα παρακάτω γίνονται σε ένα άπειρο "loop".
- Πρώτα ψάχνει όλα τα "process" για να βρει το τελευταίο από αυτά που είναι "RUNNABLE" και έχουν το "highest priority", δηλαδή το $r \rightarrow \text{priority}$ τους, έχει την μικρότερη τιμή.
- Μετά, μέσα σε ένα "for loop" που αρχίζει από το "process" που βρήκαμε πριν και τελειώνει στην αρχή του πίνακα με τα "process", εκτελούμε όλα τα process που είναι "RUNNABLE" και έχουν τιμή "priority", ίση με το "priority value" που έχει το process που βρήκαμε.
- Αποτελέσματα:
 - usertests (default number of cpus):

```

OK
test sbrklast: OK
test sbrk8000: OK
test badarg: OK
usertests slow tests starting
test bigdir: OK
test manywrites: OK
test badwrite: OK
test execout: OK
test diskfull: balloc: out of blocks
ialloc: no inodes
ialloc: no inodes
OK
test outofinodes: ialloc: no inodes
OK
ALL TESTS PASSED
$ █

```

- usertests (cpus number = 1):

```
test sbrklast: OK
test sbrk8000: OK
test badarg: OK
usertests slow tests starting
test bigdir: OK
test manywrites: OK
test badwrite: OK
test execout: OK
test diskfull: balloc: out of blocks
ialloc: no inodes
ialloc: no inodes
OK
test outofinodes: ialloc: no inodes
OK
ALL TESTS PASSED
$ █
```

- priotest (default number of cpus):

```
$ priotest
Child pid 6631, small, with priority 2 finished. Useless sum: 448743748
Child pid 6612, small, with priority 2 finished. Useless sum: 448743748
Child pid 6632, small, with priority 3 finished. Useless sum: 448743748
Child pid 6613, small, with priority 3 finished. Useless sum: 448743748
Child pid 6633, small, with priority 4 finished. Useless sum: 448743748
Child pid 6614, small, with priority 4 finished. Useless sum: 448743748
Child pid 6634, small, with priority 5 finished. Useless sum: 448743748
Child pid 6615, small, with priority 5 finished. Useless sum: 448743748
Child pid 6635, small, with priority 6 finished. Useless sum: 448743748
Child pid 6616, small, with priority 6 finished. Useless sum: 448743748
Child pid 6617, small, with priority 7 finished. Useless sum: 448743748
Child pid 6636, small, with priority 7 finished. Useless sum: 448743748
Child pid 6637, small, with priority 8 finished. Useless sum: 448743748
Child pid 6618, small, with priority 8 finished. Useless sum: 448743748
Child pid 6619, small, with priority 9 finished. Useless sum: 448743748
Child pid 6638, small, with priority 9 finished. Useless sum: 448743748
Child pid 6620, small, with priority 10 finished. Useless sum: 448743748
Child pid 6639, small, with priority 10 finished. Useless sum: 448743748
Child pid 6640, small, with priority 11 finished. Useless sum: 448743748
Child pid 6621, small, with priority 11 finished. Useless sum: 448743748
Child pid 6622, small, with priority 12 finished. Useless sum: 448743748
Child pid 6603, small, with priority 12 finished. Useless sum: 448743748
Child pid 6641, small, with priority 12 finished. Useless sum: 448743748
Child pid 6642, small, with priority 13 finished. Useless sum: 448743748
Child pid 6604, small, with priority 13 finished. Useless sum: 448743748
Child pid 6623, small, with priority 13 finished. Useless sum: 448743748
Child pid 6605, small, with priority 14 finished. Useless sum: 448743748
Child pid 6624, small, with priority 14 finished. Useless sum: 448743748
Child pid 6606, small, with priority 15 finished. Useless sum: 448743748
Child pid 6625, small, with priority 15 finished. Useless sum: 448743748
Child pid 6607, small, with priority 16 finished. Useless sum: 448743748
Child pid 6626, small, with priority 16 finished. Useless sum: 448743748
Child pid 6627, small, with priority 17 finished. Useless sum: 448743748
Child pid 6608, small, with priority 17 finished. Useless sum: 448743748
Child pid 6609, small, with priority 18 finished. Useless sum: 448743748
Child pid 6628, small, with priority 18 finished. Useless sum: 448743748
Child pid 6600, large, with priority 16 finished. Useless sum: 1818368003
Child pid 6601, large, with priority 17 finished. Useless sum: 1818368003
Child pid 6610, small, with priority 19 finished. Useless sum: 448743748
Child pid 6629, small, with priority 19 finished. Useless sum: 448743748
Child pid 6611, small, with priority 20 finished. Useless sum: 448743748
Child pid 6630, small, with priority 20 finished. Useless sum: 448743748
Child pid 6602, large, with priority 18 finished. Useless sum: 1818368003
Child pid 6599, large, with priority 20 finished. Useless sum: 1818368003
$ █
```

- priotest (cpus number = 1):

```
$ priotest
Child pid 38, small, with priority 2 finished. Useless sum: 448743748
Child pid 19, small, with priority 2 finished. Useless sum: 448743748
Child pid 39, small, with priority 3 finished. Useless sum: 448743748
Child pid 20, small, with priority 3 finished. Useless sum: 448743748
Child pid 21, small, with priority 4 finished. Useless sum: 448743748
Child pid 40, small, with priority 4 finished. Useless sum: 448743748
Child pid 41, small, with priority 5 finished. Useless sum: 448743748
Child pid 22, small, with priority 5 finished. Useless sum: 448743748
Child pid 42, small, with priority 6 finished. Useless sum: 448743748
Child pid 23, small, with priority 6 finished. Useless sum: 448743748
Child pid 43, small, with priority 7 finished. Useless sum: 448743748
Child pid 24, small, with priority 7 finished. Useless sum: 448743748
Child pid 44, small, with priority 8 finished. Useless sum: 448743748
Child pid 25, small, with priority 8 finished. Useless sum: 448743748
Child pid 26, small, with priority 9 finished. Useless sum: 448743748
Child pid 45, small, with priority 9 finished. Useless sum: 448743748
Child pid 46, small, with priority 10 finished. Useless sum: 448743748
Child pid 27, small, with priority 10 finished. Useless sum: 448743748
Child pid 8, small, with priority 10 finished. Useless sum: 448743748
Child pid 47, small, with priority 11 finished. Useless sum: 448743748
Child pid 28, small, with priority 11 finished. Useless sum: 448743748
Child pid 9, small, with priority 11 finished. Useless sum: 448743748
Child pid 29, small, with priority 12 finished. Useless sum: 448743748
Child pid 10, small, with priority 12 finished. Useless sum: 448743748
Child pid 30, small, with priority 13 finished. Useless sum: 448743748
Child pid 11, small, with priority 13 finished. Useless sum: 448743748
Child pid 12, small, with priority 14 finished. Useless sum: 448743748
Child pid 31, small, with priority 14 finished. Useless sum: 448743748
Child pid 32, small, with priority 15 finished. Useless sum: 448743748
Child pid 13, small, with priority 15 finished. Useless sum: 448743748
Child pid 33, small, with priority 16 finished. Useless sum: 448743748
Child pid 14, small, with priority 16 finished. Useless sum: 448743748
Child pid 5, large, with priority 16 finished. Useless sum: 1818368003
Child pid 34, small, with priority 17 finished. Useless sum: 448743748
Child pid 15, small, with priority 17 finished. Useless sum: 448743748
Child pid 6, large, with priority 17 finished. Useless sum: 1818368003
Child pid 35, small, with priority 18 finished. Useless sum: 448743748
Child pid 16, small, with priority 18 finished. Useless sum: 448743748
Child pid 7, large, with priority 18 finished. Useless sum: 1818368003
Child pid 36, small, with priority 19 finished. Useless sum: 448743748
Child pid 17, small, with priority 19 finished. Useless sum: 448743748
Child pid 37, small, with priority 20 finished. Useless sum: 448743748
Child pid 18, small, with priority 20 finished. Useless sum: 448743748
Child pid 4, large, with priority 20 finished. Useless sum: 1818368003
$
```