Priority Scheduling

Modify xv6 to allow for priority scheduling.

- You need to define a range of the priority values. Processes with higher priority (lower priority value) should be scheduled earlier.
- New processes should receive a default priority.
- Round robin strategy should be applied to those processes with the same priority.
- If process 1 is being executed while process 2 with higher priority becomes available, process 2 will be considered for execution the next time when the scheduler gains control. This could be the time, for example, when process 1 has used up its current quantum or when process 1 has completed its current burst.

You need to provide two system calls to perform testing:

- A system call *ps* to display the process state. This is a modification of *pstate* in the previous assignment. You need to include the display of the priority values.
- A system call *set* to modify the priority of a process dynamically, with prototype

```
int set(int pid, int priority);
```

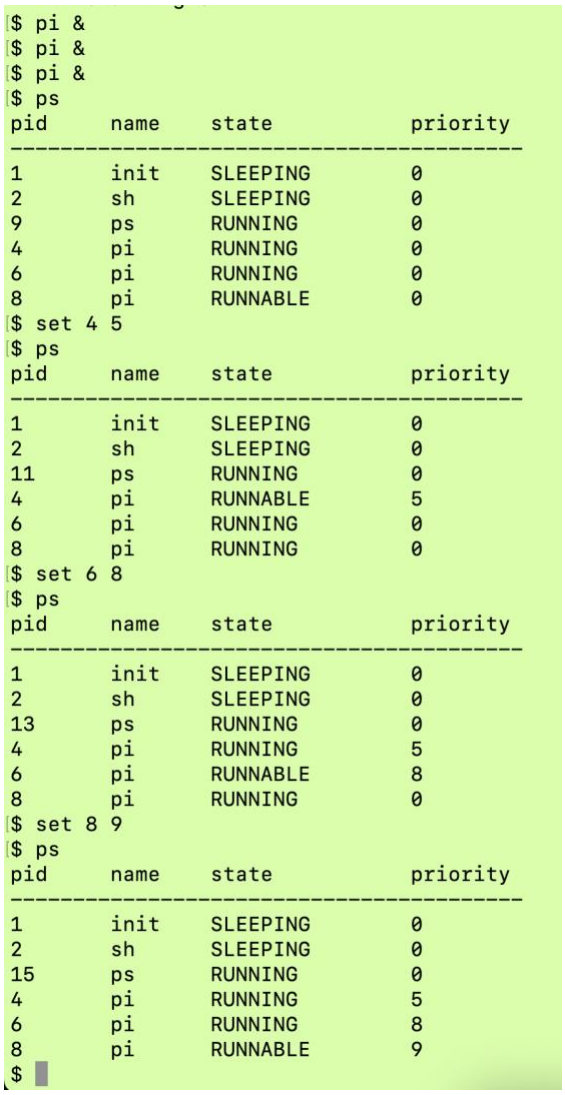
For testing, you can reuse the user program (like pi in the sample run) from Assignment 3.

You also need to provide a readme file in PDF format. In this file, use at most one page to provide information including:

- the range of your priority values
- the default priority and how it is set up
- how to test your solution

There will be a penalty for any unnecessary modifications to xv6. In particular, sh.c should not be modified.

Sample run:



```
$ pi &
$ pi &
$ pi &
$ ps
pid     name    state           priority
----------------------------------------
1       init    SLEEPING        0
2       sh      SLEEPING        0
9       ps      RUNNING         0
4       pi      RUNNING         0
6       pi      RUNNING         0
8       pi      RUNNABLE        0
$ set 4 5
$ ps
pid     name    state           priority
----------------------------------------
1       init    SLEEPING        0
2       sh      SLEEPING        0
11      ps      RUNNING         0
4       pi      RUNNABLE        5
6       pi      RUNNING         0
8       pi      RUNNING         0
$ set 6 8
$ ps
pid     name    state           priority
----------------------------------------
1       init    SLEEPING        0
2       sh      SLEEPING        0
13      ps      RUNNING         0
4       pi      RUNNING         5
6       pi      RUNNABLE        8
8       pi      RUNNING         0
$ set 8 9
$ ps
pid     name    state           priority
----------------------------------------
1       init    SLEEPING        0
2       sh      SLEEPING        0
15      ps      RUNNING         0
4       pi      RUNNING         5
6       pi      RUNNING         8
8       pi      RUNNABLE        9
$
```

It is fine if the values in your display are different, but the table should be formatted properly.

Submission: a zipped file named firstname_lastname.zip consisting of all modified xv6 files (including Makefile) and all new files (including readme.pdf).