COL 331
Operating Systems

Assignment 2

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Part 1

(a) Simply a priority variable is added in the structure of a process. And an additional print for the sys_ps() function is added. Default Priority is given to a process as and when it is created in allocproc() function.

(b) Since for making a new system call, various files were changed after understanding how the calls are implemented as in the first part of the assignment. In the system function, I iterate over ptable after acquiring a lock and then looking for the process with the required pid. Then priority field is updated.

Part 2

Scheduler of the proc.c works by iterating over the list of processes. Priority scheduler is made by adding another loop inside the main loop which looks for the process with the highest priority below that iterator process. Then this highest process is made to run on the CPU. After this process, the iterator of the loop is made to point to the highest priority process so that the search for next high priority takes place after this and hence round robin gets implemented. Whenever there is no process which is runnable, the loop is exited and sti() call is reinitialized in the outer infinite loop. For calculation of highest priority following a process, a cycle is made through the processes updating only when the curr_process_priority is strictly greater than curr_max_priority.

Part 3

(a) Another syscall has to be implemented. Simply iterating over ptable to match the pid in argument and setting the pid to the value in the argument.

(b) Simply, a counter is added to the structure of the process. And then whenever a context switch happens, counter is updated for all the processes. And priority is updated on reaching 50. The priority level is saturated at 20.