Ryan Lawlor

Professor Novak

Operating Systems

4 October 2021

<div align="center">OS HW2</div>

1. The two missing transitions would be from blocked to running and from ready to blocked. The first transition from blocked to running is possible because the process could be blocked when waiting for user input and then the input could finish. Then the process could go from blocked to running since the wait for input has finished. The second missing transition from ready to blocked is not possible, because there is nothing that could happen in the ready state that could block the process. A process can only get blocked while running.

8. CPU Utilization = $1 - p^n$

    CPU Utilization = $1 - .4^6 = .995904 = 99.5904\%$

12. I think kernel-level threads are being used for the Web server because of one of the main problems with user-level threads and the implementation of blocking system calls. If user-level threads were used, letting the thread make the blocking system call would stop all other threads and block the entire process.

14. Registers are a per-thread item because each thread's information must be saved when the thread ends, just like an overall process. If there was only one register for the entire

process instead of for each thread, whenever a thread ended its data would be lost since the register is only saving data for the process as a whole.

15. Threads work together to complete one goal, while processes work against each other trying to complete different tasks. Thus, if yielding to another thread will help complete the task, the thread should voluntarily give up its CPU time for the other thread to work on the task.