

# CPSC 3125, Operating Systems

## Examination 1

September 9, 2021

## 1 Instructions

The CSU Honor Code applies to this examination. You may not use your textbook, your notes, or any other written or electronic material, including the internet. You may not give or receive aid from another person. Violations of the Honor Code will result in the failure of this examination and dismissal from the course. Submission of your answers to this examination constitutes an acknowledgment of the Honor Code and your compliance therewith.

Please answer the following questions. Please answer in complete sentences. Please answer all questions briefly and succinctly — no long essays permitted. Do not use short answers unless the question specifically calls for short answers. You must exhibit understanding of the material covered by the question.

Submit your answers on CougarView or in accordance with the instructions given orally in class. Late submissions will result in failure of this examination.

## 2 Questions

1. (short answer) The title of the book is *Operating Systems: Three Easy Pieces*. List the three easy pieces to which the title refers.
2. What is the difference between a procedure call and a system call?
3. (short answer) What three things must an operating system do to run a program?
4. What does `fork()` do? Please discuss both the arguments and the return value of `fork()`.
5. Describe a context switch. Please be specific in your answer, that is, what it does, why it does it, and the result of doing it.
6. What do we mean when we say that turn around time and response time are inversely proportional? Describe the nature of the trade off between response time and turnaround time.
7. (short answer) List the five rules of the MLFQ scheduler.
8. What important property do lottery schedulers have that deterministic schedulers do not have? Why is this property important?
9. What is the difference between processes and threads? This difference entails both an advantage and disadvantage. For a process, what is the advantage and disadvantage. For a thread, what is the advantage and disadvantage. Note that an advantage for one is a disadvantage for the other, and *vice versa*.
10. What is the most significant concept you learned about how the operating system mediates between the CPU and the running processes? Please explain why you think this is significant. This question does not have a correct or incorrect answer. You will be graded on your understanding of the significance of the concept you discuss.