

CS 520-A: Introduction to Operating Systems

Homework Assignment # 2

Please read the following sections of Chapter 5: 5.1-5.3 and 5.7-5.9 as well as the Lecture 2 notes (except for the slides 47-54, which we will discuss later). Do *not* read section 5.4 yet; the rest of the chapter is not mandatory to read.

Solve the following problems

1. Problem 5.1. **(5 points)**
2. Prove formally that the Shortest Job First scheduling algorithm is optimal in that it minimizes the average waiting time. For simplicity, assume that 1) all n processes are already in the system at the time the scheduling decision has to be made and 2) all processes have arrived at the same time. Hint: Use the formula for average waiting time in the Lecture. **(15 points)**
3. Solve Problems 5.3 and 5.4. **(25 points each—50 points cumulative)**
4. The *Snooty Clam* restaurant does not take reservations. The dining room contains a single table seating twenty patrons. When space becomes free, parties are seated in the order in which they arrived, except that a party that cannot be seated in the available space is passed over. What is the effect of this seating policy on large parties? If parties are seated strictly in the order in which they arrive, how will this affect the utilization of the table? **(20 points)**
5. Solve Problem 5.8. **(10 points)**