

Istanbul Bilgi University
Department of Computer Engineering

SPRING, 2021
Campus: Santral

CMPE 312: OPERATING SYSTEMS

Question on MM Partition

(Duration: minutes)

Name :

Student ID :

NOTE: WRITE NEATLY. MARKS WILL BE GIVEN FOR PARTIAL ANSWERS. THEREFORE, SHOW YOUR WORK AND YOUR REASONING. YOU MAY GET EXTRA POINTS FOR AN APPROPRIATE OBSERVATION OR YOU MAY LOSE SOME MARKS DUE TO AN OBSCURE SOLUTION.

1. {100 points} 'Partition' is a memory management scheme which allocates processes in Main Memory (MM) into a continuous area of MM; each partition contains exactly one process. Thus, the degree of multiprogramming is bound by the number of partitions: when a partition is free, the Operating System (OS) selects a process from the input queue and loads it into the free partition; when the process terminates the partition becomes available. In the partition scheme, the OS needs to keep info indicating which parts of MM are available and which are occupied. Let us consider the following situation: at time t_0 processes P_1, P_2, P_3 are in the new state, and processes P_4, P_5, P_6 in the ready state.
- (a) Draw the Seven-State Process Model labeling the arcs with appropriated key words (long-short-medium term scheduler ...)
 - (b) {10 points} Draw a possible picture of the MM storing at least 3 holes of different size and the 3 mentioned processes
 - (c) {10 points} Describe the MM with the corresponding list
 - (d) {10 points} Use Process Control Blocks (PCB) to draw the input queue and the ready queue at time t_0
 - (e) {10+20 points} External and internal fragmentation are the main drawbacks of this method. Can you explain why? Can you give an example (considering the previous points)?
 - (f) {0 points} Shortly describe the 'First fit' allocation algorithm.
 - (g) {10 + 5 + 5 points} Considering your previous points, make a simulation where the long-term scheduler uses the 'First fit' allocation algorithm. Discuss advantages and disadvantages of this method.
 - (h) {0 points} Shortly describe the 'Worse fit' allocation algorithm.
 - (i) {10 + 5 + 5 points} Considering your previous points, make a simulation where the long-term scheduler uses the 'Worse fit' allocation algorithm. Discuss advantages and disadvantages of this method.
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