



2. (20pts Total) Memory

- a) (2pts) Describe two (2) benefits of using virtual memory.
- b) (3pts) What is the Translation Look Ahead Buffer (TLB). Specifically, what is stored in it, and how is it used?
- c) (12pts) Given memory partitions of 200KB, 400KB, 600KB, 300KB (in this order). How would each of the algorithms below place the following processes P1- 250KB, P2-110KB, P3-300KB, P4-280KB, P5-210KB (in this order). Assume dynamic partitioning. Show your work for full credit.
  - i. First Fit
  - ii. Best Fit
  - iii. Worst Fit
- d) (3pt) Which algorithm makes the most efficient use of memory in this case? Explain your answer.

3) (20pts) Paging

- a) (4pts) There are multiple techniques for structuring page tables in large address spaces. Choose one and describe how it works.
- b) (2pts) When discussing page replacement, what is the "working set?"
- c) (12pts) Assume 4 page frames have been allocated to a process. For each of the algorithms below, show the contents of the page frames for the requests: 1,2,3,4,2,1,5,6,2,1,2,3,7. Indicate whenever a page fault occurs.
  - i. First in First Out
  - ii. Least Recently Used
  - iii. Optimal
- d) (2pts) For this particular set of pages, which paging method is best and why? Describe any disadvantage of the "best" method if there is one.