COM S 352
Assignment 6
Due: October 27, 2017

8.13 Compare the memory organization schemes of contiguous memory allocation, pure segmentation, and pure paging with respect to the following issues:
a. External fragmentation
b. Internal fragmentation

8.20 Assuming a 1-KB page size, what are the page numbers and offsets for the following address references (provided as decimal numbers):
a. 3085
b. 42095
c. 215201
d. 650000
e. 2000001

8.23 Consider a logical address space of 256 pages with a 4-KB page size, mapped onto a physical memory of 64 frames.
a. How many bits are required in the logical address?
b. How many bits are required in the physical address?

9.21 Consider the following page reference string:
7, 2, 3, 1, 2, 5, 3, 4, 6, 7, 7, 1, 0, 5, 4, 6, 2, 3, 0 , 1.
Assuming demand paging with three frames, how many page faults would occur for the following replacement algorithms?
- LRU replacement
- FIFO replacement
- Optimal replacement

9.27 Consider a demand-paging system with the following time-measured utilizations:
CPU utilization 20%
Paging disk 97.7%
Other I/O devices 5%
For each of the following, indicate whether it will (or is likely to) improve CPU utilization. Explain your answers.
a. Install a faster CPU.
b. Install a bigger paging disk.
c. Increase the degree of multiprogramming.
d. Decrease the degree of multiprogramming.
e. Install more main memory.

f. Install a faster hard disk or multiple controllers with multiple hard disks.
g. Add pre paging to the page-fetch algorithms.
h. Increase the page size.

9.32 What is the cause of thrashing? How does the system detect thrashing? Once it detects thrashing, what can the system do to eliminate this problem?

9.34 Consider the parameter Δ used to define the working-set window in the working-set model. When Δ is set to a small value, what is the effect on the page-fault frequency and the number of active (non-suspended) processes currently executing in the system? What is the effect when Δ is set to a very high value?