Homework 8

1. (10 points) Assuming a process is in the *running* state, answer the following questions, and explain your answers:

   a. Will the process change state if it incurs a page fault? If so, to what state will it change?
   b. Will the process change state if an address reference is resolved in the page table? If so, to what state will it change?

2. Exercise 10.18 modified (15 points) The following is a page table for a system with 12-bit virtual and physical addresses and 256-byte pages. Free page frames are to be allocated in the order 9, 15, 5. A dash for a page frame indicates that the page is not in memory.

Page	Page Frame
0	4
1	11
2	10
3	–
4	–
5	2
6	–
7	0
8	12
9	1

Convert the following virtual addresses (given in hexadecimal) to their equivalent physical. Assume the address are accessed in the order given, in the case of a page fault, you must use one of the free frames to update the page table and resolve the logical address to its corresponding physical address.

a. 0x2DD
b. 0x4E6
c. 0x94A
d. 0x316

3. (15 points) Consider the following page reference string:

7, 2, 3, 1, 2, 1, 5, 1, 6, 1, 6, 0, 6, 7, 6, 7, 2, 7, 1

Assuming demand paging with three frames, how many page faults would occur for the following replacement algorithms? You must show your work (i.e., show frames after ever

reference) to receive full credits.

- LRU replacement
- FIFO replacement
- Optimal replacement

4. Exercise 10.37 (10 points) 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?

5. Exercise 10.39 (10 points) Consider the parameter Δ used to define the working-set window in the working-set model. When Δ is set to a low value, what is the effect on the page-fault frequency and the number of active (nonsuspended) processes currently executing in the system? What is the effect when Δ is set to a very high value?