



CS3844 Homework 2
Assorted Topics
Due: February 13, 2014

- Suppose we have created a scheduling algorithm which favors those processes that have used the least processor time in the “recent past”. Why will this algorithm favor I/O bound processes but yet not result in the starvation of long, CPU bound processes?
- The following sets of processes have arrived in the process queue at the following times.
 - Assuming a FCFS scheduling algorithm, draw a GANTT chart showing their processing sequence. Calculate the average waiting time. Calculate the turnaround time.
 - Assuming a SJF scheduling algorithm which executes the shortest job present on the queue at arrival time, draw a GANTT chart showing their processing sequence. Calculate the average waiting time. Calculate the turnaround time.
 - Assume that you have a round robin scheduler with a quantum of 2, draw a GANTT chart showing their processing sequence. Calculate the average waiting time. Calculate the turnaround time.

Process	Arrival Time	Burst Duration	Priority
P1	0	10	1
P2	1	4	0
P3	3	6	2
P4	5	5	3

- The following table shows the state of physical memory and the page table. Each number listed in physical memory represents one byte of data. Answer the following questions as provided.
 - Given the size of the frame provided, how many bits are present in the offset?
 - A reference is made to logical address 34 and the result is printed out to the screen. What value will appear on the screen and / or what action will occur.
 - A reference is made to logical address 10 and the result is printed out to the screen. What value will appear on the screen and / or what action will occur.
 - Physical memory address 60 is made. What logical address was accessed?

Page Table			Physical Memory																	
Page	Frame	V / I	Frame 0	128	255	32	71	45	55	33	22	Frame 1	254	128	44	55	66	77	88	99
0	1	V	Frame 2	101	135	40	150	160	170	180	190	Frame 3	102	227	32	19	48	22	15	200
1	0	I	Frame 4	105	5	22	98	99	97	91	201	Frame 5	107	10	22	101	105	113	157	210
2	3	V	Frame 6	115	21	11	10	99	96	94	220	Frame 7	120	15	97	98	92	66	23	230
3	5	V																		
4	7	V																		
5	6	V																		
6	4	I																		
7	2	V																		

- A physical address space has a 20 bit address bus. What is the maximum number of bytes that can be present in physical memory?
- A system has a 95% hit ratio, and each memory access takes 80 nanoseconds. What is the effective access time?
- A system takes on average 10ms to service a page fault and has a memory access time of 100 nanoseconds. If the effective access time of the system is to be 250 nano seconds, what percent of memory accesses can result in a page fault?
- Explain the concept of copy on write.
- What is thrashing?
- The addresses given in the trace below are accessed in order. (Note: Address are given in Hex.) If each page has 256 bytes of memory on it,
 - What is the sequence of pages that are referenced?
 - If we use FIFO page replacement, and our virtual memory system has 3 page frames associated with it, what percentage of memory accesses result in a page fault?

0x1000, 0x1001, 0x2000, 0x0555, 0x6070, 0x2000, 0x6078, 0x0527, 0x1000, 0x2000

- What is a victim frame?