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Homework #5
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1. First the virtual address is looked up in the TLB. IF a miss the address is sent to the ATU, and then the physical address is generated. The physical address is found in the page table the data is available, if not a page fault occurs and physical memory has to be accessed. Hardware is the TLB and ATU. The software is the page table.

2. RS: 1, 2, 3, 4, 1, 2, 5, 1, 2, 3, 4, 5

LFU

1	1	1	1	1	1	1	1	1	3	3	3
	2	2	2	2	2	2	2	2	2	4	4
		3	4	4	4	5	5	5	5	5	5
PF	PF	PF	PF			PF			PF	PF	

7 PF

LRU

1	2	3	4	1	2	5	1	2	3	4	5
	1	2	3	4	1	2	5	1	2	3	3
		1	2	3	4	1	2	5	1	2	2
PF	PF	PF	PF	PF	PF	PF			PF	PF	PF

10 PF

80 % - 1 microsecond
2 % - 22 microsecond
18 % - 2 microsecond

4. For large files we can break it into pieces that would fit in the cache, support for multiple levels would have to be added

a) Contigous – The block is read sequentially one block at a time
Linked – The start is found and the links are followed until the end of the links
Index – Similar to the linked version but has an index block

b) Contigous – 6 blocks must be read to rewind to the block 4
Linked – Must find the beginning of the file and read to block 4. Could take up to 14 disk reads
Index – Only one read is required