



# CS 3530 OS

## System Simulation with Threads

### Part 3

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## Version 3: model of a computer system.

- Processor w/cache Thread
- Memory Thread
- Virtual Memory Manager Thread
- I/O-Disk Thread
- Add an implementation of Least Recently Used algorithm for page replacement using reference bits.
- Use 4 reference bits, and age your bits every 5 cycles.
- To break ties, always use the first page in order.
- Use ref bits for storing pages in the cache AND to store pages in real memory from virtual.

## Version 2 model of a computer system.

- Processor w/cache Thread
- Memory Thread
- Virtual Memory Manager Thread
- I/O-Disk Thread
- The processor/cache communicates with the VM system through registers (address-reg, data-reg) located within the CPU (using shared memory).
- The VM system communicates through shared memory to memory or the I/O-disk using:
  - Address bus
  - Data bus.

- The VM system determines whether a page is in physical or Virtual mem (on disk).
- Real mem is 10 pages in size (holds 10 characters as in part 1).
- Virtual mem holds 20 pages (each holding a character) initialized A-T. Physical mem is no longer initialized.
- Processor generates addresses from 1-20 (or 0-19).
- Page replacement algorithm – whatever is easiest for you to do now. Will expand later.

- Data Assigned: Monday April 6, 2009
- Due: Monday April 13, at Midnight
- Part of today, and April 13 used for lab work time.
  
- Turn in by email by Midnight on April 13:
  - documented java code

**End**

**Of**

**Today's**

**Lecture.**



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