CS 3468 – Homework 6

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Chapter 5

What are the three most common schemes used to store and retrieve data in cache?

- Write-through
- Write-back
- Write-around

What is the difference between a cache hit and a cache miss?

During an access to a memory location, a cache hit occurs if that location is mapped into cache; otherwise, a cache miss occurs.

Name and describe at least four cache swapping schemes.

- Optimal – the mapping which will least soon be used is replaced on cache miss.
- LRU – the least recently used mapping is replaced on cache miss.
- FIFO – the least recently added mapping is replaced on cache miss.
- NRU – a mapping not used within some time limit is replaced on cache miss.

Chapter 9

What is a kernel?

A component that contains the main functionality of the OS.

Name and describe at least two functions of a kernel.

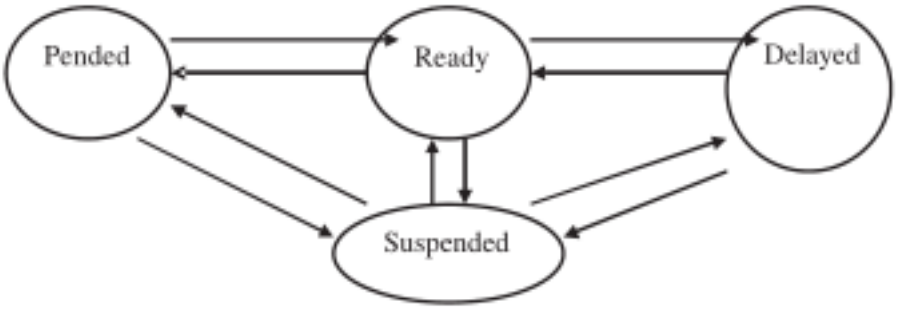
- Process Management – includes managing interrupts and error detection.
- Memory Management – includes allocation and protection of system memory.

In general terms, what states can a task be in?

A task can be ready, running, or blocked/waiting.

Give one example of an OS and its available states, including the state diagrams.

vxWorks has nine states: "STATE + I," "READY," "DELAY," "SUSPEND," "DELAY + S," "PEND," "PEND + S," "PEND + T," and "PEND + S + T:"



What is a real time operating system?

An operating system in which tasks always meet scheduling deadlines and execution times are deterministic.

Give two examples of RTOSes.

- vxWorks
- Jbed

Name and describe the most common OS intertask communication and synchronization mechanisms.

- Memory Sharing – processes communicate by reading from and writing to shared memory.
- Message Passing – processes communicate by sending messages to each other's message queues.
- Signaling – processes communicate by raising signals or interrupts in each other's execution contexts.

What is segmentation?

Segmentation is an addressing scheme which divides an address space into sets of addresses called *segments* which share accessibility information.

What are segment addresses made up of?

Segment addresses are composed of a segment base and a segment offset.

What type of information can be found in a segment?

Protection and accessibility information.