

CPE 453 Homework #1:

2.1) Describe three general methods for passing parameters to the operating system.

1. Put parameters in memory so that the CPU can access them.
2. Put parameters in registers so that they can be used in each context.
3. Registers can hold the starting address of parameters that the OS can access.

4.8) Which of the following components of program state are shared across threads in a multithread process?

- a) **Register Values** – Nope
- b) **Heap Memory** – This is shared
- c) **Global Variables** – Shared. All threads have access to the same globals.
- d) **Stack Memory** – Not shared. Thread specific.

4.10) The Google Chrome browser has a practice of opening each new website in a separate process. Would the same benefits be achieved instead Chrome had been designed to open each new website in a separate thread? Explain

If Chrome had been designed to open each website with a separate thread, Chrome would be vulnerable to have a full crash; if one thread goes down, the rest of the process must go down with it.

Additionally, threads may not make use of multiple cores in a system since they will run on one core.

4.11) Is it possible to have concurrency but not parallelism? Explain.

Yes. Parallelism describes two processes running at the same time. But if two processes are running on the same core, then the only option is concurrency since they cannot process at the same time.

5.11) Explain why interrupts are not appropriate for implementing synchronization primitives in multiprocessor systems.

If the atomic operations of mutexes and semaphores were interruptible, these primitives could not guarantee proper functionality/protection of race conditions or collisions.