The University of Alabama in Huntsville

CPE 434/534 Operating Systems

Homework 1 and 2

Due Thursday, Sept 24th

Homework 1

1. What are the three main functional areas of an operating system. In addition to listing them explain what they are.
2. Families of computer processors were introduced by IBM in the IBM 360. We still have processor families such as the X86, ARM, TI320Cxx, etc. Has the availability of ubiquitous operating systems like linux completely made the existence of processor families irrelevant. Explain your answer.
3. Text 1-14
4. Text 1-22
5. Text 1-24

Homework 2

1. Part of an operating system us usually written in the assembly language of the processor. Why? Explain your answer.
2. If a process creates three threads and then forks.
   1. A- how many threads now exist
   2. What do these threads share and what do they not share
   3. How many user text heap and stacks now exist
   4. How many kernel text heap and stacks now exist
3. We discussed user level and kernel level threads. Describe and explain one advantage and one disadvantage of each (a total of 4 answers)
4. We have discussed spinwait, semaphores, pipes, and shared memory as a mechanism for synchronizing processes and threads. Provide one example problem where you would use each of these mechanisms.
5. Write a very small program that uses 4 threads and global variables. Print out the addresses of a global variable in each thread that is and is not declared with the \_\_thread type.
6. Text 2-21
7. Text 2-45