Operating System

HW#3, Interprocess communication, mutual exclusion, producer-consumer problem

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Problem set A

1. Short questions:
   - 1.1 Which of the following components of program state are shared across threads in a multithreaded process?
     Register values, Heap memory, Global variables, Stack memory
   - 1.2 What are the advantages of threads compared to process?
   - 1.3 What is difference between synchronous threading and asynchronous threading?
   - 1.4 Explain the difference between concurrency and parallelism?
   - 1.5 Give examples of data parallelism and task parallelisms.
   - 1.6 What is atomicity of an instruction?
   - 1.7 What is mutual exclusion?
   - 1.8 What is difference between cooperating and independent processes?
   - 1.9 What three criteria a critical section code must satisfy?

Problem set B

1. What are the challenges of programming multicore systems?
2. What are the 4 parameters of following thread create command:

$$pthread\_create(\ ,\ ,\ ,\ );$$

3. What are mechanism for interprocess communication? Explain each in brief.
4. What is producer consumer problem? Give a small codes, for producer – consumer problem and explain its working.
5. Give few examples of producer consumer problems in the operating system.
6. What is critical section ?
7. What is basic idea of implementing a critical section?