Midterm Examination
CS 111
MS Online Program
Spring 2013

Answer all questions. All questions are equally weighted. This is a closed book, closed notes test. You may not use electronic equipment to take the test.

1. What is the difference between partitionable resources, sharable resources, and serially sharable resources? Give an example of each kind of resource that might be found in a computer system.

2. In a typical system, if there is a critical resource, it is difficult to maintain its utilization at a high level. Why? How would this apply to achieving high utilization in using a computer's single processor?

3. What is meant by separating policy and mechanism in the OS context? Why is it a good idea? Give an example of somewhere in an operating system where such separation provides benefits, and describe why it provides such benefits.

4. What is an interpreter's repertoire? For a process instance of the interpreter abstraction (for example, a compiler process), what determines the repertoire of the particular process?

5. Traps can occur in either user mode or supervisor mode. What is similar about traps that occur in these two modes? What is different?

6. If you wish to go from providing soft modularity to hard modularity on a single machine, what must the operating system ensure happens? Describe three resources on a typical computer where the operating system must do something to ensure hard modularity, and briefly describe what sort of thing must be done.

7. What is the relationship between interrupts and receive livelock?

8. In the scheduling context, what is starvation? Why does it happen? What can be done to avoid it?

9. Generally describe the sleep/wakeup race. What might happen as a result of such a race? How can it be prevented?

10. Why are deadlocks impossible if you prohibit incremental allocations of resources?