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IT 2300 Operating Systems

Mid-Term Exam 2

Part 2 of 2

This exam is CLOSED BOOK, CLOSED NOTES, CLOSED HOMEWORK

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Chapters 1 - 8

Complete on this Microsoft Word® document.

1. Discuss Deadlocks, including what they are, what causes them, and how they can be avoided. (20 points)

Deadlock is characterized by multiple failures, and sometimes result in an error message that would say “the application is not responding. The program may respond again if you wait. Do you want to end this process?”. It is also a system wide tangle of resource request that begins when two or more jobs are put on hold each waiting for a vital resource to become available. There are many examples of deadlock. These include file requests, databases, dedicated device allocation, multiple device allocation, spooling, network, and disk sharing. Deadlock on file requests the job request and it holds files for execution duration. An example of this is when program 1 has access to file 1 and requires file 2 then program 2 has access to file 2 but also needs access to file 1. Deadlock remains until one program is closed or one program is forcibly removed, and the file is released. Deadlocks in databases this guarantees data integrity with three different locking level. These locking levels are for the entire database for the duration of request, subsection of database, and individual record until request is completed. To prevent a deadlock the operating system must eliminate one of the four necessary conditions.

1. Discuss Livelocks, including what they are, what causes them, and how they can be avoided. (20 points)

Livelock is if two people on a landing try to pass each other but cannot do so because as one steps to the right and the other steps to the left, and they continue moving in sync back and forth but neither ever moves forward. Livelock while disk sharing. Example of this when two processes each waiting for the input and output request. The deadlock sequence arm moves back and forth between tracks 20 and 310 attempting to fulfill the two competing commands. The two competing commands sending conflicting commands which results on livelock. To prevent this the systems needs to not send multiple conflicting commands at the same time.

1. Discuss Process Starvation, including what it is, what causes it, and how it can be avoided. (20 points)

Process starvation is the result of conservative allocation of resources in which a single job is prevented from completing in execution because it is waiting for resources that never become available. An example that the power points and chapter use is the Dining Philosophers Problem which was created by Dijkstra in 1968. How to avoid starvation is to implement an algorithm tracking how long each job has been waiting for resources. Starvation is detected and block from new jobs until the starving jobs are satisfied. The dining philosopher goes like this. before the meal begins. Each philosopher is indicated by a circled P and each fork resource is. Each philosopher must have both forks to begin eating, the one on the right and the one on the left. Unless the resources, the forks, are allocated fairly, some philosophers may starve.

