Mutex (short for mutual exclusion) is a synchronization mechanism that is used to ensure that only one process or thread can access a shared resource or critical section of code at any given time.

The purpose of using Mutex is to prevent race conditions, which occur when two or more threads or processes try to access and manipulate the same data at the same time, leading to inconsistent or incorrect results.

A Mutex works by allowing only one thread or process to acquire ownership of the lock on a shared resource at any given time. When a thread or process wants to access the shared resource, it must first acquire the lock by requesting ownership of the Mutex. If the Mutex is currently owned by another thread or process, the requesting thread will be blocked until the Mutex becomes available.

Once a thread or process has acquired the lock on the Mutex, it can safely access the shared resource or critical section of code. When it is finished, it releases the lock, allowing other threads or processes to acquire it and access the shared resource in turn.

Overall, Mutexes are an important tool for ensuring the safe and efficient sharing of resources in operating systems, and they are widely used in both multi-threaded and multi-process environments.

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68. What is an Operating System? Write down its desirable characteristics ?
69. Define a deadlock ? Write down the conditions responsible for deadlock? How can we recover from deadlock ?
70. What are the various services provided by Operating system ?
71. What do you mean by PCB? Where is it used? What are its contents? Explain.
72. What is Binary and Counting semaphores ?
73. What is File? What are the different File attribute and operations?
74. What are System call? Explain briefly about various types of system call provided by an Operating System?
75. Describe necessary conditions for deadlocks situation to arise.
76. What are points to be consider in file system design? Explain linked list allocation in detail?
77. Write a Semaphore solution for dining Philosopher’s problem?
78. Consider the following page reference string:1,2,3,4,5,3,4,1,2,7,8,7,8,9,7,8,9,5,4,5.

How many page faults would occur for the following replacement algorithm, assuming four frames:a) FIFOb) LRU

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