Semaphores are useful in the multiple producer-consumer problem because they may be initialized to positive integers greater than one, and thus can be used to keep track of the number of resources still available. Mutexes, on the other hand, require additional variables to keep track of the resources still available. Using a binary semaphore ensures that only one process enters the critical region at any given time, however it is possible for a thread other than the original thread that locked the critical region to unlock the critical region. If one is not careful, programs implemented using semaphores may be slightly more prone to errors. An equivalent implementation with mutexes would eliminate this potential problem since they can only hold binary values. An advantage of using conditional variables is that they are intuitive for signaling a producer or consumer to block or be awakened at the appropriate time. Additionally, condition variables avoid busy waiting performs atomic blocking and waiting.