

1. The asymmetric solution works by forcing coordination between the philosophers. Every other philosopher will first take the left chopstick, and then the right. The philosophers in between will first take the right chopstick, and then the left. This ensures that for every round, at least two philosophers will be able to acquire both chopsticks. For this reason, assuming the philosophers eat for a finite amount of time, it is not possible for deadlock to happen.
2. It is not guaranteed that starvation will not happen, because it is possible for the checking to be aligned in time such that the waiting philosophers always wake up when the chopsticks are still in use. For example, if the eating time is very regular, and happens to synchronize with the waking time of the waiting philosophers, then the pattern will repeat itself and the waiting philosopher can starve.
3. The waiter's solution represents a simple mutex and signal solution. A mutex called waiter protects access to any chopsticks. When a philosopher gets the waiter, it checks if it can acquire both chopsticks. If so, it gets them, releases the waiter, and eats. Otherwise, it waits until a signal condition is triggered by whichever philosopher is using the chopsticks. This enforces protection of the finite resources because only one philosopher can acquire chopsticks at a time; whichever philosopher has the waiter lock is able to get both chopsticks, or wait until they become available. The other philosophers can only release their chopsticks, and since they only take them all at once, there is never an opportunity for a philosopher to hold and wait. Thus deadlock is impossible.
4. Starvation is a possibility for the waiter solution if every other philosopher synchronizes. Depending on how the signals are received and how the instructions are interleaved on waking, it is possible that one or more threads always wake up first, and that one philosopher gets starved for that round. This does not seem very likely to happen, but it is a possibility.
5. This situation could arise if the threads were interleaved such that the signal was sent, but then another philosopher waiting for the same chopstick woke up first and acquired the lock. This is exactly the kind of situation a monitor is intended to solve. A monitor enforces the order of waiting and who gets the lock on wake, so that a philosopher will not be starved.