

1. The asymmetric solution works by having the philosophers alternate the order that they pick up the chopsticks. The philosophers are placed in a queue. The philosophers in even indices will pick up the chopsticks from left to right. On the other hand, the philosophers in odd indices will pick up the chopsticks from right to left. This guarantees that the philosophers never enter a deadlock state because when an even philosopher picks up the left chopstick, the odd philosopher picks up the right chopstick. This means that there is still one chopstick available between the two philosophers.
2. The asymmetric solution does not guarantee that it will prevent starvation. This occurs when philosophers start to use and put down the chopsticks at the same time. Concurrently, two philosophers may then get put at a disadvantage and never get the chopstick, thus starving.
3. The waiter solution works by using a mutex lock on the waiter to manage when and how the philosophers get the chopsticks. When a philosopher gets the waiter, the waiter checks if the philosopher can get both chopsticks. If this is true, then the philosopher gets the chopsticks, releases the waiter, and eats. If the philosopher cannot get the chopsticks, the philosopher will wait until there is a signal triggered by the philosopher using the chopsticks. This solution guarantees that the philosophers never enter a deadlock state because only one philosopher can have both chopsticks at a time. Also, the philosopher with the waiter lock can only get both chopsticks or wait until they are free. Therefore, there is never an opportunity for a philosopher to hold the chopsticks and wait.
4. The waiter solution does not prevent starvation. Starvation occurs in a similar manner as the asymmetric solution. Philosophers may receive signals in a repeated way that certain philosophers always wake up first, and the other philosophers starve.
5. This situation could occur if Phil sees that the chopsticks are not free if another philosopher is also waiting and gets the chopsticks before Phil does. Consequently, Phil would find that both chopsticks are not free when he checks.