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EECS678 Lab7 Report
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1. Describe the asymmetric solution. How does the asymmetric solution guarantee the philosophers never enter a deadlocked state?
Asymmetric solution is to have the even numbered philosophers pick up in left-right order, while odd-numbered pick up in right-left order. To avoid philosophers entering a deadlocked state,the asymmetric solution offers a good way. Since each philosopher has picked up the left fork before ant pick up the right, the deadlock will always exist. When we use an asymmetric solution, odd philosophers pick up left chopsticks before they pick right chopsticls. Even philosophers pick up right before they pick up left, the problem still can be solved. So the asymmetric solution can solve the deadlock problem of philosophers easily.

2.Does the asymmetric solution prevent starvation? Explain.
Sometimes. If the eating periods vary randomly when a philosopher tries to pick up their chopstics vary randomly, no philosopher should starve. But if it is not randm, the starvation may not be prevented. For example, if a philosopher is waiting for a chopstick when another philosopher with holdinf the chopstick is eating. Even though another philosopher can put the chopstick down, we can not sure that the first philosopher who are waiting for a chopstick can get the chopstick from another philosopher who want to keep eating. In other words, before thread is rescheduled. So whether the astmmetric solution can prevent starvation depends on the overall implementation of thread system.

3. Describe the waiter's solution. How does the waiter's solution guarantee the philosophers never enter a deadlocked state?
The waiter's solution can let all philosophers speak with a waiter so that the waiter could konw all information of the entire dinning table and decide who get chopsticks and when. Because philosopher cannot speak with each other, the waiter's solution solves this problem and as a connection between every philosopher (thread). The waiters could through communicating with every philosopher to solve the deadlock state by use any conditions for deadlock, such as mutual exclusion, no preemption, hold and wait or circular wait. So the waiter's solution can guarantee the philosophers never enter a deadlocked state.

4.Does the waiter's solution prevent starvation? Explain.
No.The waiter's solution cannot prevent starvation. If a philosopher is awakened and both

chopsticks are not free, it must wait again. In other words, it depends on the philosophers behaving. If a philosopher picks up his chopsticks without putting them down, other philosophers who sitting besides himm will have starvation. For example, if A and B are eating at the same time and they do not put down their chopsticks. So another person C who sit in the middle of A and B always cannot get both of two chopsticks. So the waiters solution cannot prevent this condition.

5. Consider a scenario under a condition variable based solution where a philosopher determines at the time it frees its chopsticks that both chopsticks of another philosopher (Phil) it shares with are free, and so it sends the (possibly) waiting Phil a signal. Under what circumstances may Phil find that both of its chopsticks are NOT free when it checks?

In the condition of starvation, Pholosphy may find that both of its chopsticks are not free when it checks. Because the third philosopher are always waiting for the first and second philosophers besides of him.