CSE 4502 [Operating Systems Lab]
Lab # 06

The Dining Philosopher Problem – The Dining Philosopher Problem states that K philosophers seated around a circular table with one chopstick between each pair of philosophers. There is one chopstick between each philosopher. A philosopher may eat if he can pick up the two chopsticks adjacent to him. One chopstick may be picked up by any one of its adjacent followers but not both.

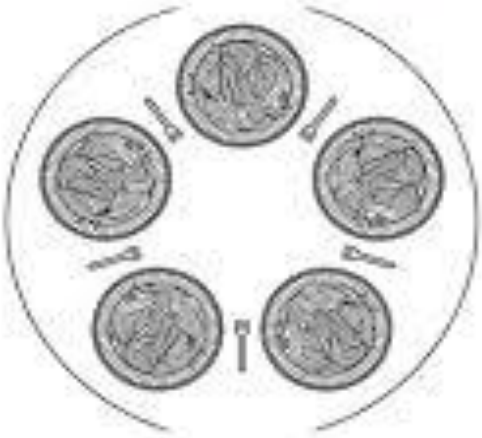

Figure: The Dining Philosopher Problem

The solution imposes the restriction that a philosopher may pick up his chopsticks only if both of them are available.

There are three states of philosopher: **THINKING, HUNGRY and EATING**

THINKING – When philosopher doesn't want to gain access to either fork.
HUNGRY – When philosopher wants to enter the critical section.
EATING – When philosopher has got both the forks, i.e., he has entered the section.

At each time slot: A philosopher can be

a. Thinking
b. Hungry
c. Eating
d. Picking up chopsticks
e. Removing chopsticks

1. Initially, all the philosophers are at thinking state.
2. A philosopher who wants to enter critical section, changes his state to Hungry.
3. If a hungry philosopher can pick up both available chopsticks, he changes his state to Eating.
4. After eating a philosopher change his state to thinking by removing the chopsticks.

Deadlock handling:

1 Allow a philosopher to pick up the forks only if both are available (picking must be done in a critical section.)
2 Allow at most 4 philosophers to be sitting simultaneously at the table.
3 Use an asymmetric solution -- an odd-numbered philosopher picks up first the left chopstick and then the right chopstick. Even-numbered philosopher picks up first the right chopstick and then the left chopstick.