

Name: Shubham Chemate

Roll Number: 31118

Subject: LP-1

Assignment Name: Write a program to solve classical problem of synchronization using mutex and semaphore

Code:

```
import java.util.Random;
import java.util.concurrent.Semaphore;

public class DiningPhilo {
    private static final int NUM_PHILOSOPHERS = 4;

    public static void main(String[] args) {
        Semaphore[] chopsticks = new Semaphore[NUM_PHILOSOPHERS];

        for (int i = 0; i < NUM_PHILOSOPHERS; i++)
            chopsticks[i] = new Semaphore(1);

        Philosopher[] philosophers = new Philosopher[NUM_PHILOSOPHERS];
        for (int i = 0; i < NUM_PHILOSOPHERS; i++) {
            chopsticks[(i + 1) % NUM_PHILOSOPHERS];
            philosophers[i] = new Philosopher(i, chopsticks[i],
            new Thread(philosophers[i]).start());
        }
    }

    class Philosopher implements Runnable {
        private Random numGenerator = new Random();
        private int id;
        private Semaphore leftChopstick;
        private Semaphore rightChopstick;

        public Philosopher(int id, Semaphore leftChopstick, Semaphore
        rightChopstick) {
            this.id = id;
            this.leftChopstick = leftChopstick;
            this.rightChopstick = rightChopstick;
        }

        public void run() {
            try {
                while (true) {
                    think();
                    pickUpLeftChopstick();
                    pickUpRightChopstick();
                    eat();
                    putDownChopsticks();
                }
            } catch (InterruptedException e) {
```

```

        System.out.println("Philosopher " + id + " was
interrupted.\n");
    }

    private void think() throws InterruptedException {
        System.out.println("Philosopher " + id + " is thinking.\n");
        System.out.flush();
        Thread.sleep(numGenerator.nextInt(10));
    }

    private void pickUpLeftChopstick() throws InterruptedException {
        if (leftChopstick.availablePermits() == 0) {
            System.out.println("Philosopher " + id + " is WAITING for left
chopstick");
        }
        leftChopstick.acquire();
        System.out.println("Philosopher " + id + " is HOLDING left
chopstick.\n");
        System.out.flush();
    }

    private void pickUpRightChopstick() throws InterruptedException {
        if (rightChopstick.availablePermits() == 0)
            System.out.println("Philosopher " + id + " is WAITING for
right chopstick");

        rightChopstick.acquire();
        System.out.println("Philosopher " + id + " is HOLDING right
chopstick.\n");
        System.out.flush();
    }

    private void eat() throws InterruptedException {
        System.out.println("Philosopher " + id + " is eating.\n");
        System.out.flush();
        Thread.sleep(numGenerator.nextInt(10));
    }

    private void putDownChopsticks() {
        leftChopstick.release();
        rightChopstick.release();
    }
}

```

Output:

Philosopher 0 is thinking.

Philosopher 3 is thinking.

Philosopher 2 is thinking.

Philosopher 1 is thinking.

Philosopher 3 is HOLDING left chopstick.

Philosopher 3 is HOLDING right chopstick.

Philosopher 3 is eating.

Philosopher 0 is WAITING for left chopstick
Philosopher 1 is HOLDING left chopstick.

Philosopher 1 is HOLDING right chopstick.

Philosopher 1 is eating.

Philosopher 3 is thinking.

Philosopher 0 is HOLDING left chopstick.

Philosopher 0 is WAITING for right chopstick
Philosopher 1 is thinking.

Philosopher 2 is HOLDING left chopstick.

Philosopher 2 is HOLDING right chopstick.

Philosopher 2 is eating.

Philosopher 0 is HOLDING right chopstick.

Philosopher 0 is eating.

Philosopher 3 is WAITING for left chopstick
Philosopher 2 is thinking.

Philosopher 3 is HOLDING left chopstick.

Philosopher 3 is WAITING for right chopstick
Philosopher 2 is HOLDING left chopstick.

Philosopher 2 is WAITING for right chopstick
Philosopher 1 is WAITING for left chopstick
Philosopher 0 is thinking.

Philosopher 1 is HOLDING left chopstick.

Philosopher 3 is HOLDING right chopstick.

Philosopher 1 is WAITING for right chopstick
Philosopher 3 is eating.

Philosopher 3 is thinking.

Philosopher 2 is HOLDING right chopstick.

Philosopher 2 is eating.

Philosopher 0 is HOLDING left chopstick.

Philosopher 0 is WAITING for right chopstick
Philosopher 2 is thinking.

Philosopher 1 is HOLDING right chopstick.

Philosopher 1 is eating.

Philosopher 3 is HOLDING left chopstick.

Philosopher 3 is WAITING for right chopstick
Philosopher 1 is thinking.

Philosopher 0 is HOLDING right chopstick.

Philosopher 0 is eating.

Philosopher 2 is HOLDING left chopstick.

Philosopher 2 is WAITING for right chopstick
Philosopher 1 is WAITING for left chopstick
Philosopher 0 is thinking.

Philosopher 3 is HOLDING right chopstick.

Philosopher 3 is eating.

Philosopher 1 is HOLDING left chopstick.

Philosopher 1 is WAITING for right chopstick
Philosopher 3 is thinking.

Philosopher 2 is HOLDING right chopstick.

Philosopher 2 is eating.

Philosopher 2 is thinking.

Philosopher 1 is HOLDING right chopstick.

Philosopher 1 is eating.

Philosopher 0 is HOLDING left chopstick.

Philosopher 0 is WAITING for right chopstick
Philosopher 3 is HOLDING left chopstick.

Philosopher 3 is WAITING for right chopstick
Philosopher 2 is WAITING for left chopstick
Philosopher 1 is thinking.

Philosopher 0 is HOLDING right chopstick.

Philosopher 1 is WAITING for left chopstick
Philosopher 2 is HOLDING left chopstick.

Philosopher 0 is eating.

Philosopher 2 is WAITING for right chopstick
Philosopher 0 is thinking.

Philosopher 3 is HOLDING right chopstick.

Philosopher 3 is eating.

Philosopher 1 is HOLDING left chopstick.

Philosopher 1 is WAITING for right chopstick
Philosopher 0 is WAITING for left chopstick
Philosopher 2 is HOLDING right chopstick.

Philosopher 2 is eating.

Philosopher 3 is thinking.

Philosopher 0 is HOLDING left chopstick.

Philosopher 0 is WAITING for right chopstick
Philosopher 3 is WAITING for left chopstick
Philosopher 2 is thinking.

Philosopher 3 is HOLDING left chopstick.

Philosopher 3 is WAITING for right chopstick
Philosopher 1 is HOLDING right chopstick.

Philosopher 1 is eating.

Philosopher 1 is thinking.

Philosopher 0 is HOLDING right chopstick.

Philosopher 0 is eating.

Philosopher 1 is WAITING for left chopstick
Philosopher 2 is HOLDING left chopstick.

Philosopher 2 is WAITING for right chopstick
Philosopher 0 is thinking.

Philosopher 3 is HOLDING right chopstick.

Philosopher 1 is HOLDING left chopstick.

Philosopher 1 is WAITING for right chopstick
Philosopher 3 is eating.

Philosopher 0 is WAITING for left chopstick
Philosopher 3 is thinking.

Philosopher 2 is HOLDING right chopstick.

Philosopher 0 is HOLDING left chopstick.

Philosopher 0 is WAITING for right chopstick
Philosopher 2 is eating.

Philosopher 3 is WAITING for left chopstick
Philosopher 2 is thinking.

Philosopher 1 is HOLDING right chopstick.

Philosopher 3 is HOLDING left chopstick.

Philosopher 1 is eating.

Philosopher 3 is WAITING for right chopstick
Philosopher 1 is thinking.

Philosopher 0 is HOLDING right chopstick.

Philosopher 0 is eating.

Philosopher 2 is WAITING for left chopstick
Philosopher 2 is HOLDING left chopstick.

Philosopher 2 is WAITING for right chopstick
Philosopher 0 is thinking.

Philosopher 3 is HOLDING right chopstick.

Philosopher 3 is eating.

Philosopher 3 is thinking.

Philosopher 2 is HOLDING right chopstick.

Philosopher 2 is eating.

Philosopher 1 is HOLDING left chopstick.

Philosopher 1 is HOLDING right chopstick.

Philosopher 2 is thinking.

Philosopher 2 is WAITING for left chopstick
Philosopher 1 is eating.

Philosopher 3 is HOLDING left chopstick.

Philosopher 3 is HOLDING right chopstick.

Philosopher 3 is eating.

Philosopher 0 is WAITING for left chopstick
Philosopher 1 is thinking.

Philosopher 2 is HOLDING left chopstick.

Philosopher 2 is WAITING for right chopstick
Philosopher 3 is thinking.

Philosopher 2 is HOLDING right chopstick.

Philosopher 2 is eating.

Philosopher 0 is HOLDING left chopstick.

Philosopher 0 is HOLDING right chopstick.

Philosopher 0 is eating.

Philosopher 2 is thinking.

Philosopher 3 is HOLDING left chopstick.

Philosopher 3 is WAITING for right chopstick
Philosopher 1 is WAITING for left chopstick
Philosopher 0 is thinking.

Philosopher 3 is HOLDING right chopstick.

Philosopher 3 is eating.

Philosopher 1 is HOLDING left chopstick.

Philosopher 1 is HOLDING right chopstick.

Philosopher 1 is eating.

Philosopher 3 is thinking.

Philosopher 2 is WAITING for left chopstick
Philosopher 3 is HOLDING left chopstick.

Philosopher 3 is HOLDING right chopstick.

Philosopher 3 is eating.

Philosopher 0 is WAITING for left chopstick
Philosopher 1 is thinking.

Philosopher 2 is HOLDING left chopstick.

Philosopher 2 is WAITING for right chopstick
Philosopher 3 is thinking.

Philosopher 0 is HOLDING left chopstick.

Philosopher 0 is HOLDING right chopstick.

Philosopher 0 is eating.

Philosopher 2 is HOLDING right chopstick.

Philosopher 2 is eating.

Philosopher 1 is WAITING for left chopstick
Philosopher 2 is thinking.

Philosopher 3 is HOLDING left chopstick.

Philosopher 3 is WAITING for right chopstick
Philosopher 0 is thinking.

Philosopher 1 is HOLDING left chopstick.

Philosopher 1 is HOLDING right chopstick.

Philosopher 1 is eating.

Philosopher 3 is HOLDING right chopstick.

Philosopher 0 is WAITING for left chopstick
Philosopher 3 is eating.

Philosopher 3 is thinking.

Philosopher 0 is HOLDING left chopstick.

Philosopher 0 is WAITING for right chopstick
Philosopher 1 is thinking.

Philosopher 0 is HOLDING right chopstick.

Philosopher 0 is eating.

Philosopher 2 is HOLDING left chopstick.

Philosopher 2 is HOLDING right chopstick.

Philosopher 2 is eating.

Philosopher 3 is WAITING for left chopstick
Philosopher 2 is thinking.

Philosopher 3 is HOLDING left chopstick.

Philosopher 3 is WAITING for right chopstick
Philosopher 1 is WAITING for left chopstick
Philosopher 0 is thinking.

Philosopher 3 is HOLDING right chopstick.

Philosopher 3 is eating.

Philosopher 1 is HOLDING left chopstick.

Philosopher 1 is HOLDING right chopstick.

Philosopher 1 is eating.

Philosopher 2 is WAITING for left chopstick
Philosopher 1 is thinking.

Philosopher 2 is HOLDING left chopstick.

Philosopher 2 is WAITING for right chopstick
Philosopher 3 is thinking.

Philosopher 2 is HOLDING right chopstick.

Philosopher 2 is eating.

Philosopher 0 is HOLDING left chopstick.

Philosopher 0 is HOLDING right chopstick.

Philosopher 0 is eating.

Philosopher 3 is WAITING for left chopstick

Philosopher 0 is thinking.

Philosopher 0 is HOLDING left chopstick.

Philosopher 0 is HOLDING right chopstick.

Philosopher 0 is eating.

Philosopher 2 is thinking.

Philosopher 3 is HOLDING left chopstick.

Philosopher 3 is WAITING for right chopstick
Philosopher 1 is WAITING for left chopstick
Philosopher 0 is thinking.

Philosopher 1 is HOLDING left chopstick.

Philosopher 3 is HOLDING right chopstick.

Philosopher 3 is eating.

Philosopher 1 is HOLDING right chopstick.

Philosopher 1 is eating.

Philosopher 0 is WAITING for left chopstick
Philosopher 2 is WAITING for left chopstick
Philosopher 1 is thinking.

Philosopher 2 is HOLDING left chopstick.

Philosopher 2 is WAITING for right chopstick
Philosopher 3 is thinking.

Philosopher 2 is HOLDING right chopstick.

Philosopher 2 is eating.

Philosopher 2 is thinking.

Philosopher 0 is HOLDING left chopstick.

Philosopher 0 is HOLDING right chopstick.

Philosopher 0 is eating.

Philosopher 0 is thinking.

Philosopher 2 is HOLDING left chopstick.

Philosopher 2 is HOLDING right chopstick.

Philosopher 2 is eating.

Philosopher 2 is thinking.

Philosopher 1 is HOLDING left chopstick.

Philosopher 1 is HOLDING right chopstick.
Philosopher 1 is eating.
Philosopher 3 is HOLDING left chopstick.
Philosopher 3 is HOLDING right chopstick.
Philosopher 3 is eating.
Philosopher 3 is thinking.
Philosopher 2 is WAITING for left chopstick
Philosopher 3 is HOLDING left chopstick.
Philosopher 3 is HOLDING right chopstick.
Philosopher 3 is eating.
Philosopher 1 is thinking.
Philosopher 2 is HOLDING left chopstick.
Philosopher 2 is WAITING for right chopstick
Philosopher 0 is WAITING for left chopstick
Philosopher 1 is HOLDING left chopstick.
Philosopher 1 is WAITING for right chopstick
Philosopher 3 is thinking.
Philosopher 2 is HOLDING right chopstick.
Philosopher 2 is eating.
Philosopher 0 is HOLDING left chopstick.
Philosopher 0 is WAITING for right chopstick
Philosopher 3 is WAITING for left chopstick
Philosopher 3 is HOLDING left chopstick.
Philosopher 3 is WAITING for right chopstick
Philosopher 1 is HOLDING right chopstick.
Philosopher 1 is eating.
Philosopher 2 is thinking.
Philosopher 2 is WAITING for left chopstick
Philosopher 1 is thinking.
Philosopher 0 is HOLDING right chopstick.
Philosopher 0 is eating.
Philosopher 2 is HOLDING left chopstick.
Philosopher 2 is WAITING for right chopstick
Philosopher 1 is WAITING for left chopstick
Philosopher 0 is thinking.

Philosopher 3 is HOLDING right chopstick.

Philosopher 3 is eating.

Philosopher 1 is HOLDING left chopstick.

Philosopher 1 is WAITING for right chopstick
Philosopher 3 is thinking.

Philosopher 2 is HOLDING right chopstick.

Philosopher 2 is eating.

Philosopher 0 is HOLDING left chopstick.

Philosopher 0 is WAITING for right chopstick
Philosopher 2 is thinking.

Philosopher 1 is HOLDING right chopstick.

Philosopher 1 is eating.

Philosopher 3 is WAITING for left chopstick
Philosopher 3 is HOLDING left chopstick.

Philosopher 3 is WAITING for right chopstick
Philosopher 1 is thinking.

Philosopher 0 is HOLDING right chopstick.

Philosopher 0 is eating.

Philosopher 0 is thinking.

Philosopher 3 is HOLDING right chopstick.

Philosopher 3 is eating.

Philosopher 1 is HOLDING left chopstick.

Philosopher 1 is WAITING for right chopstick
Philosopher 2 is HOLDING left chopstick.

Philosopher 2 is WAITING for right chopstick
Philosopher 0 is WAITING for left chopstick
Philosopher 3 is thinking.

Philosopher 3 is WAITING for left chopstick
Philosopher 2 is HOLDING right chopstick.

Philosopher 2 is eating.

Philosopher 0 is HOLDING left chopstick.

Philosopher 0 is WAITING for right chopstick
Philosopher 2 is thinking.

Philosopher 1 is HOLDING right chopstick.

Philosopher 1 is eating.

Philosopher 1 is thinking.

Philosopher 3 is HOLDING left chopstick.

Philosopher 3 is WAITING for right chopstick
Philosopher 0 is HOLDING right chopstick.

Philosopher 0 is eating.

Philosopher 0 is thinking.

Philosopher 3 is HOLDING right chopstick.

Philosopher 3 is eating.

Philosopher 3 is thinking.

Philosopher 0 is HOLDING left chopstick.

Philosopher 0 is HOLDING right chopstick.

Philosopher 0 is eating.

Philosopher 2 is HOLDING left chopstick.

Philosopher 2 is HOLDING right chopstick.

Philosopher 2 is eating.

Philosopher 1 is WAITING for left chopstick
Philosopher 2 is thinking.

Philosopher 2 is HOLDING left chopstick.

Philosopher 3 is WAITING for left chopstick
Philosopher 2 is HOLDING right chopstick.

Philosopher 2 is eating.

Philosopher 0 is thinking.

Philosopher 1 is HOLDING left chopstick.

Philosopher 1 is WAITING for right chopstick
Philosopher 2 is thinking.

Philosopher 3 is HOLDING left chopstick.

Philosopher 1 is HOLDING right chopstick.

Philosopher 1 is eating.

Philosopher 3 is HOLDING right chopstick.

Philosopher 3 is eating.

Philosopher 1 is thinking.

Philosopher 1 is HOLDING left chopstick.

Philosopher 1 is HOLDING right chopstick.

Philosopher 1 is eating.

Philosopher 0 is WAITING for left chopstick
Philosopher 2 is WAITING for left chopstick
Philosopher 3 is thinking.

Philosopher 0 is HOLDING left chopstick.

Philosopher 0 is WAITING for right chopstick
Philosopher 1 is thinking.

Philosopher 0 is HOLDING right chopstick.

Philosopher 0 is eating.

Philosopher 2 is HOLDING left chopstick.

Philosopher 2 is HOLDING right chopstick.

Philosopher 2 is eating.

Philosopher 3 is WAITING for left chopstick
Philosopher 0 is thinking.

Philosopher 0 is HOLDING left chopstick.

Philosopher 3 is HOLDING left chopstick.

Philosopher 2 is thinking.

Philosopher 3 is WAITING for right chopstick
Philosopher 0 is HOLDING right chopstick.

Philosopher 0 is eating.

Philosopher 0 is thinking.

Philosopher 3 is HOLDING right chopstick.

Philosopher 3 is eating.

Philosopher 1 is HOLDING left chopstick.

Philosopher 1 is HOLDING right chopstick.

Philosopher 1 is eating.

Philosopher 0 is WAITING for left chopstick
Philosopher 1 is thinking.

Philosopher 2 is HOLDING left chopstick.

Philosopher 2 is WAITING for right chopstick

Philosopher 3 is thinking.

Philosopher 2 is HOLDING right chopstick.

Philosopher 2 is eating.

Philosopher 0 is HOLDING left chopstick.

Philosopher 0 is HOLDING right chopstick.

Philosopher 0 is eating.

Philosopher 1 is WAITING for left chopstick
Philosopher 2 is thinking.

Philosopher 2 is HOLDING left chopstick.

Philosopher 2 is HOLDING right chopstick.

Philosopher 2 is eating.

Philosopher 3 is WAITING for left chopstick
Philosopher 0 is thinking.

Philosopher 1 is HOLDING left chopstick.

Philosopher 1 is WAITING for right chopstick
Philosopher 0 is HOLDING left chopstick.

Philosopher 0 is WAITING for right chopstick
Philosopher 2 is thinking.

Philosopher 3 is HOLDING left chopstick.

Philosopher 3 is WAITING for right chopstick
Philosopher 1 is HOLDING right chopstick.

Philosopher 1 is eating.

Philosopher 2 is WAITING for left chopstick
Philosopher 1 is thinking.

Philosopher 2 is HOLDING left chopstick.

Philosopher 0 is HOLDING right chopstick.

Philosopher 0 is eating.

Philosopher 0 is thinking.

Philosopher 2 is WAITING for right chopstick
Philosopher 3 is HOLDING right chopstick.

Philosopher 3 is eating.

Philosopher 3 is thinking.

Philosopher 2 is HOLDING right chopstick.

Philosopher 2 is eating.

Philosopher 0 is HOLDING left chopstick.

Philosopher 0 is HOLDING right chopstick.

Philosopher 0 is eating.

Philosopher 3 is WAITING for left chopstick
Philosopher 1 is WAITING for left chopstick
Philosopher 2 is thinking.

Philosopher 1 is HOLDING left chopstick.

Philosopher 1 is HOLDING right chopstick.

Philosopher 1 is eating.

Philosopher 0 is thinking.

Philosopher 3 is HOLDING left chopstick.

Philosopher 3 is HOLDING right chopstick.

Philosopher 3 is eating.

Philosopher 0 is WAITING for left chopstick
Philosopher 3 is thinking.

Philosopher 0 is HOLDING left chopstick.

Philosopher 0 is WAITING for right chopstick
Philosopher 1 is thinking.

Philosopher 0 is HOLDING right chopstick.

Philosopher 0 is eating.

Philosopher 2 is HOLDING left chopstick.

Philosopher 2 is HOLDING right chopstick.

Philosopher 2 is eating.

Philosopher 0 is thinking.

Philosopher 3 is WAITING for left chopstick
Philosopher 1 is HOLDING left chopstick.

Philosopher 1 is WAITING for right chopstick
Philosopher 0 is HOLDING left chopstick.

Philosopher 0 is WAITING for right chopstick
Philosopher 2 is thinking.

Philosopher 1 is HOLDING right chopstick.

Philosopher 1 is eating.

Philosopher 3 is HOLDING left chopstick.

Philosopher 3 is WAITING for right chopstick
Philosopher 2 is WAITING for left chopstick
Philosopher 2 is HOLDING left chopstick.

Philosopher 2 is WAITING for right chopstick
Philosopher 1 is thinking.

Philosopher 0 is HOLDING right chopstick.

Philosopher 0 is eating.

Philosopher 0 is thinking.

Philosopher 3 is HOLDING right chopstick.

Philosopher 3 is eating.

Philosopher 1 is HOLDING left chopstick.

Philosopher 1 is WAITING for right chopstick
Philosopher 2 is HOLDING right chopstick.

Philosopher 2 is eating.

Philosopher 3 is thinking.

Philosopher 2 is thinking.

Philosopher 1 is HOLDING right chopstick.

Philosopher 1 is eating.

Philosopher 0 is HOLDING left chopstick.

Philosopher 0 is WAITING for right chopstick
Philosopher 1 is thinking.

Philosopher 0 is HOLDING right chopstick.

Philosopher 0 is eating.

Philosopher 2 is HOLDING left chopstick.

Philosopher 2 is HOLDING right chopstick.

Philosopher 2 is eating.

Philosopher 1 is WAITING for left chopstick
Philosopher 1 is HOLDING left chopstick.

Philosopher 1 is WAITING for right chopstick
Philosopher 0 is thinking.

Philosopher 2 is thinking.

Philosopher 1 is HOLDING right chopstick.

Philosopher 1 is eating.

Philosopher 2 is WAITING for left chopstick
Philosopher 3 is HOLDING left chopstick.

Philosopher 3 is HOLDING right chopstick.

Philosopher 3 is eating.

Philosopher 0 is WAITING for left chopstick
Philosopher 1 is thinking.

Philosopher 2 is HOLDING left chopstick.

Philosopher 2 is WAITING for right chopstick
Philosopher 1 is HOLDING left chopstick.

Philosopher 2 is HOLDING right chopstick.

Philosopher 2 is eating.

Philosopher 2 is thinking.

Philosopher 3 is thinking.

Philosopher 0 is HOLDING left chopstick.

Philosopher 0 is WAITING for right chopstick
Philosopher 1 is HOLDING right chopstick.

Philosopher 1 is eating.

Philosopher 2 is WAITING for left chopstick
Philosopher 3 is HOLDING left chopstick.

Philosopher 3 is WAITING for right chopstick
Philosopher 1 is thinking.

Philosopher 0 is HOLDING right chopstick.

Philosopher 0 is eating.

Philosopher 2 is HOLDING left chopstick.

Philosopher 2 is WAITING for right chopstick
Philosopher 1 is WAITING for left chopstick
Philosopher 1 is HOLDING left chopstick.

Philosopher 3 is HOLDING right chopstick.

Philosopher 3 is eating.

Philosopher 0 is thinking.

Philosopher 1 is WAITING for right chopstick
Philosopher 3 is thinking.

Philosopher 0 is HOLDING left chopstick.

Philosopher 0 is WAITING for right chopstick
Philosopher 2 is HOLDING right chopstick.

Philosopher 2 is eating.

Philosopher 3 is WAITING for left chopstick
Philosopher 2 is thinking.

Philosopher 1 is HOLDING right chopstick.

Philosopher 1 is eating.

Philosopher 3 is HOLDING left chopstick.

Philosopher 3 is WAITING for right chopstick
Philosopher 1 is thinking.

Philosopher 0 is HOLDING right chopstick.

Philosopher 0 is eating.

Philosopher 2 is HOLDING left chopstick.

Philosopher 2 is WAITING for right chopstick
Philosopher 1 is WAITING for left chopstick
Philosopher 0 is thinking.

Philosopher 1 is HOLDING left chopstick.

Philosopher 1 is WAITING for right chopstick
Philosopher 3 is HOLDING right chopstick.

Philosopher 3 is eating.

Philosopher 3 is thinking.

Philosopher 2 is HOLDING right chopstick.

Philosopher 2 is eating.

Philosopher 2 is thinking.

Philosopher 1 is HOLDING right chopstick.

Philosopher 1 is eating.

Philosopher 1 is thinking.

Philosopher 0 is HOLDING left chopstick.

Philosopher 0 is HOLDING right chopstick.

Philosopher 0 is eating.

Philosopher 1 is WAITING for left chopstick
Philosopher 0 is thinking.

Philosopher 1 is HOLDING left chopstick.

Philosopher 1 is HOLDING right chopstick.

Philosopher 1 is eating.

Philosopher 3 is HOLDING left chopstick.

Philosopher 3 is HOLDING right chopstick.

Philosopher 3 is eating.

Philosopher 0 is WAITING for left chopstick
Philosopher 2 is WAITING for left chopstick
Philosopher 1 is thinking.

Philosopher 2 is HOLDING left chopstick.

Philosopher 2 is WAITING for right chopstick
Philosopher 3 is thinking.

Philosopher 2 is HOLDING right chopstick.

Philosopher 2 is eating.

Philosopher 0 is HOLDING left chopstick.

Philosopher 0 is HOLDING right chopstick.

Philosopher 0 is eating.

Philosopher 2 is thinking.

Philosopher 2 is HOLDING left chopstick.

Philosopher 2 is HOLDING right chopstick.

Philosopher 2 is eating.

Philosopher 0 is thinking.

Philosopher 3 is WAITING for left chopstick
Philosopher 1 is HOLDING left chopstick.

Philosopher 1 is WAITING for right chopstick
Philosopher 0 is HOLDING left chopstick.

Philosopher 0 is WAITING for right chopstick
Philosopher 2 is thinking.

Philosopher 1 is HOLDING right chopstick.

Philosopher 1 is eating.

Philosopher 1 is thinking.

Philosopher 3 is HOLDING left chopstick.

Philosopher 3 is WAITING for right chopstick
Philosopher 0 is HOLDING right chopstick.

Philosopher 0 is eating.

Philosopher 0 is thinking.

Philosopher 3 is HOLDING right chopstick.

Philosopher 3 is eating.

Philosopher 1 is HOLDING left chopstick.

Philosopher 1 is HOLDING right chopstick.

Philosopher 1 is eating.

Philosopher 0 is WAITING for left chopstick
Philosopher 2 is WAITING for left chopstick
Philosopher 1 is thinking.

Philosopher 2 is HOLDING left chopstick.

Philosopher 2 is WAITING for right chopstick
Philosopher 3 is thinking.

Philosopher 0 is HOLDING left chopstick.

Philosopher 0 is HOLDING right chopstick.

Philosopher 0 is eating.

Philosopher 2 is HOLDING right chopstick.

Philosopher 2 is eating.

Philosopher 0 is thinking.

Philosopher 1 is HOLDING left chopstick.

Philosopher 1 is WAITING for right chopstick
Philosopher 0 is HOLDING left chopstick.

Philosopher 0 is WAITING for right chopstick
Philosopher 2 is thinking.

Philosopher 1 is HOLDING right chopstick.

Philosopher 1 is eating.

Philosopher 1 is thinking.

Philosopher 0 is HOLDING right chopstick.

Philosopher 0 is eating.

Philosopher 3 is HOLDING left chopstick.

Philosopher 3 is WAITING for right chopstick
Philosopher 1 is WAITING for left chopstick
Philosopher 2 is HOLDING left chopstick.

Philosopher 2 is WAITING for right chopstick
Philosopher 0 is thinking.

Philosopher 0 is HOLDING left chopstick.

Philosopher 1 is HOLDING left chopstick.

Philosopher 1 is WAITING for right chopstick
Philosopher 0 is WAITING for right chopstick