

## Write a C program to stimulate Dining-Philosopher's problem

```
#include <stdio.h>
#include <stdlib.h>
#include <pthread.h>
#include <unistd.h>

#define N 5

pthread_mutex_t chopstick[N];

void* philosopher(void* num) {
    int id = *(int*)num;

    while (1) {
        printf("Philosopher %d is thinking...\n", id);
        sleep(1);

        printf("Philosopher %d is hungry.\n", id);

        pthread_mutex_lock(&chopstick[id]);
        pthread_mutex_lock(&chopstick[(id + 1) % N]);

        printf("Philosopher %d is eating...\n", id);
        sleep(2);

        pthread_mutex_unlock(&chopstick[id]);
        pthread_mutex_unlock(&chopstick[(id + 1) % N]);

        printf("Philosopher %d has finished eating and puts down chopsticks.\n", id);
        sleep(1);
    }

    return NULL;
}

int main() {
    pthread_t
    threads[N];
    int ids[N];

    for (int i = 0; i < N; i++) {
        pthread_mutex_init(&chopstick[i], NULL);
    }

    for (int i = 0; i < N; i++) {
        ids[i] = i;
    }
}
```

```

        pthread_create(&threads[i], NULL, philosopher, &ids[i]);
    }

    for (int i = 0; i < N; i++) {
        pthread_join(threads[i], NULL);
    }

    for (int i = 0; i < N; i++) {
        pthread_mutex_destroy(&chopstick[i]);
    }

    return 0;
}

```

## OUTPUT:

```

Philosopher 0 is thinking...
Philosopher 1 is thinking...
Philosopher 2 is thinking...
Philosopher 3 is thinking...
Philosopher 4 is thinking...
Philosopher 3 is hungry.
Philosopher 3 is eating...
Philosopher 2 is hungry.
Philosopher 4 is hungry.
Philosopher 1 is hungry.
Philosopher 0 is hungry.
Philosopher 2 is eating...
Philosopher 3 has finished eating and puts down chopsticks.
Philosopher 3 is thinking...
Philosopher 2 has finished eating and puts down chopsticks.
Philosopher 1 is eating...
Philosopher 3 is hungry.
Philosopher 2 is thinking...
Philosopher 1 has finished eating and puts down chopsticks.
Philosopher 0 is eating...
Philosopher 2 is hungry.
Philosopher 1 is thinking...
Philosopher 4 is eating...
Philosopher 0 has finished eating and puts down chopsticks.
Philosopher 1 is hungry.
Philosopher 0 is thinking...
Philosopher 4 has finished eating and puts down chopsticks.
Philosopher 3 is eating...
Philosopher 0 is hungry.
Philosopher 4 is thinking...
Philosopher 3 has finished eating and puts down chopsticks.
Philosopher 2 is eating...
Philosopher 4 is hungry.
Philosopher 3 is thinking...

```