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**Dinning Philosopher's problem using Semaphores / POSIX Pthreads library.**

**Code :**

```c
#include<stdio.h>

#include<unistd.h>

#include<pthread.h>

#include<semaphore.h>

#include<stdlib.h>


sem_t chopsticks[5];

void * trying();


int main()

{

    int i;

    pthread_t philosopher[5];
```

```c
        for(i=0;i<5;i++)

        sem_init(&chopsticks[i],0,1);

        for(i=0;i<5;i++)

        {

                pthread_create(&philosopher[i],NULL,trying,&i);

                sleep(1);

        }

        for(i=0;i<5;i++)

        {

                pthread_join(philosopher[i],NULL);

        }

        pthread_exit(0);

        return 0;

}
void * trying(void *k)

{

        int i;

        i=*(int *)k;

        while(1)

        {

                printf("\n Philosopher %d is thinking..",i);
```

```
sleep(rand()%10);

printf("\n Philosopher %d is hungry and planning tograb the

chopstick..",i);

sem_wait(&chopsticks[i]);

printf("\n Philosopher %d grabbed thechopstick %d..",i,(i+1)%5);

printf("\n Philosopher %d is eating..",i);

sleep(rand()%10);

sem_post(&chopsticks[i]);

printf("\n Philosopher %d released thechopstick %d..",i,i);

sem_post(&chopsticks[(i+1)%5]);

printf("\n Philosopher %d released thechopstick %d..",i,(i+1)%5);
    }
}
```

**Output :**

Activities — Terminal — Apr 22 09:51

deepan2001@ubuntu: ~/Desktop/Lab

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

sem_t chopsticks[5];
void * trying();

int main()
{
int i;
pthread_t philosopher[5];
for(i=0;i<5;i++)
sem_init(&chopsticks[i],0,1);
for(i=0;i<5;i++)
{
pthread_create(&philosopher[i],NULL,trying,&i);
sleep(1);
}
for(i=0;i<5;i++)
{
pthread_join(philosopher[i],NULL);
}
pthread_exit(0);
return 0;
}
void * trying(void *k)
{
int i;
i=*(int *)k;
while(1)
{
printf("\n Philosopher %d is thinking..",i);
sleep(rand()%10);
printf("\n Philosopher %d is hungry and planning tograb the chopstick..",i);
sem_wait(&chopsticks[i]);
printf("\n Philosopher %d grabbed thechopstick %d..",i,(i+1)%5);
printf("\n Philosopher %d is eating..",i);
sleep(rand()%10);
sem_post(&chopsticks[i]);
printf("\n Philosopher %d released thechopstick %d..",i,i);
sem_post(&chopsticks[(i+1)%5]);
printf("\n Philosopher %d released thechopstick %d..",i,(i+1)%5);
}
}
```

```
Philosopher 2 is eating..
Philosopher 0 is hungry and planning tograb the chopstick..
Philosopher 0 grabbed thechopstick 1..
Philosopher 0 is eating..
Philosopher 1 released thechopstick 1..
Philosopher 1 released thechopstick 2..
Philosopher 1 is thinking..
Philosopher 3 is hungry and planning tograb the chopstick..
Philosopher 3 grabbed thechopstick 4..
Philosopher 3 is eating..
Philosopher 2 released thechopstick 2..
Philosopher 2 released thechopstick 3..
Philosopher 2 is thinking..
Philosopher 4 is hungry and planning tograb the chopstick..
Philosopher 4 grabbed thechopstick 0..
Philosopher 4 is eating..
Philosopher 0 released thechopstick 0..
Philosopher 0 released thechopstick 1..
Philosopher 0 is thinking..
Philosopher 3 released thechopstick 3..
Philosopher 3 released thechopstick 4..
Philosopher 3 is thinking..
Philosopher 1 is hungry and planning tograb the chopstick..
Philosopher 1 grabbed thechopstick 2..
Philosopher 1 is eating..
Philosopher 2 is hungry and planning tograb the chopstick..
Philosopher 2 grabbed thechopstick 3..
Philosopher 2 is eating..
Philosopher 0 is hungry and planning tograb the chopstick..
Philosopher 0 grabbed thechopstick 1..
Philosopher 0 is eating..
Philosopher 1 released thechopstick 1..
Philosopher 1 released thechopstick 2..
Philosopher 1 is thinking..
Philosopher 0 released thechopstick 0..
Philosopher 0 released thechopstick 1..
Philosopher 0 is thinking..
Philosopher 4 released thechopstick 4..
Philosopher 4 released thechopstick 0..
Philosopher 4 is thinking..
Philosopher 2 released thechopstick 2..
Philosopher 2 released thechopstick 3..
Philosopher 2 is thinking..
Philosopher 3 is hungry and planning tograb the chopstick..
Philosopher 3 grabbed thechopstick 4..
```

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