

OS LAB 06

1) Implement the above code and paste the screen shot of the output.

CODE:

```
#include <stdio.h>
#define n 4

int completedPhilo = 0, i;

struct fork {
    int taken;
} ForkAvil[n];

struct philosopher {
    int left;
    int right;
} PhiloStatus[n];

void goForDinner(int philID) {
    if (PhiloStatus[philID].left == 10 && PhiloStatus[philID].right == 10) {
        printf("Philosopher %d already completed his dinner\n", philID + 1);
    }
    else if (PhiloStatus[philID].left == 1 && PhiloStatus[philID].right == 1) {
        printf("Philosopher %d completed his dinner\n", philID + 1);
        PhiloStatus[philID].left = PhiloStatus[philID].right = 10;
        int otherFork = (philID - 1 + n) % n;
        ForkAvil[philID].taken = ForkAvil[otherFork].taken = 0;
        printf("Philosopher %d released fork %d and fork %d\n", philID + 1, philID + 1, otherFork + 1);
        completedPhilo++;
    }
    else if (PhiloStatus[philID].left == 1 && PhiloStatus[philID].right == 0) {
        int otherFork = philID == n - 1 ? philID : (philID - 1 + n) % n;
        if (ForkAvil[otherFork].taken == 0) {
            ForkAvil[otherFork].taken = PhiloStatus[philID].right = 1;
            printf("Fork %d taken by philosopher %d\n", otherFork + 1, philID + 1);
        } else {
            printf("Philosopher %d is waiting for fork %d\n", philID + 1, otherFork + 1);
        }
    }
    else if (PhiloStatus[philID].left == 0) {
        int otherFork = philID == n - 1 ? philID - 1 : philID;
        if (ForkAvil[otherFork].taken == 0) {
            ForkAvil[otherFork].taken = PhiloStatus[philID].left = 1;
            printf("Fork %d taken by philosopher %d\n", otherFork + 1, philID + 1);
        } else {
            printf("Philosopher %d is waiting for fork %d\n", philID + 1, otherFork + 1);
        }
    }
}

int main() {
    for (i = 0; i < n; i++) {
        ForkAvil[i].taken = PhiloStatus[i].left = PhiloStatus[i].right = 0;
    }
    while (completedPhilo < n) {
        for (i = 0; i < n; i++) {
            goForDinner(i);
        }
        printf("\nTill now, number of philosophers who completed dinner: %d\n", completedPhilo);
    }
    return 0;
}
```

OUTPUT

```
C:\Users\admin\Downloads\os lab 06.exe
Fork 1 taken by philosopher 1
Fork 2 taken by philosopher 2
Fork 3 taken by philosopher 3
Philosopher 4 is waiting for fork 3

Till now, number of philosophers who completed dinner: 0

Fork 4 taken by philosopher 1
Philosopher 2 is waiting for fork 1
Philosopher 3 is waiting for fork 2
Philosopher 4 is waiting for fork 3

Till now, number of philosophers who completed dinner: 0

Philosopher 1 completed his dinner
Philosopher 1 released fork 1 and fork 4
Fork 1 taken by philosopher 2
Philosopher 3 is waiting for fork 2
Philosopher 4 is waiting for fork 3

Till now, number of philosophers who completed dinner: 1

Philosopher 1 already completed his dinner
Philosopher 2 completed his dinner
Philosopher 2 released fork 2 and fork 1
Fork 2 taken by philosopher 3
Philosopher 4 is waiting for fork 3

Till now, number of philosophers who completed dinner: 2

completedPhilo++;

Till now, number of philosophers who completed dinner: 2

#include
#define
Philosopher 1 already completed his dinner
Philosopher 2 already completed his dinner
Philosopher 3 completed his dinner
Philosopher 3 released fork 3 and fork 2
Fork 3 taken by philosopher 4

struct
in
} Fork
Philosopher 1 already completed his dinner
Philosopher 2 already completed his dinner
Philosopher 3 already completed his dinner
in
in
} Phil
Till now, number of philosophers who completed dinner: 3

void g
Philosopher 1 already completed his dinner
Philosopher 2 already completed his dinner
Philosopher 3 already completed his dinner
Philosopher 4 completed his dinner
} Philosopher 4 released fork 4 and fork 3
el
Till now, number of philosophers who completed dinner: 4

-----
Process exited after 20.84 seconds with return value 0
Press any key to continue . . .

completedPhilo++;
```

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DT-047