NED UNIVERSITY OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE & IT
Specialization in Data Science

CT-353
OPERATING SYSTEMS

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LAB : 06

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

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

int compltedPhilo = 0, i;

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

struct philosp {
    int left;
    int right;
} Philostatus[n];

void goForDinner(int philIC) {
    if(Philostatus[philIC].left==10 && Philostatus[philIC].right==10)
        printf("Philosopher %d completed his dinner\n",philIC+1);
    else if(Philostatus[philIC].left==1 && Philostatus[philIC].right==1) {
        printf("Philosopher %d completed his dinner\n",philIC+1);
        Philostatus[philIC].left = Philostatus[philIC].right = 10;
        int otherfork = philIC-1;
        if(otherfork== -1)
            otherfork=(n-1);
        ForkAvil[philIC].taken = ForkAvil[otherfork].taken = 0;
        printf("Philosopher %d released fork %d and fork %d\n",philIC+1,philIC+1,otherfork+1);
        compltedPhilo++;
    }
    else if(Philostatus[philIC].left==1 && Philostatus[philIC].right==0) {
        if(philIC==(n-1)) {
            if(ForkAvil[philIC].taken==0) {
                ForkAvil[philIC].taken = Philostatus[philIC].right = 1;
                printf("Fork %d taken by philosopher %d\n",philIC+1,philIC+1);
            } else {
                printf("Philosopher %d is waiting for fork %d\n",philIC+1,philIC+1);
            }
        } else {
            int dupphilID = philIC;
            philIC++;
            if(philIC== -1)
                philIC=(n-1);
            if(ForkAvil[philIC].taken == 0) {
                ForkAvil[philIC].taken = Philostatus[dupphilIC].right = 1;
                printf("fork %d taken by Philosopher %d\n",philIC+1,dupphilIC+1);
            } else {
                printf("Philosopher %d is waiting for fork %d\n",dupphilIC+1,philIC+1);
            }
        }
    }
    else if(Philostatus[philIC].left==0) {
        if(philIC==(n-1)) {
            if(ForkAvil[philIC-1].taken==0) {
                ForkAvil[philIC-1].taken = Philostatus[philIC].left = 1;
                printf("fork %d taken by philosopher %d\n",philIC,philIC+1);
            } else {
                printf("Philosopher %d is waiting for fork %d\n",philIC+1,philIC);
            }
        } else {
            if(ForkAvil[philIC].taken == 0) {
                ForkAvil[philIC].taken = Philostatus[philIC].left = 1;
                printf("fork %d taken by Philosopher %d\n",philIC+1,philIC+1);
            } else {
                printf("Philosopher %d is waiting for fork %d\n",philIC+1,philIC+1);
            }
        }
    }
}

int main() {
    for(i=0;i<n;i++)
        ForkAvil[i].taken=Philostatus[i].left=Philostatus[i].right=0;

    while(compltedPhilo<n) {
        for(i=0;i<n;i++)
            goForDinner(i);
        printf("\n\till now num of philosophers completed dinner are %d\n\n",compltedPhilo);
    }

    return 0;
}
```

Output:

```
C:\Users\marya\Downloads\O    X    +    ∨

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 num of philosophers completed dinner are 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 num of philosophers completed dinner are 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 num of philosophers completed dinner are 1

Philosopher 1 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 num of philosophers completed dinner are 2

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

Till now num of philosophers completed dinner are 3

Philosopher 1 completed his dinner
Philosopher 2 completed his dinner
Philosopher 3 completed his dinner
```

c