Operating Systems (CT-353) Lab 06

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Code:

```
#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 philID) {

   // If philosopher has completed dinner

   if (Philostatus[philID].left == 10 && Philostatus[philID].right == 10) {

      printf("Philosopher %d completed his dinner\n", philID + 1);

   }

   // If both forks are taken now

   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;

      if (otherFork == -1)
```

```
        otherFork = n - 1;
      ForkAvil[philID].taken = ForkAvil[otherFork].taken = 0;
      printf("Philosopher %d released fork %d and fork %d\n", philID + 1, philID + 1, otherFork +
1);
      compltedPhilo++;
    }
    // If left fork is taken, trying for right
    else if (Philostatus[philID].left == 1 && Philostatus[philID].right == 0) {
      if (philID == (n - 1)) {
        if (ForkAvil[philID].taken == 0) {
          ForkAvil[philID].taken = Philostatus[philID].right = 1;
          printf("Fork %d taken by philosopher %d\n", philID + 1, philID + 1);
        } else {
          printf("Philosopher %d is waiting for fork %d\n", philID + 1, philID + 1);
        }
      } else {
        int dupphilID = philID;
        philID -= 1;
        if (philID == -1)
          philID = n - 1;

        if (ForkAvil[philID].taken == 0) {
          ForkAvil[philID].taken = Philostatus[dupphilID].right = 1;
          printf("Fork %d taken by Philosopher %d\n", philID + 1, dupphilID + 1);
        } else {
          printf("Philosopher %d is waiting for Fork %d\n", dupphilID + 1, philID + 1);
```

```
            }
        }
    }
    // If no fork is taken yet
    else if (Philostatus[philID].left == 0) {
        if (philID == (n - 1)) {
            if (ForkAvil[philID - 1].taken == 0) {
                ForkAvil[philID - 1].taken = Philostatus[philID].left = 1;
                printf("Fork %d taken by philosopher %d\n", philID, philID + 1);
            } else {
                printf("Philosopher %d is waiting for fork %d\n", philID + 1, philID);
            }
        } else {
            if (ForkAvil[philID].taken == 0) {
                ForkAvil[philID].taken = Philostatus[philID].left = 1;
                printf("Fork %d taken by Philosopher %d\n", philID + 1, philID + 1);
            } else {
                printf("Philosopher %d is waiting for Fork %d\n", philID + 1, philID + 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("\nTill now number of philosophers who completed dinner: %d\n\n",
compltedPhilo);
    }
    return 0;
}
```

Output:

```
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
```

```
Till now number of philosophers who completed dinner: 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 number of philosophers who completed dinner: 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 number of philosophers who completed dinner: 3
```