CSE2005

Operating Systems

Lab Digital Assignment

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Slot: F1

(b) Implement the solution for dining philosopher's problem.

```
#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(Philostatus[philID].left==10 && Philostatus[philID].right==10)
    printf("Philosopher %d 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;

      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++;
    }
    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);
          }
        }
      }
      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);
            }
          }
    }else{}
}

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);
```

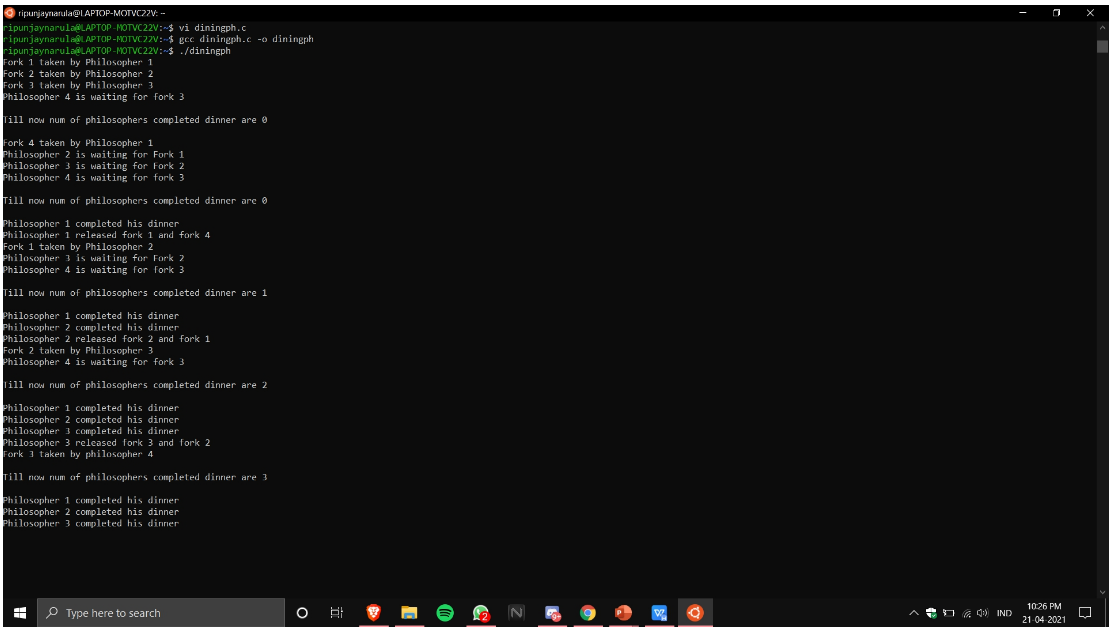
```
                printf("\nTill now num of philosophers completed dinner
are %d\n\n",compltedPhilo);

        }



        return 0;

}
```



```
ripunjaynarula@LAPTOP-MOTVC22V:~$ vi diningph.c
ripunjaynarula@LAPTOP-MOTVC22V:~$ gcc diningph.c -o diningph
ripunjaynarula@LAPTOP-MOTVC22V:~$ ./diningph
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
```