#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){ //same like threads concept here cases implemented

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

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

//if already completed dinner

else if(Philostatus[philID].left==1 && Philostatus[philID].right==1){

//if just taken two forks

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

Philostatus[philID].left = Philostatus[philID].right = 10; //remembering that he completed dinner by assigning value 10

int otherFork = philID-1;

if(otherFork== -1)

otherFork=(n-1);

ForkAvil[philID].taken = ForkAvil[otherFork].taken = 0; //releasing forks

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){ //left already taken, trying for right fork

if(philID==(n-1)){

if(ForkAvil[philID].taken==0){ //KEY POINT OF THIS PROBLEM, THAT LAST PHILOSOPHER TRYING IN reverse DIRECTION

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{ //except last philosopher case

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){ //nothing taken yet

if(philID==(n-1)){

if(ForkAvil[philID-1].taken==0){ //KEY POINT OF THIS PROBLEM, THAT LAST PHILOSOPHER TRYING IN reverse DIRECTION

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{ //except last philosopher case

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){

/\* Observe here carefully, while loop will run until all philosophers complete dinner

Actually problem of deadlock occur only thy try to take at same time

This for loop will say that they are trying at same time. And remaining status will print by go for dinner function

\*/

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

goForDinner(i);

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

}

return 0;

}