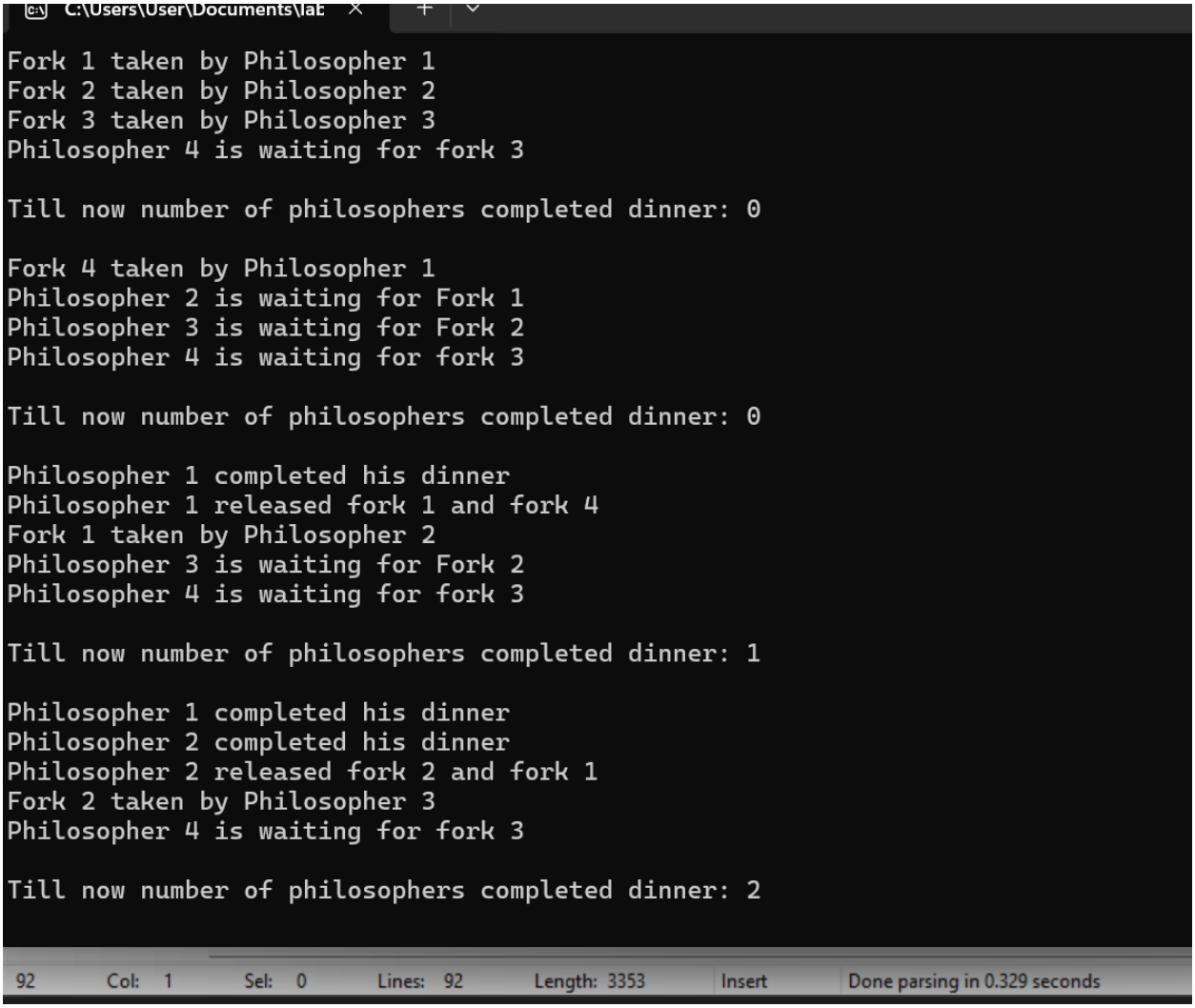
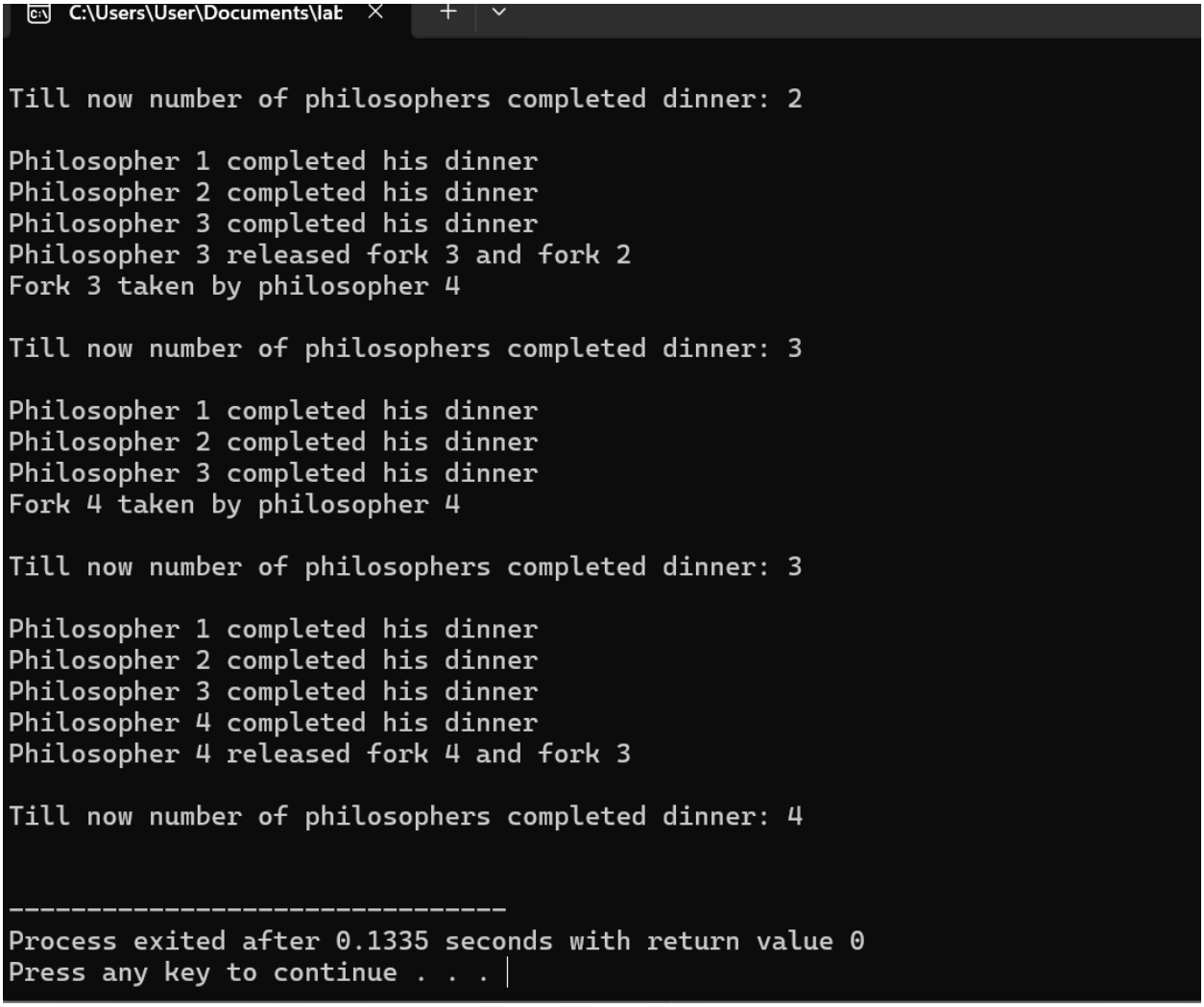
Lab-6

```
#include <stdio.h>
#define n 4  // Number of philosophers and forks

int completedPhilo = 0, i;

struct fork {
   int taken; // 0 if free, 1 if taken
} ForkAvail[n];

struct philos {
   int left;  // 1 if left fork taken
   int right; // 1 if right fork taken
} PhiloStatus[n];

void goForDinner(int philID) {
   // If already completed dinner
   if (PhiloStatus[philID].left == 10 && PhiloStatus[philID].right == 10) {
      printf("Philosopher %d completed his dinner\n", philID + 1);
   }

   // If both forks taken just 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; // Mark completed
      int otherFork = philID - 1;
      if (otherFork == -1) otherFork = n - 1;

      ForkAvail[philID].taken = 0;
      ForkAvail[otherFork].taken = 0;

      printf("Philosopher %d released fork %d and fork %d\n", philID + 1, philID + 1, otherFork + 1);
      completedPhilo++;
   }

   // If left fork taken, trying for right
   else if (PhiloStatus[philID].left == 1 && PhiloStatus[philID].right == 0) {
      if (philID == (n - 1)) { // Last philosopher, try reverse
         if (ForkAvail[philID].taken == 0) {
            ForkAvail[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;
         int rightFork = philID - 1;
         if (rightFork == -1) rightFork = n - 1;

         if (ForkAvail[rightFork].taken == 0) {
            ForkAvail[rightFork].taken = PhiloStatus[dupPhilID].right = 1;
            printf("Fork %d taken by Philosopher %d\n", rightFork + 1, dupPhilID + 1);
         } else {
            printf("Philosopher %d is waiting for Fork %d\n", dupPhilID + 1, rightFork + 1);
         }
      }
   }

   // No fork taken yet
   else if (PhiloStatus[philID].left == 0) {
      if (philID == (n - 1)) {
         if (ForkAvail[philID - 1].taken == 0) {
            ForkAvail[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 (ForkAvail[philID].taken == 0) {
            ForkAvail[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++) {
      ForkAvail[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 completed dinner: %d\n\n", completedPhilo);
   }

   return 0;
}
```


C:\Users\User\Documents\lab
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 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 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 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 completed dinner: 2
92 Col: 1 Sel: 0 Lines: 92 Length: 3353 Insert Done parsing in 0.329 seconds


C:\Users\User\Documents\lab
Till now number of philosophers 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 completed dinner: 3
Philosopher 1 completed his dinner
Philosopher 2 completed his dinner
Philosopher 3 completed his dinner
Fork 4 taken by philosopher 4
Till now number of philosophers completed dinner: 3
Philosopher 1 completed his dinner
Philosopher 2 completed his dinner
Philosopher 3 completed his dinner
Philosopher 4 completed his dinner
Philosopher 4 released fork 4 and fork 3
Till now number of philosophers completed dinner: 4

Process exited after 0.1335 seconds with return value 0
Press any key to continue . . .