Assignment 2

OS Lab 110698

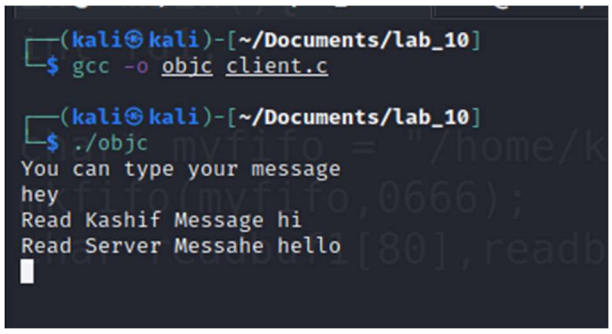
11762 Muhammad Kashif

Task 1 (Group Chatting)

Client Code

```
#include<stdio.h>
#include<unistd.h>
#include<string.h>
#include<fcntl.h>
#include<sys/stat.h>
#include<sys/types.h>
#define FIFO_FILE "MYFIFO"
int main(){
int fd2;
char* myfifo = "/home/kali/Documents/lab_10/myfifo";
mkfifo(myfifo,0666);
char readbuf1[80],readbuf2[80],readbuf3[80];
while(1){
printf("You can type your message\n");
fd2=open(myfifo,O_CREAT|O_WRONLY);
fgets(readbuf1,80,stdin);
write(fd2,readbuf1,strlen(readbuf1)+1);
close(fd2);
fd2=open(myfifo,O_RDONLY);
read(fd2,readbuf2,sizeof(readbuf2));
printf("Read Kashif Message %s\n",readbuf2);
read(fd2,readbuf3,sizeof(readbuf3));
printf("Read Server Message %s\n",readbuf3);
close(fd2);}
return 0;}
```

Client Output

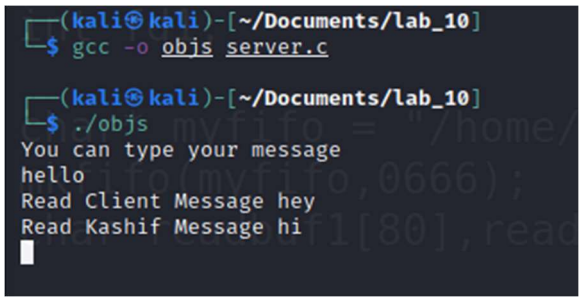


Server Code

```
#include<stdio.h>
#include<unistd.h>
```

```
#include<string.h>
#include<fcntl.h>
#include<sys/stat.h>
#include<sys/types.h>
#define FIFO_FILE "MYFIFO"
int main(){
int fd;
char* myfifo = "/home/kali/Documents/lab_10/myfifo";
mkfifo(myfifo,0666);
char readbuf1[80],readbuf2[80],readbuf3[80];
while(1){
printf("You can type your message\n");
fd=open(myfifo,O_CREAT|O_WRONLY);
fgets(readbuf3,80,stdin);
write(fd,readbuf3,strlen(readbuf3)+1);
close(fd);
fd=open(myfifo,O_RDONLY);
read(fd,readbuf1,sizeof(readbuf1));
printf("Read Client Message %s\n",readbuf1);
read(fd,readbuf2,sizeof(readbuf2));
printf("Read Kashif Message %s\n",readbuf2);
close(fd);}
return 0;}
```

Server Output

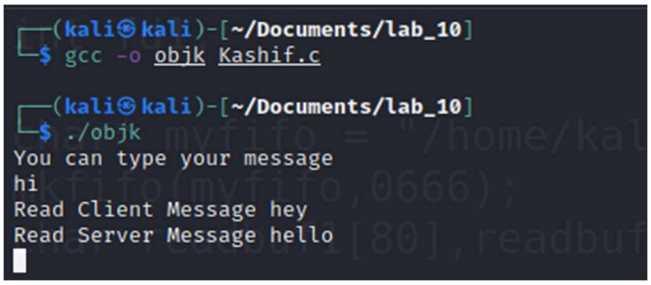


Kashif Code

```
#include<stdio.h>
#include<unistd.h>
#include<string.h>
#include<fcntl.h>
#include<sys/stat.h>
#include<sys/types.h>
#define FIFO_FILE "MYFIFO"
int main(){
int fd1;
char* myfifo = "/home/kali/Documents/lab_10/myfifo";
mkfifo(myfifo,0666);
char readbuf1[80],readbuf2[80],readbuf3[80];
while(1){
```

```
printf("You can type your message\n");
fd1=open(myfifo,O_CREAT|O_WRONLY);
fgets(readbuf2,80,stdin);
write(fd1,readbuf2,strlen(readbuf2)+1);
close(fd1);
fd1=open(myfifo,O_RDONLY);
read(fd1,readbuf1,sizeof(readbuf1));
printf("Read Client Message %s\n",readbuf1);
read(fd1,readbuf3,sizeof(readbuf3));
printf("Read Server Message %s\n",readbuf3);
close(fd1);}
return 0;}
```

Kashif Output



Task 2 (ATM Machine)

```
#include <stdio.h>
#include <pthread.h>
#include <unistd.h>
#define NO_THREAD 15
#define CASH_LIMIT 10000
#define BALANCE 150000
int cash_balance = BALANCE;
pthread_mutex_t balance_mutex;
pthread_cond_t client_ready;
void *atm_thread(void *arg) {
 int id = *((int *) arg);
 int password;
 int choice;
 int amount;
 pthread_mutex_lock(&balance_mutex);
 pthread_cond_wait(&client_ready, &balance_mutex);
 pthread_mutex_unlock(&balance_mutex);
 printf("Thread No %d: Please Enter your password: ", (id+1));
 scanf("%d", &password);
 printf("Thread No %d: Enter your choice (1 - Check Balance, 2 - Withdraw): ", (id+1));
 scanf("%d", &choice);
 pthread_mutex_lock(&balance_mutex);
 if (choice == 1) {
  printf("Thread No %d: Your balance is %d\n", (id+1), cash_balance);
 } else if (choice == 2) {
```

```
    printf("Thread No %d: Please Enter the amount to withdraw: ", (id+1));
    scanf("%d", &amount);
    if (amount > cash_balance) {
      printf("Thread No %d: Insufficient balance\n", (id+1));
    } else if (cash_balance - amount < CASH_LIMIT) {
      printf("Thread No %d: ATM is out of cash\n", (id+1));
    } else {
      cash_balance -= amount;
      printf("Thread No %d: Successfully withdrew %d. Your balance is %d\n", (id+1), amount,
cash_balance);}}
  pthread_mutex_unlock(&balance_mutex);
  return NULL;}
int main(void) {
  pthread_t threads[NO_THREAD];
  pthread_mutex_init(&balance_mutex, NULL);
  pthread_cond_init(&client_ready, NULL);
  int i;
  int thread_ids[NO_THREAD];
  for (i = 0; i < NO_THREAD; i++) {
    thread_ids[i] = i;
    pthread_create(&threads[i], NULL, atm_thread, &thread_ids[i]);}
  for (i = 0; i < NO_THREAD; i++) {
    pthread_cond_signal(&client_ready);
    pthread_join(threads[i], NULL);}
  pthread_cond_destroy(&client_ready);
  pthread_mutex_destroy(&balance_mutex);
  return 0;}
```

Output

```
┌──(kali㉿kali)-[~/Documents/Assignment 2]
└─$ ./obj
Thread No 1: Please Enter your password: 245
Thread No 1: Enter your choice (1 - Check Balance, 2 - Withdraw): 1
Thread No 1: Your balance is 150000
Thread No 2: Please Enter your password: 245
Thread No 2: Enter your choice (1 - Check Balance, 2 - Withdraw): 2
Thread No 2: Please Enter the amount to withdraw: 10000
Thread No 2: Successfully withdrew 10000. Your balance is 140000
Thread No 3: Please Enter your password: 245
Thread No 3: Enter your choice (1 - Check Balance, 2 - Withdraw): 2
Thread No 3: Please Enter the amount to withdraw: 18000
Thread No 3: Successfully withdrew 18000. Your balance is 122000
Thread No 6: Please Enter your password: 245
Thread No 6: Enter your choice (1 - Check Balance, 2 - Withdraw): 1
Thread No 6: Your balance is 122000
```