ASSIGNMENT 1

Name : Dishank Shekokare
Class : T.E (I.T)
Roll No. : 5317

```
#!/bin/bash

# Initialize an empty address book file
address_book_file="address_book.txt"
touch "$address_book_file"

# Function to create an address book
create_address_book() {
    > "$address_book_file"
    echo "Address book created."
}

# Function to view the address book
view_address_book() {
    if [ -s "$address_book_file" ]; then
        echo "Address Book:"
        cat "$address_book_file"
    else
        echo "Address book is empty."
    fi
}

# Function to insert a record
insert_record() {
    echo "Enter the name: "
    read name
    echo "Enter the address: "
    read address
    echo "Enter the phone number: "
    read phone
    echo "Enter the email: "
    read email

    echo "Name: $name" >> "$address_book_file"
    echo "Address: $address" >> "$address_book_file"
    echo "Phone Number: $phone" >> "$address_book_file"
    echo "Email: $email" >> "$address_book_file"
```

```
    echo "Record added to the address book."
}

while true; do
    echo ""
    echo "Options:"
    echo "a) Create address book"
    echo "b) View address book"
    echo "c) Insert a record"
    echo "d) Exit"
    echo "Select an option: "
    read option

    case "$option" in
        "a")
            create_address_book
            ;;
        "b")
            view_address_book
            ;;
        "c")
            insert_record
            ;;
        "d")
            echo "Exiting the address book."
            break
            ;;
        *)
            echo "Invalid option. Please select a valid option."
            ;;
    esac
done
```

Output :
$ ./address_book.sh

Options:
a) Create address book
b) View address book
c) Insert a record
d) Exit
Select an option: a
Address book created.

Options:
a) Create address book
b) View address book
c) Insert a record
d) Exit
Select an option: c
Enter the name:
John
Enter the address:
123 Main St
Enter the phone number:
555-1234
Enter the email:
john@example.com
Record added to the address book.

Options:
a) Create address book
b) View address book
c) Insert a record
d) Exit
Select an option: b
Address Book:
Name: John
Address: 123 Main St
Phone Number: 555-1234
Email: john@example.com

Options:
a) Create address book
b) View address book
c) Insert a record
d) Exit

```
Select an option: d
Exiting the address book.
```

ASSIGNMENT 2 - a

Name : Dishank Shekokare
Class : T.E (I.T)
Roll No. : 5317

```
# include<stdio.h>
# include <stdlib.h>
# include<sys/types.h>
# include<unistd.h>


   int split ( int[], int , int );
   void quickSort(int* ,int, int);

   void mergeSort(int arr[],int low,int mid,int high)
   {
        int i,j,k,l,b[20];
       l=low;
        i=low;
        j=mid+1;

        while((l<=mid)&&(j<=high)){
              if(arr[l]<=arr[j]){
                    b[i]=arr[l];
                    l++;
               }
              else{
                    b[i]=arr[j];
                    j++;
               }

              i++;
         }

        if(l>mid){
              for(k=j;k<=high;k++){
                 b[i]=arr[k];
                 i++;
               }
         }
        else{
              for(k=l;k<=mid;k++){
```

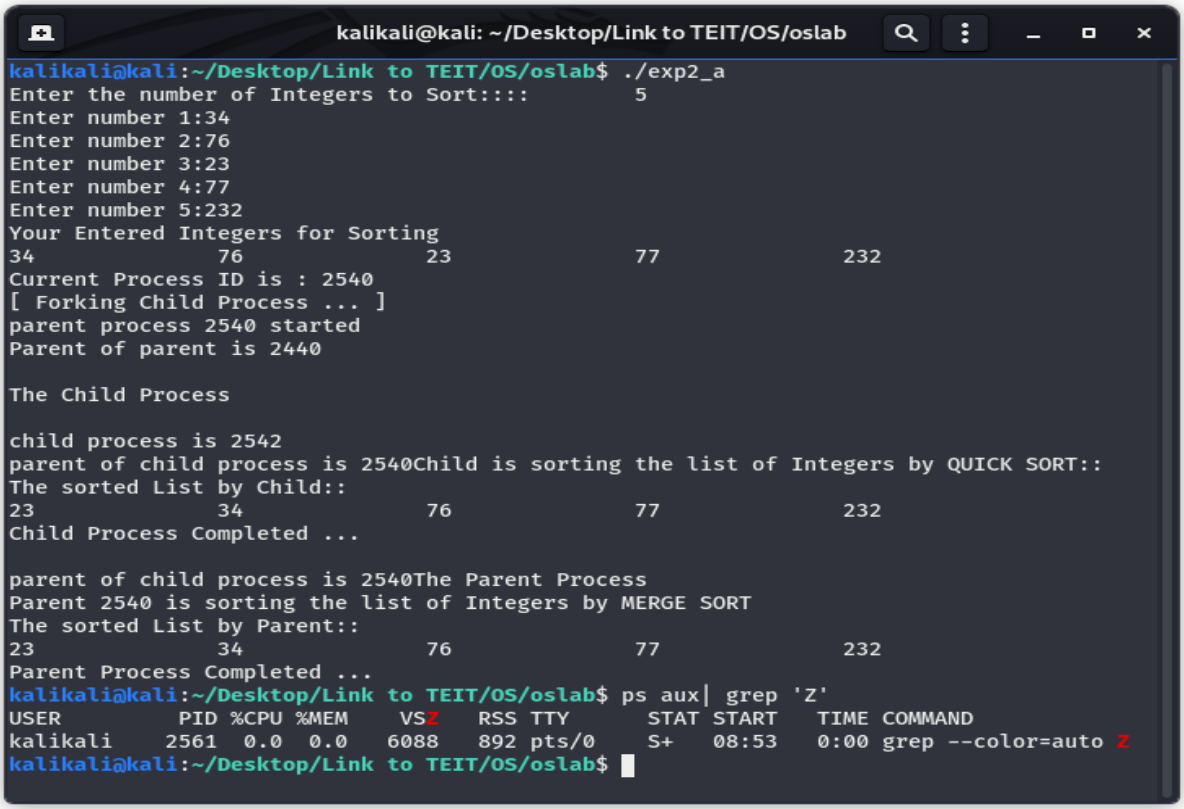
```
                b[i]=arr[k];
                i++;
               }
          }

 for(k=low;k<=high;k++)
    {
     arr[k]=b[k];
    }
}

void partition(int arr[],int low,int high)
{
 int mid;
 if(low<high)
   {
    double temp;

    mid=(low+high)/2;
    partition(arr,low,mid);
    partition(arr,mid+1,high);
    mergeSort(arr,low,mid,high);
   }
}



    void display(int a[],int size){
        int i;
        for(i=0;i<size;i++){
            printf("%d\t\t",a[i]);
        }
        printf("\n");
    }

    int main()
    {
        int pid, child_pid;
        int size,i,status;

        /*    Input the Integers to be sorted    */
        printf("Enter the number of Integers to Sort::::\t");
        scanf("%d",&size);
```

```
    int a[size];
    int pArr[size];
    int cArr[size];

    for(i=0;i<size;i++){
        printf("Enter number %d:",(i+1));
        scanf("%d",&a[i]);
        pArr[i]=a[i];
        cArr[i]=a[i];

    }



/*    Display the Enterd Integers    */

    printf("Your Entered Integers for Sorting\n");
    display(a,size);


/*    Process ID of the Parent    */

        pid=getpid();
        printf("Current Process ID is : %d\n",pid);

/*    Child Process Creation    */

        printf("[ Forking Child Process ... ] \n");
        child_pid=fork();     /* This will Create Child Process and
                              Returns Child's PID */
    if( child_pid < 0){

        /* Process Creation Failed ... */

         printf("\nChild Process Creation Failed!!!!\n");
               exit(-1);
        }
        else if( child_pid==0) {
    /* Child Process */
        printf("\nThe Child Process\n");
        printf("\nchild process is %d",getpid());
            printf("\nparent of child process is %d",getppid());
        printf("Child is sorting the list of Integers by QUICK SORT::\n");
        quickSort(cArr,0,size-1);
```

```
            printf("The sorted List by Child::\n");
            display(cArr,size);
            printf("Child Process Completed ...\n");
            sleep(10);
                printf("\nparent of child process is %d",getppid());
            }

            else {
        /* Parent Process */
            printf("parent process %d started\n",getpid());
               printf("Parent of parent is %d\n",getppid());

            sleep(30);
            printf("The Parent Process\n");
            printf("Parent %d is sorting the list of Integers by MERGE SORT\n",pid);
            partition(pArr,0,size-1);
            printf("The sorted List by Parent::\n");
            display(pArr,size);
           // wait(&status);
               printf("Parent Process Completed ...\n");
            }

    return 0;
}


int split ( int a[ ], int lower, int upper )
{
    int i, p, q, t ;

    p = lower + 1 ;
    q = upper ;
    i = a[lower] ;

    while ( q >= p )
    {
        while ( a[p] < i )
            p++ ;

        while ( a[q] > i )
            q-- ;

        if ( q > p )
        {
```

```
            t = a[p] ;
            a[p] = a[q] ;
            a[q] = t ;
        }
    }

    t = a[lower] ;
    a[lower] = a[q] ;
    a[q] = t ;

    return q ;
}

void quickSort(int a[],int lower, int upper){
     int i ;
        if ( upper > lower )
        {
            i = split ( a, lower, upper ) ;
            quickSort ( a, lower, i - 1 ) ;
            quickSort ( a, i + 1, upper ) ;
        }
}
```

Output :



ASSIGNMENT 2 - b

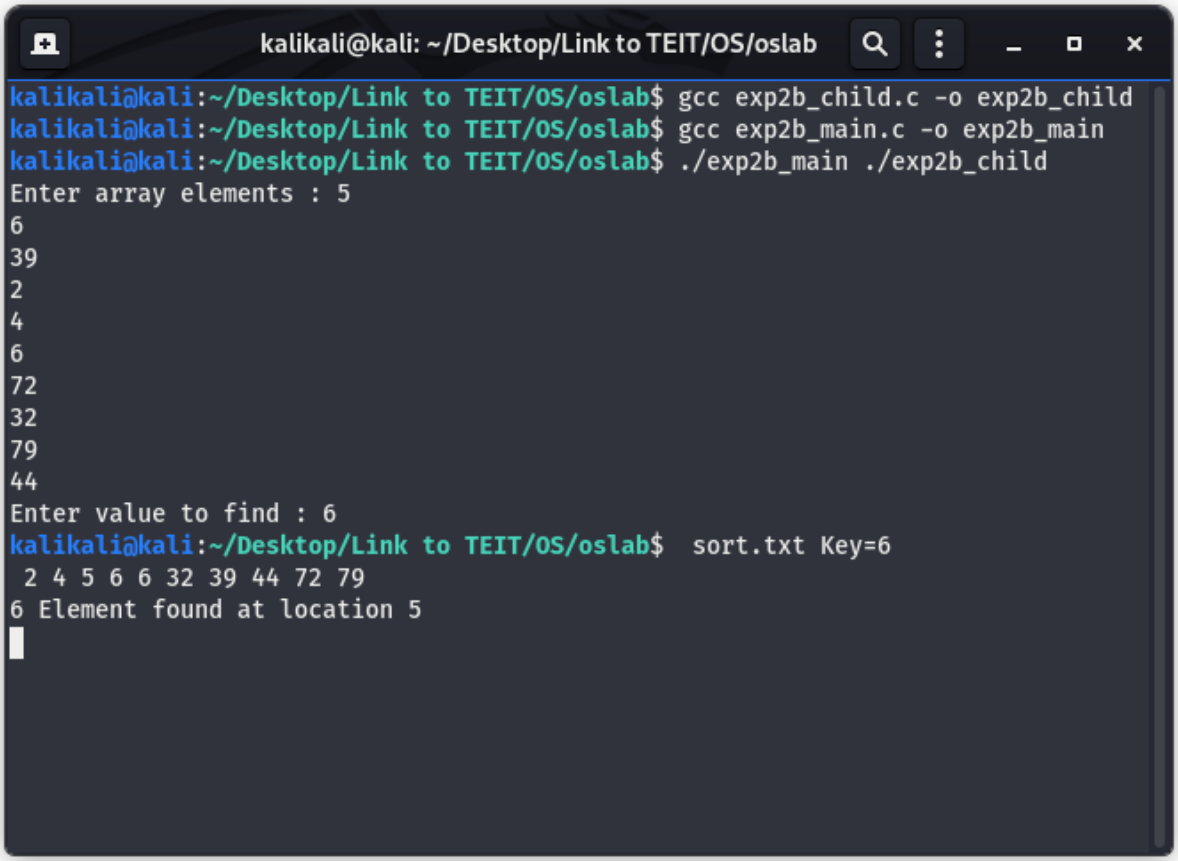
Name : Dishank Shekokare
Class : T.E (I.T)
Roll No. : 5317

```
#include<stdio.h>
#include<sys/types.h>
#include<unistd.h>

void bsearch(int a[10], int search);

int main(int argc,char *argv[])
{
int a[11],i,n=10,search,first, last, middle,flag=0;
FILE *f;

f=fopen(argv[1],"r");

printf(" %s",argv[1]);
fscanf(f,"%d",&search);
```

```
printf(" Key=%d\n",search);

for(i=0;i<n;i++)
{
fscanf(f," %d",&a[i]);

printf(" %d",a[i]);
}

first=0;
last=n-1;
middle=(first+last)/2;

while(first<=last)
{
if(a[middle]<search){

first= middle+1;
middle=(first+last)/2;
}

else if(a[middle]==search)
{
printf("\n%d Element found at location %d \n", search, middle+1);
flag=1;
break;
}
else
{
last=middle-1;
middle=(first+last)/2;
}
}

if(flag==0)
printf("\n Not found");



return(0);
}
```

```
void bsearch(int a[11], int search)
{
int i, first, last, middle, n=10;




first=0;
last=n-1;
middle=(first+last)/2;

while(first<=last)
{
if(a[middle]<search)

first= middle+1;

else if(a[middle]==search)
{
printf("%d Element found at location %d \n", search, middle+1);
break;
}
else
{
last=middle-1;
middle=(first+last)/2;
}

if(first>last)
{
printf("Element not found %d is not present in the list\n", search);
//return 0;
}
}
}
```

Output :


kalikali@kali: ~/Desktop/Link to TEIT/OS/oslab
kalikali@kali:~/Desktop/Link to TEIT/OS/oslab$ gcc exp2b_child.c -o exp2b_child
kalikali@kali:~/Desktop/Link to TEIT/OS/oslab$ gcc exp2b_main.c -o exp2b_main
kalikali@kali:~/Desktop/Link to TEIT/OS/oslab$ ./exp2b_main ./exp2b_child
Enter array elements : 5
6
39
2
4
6
72
32
79
44
Enter value to find : 6
kalikali@kali:~/Desktop/Link to TEIT/OS/oslab$ sort.txt Key=6
2 4 5 6 6 32 39 44 72 79
6 Element found at location 5

ASSIGNMENT 3

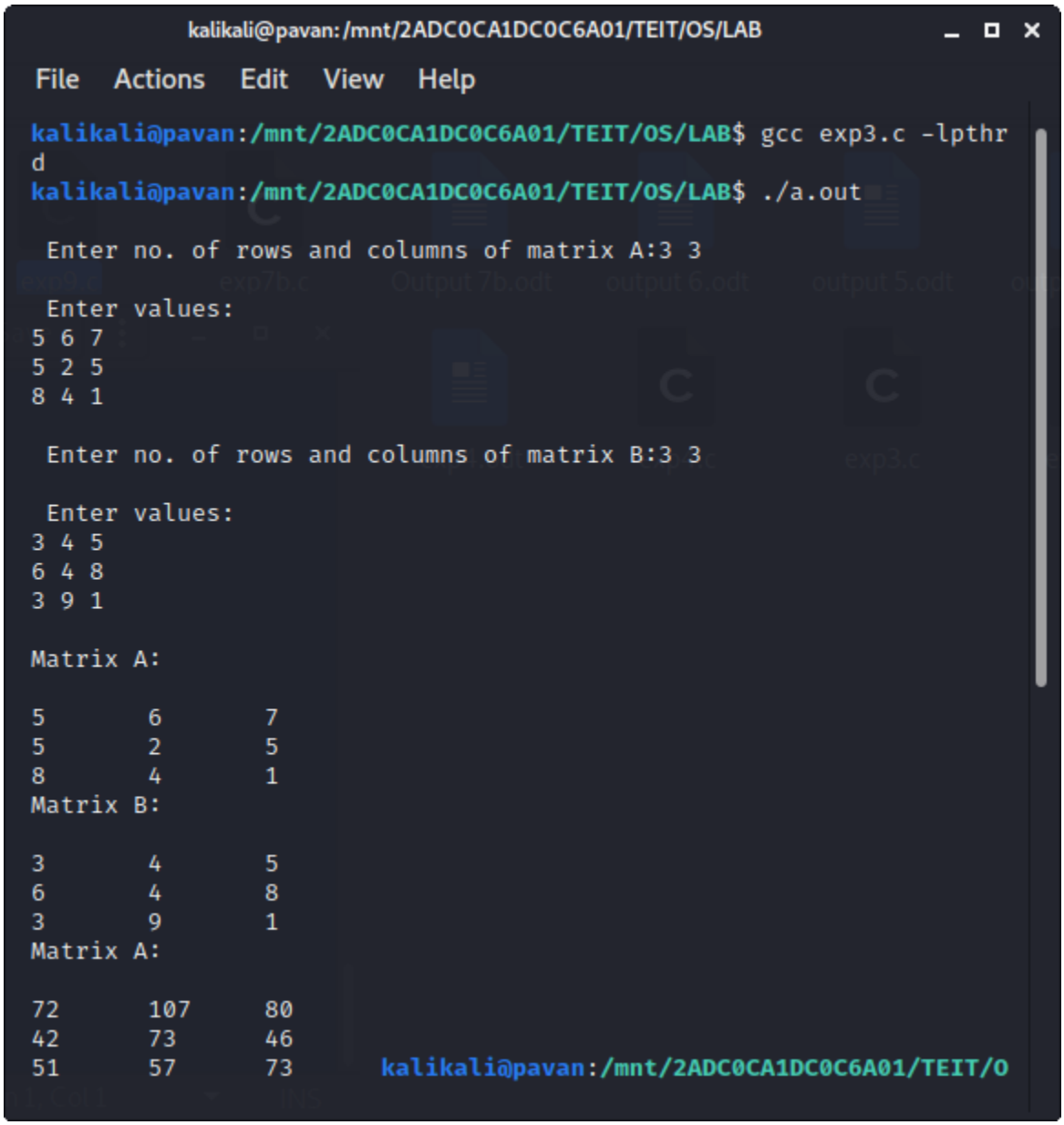
Name : Dishank Shekokare
Class : T.E (I.T)
Roll No. : 5317

```
#include<stdio.h>
#include<pthread.h>
#define size 10

int a[size][size],b[size][size],c[size][size];

void *mul_thread(void *args)
{
  int row,col,*rcargs,i;
  int long return_val;

  rcargs=(int*)args;
  row=rcargs[0];
  col=rcargs[1];
  i=rcargs[2];
  return_val=a[row][i]*b[i][col];
  pthread_exit((void *)return_val);
}

void accept(int m[size][size],int row,int col)
{
  for(int i=0;i<row;i++)
  {
    for(int j=0;j<col;j++)
    {
      scanf("%d",&m[i][j]);
    }
  }
}

void display(int m[size][size],int row,int col)
{
  for(int i=0;i<row;i++)
  {
    printf("\n");
    for(int j=0;j<col;j++)
    {
      printf("%d\t",m[i][j]);
```

```
    }
  }
}

int main()
{
  int rowa,rowb,cola,colb,i,k,j;
  int rcargs[3],*status;
  pthread_t p[size][size][size];

  printf("\n Enter no. of rows and columns of matrix A:");
  scanf("%d %d",&rowa,&cola);
  printf("\n Enter values:\n");
  accept(a,rowa,cola);

  printf("\n Enter no. of rows and columns of matrix B:");
  scanf("%d %d",&rowb,&colb);
  printf("\n Enter values:\n");
  accept(b,rowb,colb);
  if(cola==rowb)
  {
  for(i=0;i<rowa;i++)
  {
    for(j=0;j<colb;j++)
    {
      for(k=0;k<cola;k++)
      {
        rcargs[0]=i;
        rcargs[1]=j;
        rcargs[2]=k;
        pthread_create(&p[i][j][k],NULL,mul_thread,rcargs);
        pthread_join(p[i][j][k],(void **)&status);
        c[i][j]+=(long)status;
      }
    }
  }

  printf("\nMatrix A:\n");
  display(a,rowa,cola);

  printf("\nMatrix B:\n");
  display(b,rowb,colb);

  printf("\nMatrix A:\n");
```

```
 display(c,rowa,colb);
 }
 else printf("\n Multiplication not possible!");
 return 0;
}
```

Output :



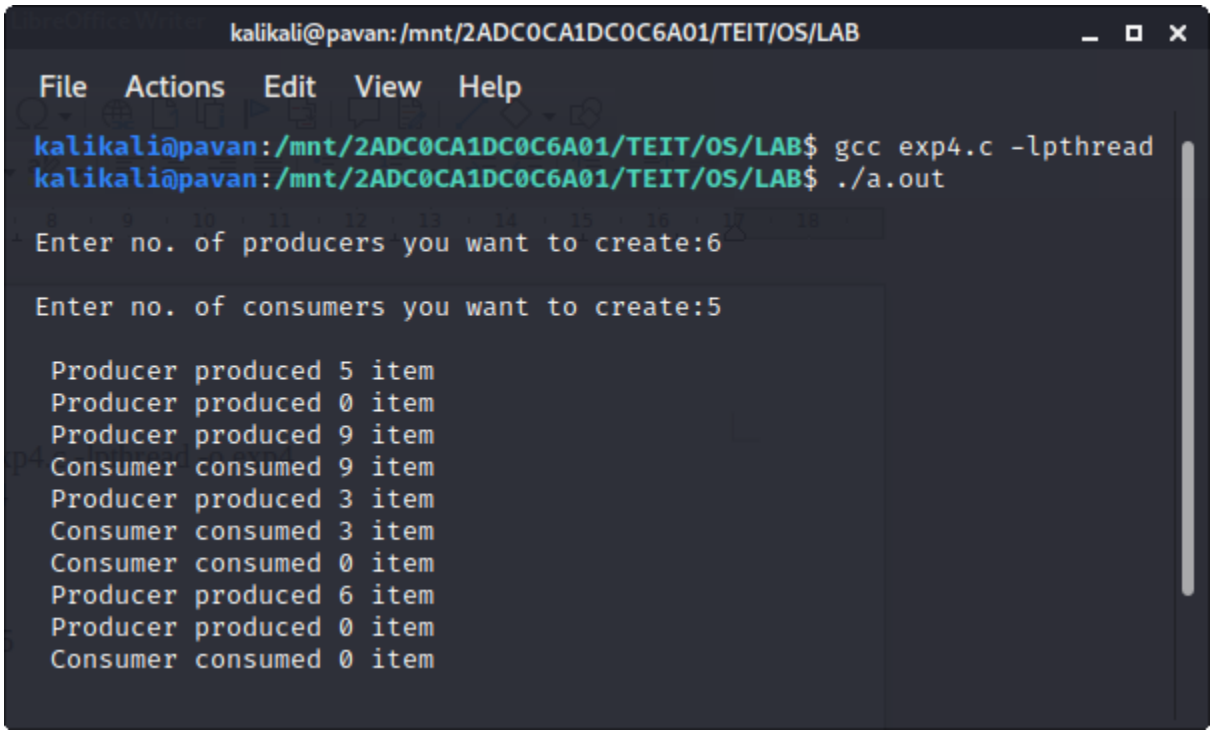
ASSIGNMENT 4

Name : Dishank Shekokare
Class : T.E (I.T)
Roll No. : 5317

```
#include<stdio.h>
#include<pthread.h>
#include<stdlib.h>
#include<semaphore.h>
#include<unistd.h>
#define buffer_size 10

sem_t full,empty;
int buffer[buffer_size];
pthread_mutex_t mutex;
void *producer(void *p);
void *consumer(void *p);
void insert_item(int);
int remove_item();
int counter;

void initialize()
{
  pthread_mutex_init(&mutex,NULL);
  sem_init(&full,1,0);
  sem_init(&empty,1,buffer_size);
  counter=0;
}

int main()
{
  int n1,n2,i;
  printf("\nEnter no. of producers you want to create:");
  scanf("%d",&n1);
  printf("\nEnter no. of consumers you want to create:");
  scanf("%d",&n2);
  initialize();
  pthread_t tid[n1],tid1[n2];
  for(i=0;i<n1;i++)
  pthread_create(&tid[i],NULL,producer,NULL);
  for(i=0;i<n2;i++)
  pthread_create(&tid1[i],NULL,consumer,NULL);
  sleep(50);
```

```
  exit(0);
}

void *producer(void *p)
{
  int item,waittime;
  waittime=rand()%5;
  sleep(waittime);

  item =rand()%10;
  sem_wait(&empty);
  pthread_mutex_lock(&mutex);
  printf("\n Producer produced %d item",item);
  insert_item(item);
  pthread_mutex_unlock(&mutex);
  sem_post(&full);
}

void *consumer(void *p)
{
  int item,waittime;
  waittime=rand()%10;
  sleep(waittime);
  sem_wait(&full);
  pthread_mutex_lock(&mutex);
  item=remove_item();
  printf("\n Consumer consumed %d item",item);

  pthread_mutex_unlock(&mutex);
  sem_post(&empty);
}

void insert_item(int item)
{
  buffer[counter++]=item;
}

int remove_item()
{
  return(buffer[--counter]);
}
```

Output :


kalikali@pavan:/mnt/2ADC0CA1DC0C6A01/TEIT/OS/LAB
File Actions Edit View Help
kalikali@pavan:/mnt/2ADC0CA1DC0C6A01/TEIT/OS/LAB$ gcc exp4.c -lpthread
kalikali@pavan:/mnt/2ADC0CA1DC0C6A01/TEIT/OS/LAB$ ./a.out
Enter no. of producers you want to create:6
Enter no. of consumers you want to create:5
Producer produced 5 item
Producer produced 0 item
Producer produced 9 item
Consumer consumed 9 item
Producer produced 3 item
Consumer consumed 3 item
Consumer consumed 0 item
Producer produced 6 item
Producer produced 0 item
Consumer consumed 0 item

ASSIGNMENT 5

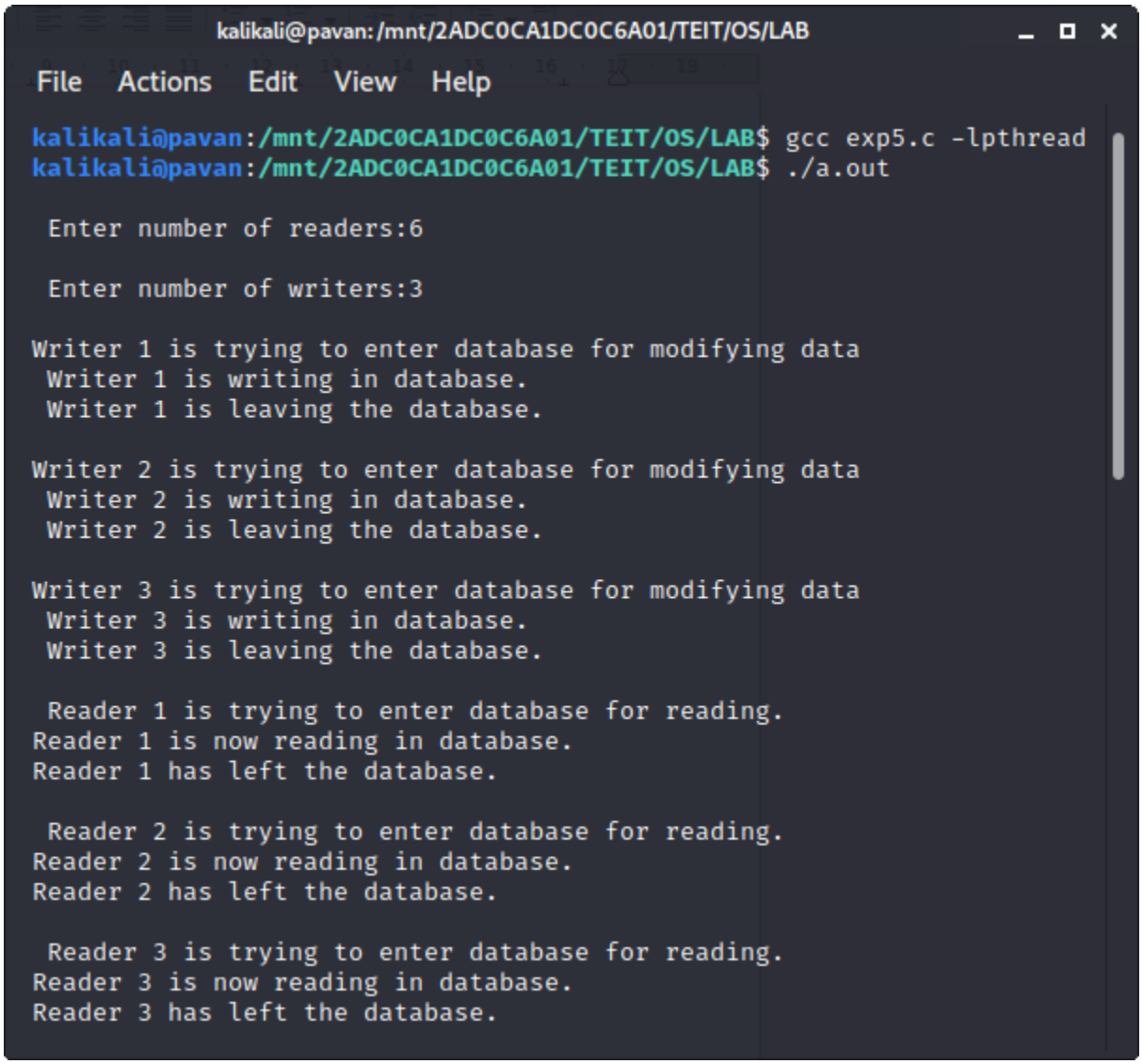
Name : Dishank Shekokare
Class : T.E (I.T)
Roll No. : 5317

```
#include<stdio.h>
#include<stdlib.h>
#include<pthread.h>
#include<semaphore.h>
#include<unistd.h>

void *writer_thr(int temp);
void *reader_thr(int temp);
sem_t mutex;
sem_t wrt;
int readcount=0,nwt,nrd;


void main()
{
  long int i;
  sem_init(&mutex,0,1);
  sem_init(&wrt,0,1);
  pthread_t reader[100],writer[100];
  printf("\n Enter number of readers:");
  scanf("%d",&nrd);
  printf("\n Enter number of writers:");
  scanf("%d",&nwt);

  for(i=1;i<=nwt;i++)
  {
    pthread_create(&writer[i],NULL,(void *)writer_thr,(int *)i);
    pthread_join(writer[i],NULL);
  }

  for(i=1;i<=nrd;i++)
  {
    pthread_create(&reader[i],NULL,(void *)reader_thr,(int *)i);
  }
```

```
  for(i=1;i<=nrd;i++)
  {
    pthread_join(reader[i],NULL);
  }

  sem_destroy(&wrt);
  sem_destroy(&mutex);

}



void *reader_thr(int temp)
{

  printf("\n Reader %d is trying to enter database for reading.",temp);
  sem_wait(&mutex);
  readcount++;
  if(readcount==1)
  sem_wait(&wrt);
   sem_post(&mutex);

  printf("\nReader %d is now reading in database.",temp);


  sem_wait(&mutex);
  readcount--;
  if(readcount==0)

  sem_post(&wrt);
  sem_post(&mutex);
  printf("\nReader %d has left the database.\n",temp);
  sleep(3);
}

void *writer_thr(int temp)
{

 printf("\nWriter %d is trying to enter database for modifying data",temp);
 sem_wait(&wrt);
 printf("\n Writer %d is writing in database.",temp);
 sleep(3);
 printf("\n Writer %d is leaving the database.\n",temp);
 sem_post(&wrt);
```

}

Output :

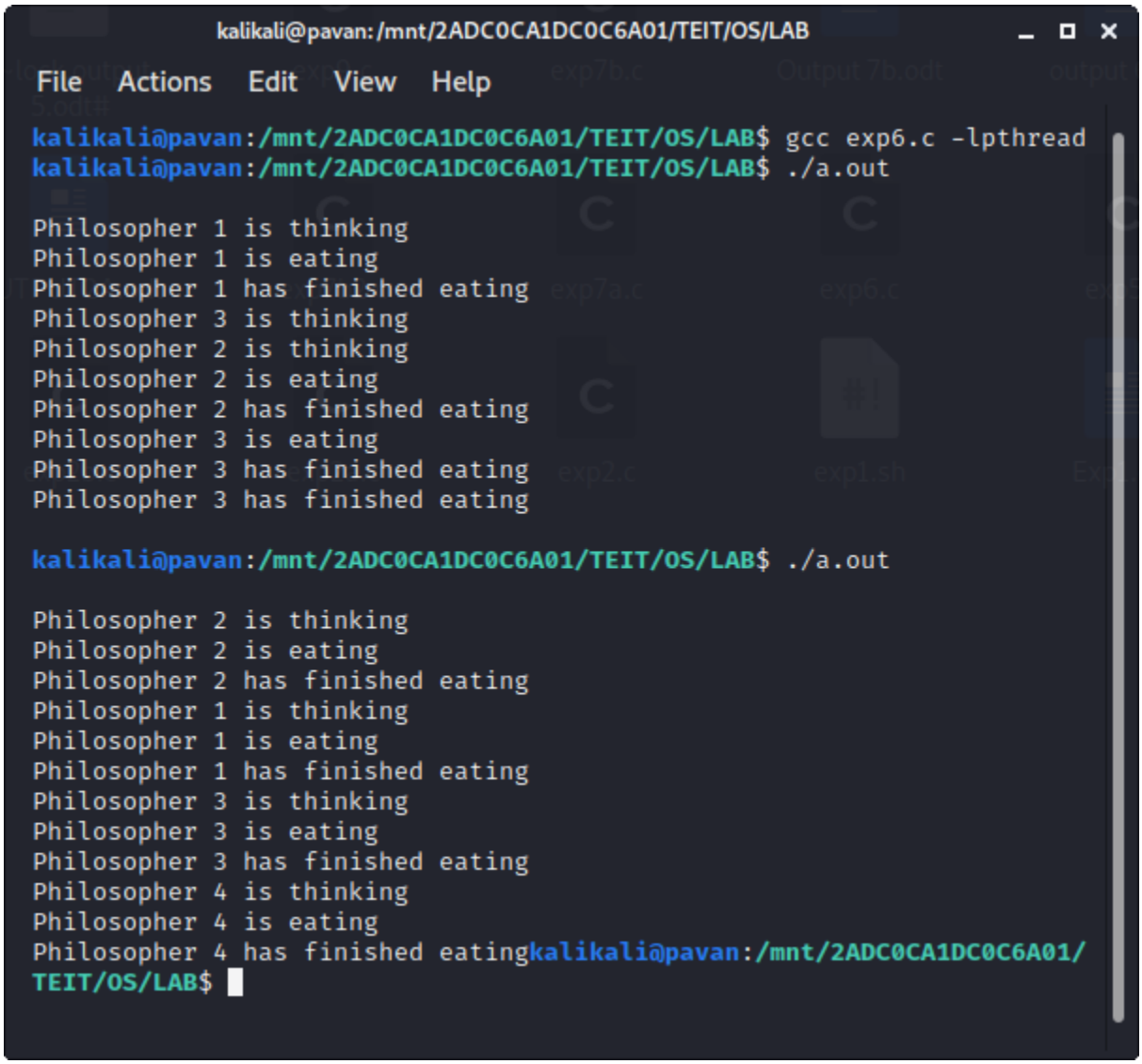

kalikali@pavan: /mnt/2ADC0CA1DC0C6A01/TEIT/OS/LAB
File Actions Edit View Help
kalikali@pavan:/mnt/2ADC0CA1DC0C6A01/TEIT/OS/LAB$ gcc exp5.c -lpthread
kalikali@pavan:/mnt/2ADC0CA1DC0C6A01/TEIT/OS/LAB$ ./a.out
Enter number of readers:6
Enter number of writers:3
Writer 1 is trying to enter database for modifying data
Writer 1 is writing in database.
Writer 1 is leaving the database.
Writer 2 is trying to enter database for modifying data
Writer 2 is writing in database.
Writer 2 is leaving the database.
Writer 3 is trying to enter database for modifying data
Writer 3 is writing in database.
Writer 3 is leaving the database.
Reader 1 is trying to enter database for reading.
Reader 1 is now reading in database.
Reader 1 has left the database.
Reader 2 is trying to enter database for reading.
Reader 2 is now reading in database.
Reader 2 has left the database.
Reader 3 is trying to enter database for reading.
Reader 3 is now reading in database.
Reader 3 has left the database.

ASSIGNMENT 6

Name : Dishank Shekokare
Class : T.E (I.T)
Roll No. : 5317

```
#include<stdio.h>
#include<pthread.h>
#include<stdlib.h>
#include<semaphore.h>
#include<unistd.h>
#include<sys/types.h>

void *func(int n);
pthread_t philosopher[5];
pthread_mutex_t chopstick[5];

void main()
{

   long int i;
  for(i=1;i<=5;i++)
  pthread_mutex_init(&chopstick[i],NULL);

  for(i=1;i<=5;i++)
  pthread_create(&philosopher[i],NULL,(void *)func,(long int *) i);

  for(i=1;i<=5;i++)
  pthread_mutex_destroy(&chopstick[i]);
 }

void *func(int n)
{

  printf("\nPhilosopher %d is thinking",n);
  pthread_mutex_lock(&chopstick[n]);
  pthread_mutex_lock(&chopstick[(n+1)%5]);
  printf("\nPhilosopher %d is eating",n);
  //sleep(3);
  pthread_mutex_unlock(&chopstick[(n+1)%5]);
  pthread_mutex_unlock(&chopstick[n]);
  printf("\nPhilosopher %d has finished eating",n);
}
```

Output :


kalikali@pavan:/mnt/2ADC0CA1DC0C6A01/TEIT/OS/LAB
File Actions Edit View Help
kalikali@pavan:/mnt/2ADC0CA1DC0C6A01/TEIT/OS/LAB$ gcc exp6.c -lpthread
kalikali@pavan:/mnt/2ADC0CA1DC0C6A01/TEIT/OS/LAB$ ./a.out
Philosopher 1 is thinking
Philosopher 1 is eating
Philosopher 1 has finished eating
Philosopher 3 is thinking
Philosopher 2 is thinking
Philosopher 2 is eating
Philosopher 2 has finished eating
Philosopher 3 is eating
Philosopher 3 has finished eating
Philosopher 3 has finished eating
kalikali@pavan:/mnt/2ADC0CA1DC0C6A01/TEIT/OS/LAB$ ./a.out
Philosopher 2 is thinking
Philosopher 2 is eating
Philosopher 2 has finished eating
Philosopher 1 is thinking
Philosopher 1 is eating
Philosopher 1 has finished eating
Philosopher 3 is thinking
Philosopher 3 is eating
Philosopher 3 has finished eating
Philosopher 4 is thinking
Philosopher 4 is eating
Philosopher 4 has finished eatingkalikali@pavan:/mnt/2ADC0CA1DC0C6A01/
TEIT/OS/LAB$

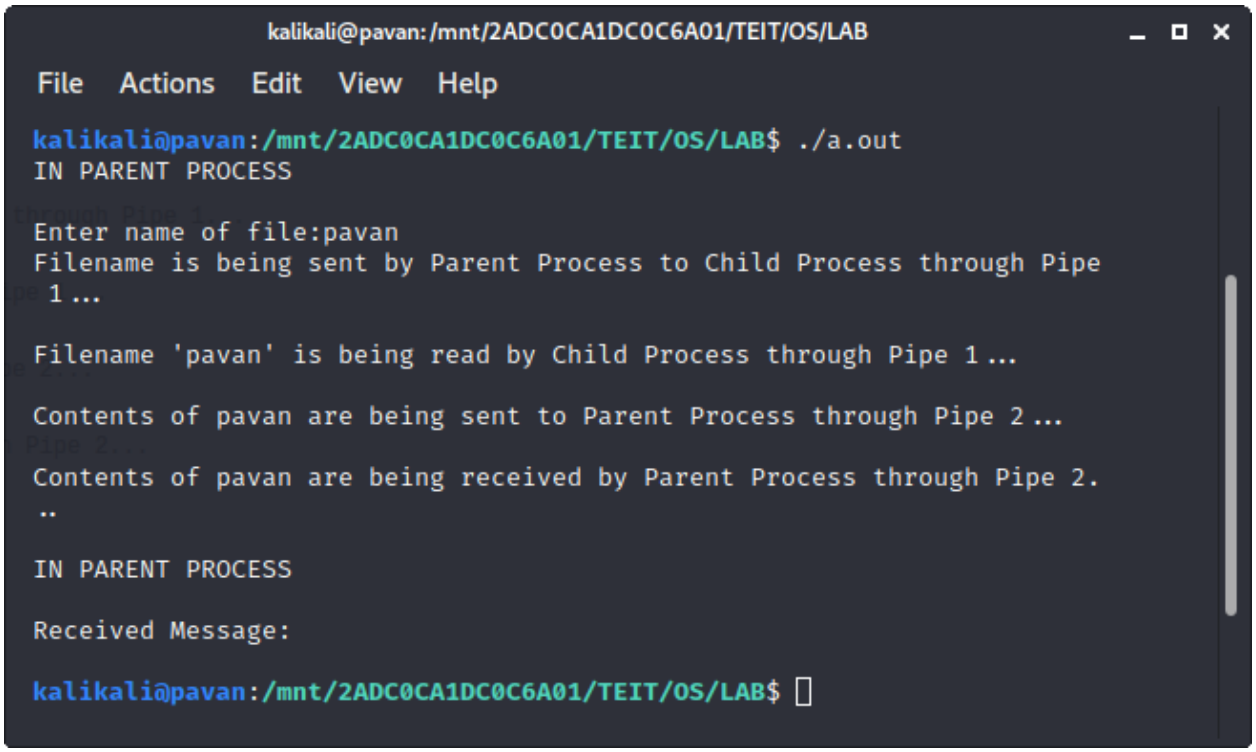
ASSIGNMENT 7 - a

Name : Dishank Shekokare
Class : T.E (I.T)
Roll No. : 5317

```
#include<stdio.h>
#include<unistd.h>
#include<string.h>
#include<stdlib.h>
#include <sys/types.h>
#include <unistd.h>

int main(void)
{
	int fd1[2], nbytes=1,fd2[2],a=0;
	pid_t pid;
	char string[80];
	char readbuffer[80];
	char ch='a',ch1='\n';
	FILE *fp;

	pipe(fd1);//PIPE CREATED
	pipe(fd2);//PIPE CREATED

	/*Error in fork*/
	if((pid = fork()) == -1)
	{
		perror("fork");
		exit(1);
	}

	//Child Process
	if(pid == 0)
	{
		close(fd1[1]);		/*closing write end of Pipe 1*/
		read(fd1[0], readbuffer, sizeof(readbuffer));	/*reading filename through Pipe 1*/
		printf("\nFilename '%s' is being read by Child Process through Pipe
1...\n",readbuffer);
		fp=fopen(readbuffer,"r");
		close(fd1[0]);		/*closing read end of Pipe 1*/
		close(fd2[0]);		/*closing read end of Pipe 2*/
		printf("\nContents of %s are being sent to Parent Process through Pipe
2...\n",readbuffer);
```

```
                while(a!=-1)
                {
                        a=fscanf(fp,"%c",&ch);
                        write(fd2[1], &ch, sizeof(ch));   /*writing contents of file on Pipe 2*/
                }
                close(fd2[1]); /*closing write end of Pipe 2*/
                exit(0);
        }
        //Parent process
        else
        {
                close(fd1[0]); /*closing read end of Pipe 1*/
                printf("IN PARENT PROCESS\n" );
                printf("\nEnter name of file:");
                scanf("%s",string);
                printf("Filename is being sent by Parent Process to Child Process through Pipe
1...\n");
                write(fd1[1], string, (strlen(string)+1));  /*writing filename on Pipe 1*/
                wait();
                close(fd1[1]); /*closing write end of Pipe 1*/
                close(fd2[1]);  /*closing write end of Pipe 2*/

                printf("\nContents of %s are being received by Parent Process through Pipe
2...\n\n",string);
                printf("IN PARENT PROCESS\n" );
                printf("\nReceived Message:\n");

                while(nbytes!=0)
                {
                        printf("%c",ch1);
                        nbytes = read(fd2[0], &ch1, sizeof(ch1));   /*reading contents of file from
Pipe 2*/
                }
                close(fd2[0]); /*closing read end of Pipe 2*/
        }
        return(0);
}
```

Output :


kalikali@pavan: /mnt/2ADC0CA1DC0C6A01/TEIT/OS/LAB
File Actions Edit View Help
kalikali@pavan:/mnt/2ADC0CA1DC0C6A01/TEIT/OS/LAB$ ./a.out
IN PARENT PROCESS
Enter name of file:pavan
Filename is being sent by Parent Process to Child Process through Pipe 1 ...
Filename 'pavan' is being read by Child Process through Pipe 1 ...
Contents of pavan are being sent to Parent Process through Pipe 2 ...
Contents of pavan are being received by Parent Process through Pipe 2.
..
IN PARENT PROCESS
Received Message:
kalikali@pavan:/mnt/2ADC0CA1DC0C6A01/TEIT/OS/LAB$

ASSIGNMENT 7 - b

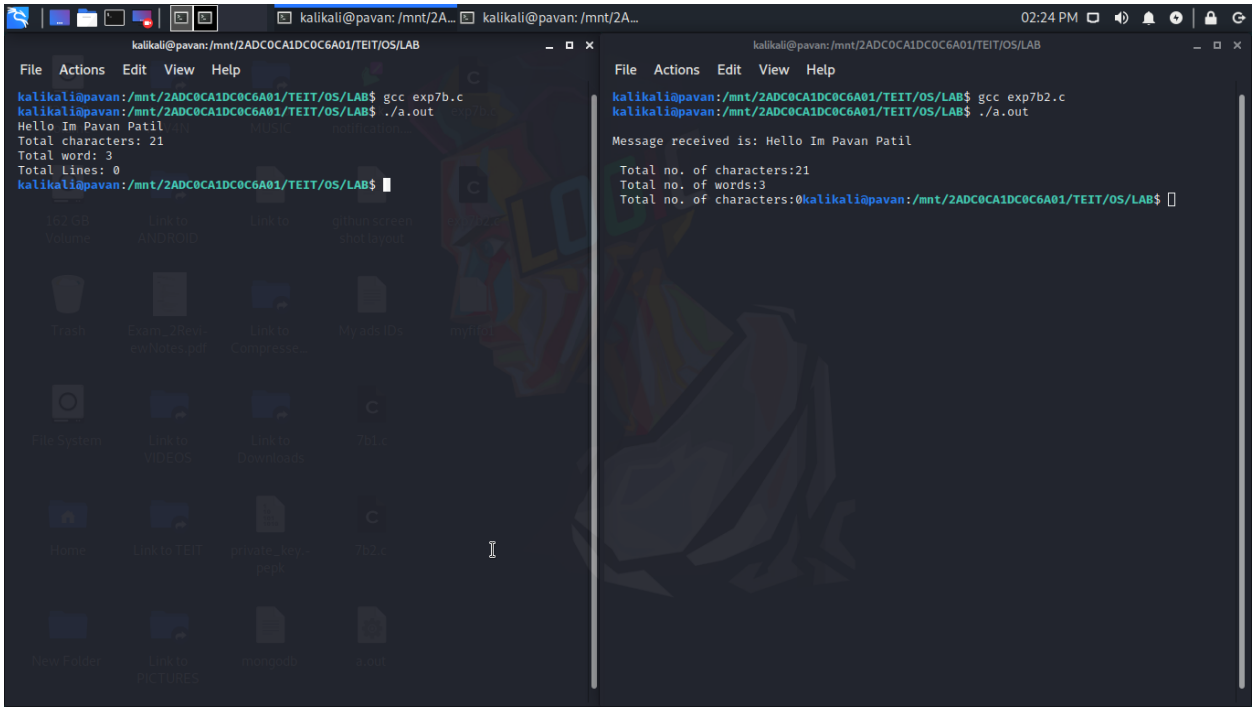
Name : Dishank Shekokare
Class : T.E (I.T)
Roll No. : 5317

//FIFO 2

```
#include<stdio.h>
#include<unistd.h>
#include<sys/types.h>
#include<sys/stat.h>
#include<fcntl.h>
#define max_buf 100

int main()
{
  char *myfifo1="myfifo1",*myfifo2="myfifo2";
  char buf[50];
  FILE *fp;
  int i=0,words=0,lines=0;
  mkfifo(myfifo2,0777);
  int fd,fd1;
  fd=open(myfifo1,O_RDWR);
  read(fd,buf,max_buf);
  printf("\nMessage received is: %s",buf);
  while(buf[i]!='\0')
  {
    while(buf[i]==' ')
    {
      words++,i++;
    }
    if(buf[i]=='.'||buf[i]=='?'||buf[i]=='!')
    {
      lines++,i++;
    }
    i++;
  }

  printf("\n Total no. of characters:%d",i);
   fp=fopen("abc.txt","w+");
   fprintf(fp,"Total characters=%d",i);

    printf("\n Total no. of words:%d",words);
```

```
   fp=fopen("abc.txt","w+");
   fprintf(fp,"Total characters=%d",words);

   printf("\n Total no. of characters:%d",lines);
   fp=fopen("abc.txt","w+");
   fprintf(fp,"Total no. of lines=%d",lines);
   fclose(fp);
   unlink(myfifo1);

   fd1=open(myfifo2,O_RDWR);
   write(fd1,&i,sizeof(i));
   write(fd1,&words,sizeof(words));
   write(fd1,&lines,sizeof(lines));
   close(fd1);
  return 0;
}
```

Output :



ASSIGNMENT 8 - a,b

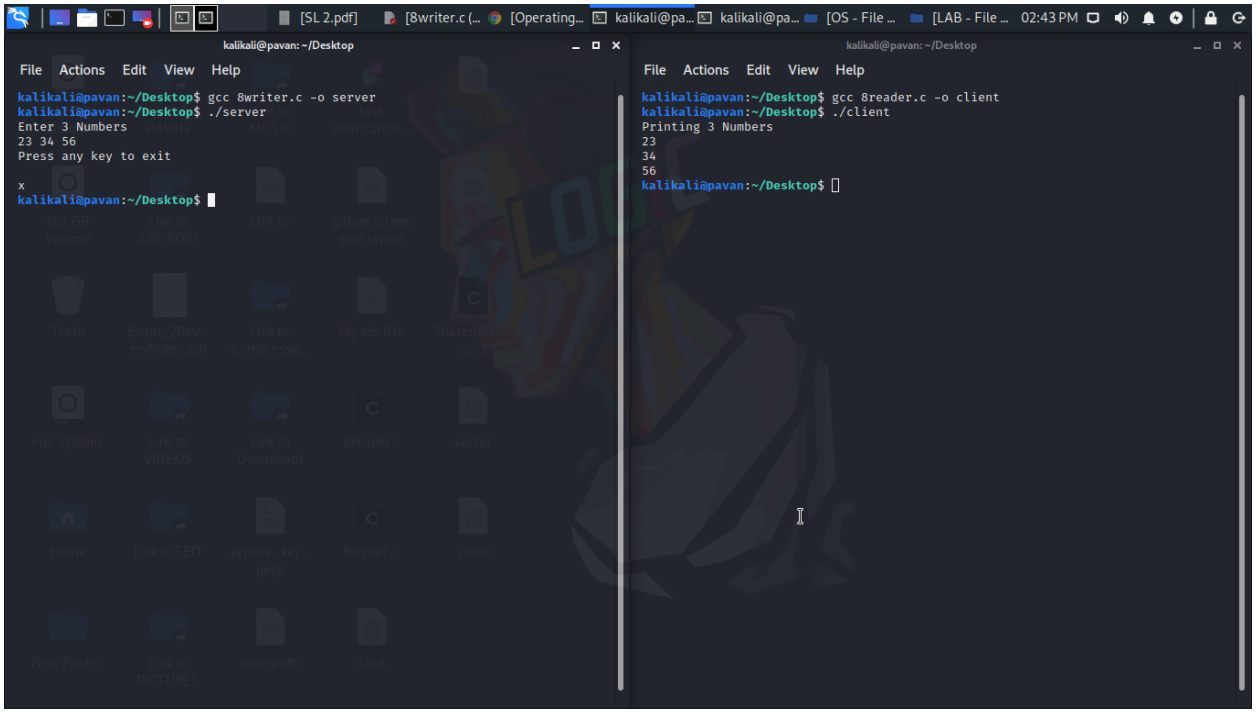
Name : Dishank Shekokare
Class : T.E (I.T)
Roll No. : 5317

//reader os

```
#include <stdio.h>
#include <stdlib.h>
#include "SharedMemory.c"

int main() {
   int shm_id, i;
   if ((shm_id = shm_init()) == -1) {
      perror("Error occured while initialising Shared Memory\n");
      exit(-1);
   }

   SharedMemory *mSharedMemory = attach(shm_id);

   if (mSharedMemory->status == READ_BY_CLIENT) {
      printf("Server hasn't written value yet\n");
      exit(-1);
   }

   printf("Printing %d Numbers\n", ARRAY_LENGTH);
   for (i = 0;i < ARRAY_LENGTH;i++) {
      printf("%d\n", mSharedMemory->array[i]);
   }

   mSharedMemory->status = READ_BY_CLIENT;

   if (detach(mSharedMemory) == -1) {
      perror("Error occured while detaching Shared memory\n");
      exit(-1);
   }

}
```

```
//writer os

#include <stdio.h>
#include <stdlib.h>
#include "SharedMemory.c"

int main() {
   int shm_id, i;
   if ((shm_id = shm_init()) == -1) {
      perror("Error occured while initialising Shared Memory\n");
      exit(-1);
   }

   SharedMemory *mSharedMemory = attach(shm_id);

   if (mSharedMemory->status == WRITTEN_BY_SERVER) {
      printf("Client hasn't read value yet\n");
      exit(-1);
   }

   printf("Enter %d Numbers\n", ARRAY_LENGTH);
   for (i = 0;i < ARRAY_LENGTH;i++) {
      scanf("%d", &mSharedMemory->array[i]);
   }

   mSharedMemory->status = WRITTEN_BY_SERVER;

   if (detach(mSharedMemory) == -1) {
      perror("Error occured while detaching Shared memory\n");
      exit(-1);
   }

   char c;
   printf("Press any key to exit\n");
   scanf(" %c", &c);

}
```

Output :


[SL 2.pdf]
[8writer.c (...
[Operating...
kalikali@pa...
kalikali@pa...
[OS - File ...
[LAB - File ...
02:43 PM
kalikali@pavan: ~/Desktop
File Actions Edit View Help
kalikali@pavan:~/Desktop$ gcc 8writer.c -o server
kalikali@pavan:~/Desktop$ ./server
Enter 3 Numbers
23 34 56
Press any key to exit
x
kalikali@pavan:~/Desktop$
kalikali@pavan: ~/Desktop
File Actions Edit View Help
kalikali@pavan:~/Desktop$ gcc 8reader.c -o client
kalikali@pavan:~/Desktop$ ./client
Printing 3 Numbers
23
34
56
kalikali@pavan:~/Desktop$

ASSIGNMENT 8 - c

Name : Dishank Shekokare
Class : T.E (I.T)
Roll No. : 5317

```
#include <stdio.h>
#include <unistd.h>
#include <stdlib.h>
#include <sys/stat.h>
#include <fcntl.h>

typedef struct Student {

  int roll;
  char name[100];
  float percentage;

}Student;

char *file_path;

void write_student(Student student) {

    int fd = open(file_path, O_WRONLY|O_APPEND);

    if(fd<0)
    {
       printf("\nError writing file");
       exit(0);
    }
    else
    {
       write(fd, &student, sizeof(student));
       printf("\n Writen successfully!");
    }
    close(fd);

}

void read_student() {
    Student student;
    int fd = open(file_path, O_RDONLY);
    if(fd<0)
```

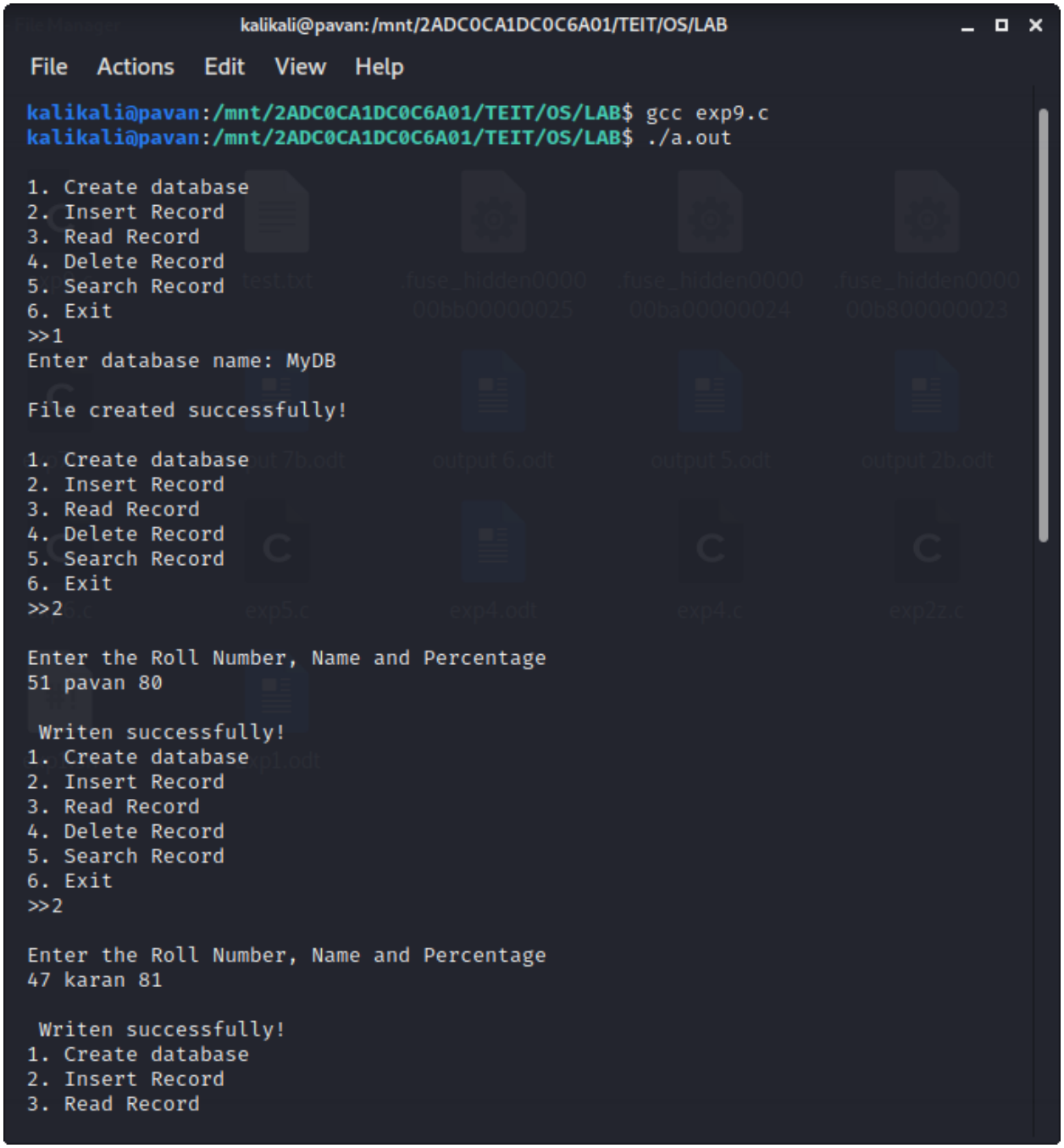
```
    {
      printf("\nError reading file");
      exit(0);
    }
    else
    {
      while(read(fd, &student, sizeof(student)))
      printf("Name: %s\nRoll Number: %d\nPercentage: %f\n", student.name, student.roll,
student.percentage);
    }

    close(fd);
}
void delete_student(int rno) {
    char *tmp = "temp";
    Student student;
    int fd1 = open(file_path, O_RDONLY);
    int fd2 = open(tmp, O_CREAT|O_WRONLY);
    if(fd1<0)
    {
      printf("\nError reading file");
      exit(0);
    }
    else
    {
      while(read(fd1, &student, sizeof(student)))
      {
        if(student.roll == rno)
        {

        }
        else
        {
            write(fd2, &student, sizeof(student));
        }
      }
    }

    remove(file_path);
    rename(tmp,file_path);

    close(fd1);
    close(fd2);
}
```

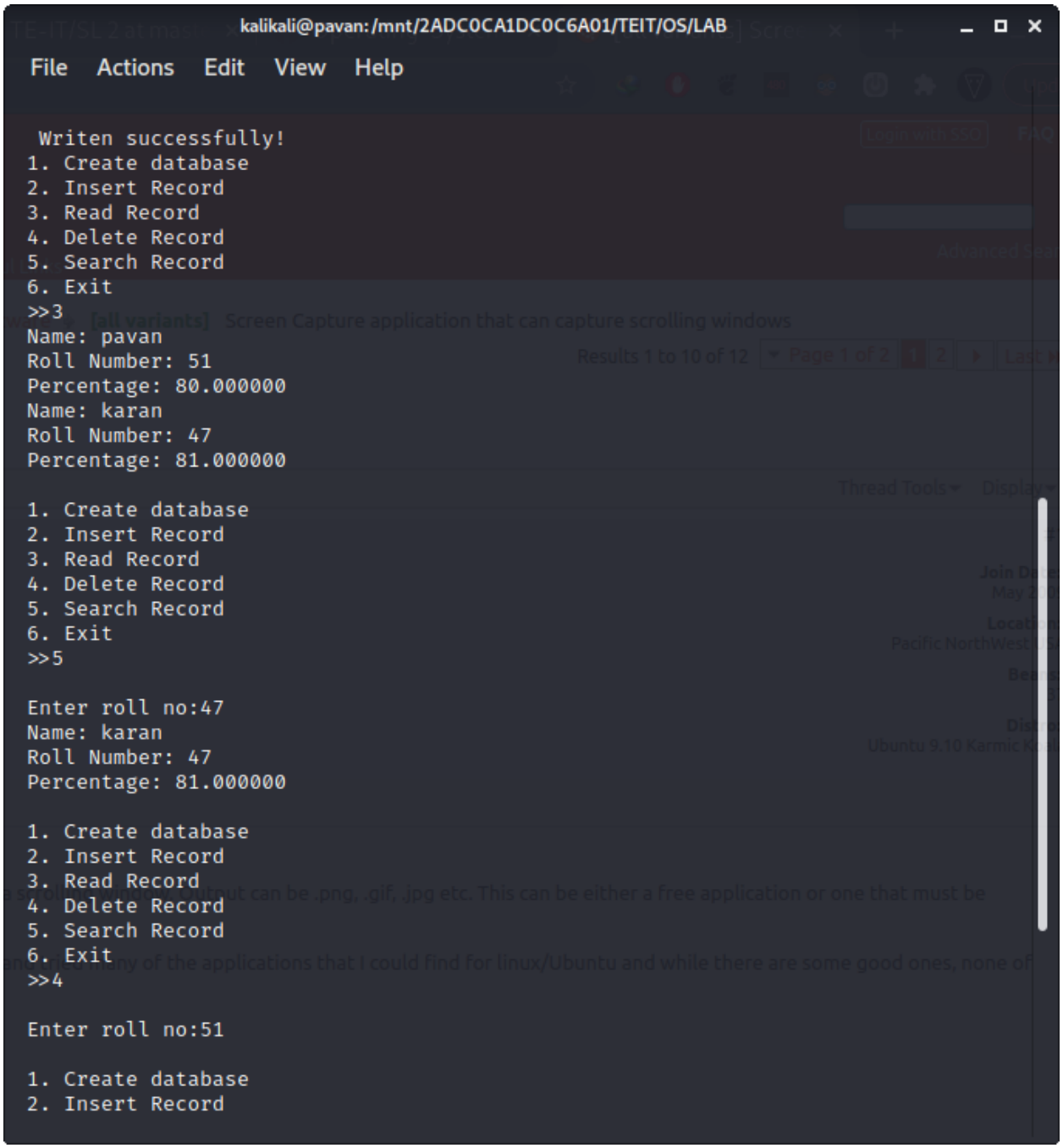
```
void search_student(int rno) {

   Student student;
   int fd1 = open(file_path, O_RDONLY);
   int flag = 0;
   if(fd1<0)
   {
      printf("\nError reading file");
      exit(0);
   }
   else
   {
      while(read(fd1, &student, sizeof(student)))
      {
        if(student.roll == rno)
        {
            printf("Name: %s\nRoll Number: %d\nPercentage: %f\n", student.name, student.roll,
student.percentage);
            flag = 1;
        }
      }
   }

   if(flag == 0)
         printf("\nRecord not Found!");


   close(fd1);

}

int main(int argc, char const *argv[])
{
  Student student;
  int ch;
  int fd, r;
  char dname[20];


  while(1)
  {
     printf("\n1. Create database \n2. Insert Record \n3. Read Record \n4. Delete Record \n5.
Search Record \n6. Exit \n>>") ;
```

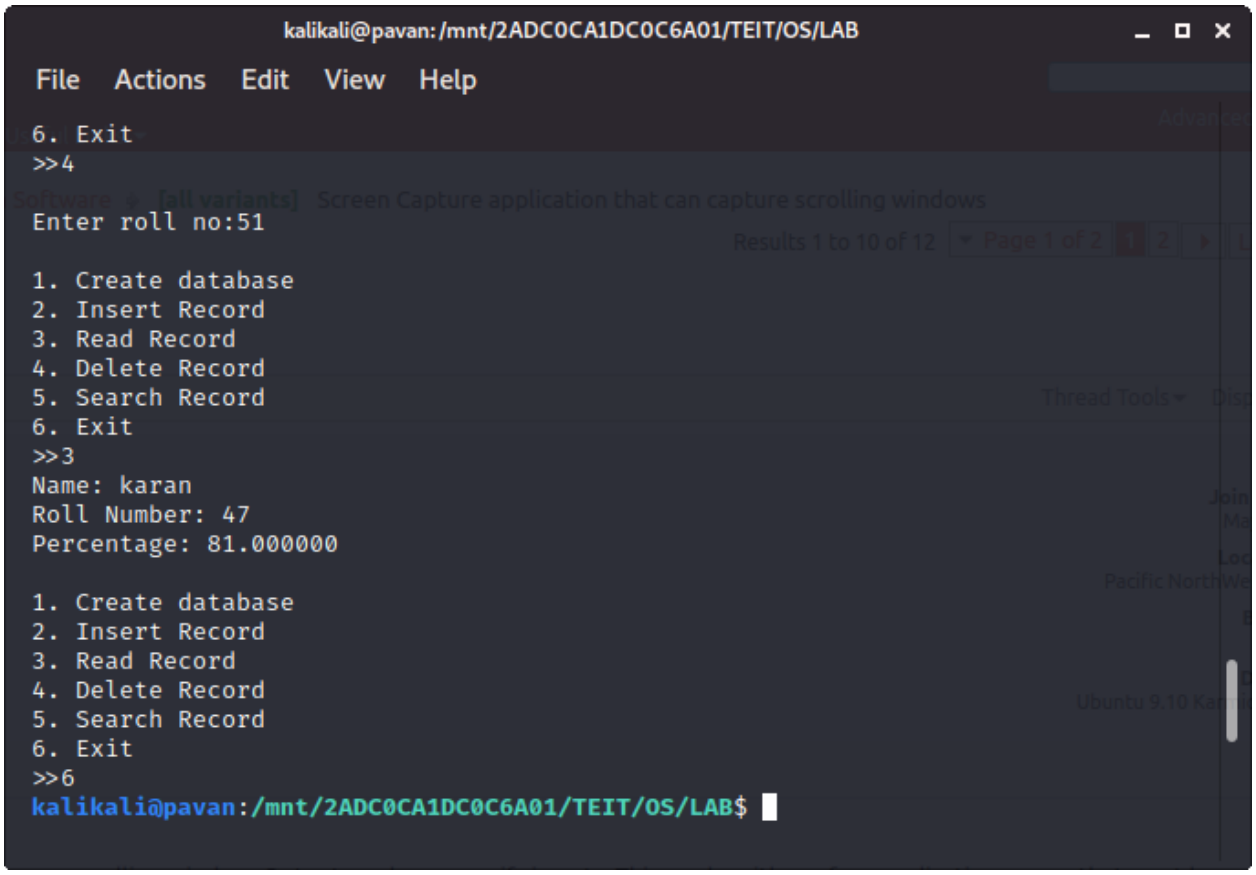
```
  scanf("%d", &ch);

  switch(ch)
  {
    case 1:
        printf("Enter database name: ");
        scanf("%s", dname);
     file_path = dname;
     int fd = open(file_path, O_CREAT);
     if(fd<0)
     {
        printf("\nError creating file");
        exit(0);
     }
     else
     {
        printf("\nFile created successfully!\n");
     }
     close(fd);
       break;
    case 2:
        printf("\nEnter the Roll Number, Name and Percentage\n");
     scanf("%d%s%f", &student.roll, student.name, &student.percentage);
       write_student(student);
       break;
    case 3:
     read_student();
     break;
    case 4:
        printf("\nEnter roll no:");
        scanf("%d", &r);
        delete_student(r);
        break;
    case 5:
     printf("\nEnter roll no:");
       scanf("%d", &r);
       search_student(r);
       break;
    case 6:
       exit(0)    ;
    default:
       printf("\nInvalid Choce!");
  }
}
```

```
  return 0;
}
```

Output :




kalikali@pavan: /mnt/2ADC0CA1DC0C6A01/TEIT/OS/LAB
File Actions Edit View Help
Writen successfully!
1. Create database
2. Insert Record
3. Read Record
4. Delete Record
5. Search Record
6. Exit
>>3
Name: pavan
Roll Number: 51
Percentage: 80.000000
Name: karan
Roll Number: 47
Percentage: 81.000000
1. Create database
2. Insert Record
3. Read Record
4. Delete Record
5. Search Record
6. Exit
>>5
Enter roll no:47
Name: karan
Roll Number: 47
Percentage: 81.000000
1. Create database
2. Insert Record
3. Read Record
4. Delete Record
5. Search Record
6. Exit
>>4
Enter roll no:51
1. Create database
2. Insert Record


kalikali@pavan: /mnt/2ADC0CA1DC0C6A01/TEIT/OS/LAB
File Actions Edit View Help
6. Exit
>>4
Enter roll no:51
1. Create database
2. Insert Record
3. Read Record
4. Delete Record
5. Search Record
6. Exit
>>3
Name: karan
Roll Number: 47
Percentage: 81.000000
1. Create database
2. Insert Record
3. Read Record
4. Delete Record
5. Search Record
6. Exit
>>6
kalikali@pavan:/mnt/2ADC0CA1DC0C6A01/TEIT/OS/LAB$