SRI KRISHNA COLLEGE OF ENGINEERING AND TECHNOLOGY, COIMBATORE-641008

Affiliated to Anna University Chennai

Accredited by NAAC with A Grade

DEPARTMENT OF INFORMATION TECHNOLOGY

II B.Tech- Information Technology

21CS301 - OPERATING SYSTEMS LAB

PRACTICAL RECORD

Submitted by

Name : **RASIKA B**

Reg.No : **727721EUIT126**

727721EUIT126
RASIKA B

SRI KRISHNA COLLEGE OF ENGINEERING AND TECHNOLOGY, COIMBATORE-641 008

DEPARTMENT OF INFORMATION TECHNOLOGY

21CS301- OPERATING SYSTEMS LAB

PRACTICAL RECORD

Name : RASIKA B **Reg.no :727721EUIT126**

Class : II BTECH IT 'C' **Semester : III**

BONAFIDE CERTIFICATE

Certified bonafide record of work done by Mr. /Ms RASIKA B

during the academic year 2022-2023 (Odd Semester)

Staff-In Charge **HOD**

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AFFILIATED TO ANNA UNIVERSITY CHENNAI
ACCREDITED BY NAAC WITH `A` GRADE

Department of IT

Rubrics for Evaluating Laboratory

Subject Code : 21CS301

Lab Name : Operating Systems Lab

Method: Lab Reports and Observation of Faculty Incharge

Outcomes Assessed:

a) Graduates will demonstrate knowledge of mathematical, scientific and multidisciplinary approach for problem solving.

b) Graduates will be able to apply their knowledge in various programming skills to create solutions for product based and application based software.

c) Graduates will possess the ability to create real time solutions for different projects by using modern tools prevailing in the current trends.

e) Graduates attain advanced knowledge in the stream of Information Technology and basic knowledge in Electronics and Communication Engineering to develop and maintain the simple and complex information systems.

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Department of IT

Reg No:727721EUIT126 **Name of the Student:RASIKA B**

Name of the lab: 21CS301 Operating Systems Lab

Components	Exp No and Date																				Average Score
	Ex 1	Ex 2	Ex 3	Ex 4	Ex 5	Ex 6	Ex 7	Ex 8	Ex 9	Ex 10	Ex 11	Ex 12	Ex 13	Ex 14	Ex 15	Ex 16	Ex 17	Ex 18	Ex 19	Ex 20	
Aim & Algorithm 20 Marks																					
Coding 30 Marks																					
Compilation & Debugging 30 Marks																					
Execution & Results 10 Marks																					
Documentation & Viva 10 Marks																					
Total																					

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PROGRAMME OUTCOMES

a) Graduates will demonstrate knowledge of mathematical, scientific and multidisciplinary approach for problem solving.

(Criteria to be used for assessment Aim, Algorithm, Flowchart (Optional) and Description with sample Test cases, Coding, Compilation and Debugging)

b) Graduates will be able to apply their knowledge in various programming skills to create solutions for product based and application based software.

(Criteria to be used for assessment Coding, Compilation and Debugging)

c) Graduates will possess the ability to create real time solutions for different projects by using modern tools prevailing in the current trends.

(Criteria to be used for assessment Aim, Algorithm, Flowchart (Optional) and Description with sample Test cases, Coding, Compilation and Debugging, Execution and Results (Inclusion of Generalization like Subroutines, Modules)

e) Graduates attain advanced knowledge in the stream of Information Technology and basic knowledge in Electronics and Communication Engineering to develop and maintain the simple and complex information systems.

(Criteria to be used for assessment Aim, Algorithm, Flowchart (Optional) and Description with sample Test cases, Coding, Compilation and Debugging, Execution and Results (Inclusion of Generalization like Subroutines, Modules

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EX:NO:1	BASIC LINUX COMMANDS
DATE:16.08.22	

AIM:

To study and demonstrate the use of basic linux commands.

COMMANDS:

1.man command:

It is an interface to the on-line reference manual to any of the command.

Syntax: man command name

Ex: man man

2.mkdir command:

mkdir command creates the directory, if they do not already exist.

Syntax: mkdir [option] directory

Ex: mkdir Nature

3.cd command:

Change directory command is used to change the current working directory.

Syntax: cd directoryname

Ex: cd Nature

4.cd.. command:

This command is used to move to parent directory of current directory.

Syntax: cd ..

Ex: cd ..

5.Is command:

It is used to list the directory contents.

Syntax: Is [option] [File]

Is – t:

This command sorts by time and date
Ex: Is - t

Is – Is:

This command displays the list with long format with file size.
Ex: Is – Is

Is – r:

This command displays the list in the reverse order.
Ex: Is – r

Is – s:

This command displays the list file size.
Ex: Is - s

Is – R:

This command displays recursively directory tree.
Ex: Is – R

6.cat command:

cat command is used to concatenate files and print on the standard output.

Syntax: cat [option] [File]

Cat > newfile:

To create a new file.
Ex: cat > Linux1

Cat file1 >> file2:

This command can append the contents of one file to the end of another file.
Ex: cat Linux1 >> Windows

Cat file1 file2 > file3:

This command is used to merge the contents of multiple file.
Ex: cat Linux1 Windows > Final

7.cp command:

This command is used to copy files or group of files or directory.

Ex: cp Linux1 linux

Syntax: cp Sourse destination.

8.mv command:

This command moves one or more files or directories from one place to another.

Ex: mv Linux1 copylinux

9.pwd command:

This command gives the full pathname of the current working directory to the standard output.

Syntax: pwd

10.rm command:

Rm command is used to remove objects such as files.

Syntax: rm filename

Ex: rm Final

11.wc command:

It is used to find out number of newline count, word count byte and characters.

Syntax: wc filename

Ex: wc windows

12.Sort command:

Sorts the contents of a text file, line by line.

Syntax: Sort filename

Ex: Sort windows

Sort – r:

Sorts the contents in descending order.
Syntax: Sort – r filename
Ex: Sort – r Windows

13.history command:

This shows the last five hundred commands we entered.

Syntax: history

14.! n command:

Does the particular command use mention.

Syntax: ! (number)

Ex: !2

15.whoami command:

It displays the username of the current user.

Syntax: whoami

16.ps command:

It is used for viewing information related with the processes on a system.

Syntax: ps

17.grep command:

It is used to search for a string of characters in a specified file.

grep – v:

It display the lines which does not match the given word.
Syntax: grep – v (word) filename
Ex: grep – v It Windows

grep – c:

It gives the count of the number of lines having the word.
Syntax: grep – c (word) filename
Ex: grep – c It Windows

grep – n:

It displays the line and line number which has the given word.
Syntax: grep – n (word) filename
Ex: grep – n It Windows

18.cmp command:

It used to compare the two files byte by byte and find out whether two files are identical or not.

Syntax: cmp file1 file2

Ex: cmp Windows copylinux

19.diff command:

This command displays the difference in the files by comparing the files line by line.

Syntax: diff file1 file2

Ex: diff Windows copylinux

20.date command:

It displays the current date and time.

Syntax: date

21. cal command:

Used to see the calendar of a specific month or a whole year.

Syntax: cal year

Ex: cal 2022

Syntax: (gives today's date) cal month year

Ex: cal May 2022

22.echo command:

It displays the given line on the screen.

Syntax: echo line

Ex: echo Hello world

23. vi command:

It is used to edit file.

Syntax: vi filename

Ex: vi fileOs

24.rmdir command:

It is used to remove directory if it is empty.

Syntax: rmdir directoryname

Ex: rmdir OperatingSystem

25.head command:

It prints first n lines specified of each file given to stdout.

Syntax: head - number of lines filename

Ex: head - 3 final

26.tail command:

It prints last n lines specified of each file given to stdout.

Syntax: tail - number of lines filename

Ex: tail – 3 final

27.chmod command:

It changes the mode of the file.

Syntax: chmod mode filename

Ex: chmod 000 final

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OUTPUT:

1.man command

NAME
man - an interface to the system reference manuals

SYNOPSIS
man [man options] [[section] page ...] ...
man -k [apropos options] regexp ...
man -K [man options] [section] term ...
man -f [whatis options] page ...
man -l [man options] file ...
man -w|-W [man options] page ...

DESCRIPTION
man is the system's manual pager. Each page argument given to man is normally the name of a program, utility or function. The manual page associated with each of these arguments is then found and displayed. A section, if provided, will direct man to look only in that section of the manual. The default action is to search in all of the available sections following a pre-defined order (see DEFAULTS), and to show only the first page found, even if page exists in several sections.

The table below shows the section numbers of the manual followed by the types of pages they contain.

1 Executable programs or shell commands
2 System calls (functions provided by the kernel)
3 Library calls (functions within program libraries)
4 Special files (usually found in /dev)
5 File formats and conventions, e.g. /etc/passwd
6 Games
7 Miscellaneous (including macro packages and conventions), e.g. man(7), groff(7)
8 System administration commands (usually only for root)

2.mkdir command

skcet@SK-ED-59:~$ mkdir nikita
skcet@SK-ED-59:~$ cd nikita
skcet@SK-ED-59:~/nikita$

3.cd command
skcet@SK-ED-59:~$ cd..

4.Is command
skcet@SK-ED-59:~$ ls

'Abirami WT Lab' Desktop Documents Downloads eclipse-workspace Music nikita Pictures Public R snap Templates Videos

5.skcet@SK-ED-59:~$ gedit green
^C
skcet@SK-ED-59:~$ cat green
In the world trees are in green color
Green is a wonderful color
Nature intimate in green color
I love green
But we destroy the nature,so we reduce the green
our national flag also contain green

6.skcet@SK-ED-59:~$ ls -t
green R nikita Pictures Documents Downloads eclipse-workspace snap 'Abirami WT Lab' Desktop Music Public Templates Videos

7.skcet@SK-ED-59:~$ ls -ls
total 56
4 drwxrwxr-x 2 skcet skcet 4096 Apr 11 14:14 'Abirami WT Lab'
4 drwxr-xr-x 2 skcet skcet 4096 Apr 9 09:50 Desktop
4 drwxr-xr-x 3 skcet skcet 4096 Sep 6 09:37 Documents
4 drwxr-xr-x 3 skcet skcet 4096 Aug 13 09:57 Downloads
4 drwxrwxr-x 17 skcet skcet 4096 Aug 1 12:11 eclipse-workspace
4 -rw-rw-r-- 1 skcet skcet 198 Sep 13 09:25 green
4 drwxr-xr-x 2 skcet skcet 4096 Apr 9 09:50 Music
4 drwxrwxr-x 2 skcet skcet 4096 Sep 13 09:10 nikita
4 drwxr-xr-x 2 skcet skcet 4096 Sep 6 16:18 Pictures
4 drwxr-xr-x 2 skcet skcet 4096 Apr 9 09:50 Public
4 drwxrwxr-x 3 skcet skcet 4096 Sep 13 09:13 R
4 drwx------ 5 skcet skcet 4096 May 20 13:20 snap
4 drwxr-xr-x 2 skcet skcet 4096 Apr 9 09:50 Templates
4 drwxr-xr-x 2 skcet skcet 4096 Apr 9 09:50 Videos

8.skcet@SK-ED-59:~$ ls -r
Videos Templates snap R Public Pictures nikita Music green eclipse-workspace Downloads Documents Desktop 'Abirami WT Lab'

9.skcet@SK-ED-59:~$ ls -s
total 56
4 'Abirami WT Lab' 4 Documents 4 eclipse-workspace 4 Music 4 Pictures 4 R 4 Templates
4 Desktop 4 Downloads 4 green 4 nikita 4 Public 4 snap 4 Videos

10.skcet@SK-ED-59:~$ ls -a
. .bash_history .cache Documents eclipse-workspace green .mozilla Pictures Public .Rhistory .swt Videos
.. .bash_logout .config Downloads .gnome .java Music .pki .r snap Templates

'Abirami WT
Lab' .bashrc Desktop .eclipse .gnupg .local nikita .profile R .ssh . tooling

11.cat command

```
skcet@SK-ED-59:~$ cat green
In the world trees are in green color
Green is a wonderful color
Nature intimate in green color
I love green
But we destroy the nature,so we reduce the green
our national flag also contain green
```

12.cp command

```
skcet@SK-ED-59:~$ gedit blue
skcet@SK-ED-59:~$ cp green blue
skcet@SK-ED-59:~$ cat blue
In the world trees are in green color
Green is a wonderful color
Nature intimate in green color
I love green
But we destroy the nature,so we reduce the green
our national flag also contain green
```

13..mv command

```
skcet@SK-ED-59:~$ mv blue twin
skcet@SK-ED-59:~$ cat twin
In the world trees are in green color
Green is a wonderful color
Nature intimate in green color
I love green
But we destroy the nature,so we reduce the green
our national flag also contain green
```

14..wc command

```
skcet@SK-ED-59:~$ wc twin
  9  36 198 twin
```

15..sort command

```
skcet@SK-ED-59:~$ sort twin
But we destroy the nature,so we reduce the green
Green is a wonderful color
I love green
In the world trees are in green color
Nature intimate in green color
our national flag also contain green
```

```
skcet@sk-dk-76:~$ mkdir 113
skcet@sk-dk-76:~$ ls
 113                Clientecho.class       files.c    SEARCH.c
 152                Clientecho.java        hello      Serverecho.class
'152 gedit'         Clientecho.java~       hi         Serverecho.java
skcet@sk-dk-76:~$ rmdir 113
skcet@sk-dk-76:~$ ls
 152                Clientecho.class       fair       SEARCH
'152 gedit'         Clientecho.java        files.c    search.c
 15c.cpp            Clientecho.java~       hello      SEARCH.c
 16e.cpp            client.java            hi         Serverecho.class
 18euec018          concurrent_client.java hk.c       Serverecho.java
```

16.cp

```
skcet@sk-dk-76:~$ cp hello good
skcet@sk-dk-76:~$ ls
 113                Clientecho.class       files.c    search.c
 152                Clientecho.java        good       SEARCH.c
```

17.rm

```
skcet@sk-dk-76:~$ rm good
skcet@sk-dk-76:~$ ls
 113                Clientecho.class       files.c    SEARCH.c
 152                Clientecho.java        hello      Serverecho.class
'152 gedit'         Clientecho.java~       hi         Serverecho.java
 15c.cpp            client.java            hk.c       Serverecho.java~
```

18.history

```
skcet@sk-dk-76:~$ !537
gedit hello
```

19.comparing

```
skcet@sk-dk-76:~$ cp hello new
skcet@sk-dk-76:~$ gedit new
skcet@sk-dk-76:~$ ^C
skcet@sk-dk-76:~$ cmp hello new
hello new differ: byte 15, line 1
skcet@sk-dk-76:~$
```

20.difference between two files

```
skcet@sk-dk-76:~$ diff hello new
1c1
< hello everyone
```

```
---
> hello everyone...
3c3
< everyone is doing good...
---
> I hope everyone is doing good...
skcet@sk-dk-76:~$
```

21.pwd

persent working directory

```
skcet@sk-dk-76:~$ pwd

/home/skcet
```

22.calender

```
skcet@sk-dk-76:~$ pwd
/home/skcet
skcet@sk-dk-76:~$ cal 8 2022
    August 2022
Su Mo Tu We Th Fr Sa
    1  2  3  4  5  6
 7  8  9 10 11 12 13
14 15 16 17 18 19 20
21 22 23 24 25 26 27
28 29 30 31
```

23.who am i
gives the current user name

```
skcet@sk-dk-76:~$ whoami
skcet
```

24.date

```
skcet@sk-dk-76:~$ date

Sat Aug 13 11:35:02 IST 2022
```

25.head

syntax: head -n filename

```
skcet@sk-dk-76:~$ head -2 hello
hello everyone
```

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hi everyone how are you..

26.tail
skcet@sk-dk-76:~$ tail -3 hello
how about you..
Thank you..

27.ch mode
syntax: chmod nnn filename.
-rwx-wx--x 1 skcet skcet 163 Aug 13 11:26 hello

RESULT:

Thus the usage of basic linux commands are demonstrated.

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EX:NO:2	USE OF CONTROL STATEMENTS AND BRANCHING STATEMENTS
DATE:18.08.22	

AIM:

To illustrate the use of shell programming using control structures.

DESCRIPTION:

a)if……if statement

The if…..if statement allows shell to make decisions and execute statements conditionally

SYNTAX:

```
if[expression]
then
    statement(s)
fi
```

b)if……else statement

If else statements can be used to select an option from a given set of options.

SYNTAX:

```
if[expression]
then
    statement(s)
else
    statement(s)
fi
```

c)while loop

The while loop enables us to execute a set of commands repeatedly until some condition occurs.

SYNTAX:

```
while[condition]
do
```

statement(s)

done

d)for loop

The for loop operates on list of items. It repeats a set of commands for every item in a list.

SYNTAX:

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

do

statement(s)

done

ALGORITHM:

a) To find whether a given voter is eligible to vote. (if..else.. If)

1. START
2. get age from user
3. if age is greater than 18

   Display THE VOTER IS ELIGIBLE TO VOTE
4. else

   Display THE VOTER IS NOT ELIGIBLE
5. STOP

b) To find the grade of a student using multiple if.

1. START
2. get marks from the user
3. if marks greater then 95

   Display GRADE O
4. elif marks greater then 90

   Display GRADE A
5. elif marks greater than 80

   Display GRADE B
6. elif marks greater than 70

Display GRADE C

7. elif marks greater than 60

Display GRADE D

8. else display FAIL!!!

9. STOP

c) To find whether the given year is a leap year or no

1. START

2. get the year from user

3. assign c = year % 4

4. if c is equal to 0

Display year is a leap year

5. else

Display year is not a leap year

6. STOP

d) To find the factorial of a given number using while and for loop

 # using while loop

1. START

2. get the number to find factorial

3. initialize fact=1

4. when the number is greater than zero do

Assign fact = fact * num

num=num – 1

5. repeat the step 4 until the condition becomes false

6. stop

 # using for loop

1. start

2. get the number to find factorial

3. initialize fact = 1

4. inside for loop assign fact = fact * i

5. repeat step 4 until the for loop condition fails

6. STOP

e) To find the fibonacci of a given n numbers using while loop.

1. START

2. get a number from the user

3. assign m=0 and n=1

4. while num is not equal to 2

5. do

    Assign c=m+n

    Assign m=n and n=c

    Assign num=num-1

6. STOP

f) To find the greatest of three numbers using if ..elif..if

1. START

2. get three numbers from the user

3. check if num 1 is greater than num 2 and num 3

    Display num 1 is greater

4. elif num 2 is greater than num 3

    Display num 2 is greater

5. otherwise display num 3 is greater

6. STOP

PROGRAM:

a)To find whether a given voter is eligible to vote. (if..else.. If)

```
echo Enter age
read n
if [ $n -ge 18 ]
then
```

```
echo The voter is eligible to vote
else
echo The voter is not eligible
fi
```

b) To find the grade of a student using multiple if.

```
echo Enter marks
read n
if [ $n -ge 95 ]
then
echo GRADE O
elif [ $n -ge 90 ]
then
echo GRADE A
elif [ $n -ge 80 ]
then
echo GRADE B
elif [ $n -ge 70 ]
then
echo GRADE C
elif [ $n -ge 60 ]
then
echo GRADE D
else
echo FAIL!!!
Fi
```

c) To find whether the given year is a leap year or no

```
echo Enter year
read n
c=$((n % 4))
if [ $c -eq 0 ]
```

```
then
echo $n is a leap year
else
echo $n is not a leap year
fi
```

d) To find the factorial of a given number using while and for loop

```
#using for loop
echo Enter a number
read num
n=1
for((i=1;i<=num;i++))
do
n=$((n*i))
done
echo The factorial is $n
#using while loop
echo Enter a number
read num
n=1
i=1
while [ $i -le $num ]
do
n=$((n*i))
i=$((i+1))
done
echo The factorial is $n
```

e) To find the fibonacci of a given n numbers using while loop.

```
echo Enter a number
read num
```

```
m=0
n=1
echo $m
echo $n
while [ $num -ne 2 ]
do
c=$((m+n))
m=$n
n=$c
num=$((num-1))
echo $c
done
```

f) To find the greatest of three numbers using if ..elif..if

```
echo Enter three numbers
read a
read b
read c
if [ $a -gt $b ]
then
echo $a is greater
elif [ $b -gt $c ]
then
echo $b is greater
elif [ $c -gt $a ]
then
echo $c is greater
fi
```

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OUTPUT:

a)To find whether a given voter is eligible to vote. (if..else.. If)

```
Enter age
18
The voter is eligible to vote
```

b) To find the grade of a student using multiple if.

```
Enter marks
76
GRADE C
```

c) To find whether the given year is a leap year or no

```
Enter year
2020
2020 is a leap year
```

d) To find the factorial of a given number using while and for loop

#using for loop

```
Enter a number
12
The factorial is 479001600
```

#using while loop

```
Enter a number
5
The factorial is 120
```

e) To find the fibonacci of a given n numbers using while loop.

```
Enter a number
6
FIBONACCI SERIES
0
1
1
2
3
5
```

f) To find the greatest of three numbers using if ..elif..if

```
Enter three numbers
4
6
0
6 is greater
```

RESULT:

Thus the use of control structures by shell programming were constructed and demonstrated successfully.

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EX:NO:3 A	SWITCH CASE
DATE:18.08.22	

AIM:

To illustrate the use of switch statement by menu driven using shell programming

ALGORITHM:

1.MENU DRIVEN PROGRAM FOR SOME OPERATIONS :

1.Start

2.Read the choice from the user

3.Use switch case statement to do the operation

3.1 if choice is 1(Fibonacci series)

1.Start

2. Get the number from user

3. Assign x,y to 1,i to 2,x to 0

4. Display x and y

5. while (i<n)

i=i+1

z=x+y

6. Repeat until condition fails

7. Display z

8. Assign y to x,z to y

9. Stop

3.2 if choice is 2(sum of numbers)

1.Start

2.Get the number from user

3.Assign o to s

4.Do the operation

for (i=1;i<=n;i++)

s=s+i

5.Repeat until condition fails

6. Display s

7.Stop

3.3 if choice is 3(Armstrong number)

1.Start

2.Get the number from user,assign to t

3.Perform the operation

while(n>0)

r=n%10

i=r*r*r

s=s+i

n=n/10

4.Repeat the step 3 until condition fails

5.if(s==t)

Display Armstrong number

else

Display not an Armstrong number

6.Stop

3.4 if choice is 4(Sum of digits)

1.Start

2.Read the input number

3.Assign o to s

4.Perform the operation

while(num>0)

k=num%10

num=num/10

s=s+k

5. Repeat step4 until condition fails

6.Display s

7.Stop

3.5 if choice is 5(Swapping of numbers)

1.Start

2.Get 2 numbers from user

3.Assign that to a.b

4.Assign a to temp

b to a

temp to b

5.Display a,b

6.Stop

4.Stop

PROGRAM:

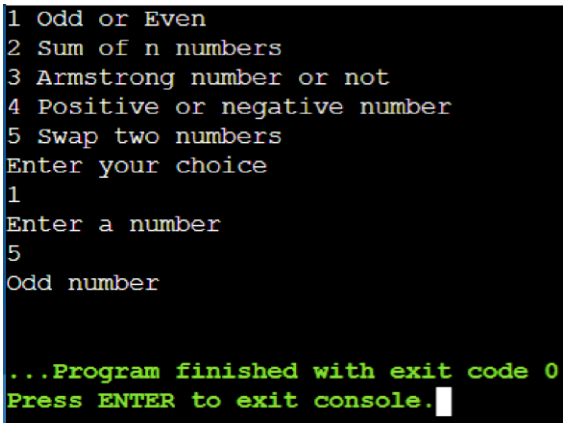
```
echo 1 - Even or odd :
echo 2 - sum of n numbers :
echo 3 - Armstrong number :
echo 4 - Number is positive or negative :
echo 5 - swap two numbers :
echo Enter the choice :
read choice
case $choice in
1)
echo Enter the number :
read a
c=$((a%2))
if [ $c -eq 0 ]
then
  echo The number $a ia an even number.
else
  echo The number $a is a odd number.
fi
;;
2)
echo Enter the number :
read a
sum=0
for((i=0;i<=a;i++))
do
sum+$((sum+i))
```

```
done
echo The sum of $a numbera be $sum.
;;
3)
echo Enter the number:
read a
b=$a
c=$a
d=0
while [ $a -ne 0 ]
do
d=$((d+1))
a=$((a/10))
done
while [ $a -ne 0 ]
do
m=$((b%10))
b=$((b/10))
n=$((n+(m**$d)))
done
if [ $c -eq $n ]
then
  echo The number is an Armstrong number.
else
  echo The number is not an Armstrong number.
fi
;;
4)
echo enter the number :
read a
if [ $a -gt 0 ]
```

```
then
   echo The number $a is positive.
else
   echo The number $a is negative.
fi
;;
5)
read a
read b
echo Before swapping : a be $a and b be $b.
temp=0
$temp =$a
$a=$b
$b=$temp
echo After swapping : a be $b and b be $a.
;;
esac
```

OUTPUT:

Odd or even:



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Sum of n numbers:

```
1 Odd or Even
2 Sum of n numbers
3 Armstrong number or not
4 Positive or negative number
5 Swap two numbers
Enter your choice
2
Enter value of n
5
Sum of 5 numbers is 15


...Program finished with exit code 0
Press ENTER to exit console.
```

Armstrong number:

```
1 Odd or Even
2 Sum of n numbers
3 Armstrong number or not
4 Positive or negative number
5 Swap two numbers
Enter your choice
3
Enter a number
153
Armstrong Number


...Program finished with exit code 0
Press ENTER to exit console.
```

Positive or negative:

```
1 Odd or Even
2 Sum of n numbers
3 Armstrong number or not
4 Positive or negative number
5 Swap two numbers
Enter your choice
4
Enter a number
-8
Negative number


...Program finished with exit code 0
Press ENTER to exit console.
```

Swap two numbers:

```
1 Odd or Even
2 Sum of n numbers
3 Armstrong number or not
4 Positive or negative number
5 Swap two numbers
Enter your choice
5
Enter two numbers
3 7
Values before swapping: 3 7
Values after swapping: 7 3


...Program finished with exit code 0
Press ENTER to exit console.
```

RESULT:

Thus the use of menu driven using shell programming were constructed and demonstrated successfully.

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EX:NO:3 B	FILE OPERATIONS
DATE:18.08.22	

AIM:

To illustrate the file operations by menu driving shell programming.

ALGORITHM:

1. Start
2. Using while loop, perform
3.Read the choice from user
4.Use switch case ,to perform file operations
    4.1 if choice is 1(cp)
        Read source
        Read destination
        cp $source $desti
    4.2 if choice is 2(mv)
        Read source
        Read destination
        mv $source $desti
    4.3 if choice is 3(sh)
        Read filename
        sh $filename
    4.4 if choice is 4(grep)
        Read file name
        Read word
        Read option
        Grep-$opt $word $file
    4.5 if choice is 5(sort)
        Read filename
        Read option
        sort $option $file
    4.6 if choice is 6(cat)

Read file name

cat $file name

5.Stop

PROGRAM:

```
echo File operations:
echo 1 Copy files
echo 2 Move files
echo 3 Sort contents of the files
echo 4 Display contents of the files
echo 5 File match
echo 6 Execute the file
echo Enter your choice
read ch
case $ch in
1)
echo Enter file1
read file1
echo Enter file2
read file2
cp $file1 $file2
;;
2)
echo Enter file1
read file1
echo Enter file2
read file2
mv $file1 $file2
;;
3)
echo Enter file to be sorted
```

```
read s
sort $s
;;
4)
echo Enter file to be displayed
read s
cat $s
;;
5)
echo File match
read s
echo Enter word to be matched
read m
echo Enter any operation
read op
case $op in
v)
grep -v $m $s
;;
c)
grep -c $m $s
;;
h)
grep -h $m $s
;;
esac
;;
6)
echo Enter file to be executed
read s
sh $s
```

;;

Esac

OUTPUT:

Copy files

```
File operations:
1 Copy files
2 Move files
3 Sort contents of the files
4 Display contents of the files
5 File match
6 Execute the file
Enter your choice
1
Enter file1
f1
Enter file2
f2


...Program finished with exit code 0
Press ENTER to exit console.
```

main.bash | f1 | f2

```
1 hello world
```

Move files

```
File operations:
1 Copy files
2 Move files
3 Sort contents of the files
4 Display contents of the files
5 File match
6 Execute the file
Enter your choice
2
Enter file1
f1
Enter file2
f


...Program finished with exit code 0
Press ENTER to exit console.
```

main.bash | f1 | f2 | f3 | f

```
1 hello world
```

Sort

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```
File operations:
1 Copy files
2 Move files
3 Sort contents of the files
4 Display contents of the files
5 File match
6 Execute the file
Enter your choice
3
Enter file to be sorted
f3
Coimbatore has many places to visit
Coimbatore is a beautiful city
Coimbatore is the manchester of South India
Enjoy the climate in Coimbatore
Hello all
Welcome to Coimbatore


...Program finished with exit code 0
Press ENTER to exit console.
```

Display file

```
File operations:
1 Copy files
2 Move files
3 Sort contents of the files
4 Display contents of the files
5 File match
6 Execute the file
Enter your choice
4
Enter file to be displayed
f3
Hello all
Coimbatore is a beautiful city
Coimbatore has many places to visit
Coimbatore is the manchester of South India
Welcome to Coimbatore
Enjoy the climate in Coimbatore

...Program finished with exit code 0
Press ENTER to exit console.
```

File match

```
File operations:
1 Copy files
2 Move files
3 Sort contents of the files
4 Display contents of the files
5 File match
6 Execute the file
Enter your choice
5
File match
f3
Enter word to be matched
Coimbatore
Enter any operation
v
Hello all


...Program finished with exit code 0
Press ENTER to exit console.
```

```
File operations:
1 Copy files
2 Move files
3 Sort contents of the files
4 Display contents of the files
5 File match
6 Execute the file
Enter your choice
5
File match
f3
Enter word to be matched
Coimbatore
Enter any operation
c
5


...Program finished with exit code 0
Press ENTER to exit console.
```

```
File operations:
1 Copy files
2 Move files
3 Sort contents of the files
4 Display contents of the files
5 File match
6 Execute the file
Enter your choice
5
File match
f3
Enter word to be matched
Coimbatore
Enter any operation
h
Coimbatore is a beautiful city
Coimbatore has many places to visit
Coimbatore is the manchester of South India
Welcome to Coimbatore
Enjoy the climate in Coimbatore


...Program finished with exit code 0
Press ENTER to exit console.
```

Execute the file

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```
File operations:
1 Copy files
2 Move files
3 Sort contents of the files
4 Display contents of the files
5 File match
6 Display the file
Enter your choice
6
Enter file to be displayed
f3
f3: 1: Hello: not found
f3: 2: Coimbatore: not found
f3: 3: Coimbatore: not found
f3: 4: Coimbatore: not found
f3: 5: Welcome: not found
f3: 6: Enjoy: not found


...Program finished with exit code 127
Press ENTER to exit console.
```

RESULT:

Thus the use of menu driven using shell programming were constructed and demonstrated successfully.

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EX:NO:4A	USE OF PROCESS OF SYSTEM CALLS
DATE:24.08.22	

AIM:

To illustrate the use of process of system calls using C program

ALGORITHM:

1. Start
2. Declare pid
3. Create a new process using fork()
4. Perform if pid<0

   Display fork cannot be created

   else if pid==0

   Display parent by getppid and child by getpid

   Else

   Display parent by getpid and grandparent getppid
5. Stop

INFERENCE:

Processes use the fork() system call to create a program that is a copy of themselves.

This is one of the major methods of process creation in operating systems.

When a parent process creates a child process and the execution of the parent process is suspended until the child process executes.

The process which is called fork() call is the parent process and the process which is created newly is the child process.

The child process will be exactly the same as the parent .

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PROGRAM:

```
#include<stdio.h>
#include<unistd.h>
#include<stdlib.h>
void main()
{
int pid;
pid=fork();
if (pid < 0)
{
printf("The fork cannot be created");
exit(0);
}
else
if (pid==0)
{
execlp("/bin/ps","ps");
printf("\n The process id of the child: %d", getpid());
printf("\n The process id of the parent: %d", getppid());
}
else{
printf("\n The process id of the parent: %d", getpid());
printf("\n The process id of the grandparent: %d", getppid());
}
}
```

OUTPUT:

RESULT:

Thus the use of process system call using c program has been illustrated and executed successfully.

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EX:NO:4B	USE OF GETPID
DATE:24.08.22	

AIM:

To illustrate the use of process of system calls using C program

ALGORITHM:

1.Start

2.Declare pid

3.Create a new process using fork()

4.Perform if pid<0

Display fork cannot be created

else if pid==0

Display parent by getppid and child by getpid

Else

Display parent by getpid and grandparent getppid

5.Stop

INFERENCE:

Processes use the fork() system call to create a program that is a copy of themselves.

This is one of the major methods of process creation in operating systems.

When a parent process creates a child process and the execution of the parent process is suspended until the child process executes.

The process which is called fork() call is the parent process and the process which is created newly is the child process.

The child process will be exactly the same as the parent .

PROGRAM:

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

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```
#include<stdlib.h>
void main()
{
int pid;
pid=fork();
if (pid < 0)
{
printf("The fork cannot be created");
exit(0);
}
else
if (pid==0)
{
execlp("/bin/ps","ps");
printf("\n The process id of the child: %d", getpid());
printf("\n The process id of the parent: %d", getppid());
}
else{
printf("\n The process id of the parent: %d", getpid());
printf("\n The process id of the grandparent: %d", getppid());
}
}
```

OUTPUT:

RESULT:

Thus the use of process system call using c program has been illustrated and executed Successfully.

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EX NO: 5	FCFS CPU SCHEDULING
DATE:24.08.22	

AIM:

To illustrate FCFS CPU Scheduling using C Program.

ALGORITHM:

1. Start
2. Declare the variables
3. Input the number of process from user
4. Using for loop input the arrival time and burst time for each process
5. Using for loop, for each process
   Calculate turn around time by
   TAT = completion - arrival
   Calculate waiting time by
   WT = Turn around time – burst time
6. Now calculate average turn around time and waiting time
7. Display every calculated values
8. Stop.

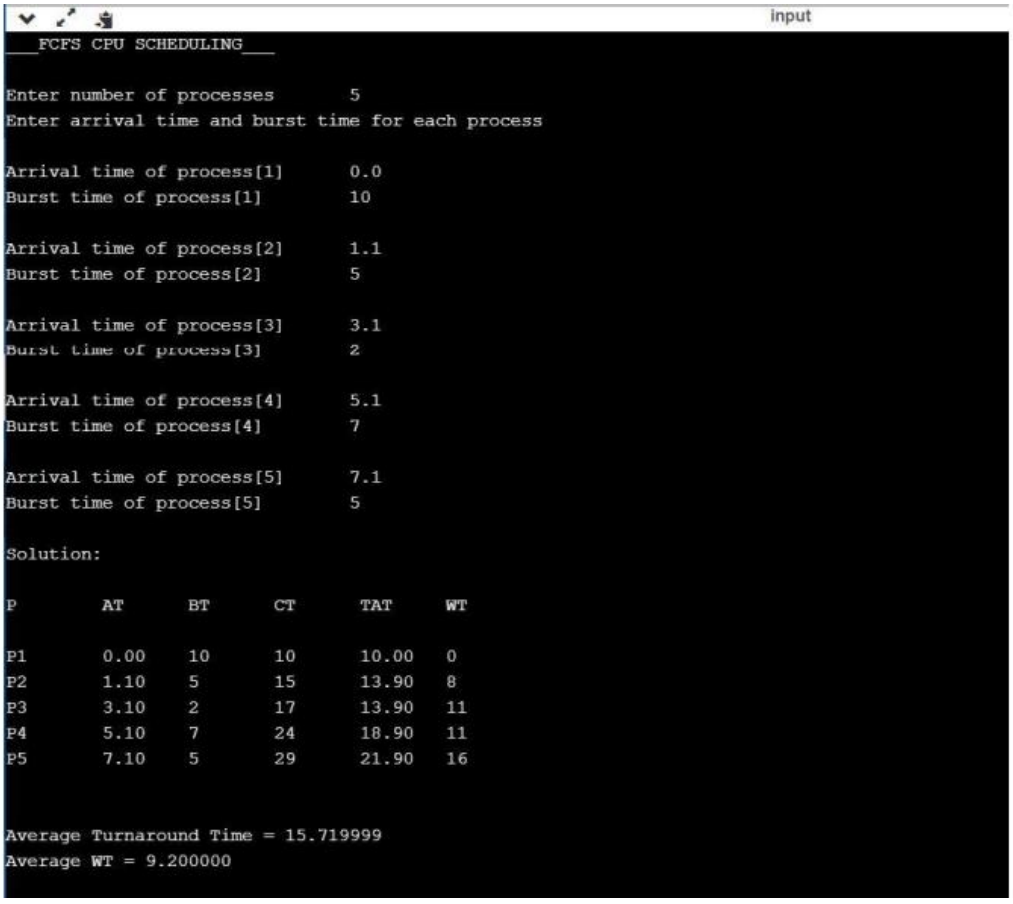
PROGRAM:

```
#include<stdio.h>
int main(){
 int bt[10]={0},wt[10]={0},ct[10]={0};
        float at[10]={0},tat[10]={0};
        int n,sum=0;
        float totalTAT=0,totalWT=0;
```

```
printf("___FCFS CPU SCHEDULING___");
        printf("\n\nEnter number of processes ");
        scanf("%d",&n);
        printf("Enter arrival time and burst time for each process\n\n");
for(int i=0;i<n;i++)
        {
                printf("Arrival time of process[%d] ",i+1);
                scanf("%f",&at[i]);
                printf("Burst time of process[%d] ",i+1);
                scanf("%d",&bt[i]);
                printf("\n");
        }
        for(int j=0;j<n;j++)
        {
                sum+=bt[j];
                ct[j]+=sum;
        }
for(int k=0;k<n;k++)
        {
                tat[k]=ct[k]-at[k];
                totalTAT+=tat[k];
        }
for(int k=0;k<n;k++)
        {
                wt[k]=tat[k]-bt[k];
                totalWT+=wt[k];
        }
        printf("Solution: \n\n");
```

```
        printf("P\t AT\t BT\t CT\t TAT\t WT\t\n\n");
        for(int i=0;i<n;i++)
        {
                printf("P%d\t %.2f\t %d\t %d\t %.2f\t %d\n",
                        i+1,at[i],bt[i],ct[i],tat[i],wt[i]);
        }
        printf("\n\nAverage Turnaround Time = %f\n",totalTAT/n);
        printf("Average WT = %f\n\n",totalWT/n);
        return 0;
}
```

OUTPUT:



RESULT:

Thus the FCFS CPU scheduling using c program has been illustrated and executed successfully.

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EX.NO:6	PRODUCER CONSUMER PROBLEM
DATE:26.08.22	

AIM:

To illustrate interprocess communication producer consumer problem using c program.

ALGORITHM:

1.Start
2.Declare the variables
3.Using switch case get the choice from user
Case 1:
Call the producer function
Get the data from the user
Add it to buffer front
Front =(front+1)%5
Increment count
If (Consumersleep==1 and count==1)
Display consumer is now ready
Else
Display Buffer is full
Producersleep is one
Case 2:
Call the consumer function
Get the item from user
Buffer [rear]= " "
Now display the consumed items
Tear + (Tear+1) %5
Decrement count
If producersleep ==1 and count==4
Display Producer is now ready
Else
Display Buffer is empty
Consumer sleep is,
Case 3:
Call view function
Using for loop
Display buffer data
Case 4:
Exit

4.Stop.

PROGRAM:

```
#include<stdio.h>
#include<conio.h>
#define N 5;
int count=0;
int front=0;int rear=0;
char buffer[7];
int prodsleep=0;int consleep=0;
void producer(void){
char item;
if (count<5){
printf("Enter data :");
scanf(" %c",&item);
buffer [front]=item;
front = (front+1)%5;
count++;
if(consleep==1 && count==1){
printf("\n Consumer is now ready ");
}
}
else{
printf("\n Buffer is full...");
prodsleep=1;
}
}
void consumer(void){
char item;
if (count>0){
```

```
item = buffer[rear];
buffer[rear]=' ';
printf("\n C: %c",item);
rear=(rear+1)%5;
count--;
if(prodsleep==1 && count==4)
{
printf("\n Producer is now ready");
}
}
else{
printf("\n Buffer is empty...");
consleep=1;
}
}
void view(void)
{
int i;
printf("\n Data of buffer: ");
for(i=0;i<5;i++){
printf("- %c ",buffer[i]);
}
}
void main(){
int i,choice,flag=0;
printf("___PRODUCER CONSUMER___\n");
printf("\n 1: Produce item ");
printf("\n 2: Consume item ");
```

```
printf("\n 3: To view buffer ");
printf("\n 4: Exit");
do{
printf("\n\n Enter your choice :");
scanf("%d",&choice);
switch(choice){
case 1:producer();
        break;
case 2:consumer();
        break;
case 3:view();
        break;
case 4:flag=1;
        break;
default:printf("\n Enter correct choice");
        break;}
}
while(flag==0);
}
```

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OUTPUT:

RESULT:

Thus the interprocess communication producer consumer problem has been illustrated and executed successfully**.**

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EX:NO:7	C-SIMULATION OF VI,CAT AND CP
DATE:26.08.22	

AIM:

To illustrate the simulation of vi,cat and cp using c program.

ALGORITHM:

1. START
2. Declare the required variables.
3. Input the choice from the user.
4. Perform the operation using switch case.
5. Case 1(vi)
   Get the file from the user
   Using while loop
   While(a!='*'){
   Fput c(a,file)
   a=getchar()
   }
   Fclose(f1)
6. Case 2(cat)
   Get the file name
   File must be in read mode
   if (file 1=='\0')
   DISPLAY FILE IS EMPTY
   Else
   a=fgetc(file 1)
   using while loop perform
   while(a!=EOF){
   DSPLAY a
   a=fgetc(file 1)
   }
   fclose(f1)
7. Case 3(cp)
   Get the file name for the source and destination
   Source file should be in read mode and destination in write mode
   if (file1 =='\0' && file2=='\0')
   DISPLAY File is empty
   else
   b=fgetc(file 1)

using while loop perform
while (b!=EOF){
fputc(b,file 1);
b=getc(file 1)
}
fclose (f1)

8. By default if no cases matches
   DISPLAY Enter valid option
9. STOP

PROGRAM:

```
#include<stdio.h>
#include<stdlib.h>
int main()
{
 int ch;
 char a,b,file1[10],file2[10];
 FILE *f1,*f2;
 printf("MENU");
 printf("\n1.Press 1 for vi \n2.Press 2 for cat \n3.Press 3 for cp ");
 printf("\nEnter your choice: ");
 scanf("%d",&ch);
 switch(ch)
 {
 case 1:
 printf("\n___vi command___");
 printf("\nEnter the file name: ");
 scanf("%s",file1);
 f1=fopen(file1,"w");
 a=getchar();
 while(a!='*')
 {
```

```
fputc(a,f1);
a=getchar();
}
fclose(f1);
break;
case 2:
printf("\n____cat command___");
printf("\nEnter the file name: ");

scanf("%s",file1);
f1=fopen(file1,"r");
if(f1=='\0')
{
printf("\n File is empty");
exit(0);
}
else
{
a=fgetc(f1);
while(a!=EOF)
{
printf("%c",a);
a=fgetc(f1);
}
}
fclose(f1);
break;
case 3:
printf("\n___cp command___");
```

```
printf("\nEnter the source file name: ");
scanf("%s",file1);
printf("\nEnter the destination file name: ");
scanf("%s",file2);
f1=fopen(file1,"r");
f2=fopen(file2,"w");
if(f1=='\0' && f2=='\0')
{
printf("\nFile is empty");
}

else
{
b=fgetc(f1);
while(b!=EOF)
{
fputc(b,f2);
b=getc(f1);
}
}
fclose(f1);
fclose(f2);
printf("\n File is copied successfully");
break;
default:
printf("\nEnter a valid option");
}
}
```

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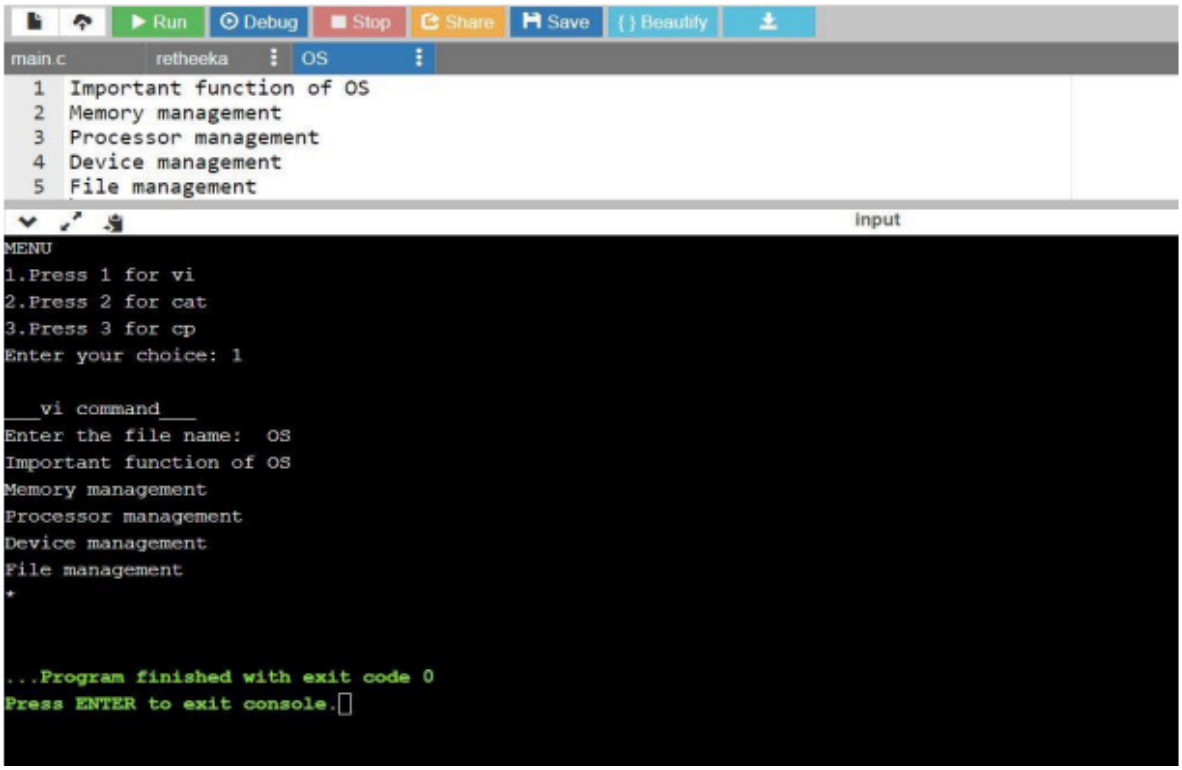
OUTPUT:

vi:



cat:

```
main.c    retheeka    OS
  1  An Operating System is an interface between a computer user and computer hardware.
  2  An operating system is a software that runs on every device.

                                                                    input
MENU
1.Press 1 for vi
2.Press 2 for cat
3.Press 3 for cp
Enter your choice: 2

___cat command___
Enter the file name: retheeka
An Operating System is an interface between a computer user and computer hardware.
An operating system is a software that runs on every device.

...Program finished with exit code 0
Press ENTER to exit console.
```

cp :

```
main.c    retheeka    OS    copy
  1  An Operating System is an interface between a computer user and computer hardware.
  2  An operating system is a software that runs on every device.

                                                                    input
MENU
1.Press 1 for vi
2.Press 2 for cat
3.Press 3 for cp
Enter your choice: 3

___cp command___
Enter the source file name:  retheeka

Enter the destination file name: copy

 File is copied successfully

...Program finished with exit code 0
Press ENTER to exit console.
```

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RESULT:

Thus the simulation of vi,cat and cp using c program has been illustrated

EX.NO:08-A	**USE OF FILE SYSTEM CALLS**
DATE:26.08.22	

and executed successfully.

AIM:

To write a program to establish the concept of file system call and its uses.

ALGORITHM:

1. Start
2. Import the necessary reader file
3. Declare necessary variables
4. Declare a static char message
5. Assign a string ‘HELLOWORLD’ to message
6. Declare char buffer
7. Open the file
8. if fd=-1
9. print file is opened for read/write access
10. write the message into the file
11. lseek(fd,ol,o)
12. if
13. print message written to file
14. else

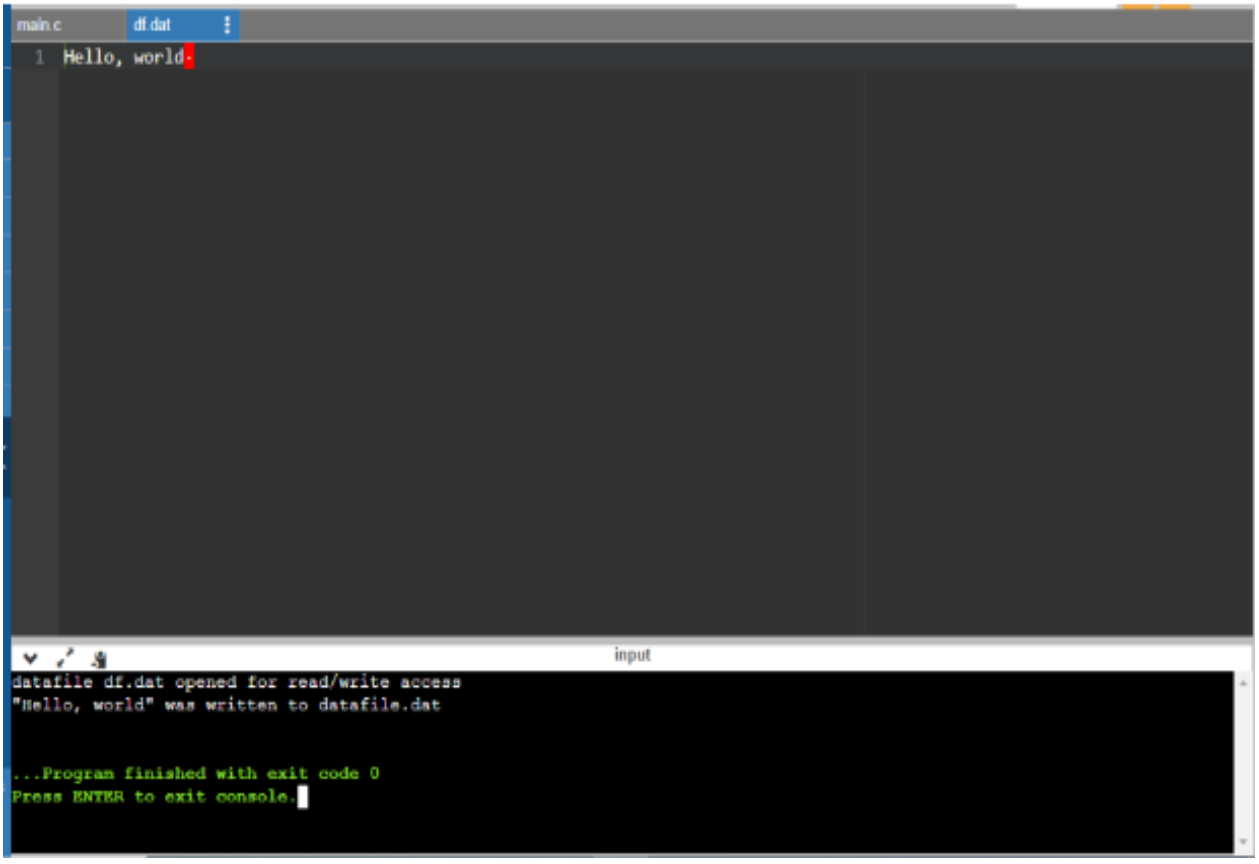
15. print error and close the file
16. else print file exists
17. stop

PROGRAM:

```
#include <fcntl.h>
#include <stdio.h>
#include <unistd.h>
#include <sys/types.h>
#include <sys/stat.h>
#include <stdlib.h>
static char message [] = "Hello, world";
int main()
{
int fd;
char buffer [80];
fd = open("df.dat",O_RDWR | O_CREAT | O_EXCL, S_IREAD |
S_IWRITE);
if (fd != -1)
{
printf("datafile df.dat opened for read/write access\n");
write(fd, message, sizeof(message));
lseek(fd, 0L, 0);
if (read(fd, buffer, sizeof(message)) == sizeof (message))
printf("\"%s\" was written to datafile.dat\n", buffer);
else
printf("*** error reading datafile.dat ***\n");
close (fd);
}
```

```
else
printf("*** datafile.dat already exists ***\n");
exit (0);
}
```

OUTPUT:



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RESULT:

Thus the use of stat system call using c program has been illustrated and executed

successfully

EX.NO:08-B	**USE OF STAT SYSTEM CALLS**
DATE: 26.08.22	

AIM:

To wite a program to exhibit the concept of stat system calls and its uses.

ALGORITHM:

1. Start
2. Declare s structure and a variable s
3. Declare necessary variables
4. If(stat("test',&s)==-1)
5. Show a perror
6. Exit
7. Compute size of input files
8. Print the file sizes

PROGRAM :

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

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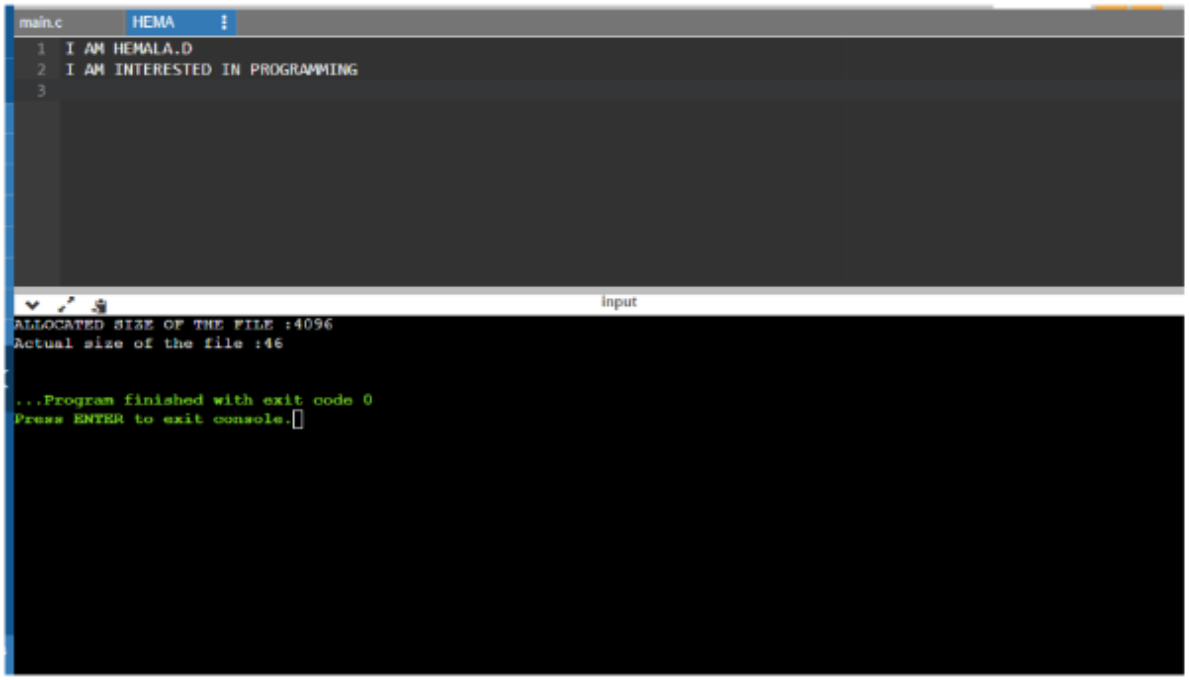
```
#include <sys/stat.h>
#include <stdlib.h>
int main()
{
struct stat s;
int a; int b;
if(stat("HEMA",&s)==(-1))
{
perror("Error: cannot stat file");
exit(0);
}
a=s.st_blksize;
b=s.st_size;
printf("ALLOCATED SIZE OF THE FILE :%d\nActual size of the file
:%d\n",a,b);
return 0;
}
```

OUTPUT:



RESULT:

Thus the use of stat system call using c program has been illustrated and executed successfully

EX.NO:08-C	**USE OF DIRECTORY SYSTEM CALLS**
DATE: 26.08.22	

AIM:

To write a program to illustrate the concept of directory system calls.

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RASIKA B

ALGORITHM:

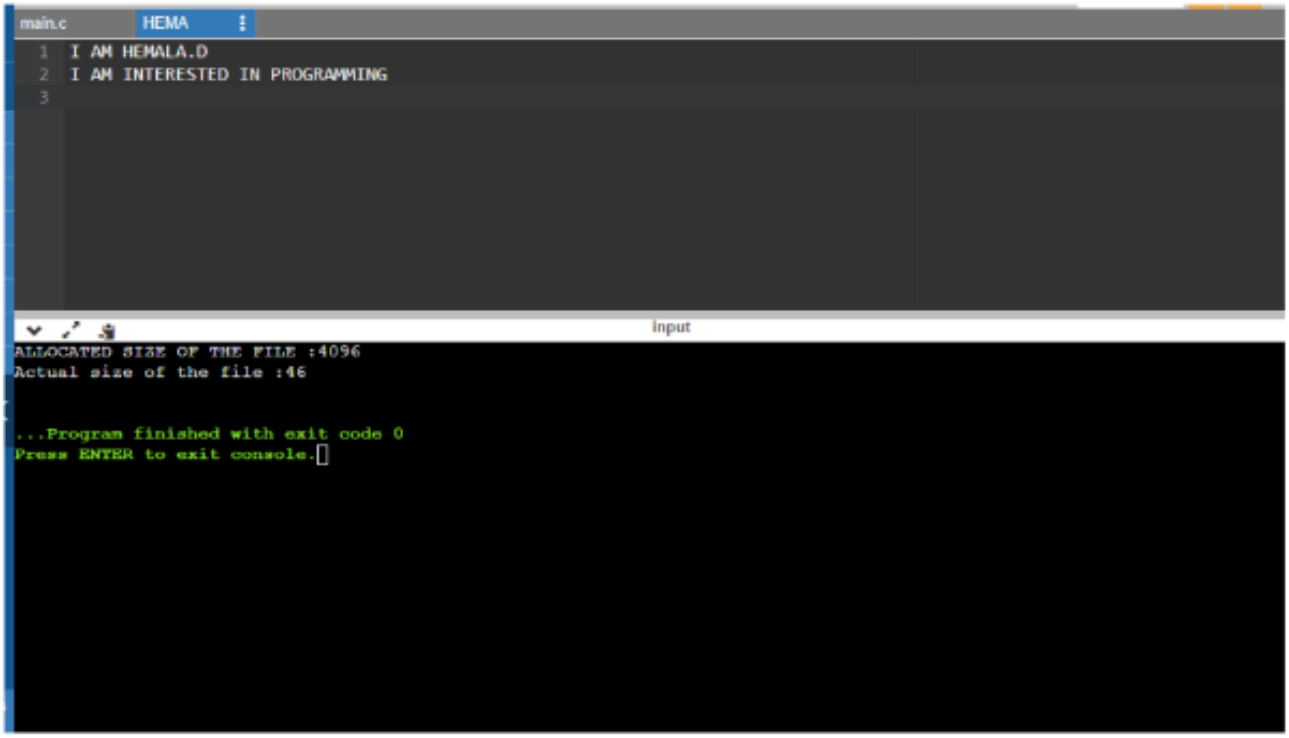
1. Start
2. Im[port necessary header files and variables
3. Search( )
4. Create a pointer for DIR
5. If file is empty or directory is empty
6. Print unable to open directory
7. Get the name of file to be searched
8. While dir is empty or NULL
9. Check for the file
10. Add 1 to flag
11. If flag is 1
12. Print file is found
13. Else
14. Print file not found
15. Main( )
16. Get name of directory
17. Search (name)
18. Stop

PROGRAM :

```
#include<stdio.h>
#include<dirent.h>
#include<stdlib.h>
#include<string.h>
void sea(char *dname)
{
DIR *dir;
struct dirent *ent;
int flag = 0;
char a[15];
if ((dir= opendir(dname))==NULL)
{
printf("\n unable to open directory ");
exit(1);
}
```

```
printf("\n Enter the name of the file to be searched :");
scanf("%s",a);
while((ent=readdir(dir))!=NULL)
{
if(!strcmp(a,ent->d_name))
{
printf("%s",ent->d_name);
flag++;
}
}
if(flag==1)
printf("\n the given file is found\n\n");
else
printf("\nfile not found");
if(closedir(dir)!=0)
printf("unable to close directory");
}
void main()
{
char dirname[25];
printf("\n Enter the directory to be searched :\n");
scanf("%s",dirname);
sea(dirname);
}
```

OUTPUT:



RESULT:

Thus the use of stat system call using c program has been illustrated and executed Successfully.

EX NO: 9 A	**MEMORY MANAGEMENT –**

727721EUIT126
RASIKA B

DATE:01.09.22	FIRST FIT ALGORITHM

AIM:

To illustrate the first fit algorithm using c program.

PROGRAM:

```
#include<stdio.h>
#define max 25
void main(){
int frag[max],b[max],f[max],i,j,nb,nf,temp,highest=0;
static int bf[max],ff[max];int flag,flagn[max],fragi = 0,fragx = 0;
printf("\n___First Fit___\n");
printf("\nEnter the number of blocks:");
scanf("%d",&nb);
printf("Enter the number of Process:");
scanf("%d",&nf);
printf("\nEnter the size of the blocks:-\n");
for(i=1;i<=nb;i++) {
printf("Block %d:",i);
scanf("%d",&b[i]);
ff[i] = i;
}
printf("Enter the size of the Processes :-\n");
for(i=1;i<=nf;i++) {

printf("Process %d:",i);
scanf("%d",&f[i]);
}
```

```
int x = 1;
printf("\n\nProcess_No\tProcess_Size\tBlock_No\tBlock_Size\tFragment\n");
for(i=1;i<=nf;i++){
flag = 1;
for(j=x;j<=nb;j++){
if(f[i] <= b[j]){
flagn[j] = 1;
printf("%-15d\t%-15d\t%-15d\t%-15d\t",i, f[i],ff[j],b[j]);
b[j] = b[j] - f[i];
fragi = fragi + b[j];
printf("%-15d\n",b[j]);
break;
}
else{
flagn[j] = 0;
x = 1;
flag++;
} }
if(flag >nb)
printf("%-15d\t%-15d\t%-15s\t%-15s\t%-15s\n",i,f[i],"Has to wait...","...","...");
}
}
```

OUTPUT:

```
___First Fit___

Enter the number of blocks:5
Enter the number of Process:4

Enter the size of the blocks:-
Block 1:100
Block 2:500
Block 3:200
Block 4:300
Block 5:600
Enter the size of the Processes :-
Process 1:212
Process 2:417
Process 3:112
Process 4:426


Process_No      Process_Size    Block_No        Block_Size      Fragment
1               212             2               500             288
2               417             5               600             183
3               112             2               288             176
4               426             Has to wait...  ...             ...


...Program finished with exit code 4
Press ENTER to exit console.
```

RESULT:

Thus the first fit algorithm using c program has been illustrated and executed successfully.

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EX NO: 9B	BEST FIT ALGORITHM
DATE:01.09.22	

AIM:

To illustrate thebest fit algorithm using c program.

PROGRAM:

```
#include<stdio.h>
#define max 25
void main()
{
int frag[max],b[max],f[max],i,j,nb,nf,temp,lowest=10000;
static int bf[max],ff[max],fragi = 0;
printf("\n___Best Fit___\n");
printf("\nEnter the number of blocks:");
scanf("%d",&nb);
printf("Enter the number of files:");
scanf("%d",&nf);
printf("\nEnter the size of the blocks:-\n");
for(i=1;i<=nb;i++) {
printf("Block %d:",i);
scanf("%d",&b[i]);
ff[i] = i;
}
printf("Enter the size of the Processes :-\n");
for(i=1;i<=nf;i++) {
printf("Process %d:",i);
scanf("%d",&f[i]);
}
```

```
int y,m,z,temp1,flag;
for(y=1;y<=nb;y++)
{
for(z=y;z<=nb;z++)
{
if(b[y]>b[z])
{
temp=b[y];
b[y]=b[z];
b[z]=temp;
temp1=ff[y];
ff[y]=ff[z];
ff[z]=temp1;
}
}
}
int flagn[max];
int fragx = 0;
printf("\n\nProcess_No\tProcess_Size\tBlock_No\tBlock_Size\tFragment\n");
for(i=1;i<=nf;i++)
{
flag = 1;
for(j=1;j<=nb;j++)
{
if(f[i] <= b[j]){
flagn[j] = 1;
printf("%-15d\t%-15d\t%-15d\t%-15d\t",i, f[i],ff[j],b[j]);
b[j] = b[j] - f[i];
```

```
fragi = fragi + b[j];
printf("%-15d\n",b[j]);
break;
}
else
{flagn[j] = 0;
flag++;
}
}
if(flag >nb)
printf("%-15d\t%-15d\t%-15s\t%-15s\t%-15s\n",i, f[i],"Has to wait..","...","...");
}
}
```

OUTPUT:

```
___Best Fit___

Enter the number of blocks:5
Enter the number of files:4

Enter the size of the blocks:-
Block 1:100
Block 2:500
Block 3:200
Block 4:300
Block 5:600
Enter the size of the Processes :-
Process 1:212
Process 2:417
Process 3:112
Process 4:426


Process_No      Process_Size    Block_No        Block_Size      Fragment
1               212             4               300             88
2               417             2               500             83
3               112             3               200             88
4               426             5               600             174


...Program finished with exit code 4
Press ENTER to exit console.
```

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RESULT:

Thus the best fit algorithm using c program has been illustrated and executed successfully.

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EX NO: 9C	WORST FIT ALGORITHM
DATE:01.09.22	

AIM:

To illustrate theworst fit algorithm using c program.

ALGORITHM:

1. Start
2. Declare the variables
3. Input the no:of blocks and no: of processors from the users
4. Using for loop iput the memory block size and process size from user
5. Using for loop check
   *In which memory block the remaining is higher (i.e)the remaining memory when the process occupied should be greater than other.
   *If that it the memory block having higher remaining memory then assign the process to that memory block.
   b[j]=b[j]-f[i];
   fragi=fragi+b[j];
6. If no then repeat the step 5 for all processers
7. If there is insufficient space then display “Has to wait”
8. Display process no: , size , memory no; , size and the remaining size of memory
9. Stop.

PROGRAM:

```
#include<stdio.h>

#define max 25

void main()

{

int frag[max],b[max],f[max],i,j,nb,nf,temp,highest=0;

static int bf[max],ff[max];int flag,fragi = 0;

printf("\n___Worst Fit___\n");

printf("\nEnter the number of memory blocks:");

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

```
printf("Enter the number of Process:");
scanf("%d",&nf);
printf("\nEnter the size of the memory blocks:\n");
for(i=1;i<=nb;i++) {
printf("Block %d: ",i);
scanf("%d",&b[i]);
ff[i] = i;
}
printf("Enter the size of the Processes :\n");
for(i=1;i<=nf;i++) {
printf("Process %d: ",i);
scanf("%d",&f[i]);
}
int y,z,temp1;
for(y=1;y<=nb;y++)
{
for(z=y;z<=nb;z++)
{
if(b[y]<b[z])
{
temp=b[y];
b[y]=b[z];
b[z]=temp;
temp1=ff[y];
ff[y]=ff[z];
ff[z]=temp1;
}
```

```
}
}
int flagn[max];
int fragx = 0;
printf("\n\nProcess No\tProcess Size\tMemory No\tMemory Size\tRemaining\n");
for(i=1;i<=nf;i++)
{
flag = 1;
for(j=1;j<=nb;j++)
{
if(f[i] <= b[j]){
flagn[j] = 1;
printf("%-15d\t%-15d\t%-15d\t%-15d\t",i, f[i],ff[j],b[j]);
b[j] = b[j] - f[i];
fragi = fragi + b[j];
printf("%-15d\n",b[j]);
break;
}
else
{flagn[j] = 0;
flag++;
}
}
if(flag >nb)
printf("%-15d\t%-15d\t%-15s\t%-15s\t%-15s\n",i,f[i],"Has to wait..","..","..");
}
}
```

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OUTPUT:

```
___Worst Fit___

Enter the number of memory blocks:5
Enter the number of Process:4

Enter the size of the memory blocks:
Block 1: 100
Block 2: 500
Block 3: 200
Block 4: 300
Block 5: 600
Enter the size of the Processes :
Process 1: 212
Process 2: 417
Process 3: 112
Process 4: 426


Process No      Process Size    Memory No       Memory Size     Remaining
1               212             5               600             388
2               417             2               500             83
3               112             5               388             276
4               426             Has to wait..   ..              ..


...Program finished with exit code 4
Press ENTER to exit console.
```

RESULT:

Thus the worst fit algorithm using c program has been illustrated and executed successfully.

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EX.NO:10	BANKER'S ALGORITHM
DATE:01.09.22	

AIM:

To illustrate Banker's algorithm using C Program.

ALGORITHM:

1. Start
2. Declare the variables
3. Create various method to calculate
4. Print method,
   Using for loop,
   DISPLAY the required values to be printed
5. Safety method,
   In this method predict whether the resources can be allocated or not and ensure safety of the process.
6. Resource requested method,
   Create a resources request method is the user needs additional request then this method will be called
   And the process are checked for the new request and safety is also ensured.
7. Mainly used method is Banker's method
8. Here in Banker's method
   Calculate need matrix by
   Maximum - Allocation
9. Create a accept method
   To input total no: of process and resources
   Also input the available resources from the user.
10. DISPLAY Allocation , Maximum requirement and Need matrix
11. From the main method call every method to perform the task
    Ask whether there is an resource request from the user,
    if yes then use that request method
12. DISPLAY output
13. Stop

PROGRAM:

```
#include<stdio.h>

#include<stdlib.h>

void print(int x[][10],intn,int m){

inti,j;

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

```
printf("\n");
for(j=0;j<m;j++){
printf("%d\t",x[i][j]);
}
}
}
void res_request(int A[10][10],int N[10][10],int AV[10][10],intpid,int m)
{
intreqmat[1][10];
inti;
printf("\n___FOR ADDITINAL REQUEST:___");
printf("\n Enter additional request :- \n");
for(i=0;i<m;i++){
printf(" Request for resource %d : ",i+1);
scanf("%d",&reqmat[0][i]);
}
for(i=0;i<m;i++)
if(reqmat[0][i] > N[pid][i]){
printf("\n The request can be granted.\n");
exit(0);
}
for(i=0;i<m;i++)
if(reqmat[0][i] > AV[0][i]){
printf("\n Resources unavailable.\n");
exit(0);
}
for(i=0;i<m;i++){
AV[0][i]-=reqmat[0][i];
A[pid][i]+=reqmat[0][i];
N[pid][i]-=reqmat[0][i];
```

```
}
}
intsafety(int A[][10],int N[][10],int AV[1][10],intn,intm,int a[]){
inti,j,k,x=0;
int F[10],W[1][10];
intpflag=0,flag=0;
for(i=0;i<n;i++)
F[i]=0;
for(i=0;i<m;i++)
W[0][i]=AV[0][i];
for(k=0;k<n;k++){
for(i=0;i<n;i++){
if(F[i] == 0){
flag=0;
for(j=0;j<m;j++){
if(N[i][j] > W[0][j])
flag=1;
}
if(flag == 0 && F[i] == 0){
for(j=0;j<m;j++)
W[0][j]+=A[i][j];
F[i]=1;
pflag++;
a[x++]=i;
}
}
}
if(pflag == n)
return 1;
}
```

```
return 0;
}
void accept(int A[][10],int N[][10],int M[10][10],int W[1][10],int *n,int *m){
inti,j;
printf("\n Enter total no. of processes : ");
scanf("%d",n);
printf("Enter total no. of resources : ");
scanf("%d",m);
for(i=0;i<*n;i++){
printf("\n\tProcess %d\n",i+1);
for(j=0;j<*m;j++){
printf(" Allocation for resource %d : ",j+1);
scanf("%d",&A[i][j]);
printf(" Maximum for resource %d : ",j+1);
scanf("%d",&M[i][j]);
}
}
printf("\n Available resources : \n");
for(i=0;i<*m;i++){
printf(" Resource %d : ",i+1);
scanf("%d",&W[0][i]);
}
for(i=0;i<*n;i++)
for(j=0;j<*m;j++)
N[i][j]=M[i][j]-A[i][j];
printf("\n Allocation Matrix");
print(A,*n,*m);
printf("\n Maximum Requirement Matrix");
print(M,*n,*m);
printf("\n Need Matrix");
```

```
print(N,*n,*m);
}
intbanker(int A[][10],int N[][10],int W[1][10],intn,int m){
intj,i,a[10];
j=safety(A,N,W,n,m,a);
if(j != 0 ){
printf("\n\n");
for(i=0;i<n;i++)
printf(" P%d -->",a[i]);
printf("\n Hence the process sequence is safe...\n");
return 1;
}else{
printf("\n The process sequence is not safe...\n");
return 0;
}
}
intmain(){
int ret;
intA[10][10];
intM[10][10];
intN[10][10];
intW[1][10];
intn,m,pid,ch;
printf("\n___BANKER'S ALGORITHM___\n");
accept(A,N,M,W,&n,&m);
ret=banker(A,N,W,n,m);
if(ret !=0 ){
printf("\n Want make an additional request ? (1=Yes|0=No)");
scanf("%d",&ch);
if(ch == 1){
```

```
printf("\n Enter process no. : ");
scanf("%d",&pid);
res_request(A,N,W,pid-1,m);
ret=banker(A,N,W,n,m);
if(ret == 0 )
exit(0);
}
}else
exit(0);
return 0;
}
```

OUTPUT:

```
___BANKER'S ALGORITHM___

 Enter total no. of processes : 5
Enter total no. of resources : 4

       Process 1
 Allocation for resource 1 : 0
 Maximum for resource 1 : 0
 Allocation for resource 2 : 0
 Maximum for resource 2 : 0
 Allocation for resource 3 : 1
 Maximum for resource 3 : 1
 Allocation for resource 4 : 2
 Maximum for resource 4 : 2

       Process 2
 Allocation for resource 1 : 1
 Maximum for resource 1 : 1
 Allocation for resource 2 : 0
 Maximum for resource 2 : 7
 Allocation for resource 3 : 0
 Maximum for resource 3 : 5
 Allocation for resource 4 : 0
 Maximum for resource 4 : 0
```

```
       Process 3
Allocation for resource 1 : 1
Maximum for resource 1 : 2
Allocation for resource 2 : 3
Maximum for resource 2 : 3
Allocation for resource 3 : 5
Maximum for resource 3 : 5
Allocation for resource 4 : 4
Maximum for resource 4 : 6

       Process 4
Allocation for resource 1 : 0
Maximum for resource 1 : 0
Allocation for resource 2 : 6
Maximum for resource 2 : 6
Allocation for resource 3 : 3
Maximum for resource 3 : 5
Allocation for resource 4 : 2
Maximum for resource 4 : 2

       Process 5
Allocation for resource 1 : 0
Maximum for resource 1 : 0
Allocation for resource 2 : 0
Maximum for resource 2 : 6
Allocation for resource 3 : 1
Maximum for resource 3 : 5
Allocation for resource 4 : 4
Maximum for resource 4 : 6
```

```
 Available resources :
 Resource 1 : 1
 Resource 2 : 5
 Resource 3 : 2
 Resource 4 : 0

 Allocation Matrix
0       0       1       2
1       0       0       0
1       3       5       4
0       6       3       2
0       0       1       4
 Maximum Requirement Matrix
0       0       1       2
1       7       5       0
2       3       5       6
0       6       5       2
0       6       5       6
 Need Matrix
0       0       0       0
0       7       5       0
1       0       0       2
0       0       2       0
0       6       4       2

 P0 --> P2 --> P3 --> P4 --> P1 -->
 Hence the process sequence is safe...
```

```
 Want make an additional request ? (1=Yes|0=No)1

 Enter process no. : 2

___FOR ADDITINAL REQUEST:___
 Enter additional request :-
 Request for resource 1 : 0
 Request for resource 2 : 4
 Request for resource 3 : 2
 Request for resource 4 : 0


 P0 --> P2 --> P3 --> P4 --> P1 -->
 Hence the process sequence is safe...


...Program finished with exit code 0
Press ENTER to exit console.
```

RESULT:

Thus the Bankers algorithm using c program has been illustrated and executed successfully.

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EX NO: 11	PAGE REPLACEMENT ALGORITHM
DATE:05.09.22	

FIFO PAGE REPLACEMENT ALGORITHM:

AIM:

To illustrate the page replacement algorithm using C program

ALGORITHM:

1. START
2. Declare the variables required
3. Input the page numbers and page frames from the user using for loop
4. Check the need of replacement from old page to new page in memory using for loop
   If frame[k]==a[i]
   Initialize avail =1
   If (avail==0)
   Assign frame[j]=a[i]
   j = (j+1) % num
   Increment count by one
5. Form a queue to hold the pages
6. Get the page numbers and insert into the queue
7. Check for the page fault
8. Display the page numbers
9. Display the total numbers of page fault
10. STOP

PROGRAM:

```
#include<stdio.h>

intmain()

{

inti,j,n,a[50],frame[10],no,k,avail,count=0;

printf("___FIFO PAGE REPLACEMENT ALGORITHM:___");

printf("\n\nENTER THE NUMBER OF PAGES:\n");

scanf("%d",&n);

printf("\nENTER THE PAGE NUMBER :\n");

for(i=1;i<=n;i++)
```

```
scanf("%d",&a[i]);
printf("\nENTER THE NUMBER OF FRAMES :");
scanf("%d",&no);
for(i=0;i<no;i++)
frame[i]= -1;
j=0;
printf("Reg page\t Frames\n");
for(i=1;i<=n;i++)
{
printf("%d\t\t",a[i]);
avail=0;
for(k=0;k<no;k++)
if(frame[k]==a[i])
avail=1;
if (avail==0)
{
frame[j]=a[i];
j=(j+1)%no;
count++;
for(k=0;k<no;k++)
printf("%d\t",frame[k]);
}
printf("\n");
}
printf("\nTotal number of Page Fault Is %d",count);
return 0;
}
```

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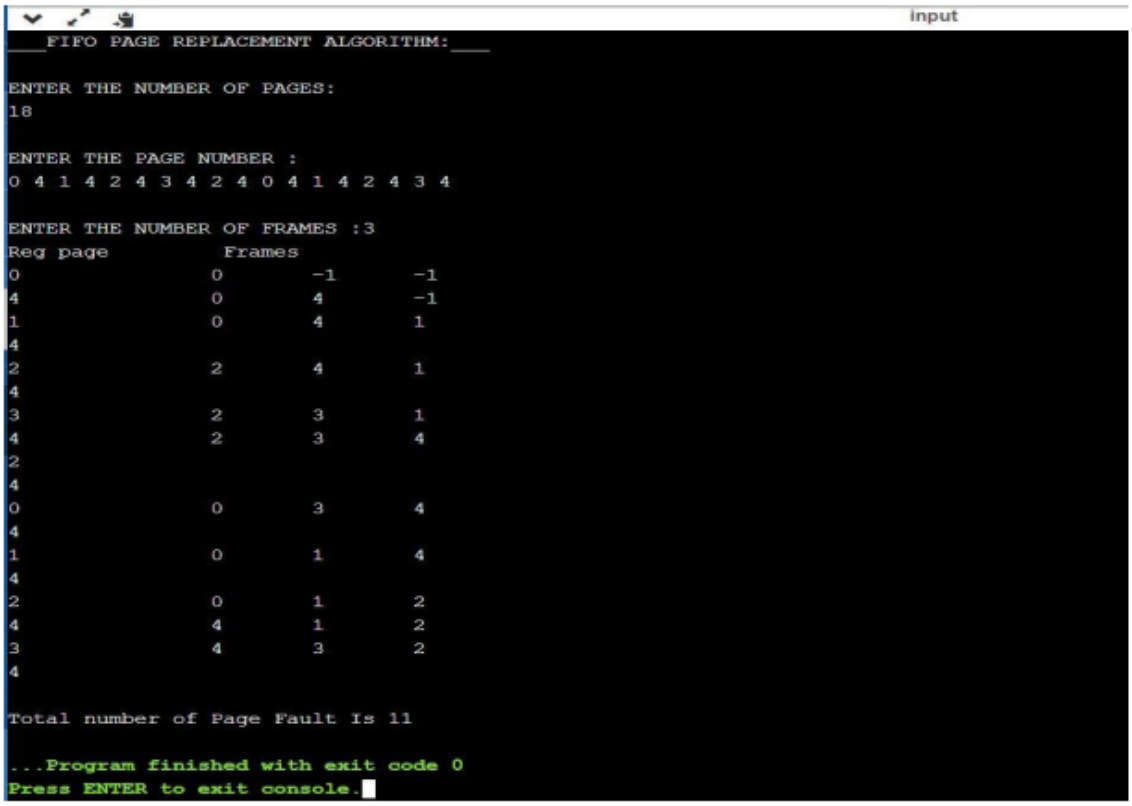
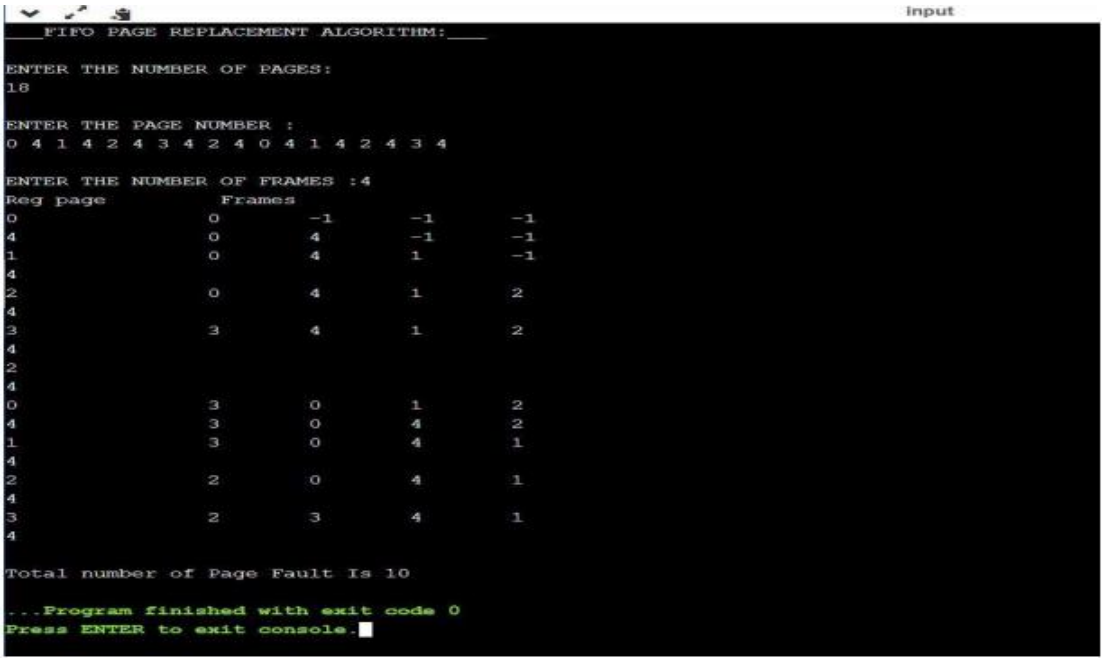
OUTPUT:

3 FRAMES:



4 FRAMES:



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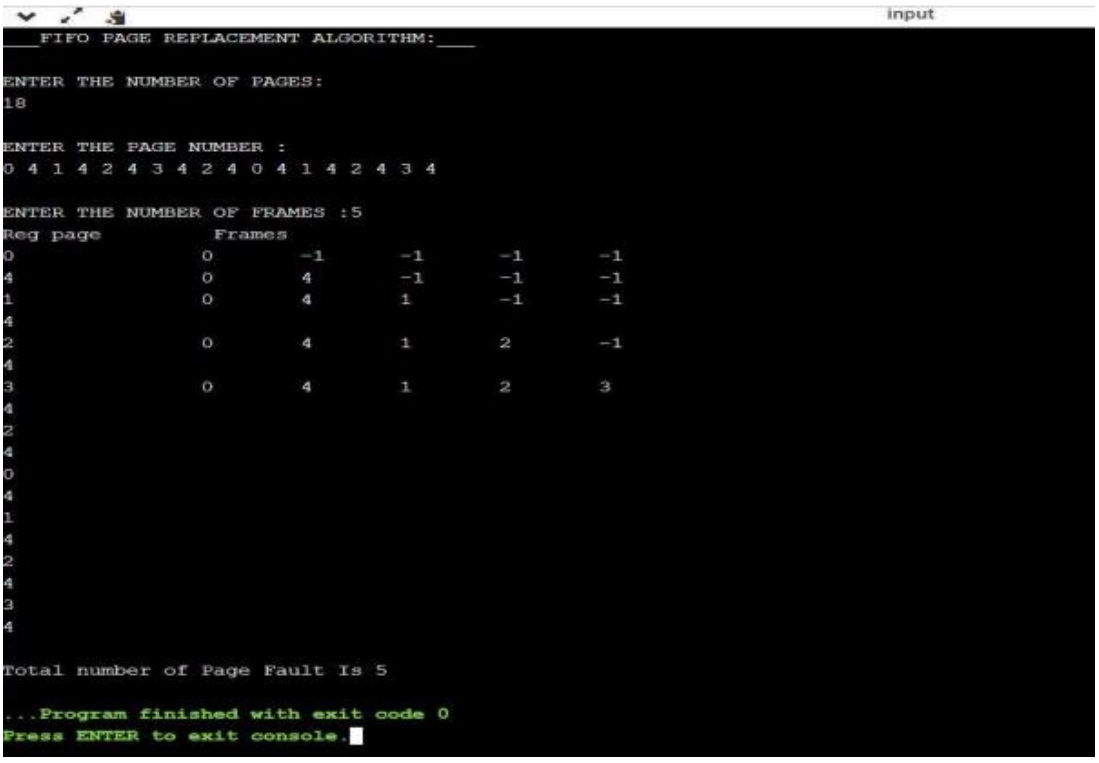
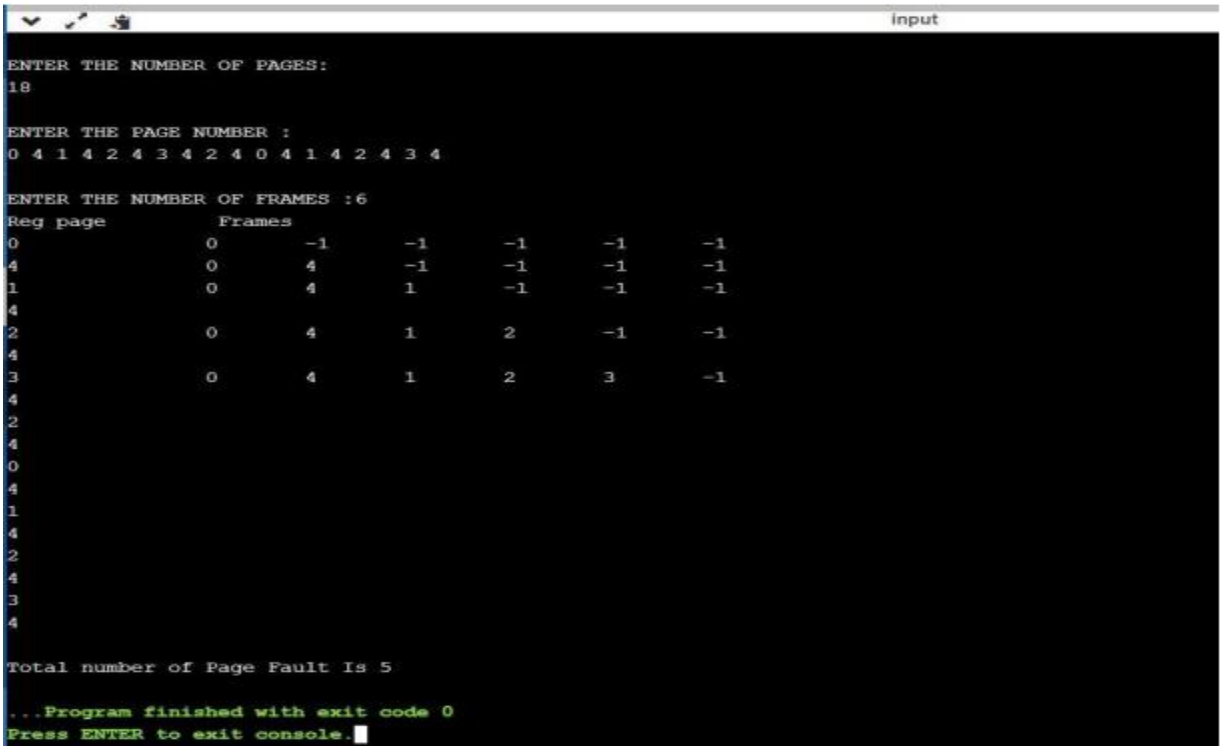
5 FRAMES:



6 FRAMES:



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RESULT:

Thus the page replacement algorithm using c program has been completed and executed successfully.

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EX.NO: 12	DISK SCHEDULING ALGORITHM
DATE:12.09.22	

AIM:

To illustrate the given disk scheduling using c programme.

ALGORITHM:

LOOK:

1. START
2. Declare the required variables
3. Get the current head position from user
4. Input the number of requests
5. Get all the request and store it and also the upper bound
6. To check whether the head is moving towards upper bound or lower bound get the info from user
7. Using for loop perform
   The head continue in moving in same direction until all the request in the direction are not finished
   While moving in this direction calculate the absolute distance of track of the head
   Increment total seek count with this distance
8. Display the need output
9. STOP

SCAN:

1. START
2. Declare the required variables
3. Input the head position and the total requests
4. Let direction represents the head is moving towards right or left
5. Using for loop perform
   Calculate the absolute distance of the track from the head
   Increment the total seek count with this distance
   Currently serviced track will become the head now
6. Perform the operation until one end of distance is reached
7. If one end is reached then reverse the direction continue the looping process until are the tracks are serviced
8. Display the required output
9. STOP

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PROGRAM:

LOOK:

```
#include<math.h>
#include<stdio.h>
intmain()
{
inti,n,j=0,k=0,x=0,l,req[50],mov=0,cp,ub,end, lower[50],upper[50], temp,a[50];
printf("___DISK SCHEDULING___(LOOK)\n\n");
printf("Enter the current head position: ");
scanf("%d",&cp);
printf("Enter the number of requests: ");
scanf("%d",&n);
printf("Enter the request order:\n");
for(i=0;i<n;i++)
{
scanf("%d",&req[i]);
}
printf("Enter the upper bound: ");
scanf("%d",&ub);

for(i=0;i<n;i++)
{
if(req[i]<cp)
{
lower[j]=req[i];
j++;
}
if(req[i]>cp)
{
upper[k]=req[i];
k++;
}
}

for(i=0;i<j;i++)
{
for(l=0;l<j
-1;l++)
{
if(lower[l]<lower[l+1])
{
temp=lower[l];
lower[l]=lower[l+1];
```

```
lower[l+1]=temp;
}
}
}

for(i=0;i<=k;i++)
{
for(l=0;l<k
-1;l++)
{
if(upper[l]>upper[l+1])
{
temp=upper[l];
upper[l]=upper[l+1];
upper[l+1]=temp;
}
}
}
printf("Enter the end to which the head is moving 0 - for lower end and 1 - for upper
end\n");

scanf("%d",&end);
printf("------------------------------------------------------------------------------------------
\n");
printf("Solution:");
printf("\n\n Movement:\n");
switch(end)
{
case 0:
for(i=0;i<j;i++)
{
a[x]=lower[i];
x++;
}

for(i=0;i<k;i++)
{
a[x]=upper[i];
x++;
}
break;
case 1:
for(i=0;i<k;i++)
```

```
{
a[x]=upper[i];
x++;
}
for(i=0;i<j;i++)
{
a[x]=lower[i];
x++;
}
break;
}
mov=mov+abs(cp-a[0]);
printf("%d -> %d",cp,a[0]);
for(i=1;i<x;i++)
{
mov=mov+abs(a[i]-a[i-1]);
printf(" -> %d",a[i]);
}
printf("\n");
printf("Total distance in cylinders = %d cylinders\n",mov);
}
```

SCAN:

```
#include <stdio.h>
#include <stdlib.h>
#define LOW 0
#define HIGH 4299
intmain(){
intqueue[20];
int head, max, q_size, temp, sum;
intdloc;
printf("\n___DISK SCHEDULING___(SCAN)\n\n");
printf("Enter head position:");
scanf("%d", &head);
printf("Enter no.of Disk Requests:");
scanf("%d", &q_size);
printf("Enter the elements into disk queue:\n");
for(inti=0; i<q_size; i++){
scanf("%d", &queue[i]);
}
queue[q_size] = head;
q_size++;
for(inti=0; i<q_size;i++){
```

```
for(int j=i; j<q_size; j++){
if(queue[i]>queue[j]){
temp = queue[i];
queue[i] = queue[j];
queue[j] = temp;
}
}
}
max = queue[q_size-1];
for(inti=0; i<q_size; i++){
if(head == queue[i]){
dloc = i;
break;
}
}
if(abs(head-LOW) <= abs(head-HIGH)){

for(int j=dloc; j>=0; j--){
}
for(int j=dloc+1; j<q_size; j++){
}
} else {
for(int j=dloc+1; j<q_size; j++){
}
for(int j=dloc; j>=0; j--){
}
}
sum = head + max;
printf("\nTotal Seek Time: %d cylinders", sum);
return 0;
}
```

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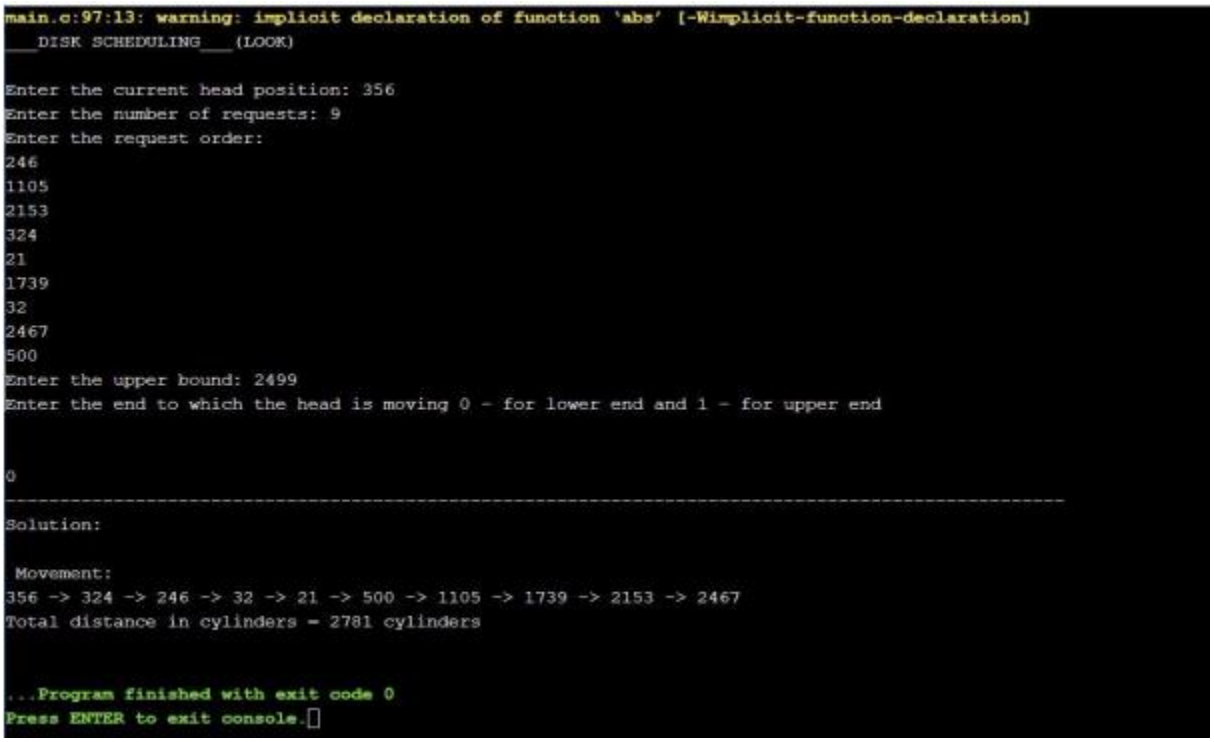
OUTPUT:

LOOK:



SCAN:

RESULT:

Thus the given disk scheduling using c program has been completed and executed successfully.

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EX.NO:13	SEGMENTATION PROBLEM
DATE:12.09.22	

AIM:

To illustrate the segmentation problem using C program.

ALGORITHM:

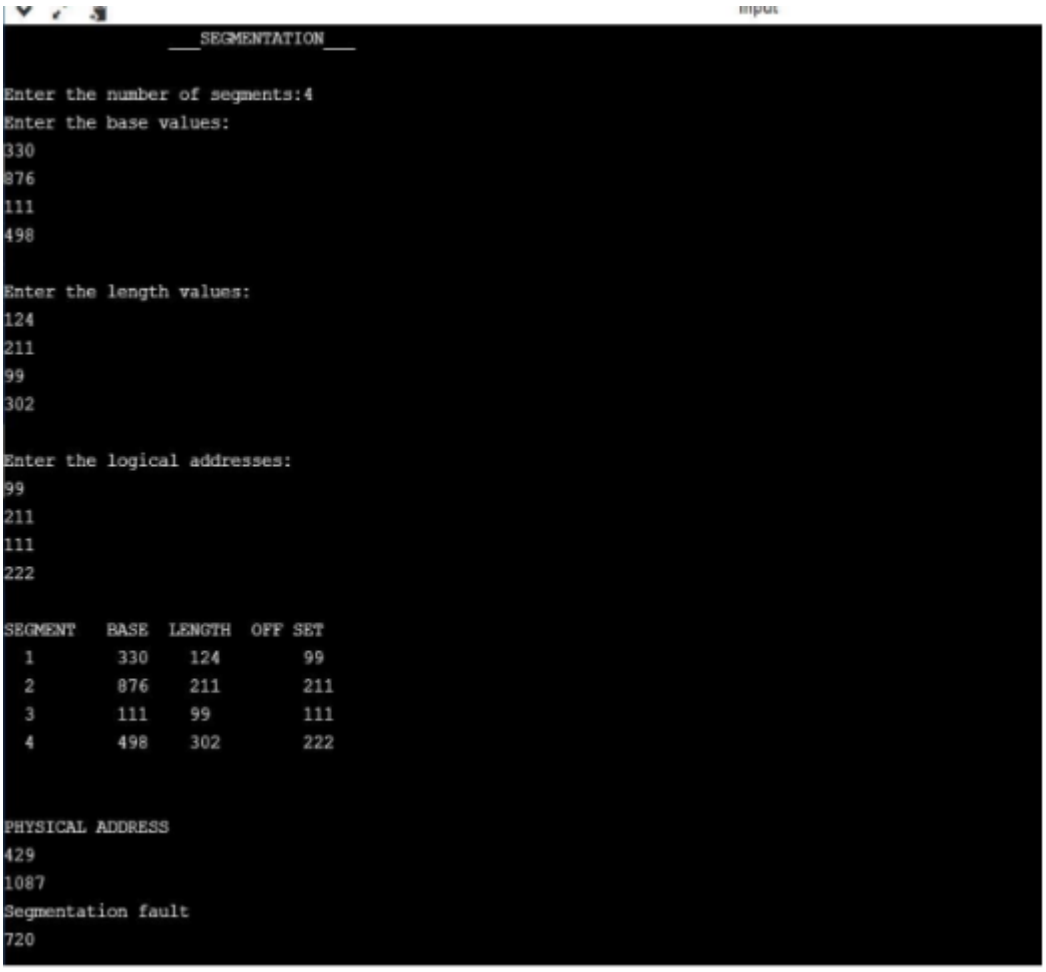
1. START
2. Declare the required variables
3. Input the number of segments, base values, length values, logical address(offset).
4. Perform the operation
   If the logical address (offset)is less than equal to length
   Then do
   Sum up offset with base address
   Else
   DISPLAY segmentation fault
5. DISPLAY the required output
6. STOP

PROGRAM:

```
#include <stdio.h>

intmain()

{

intn,bv[10],lv[10],la[10],sum[10];

printf("\t\t___SEGMENTATION___\n\n");

printf("Enter the number of segments:");

scanf("%d",&n);

printf("Enter the base values:\n");

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

{

scanf("%d",&bv[i]);

}

printf("\nEnter the length values:\n");
```

```
for(inti=0;i<n;i++)
{
scanf("%d",&lv[i]);
}
printf("\nEnter the logical addresses: \n");
for(inti=0;i<n;i++)
{
scanf("%d",&la[i]);
}
printf("\nSEGMENT\t BASE\tLENGTH\tOFF SET\n");
for(inti=0;i<n;i++)
{
printf(" %d\t %d\t %d\t %d\n",i+1,bv[i],lv[i],la[i]);
}
printf("\n\nPHYSICAL ADDRESS\n");
for (inti=0;i<n;i++)
{
if(la[i]<=lv[i])
{
sum[i]=bv[i]+la[i];
printf("%d\n",sum[i]);
}
else{
printf("Segmentation fault\n");
}
}
return 0;}
```

OUTPUT:



RESULT:

Thus, the segmentation problem using c program has been completed and executed successfully.