



COCSC09-OPERATING SYSTEM

PRACTICAL FILE



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EXPERIMENT-1,2 AND 3

Open ▾

fork.c
~/Desktop/Practical Experiments

```
1 #include <stdio.h>
2 #include <sys/types.h>
3 #include <unistd.h>
4 int main(){
5     fork();
6     fork();
7     printf("Called fork() system call \n");
8     return 0;
9 }
```

amogh@Amogh: ~/Desktop/Practical Experiments

```
amogh@Amogh:~/Desktop/Practical Experiments$ gcc -o fork fork.c
amogh@Amogh:~/Desktop/Practical Experiments$ ./fork
Called fork() system call
amogh@Amogh:~/Desktop/Practical Experiments$ Called fork() system call
Called fork() system call
Called fork() system call
```

Open ▾

fork.c
~/Desktop/Practical Experiments

```
1 // Fork()
2 #include <stdio.h>
3 #include <sys/types.h>
4 #include <unistd.h>
5
6 int main() {
7     pid_t pid, mypid, myppid;
8     pid = getpid();
9     printf("Before fork: Process id is %d\n", pid);
10    pid = fork();
11
12    if (pid < 0) {
13        perror("fork() failure\n");
14        return 1;
15    }
16
17    // Child process
18    if (pid == 0) {
19        printf("This is child process\n");
20        mypid = getpid();
21        myppid = getppid();
22        printf("Process id is %d and PPID is %d\n", mypid, myppid);
23    } else { // Parent process
24        sleep(2);
25        printf("This is parent process\n");
26        mypid = getpid();
27        myppid = getppid();
28        printf("Process id is %d and PPID is %d\n", mypid, myppid);
29        printf("Newly created process id or child pid is %d\n", pid);
30    }
31    return 0;
32 }
33
```

amogh@Amogh: ~/Desktop/Practical Experiments

```
amogh@Amogh:~/Desktop/Practical Experiments$ gcc -o fork fork.c
amogh@Amogh:~/Desktop/Practical Experiments$ ./fork
Before fork: Process id is 2495
This is child process
Process id is 2496 and PPID is 2495
This is parent process
Process id is 2495 and PPID is 2448
Newly created process id or child pid is 2496
amogh@Amogh:~/Desktop/Practical Experiments$
```

Firefox Web Browser

```
1 // C program to demonstrate working of wait()
2 #include<stdio.h>
3 #include<sys/wait.h>
4 #include<unistd.h>
5
6 int main()
7 {
8     if (fork()== 0)
9         printf("HC: hello from child\n");
10    else
11    {
12        printf("HP: hello from parent\n");
13        wait(NULL);
14        printf("CT: child has terminated\n");
15    }
16
17    printf("Bye\n");
18    return 0;
19 }
20
```

wait.c

~/Desktop/Practical Experiments

amogh@Amogh: ~/Desktop/Practical Experiments

```
amogh@Amogh:~/Desktop/Practical Experiments$ vi wait.c
amogh@Amogh:~/Desktop/Practical Experiments$ gcc -o wait wait.c
amogh@Amogh:~/Desktop/Practical Experiments$ ./wait
HP: hello from parent
HC: hello from child
Bye
CT: child has terminated
Bye
amogh@Amogh:~/Desktop/Practical Experiments$
```

Open

```
1 // C program to demonstrate working of exit()
2 #include <stdio.h>
3 #include <stdlib.h>
4
5 void exitfunc() {
6     printf("Called cleanup function - exitfunc()\n");
7     return;
8 }
9
10 int main() {
11     atexit(exitfunc);
12     printf("Hello, World!\n");
13     exit (0);
14 }
15
```

exit.c

~/Desktop/Practical Experiments

amogh@Amogh: ~/Desktop/Practical Experiments

```
amogh@Amogh:~/Desktop/Practical Experiments$ vi exit.c
amogh@Amogh:~/Desktop/Practical Experiments$ gcc -o exit exit.c
amogh@Amogh:~/Desktop/Practical Experiments$ ./exit
./exit: command not found
amogh@Amogh:~/Desktop/Practical Experiments$ ./exit
Hello, World!
Called cleanup function - exitfunc()
amogh@Amogh:~/Desktop/Practical Experiments$
```

Open

```
1 #include<stdio.h>
2 #include<stdlib.h>
3 #include<unistd.h>
4 int main(){
5     char *args[]={"/.test",NULL};
6     execvp(args[0],args);
7     printf("Terminating...");
8     return 0;
9 }
10
```

exec.c

~/Desktop/Practical Experiments

amogh@Amogh: ~/Desktop/Practical Experiments

```
amogh@Amogh:~/Desktop/Practical Experiments$ vi exec.c
amogh@Amogh:~/Desktop/Practical Experiments$ gcc -o exec exec.c
amogh@Amogh:~/Desktop/Practical Experiments$ ./exec
Hello World
amogh@Amogh:~/Desktop/Practical Experiments$
```

EXPERIMENT-4 (FCFS)

```
1 //FCFS
2 #include<stdio.h>
3 // Function to find the waiting time for all
4 // processes
5 void findWaitingTime(int processes[], int n,int bt[], int wt[])
6 {
7     // waiting time for first process is 0
8     wt[0] = 0;
9
10    // calculating waiting time
11    for (int i = 1; i < n; i++)
12        wt[i] = bt[i-1] + wt[i-1] ;
13 }
14
15 // Function to calculate turn around time
16 void findTurnAroundTime( int processes[], int n,int bt[], int wt[], int tat[])
17 {
18     // calculating turnaround time by adding
19     // bt[i] + wt[i]
20     for (int i = 0; i < n; i++)
21         tat[i] = bt[i] + wt[i];
22 }
23
24 //Function to calculate average time
25 void findavgTime( int processes[], int n, int bt[])
26 {
27     int wt[n], tat[n], total_wt = 0, total_tat = 0;
28
29     //Function to find waiting time of all processes
30     findWaitingTime(processes, n, bt, wt);
31
32     //Function to find turn around time for all processes
33     findTurnAroundTime(processes, n, bt, wt, tat);
34
35     //Display processes along with all details
36     printf("Processes Burst time Waiting time Turn around time\n");
37
38     // Calculate total waiting time and total turn
39     // around time
40     for (int i=0; i<n; i++)
41     {
42         total_wt = total_wt + wt[i];
43         total_tat = total_tat + tat[i];
44         printf(" %d ",(i+1));
45         printf(" %d ", bt[i] );
46         printf(" %d",wt[i] );
47         printf(" %d\n",tat[i] );
48     }
49     int s=(float)total_wt / (float)n;
50     int t=(float)total_tat / (float)n;
51     printf("Average waiting time = %d",s);
52     printf("\n");
53     printf("Average turn around time = %d ",t);
54 }
55
56 // Driver code
57 int main()
58 {
59     //process id's
60     int processes[] = { 1, 2, 3};
61     int n = sizeof processes / sizeof processes[0];
62
63     //Burst time of all processes
64     int burst_time[] = {10, 5, 8};
65
66     findavgTime(processes, n, burst_time);
67     return 0;
68 }
```

```
amogh@Amogh: ~/Desktop/Practical Experiments
amogh@Amogh:~/Desktop/Practical Experiments$ gcc -o fcfs fcfs.c
amogh@Amogh:~/Desktop/Practical Experiments$ ./fcfs
Processes Burst time Waiting time Turn around time
1          10           0          10
2           5          10          15
3           8          15          23
Average waiting time = 8
amogh@Amogh:~/Desktop/Practical Experiments$
```

EXPERIMENT-5 (SJF)

```

1 #include<stdio.h>
2 int main()
3 {
4     int bt[20],p[20],wt[20],tat[20],i,j,n,total=0,pos,temp;
5     float avg_wt,avg_tat;
6     printf("Enter number of process:");
7     scanf("%d",&n);
8
9     printf("\nEnter Burst Time:\n");
10    for(i=0;i<n;i++)
11    {
12        printf("p%d:",i+1);
13        scanf("%d",&bt[i]);
14        p[i]=i+1;
15    }
16
17    //sorting of burst times
18    for(i=0;i<n;i++)
19    {
20        pos=i;
21        for(j=i+1;j<n;j++)
22        {
23            if(bt[j]<bt[pos])
24                pos=j;
25        }
26        temp=bt[i];
27        bt[i]=bt[pos];
28        bt[pos]=temp;
29        temp=p[i];
30        p[i]=p[pos];
31        p[pos]=temp;
32    }
33    wt[0]=0;
34
35    for(i=1;i<n;i++)
36    {
37        wt[i]=0;
38        for(j=0;j<i;j++)
39            wt[i]+=bt[j];
40
41        total+=wt[i];
42    }
43
44    avg_wt=(float)total/n;
45    total=0;
46
47    printf("\nProcess\t Burst Time\t \tWaiting Time\tTurnaround Time");
48    for(i=0;i<n;i++)
49    {
50        tat[i]=bt[i]+wt[i];
51        total+=tat[i];
52        printf("\np%d\t\t %d\t\t %d\t\t %d",p[i],bt[i],wt[i],tat[i]);
53    }
54
55    avg_tat=(float)total/n;
56    printf("\n\nAverage Waiting Time=%f",avg_wt);
57    printf("\n\nAverage Turnaround Time=%f\n",avg_tat);
58 }

```

```

amogh@Amogh:~/Desktop/Practical Experiment$ vi sjf.c
amogh@Amogh:~/Desktop/Practical Experiment$ gcc sjf.c -o sjf
amogh@Amogh:~/Desktop/Practical Experiment$ ./sjf
./sjf: command not found
amogh@Amogh:~/Desktop/Practical Experiment$ ./sjf
Enter number of process:3
nEnter Burst Time:np1:2
p2:5
p3:1
nProcesst  Burst Time  tWaiting TimeTurnaround Timeenp3tt 1tt 0ttt1np1tt 2tt 1ttt3np2tt 5tt 3ttt8nnAverage Waiting Time=1.333333nAverage Turnaround Time=4.000000
tical Experiment$ gcc sjf.c -o sjf
amogh@Amogh:~/Desktop/Practical Experiment$ ./sjf
Enter number of process:3
Enter Burst Time:
p1:3
p2:2
p3:1
Processt  Burst Time  Waiting Time  Turnaround Time
p3 1 0 1
p2 2 1 3
p1 3 3 6
Average Waiting Time=1.333333
Average Turnaround Time=3.333333
amogh@Amogh:~/Desktop/Practical Experiment$

```

EXPERIMENT-6 (PREEMPTIVE PRIORITY)

```
1 #include<stdio.h>
2 int main()
3 {
4     int bt[20],p[20],wt[20],tat[20],i,j,n,total=0,pos,temp;
5     float avg_wt,avg_tat;
6     printf("Enter number of process:");
7     scanf("%d",&n);
8
9     printf("\nEnter Burst Time:\n");
10    for(i=0;i<n;i++)
11    {
12        printf("p%d:",i+1);
13        scanf("%d",&bt[i]);
14        p[i]=i+1;
15    }
16
17    //sorting of burst times
18    for(i=0;i<n;i++)
19    {
20        pos=i;
21        for(j=i+1;j<n;j++)
22        {
23            if(bt[j]<bt[pos])
24                pos=j;
25        }
26        temp=bt[i];
27        bt[i]=bt[pos];
28        bt[pos]=temp;
29
30        temp=p[i];
31        p[i]=p[pos];
32        p[pos]=temp;
33    }
34    wt[0]=0;
35
36    for(i=1;i<n;i++)
37    {
38        wt[i]=0;
39        for(j=0;j<i;j++)
40            wt[i]+=bt[j];
41
42        total+=wt[i];
43    }
44
45    avg_wt=(float)total/n;
46    total=0;
47
48    printf("\nProcess\t Burst Time\t \tWaiting Time\tTurnaround Time");
49    for(i=0;i<n;i++)
50    {
51        tat[i]=bt[i]+wt[i];
52        total+=tat[i];
53        printf("\np%d\t\t %d\t\t\t %d\t\t\t %d",p[i],bt[i],wt[i],tat[i]);
54    }
55
56    avg_tat=(float)total/n;
57    printf("\n\nAverage Waiting Time=%f",avg_wt);
58    printf("\n\nAverage Turnaround Time=%f\n",avg_tat);
59 }
60
61
62
```

```
amogh@Amogh:~/Desktop/Practical Experiments$ vi priority.c
amogh@Amogh:~/Desktop/Practical Experiments$ gcc priority.c -o priority
amogh@Amogh:~/Desktop/Practical Experiments$ ./priority
Enter the number of the process
3
Enter the arrival time , burst time and priority of the process
AT BT PT
0 4 1
1 2 3
2 3 2
ID WT TAT
1 0 4
2 6 8
3 2 5
Avg waiting time of the process is 2.666667
Avg turn around time of the process is 5.666667
amogh@Amogh:~/Desktop/Practical Experiments$
```

EXPERIMENT-7 (ROUND-ROBIN)

```
#include<stdio.h>

int main()
{
    int i, limit, total = 0, x, counter = 0, time_quantum;
    int wait_time = 0, turnaround_time = 0, arrival_time[10], burst_time[10], temp[10];
    float average_wait_time, average_turnaround_time;
    printf("\nEnter Total Number of Processes:\t");
    scanf("%d", &limit);
    x = limit;
    for(i = 0; i < limit; i++)
    {
        printf("\nEnter Details of Process[%d]\n", i + 1);

        printf("Arrival Time:\t");

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

        printf("Burst Time:\t");

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

        temp[i] = burst_time[i];
    }

    printf("\nEnter Time Quantum:\t");
    scanf("%d", &time_quantum);
    printf("\nProcess ID\tBurst Time\t Turnaround Time\t Waiting Time\n");
    for(total = 0, i = 0; x != 0;)
    {
        if(temp[i] <= time_quantum && temp[i] > 0)
        {
            total = total + temp[i];
            temp[i] = 0;
            counter = 1;
        }
        else if(temp[i] > 0)
        {
            temp[i] = temp[i] - time_quantum;
            total = total + time_quantum;
        }
        if(temp[i] == 0 && counter == 1)
        {
            x--;
            printf("\nProcess[%d]\t\t%d\t\t%d\t\t%d\t\t%d", i + 1, burst_time[i], total - arrival_time[i], total - arrival_time[i] - burst_time[i]);

            printf("\nEnter Time Quantum:\t");
            scanf("%d", &time_quantum);
            printf("\nProcess ID\tBurst Time\t Turnaround Time\t Waiting Time\n");
            for(total = 0, i = 0; x != 0;)
            {
                if(temp[i] <= time_quantum && temp[i] > 0)
                {
                    total = total + temp[i];
                    temp[i] = 0;
                    counter = 1;
                }
                else if(temp[i] > 0)
                {
                    temp[i] = temp[i] - time_quantum;
                    total = total + time_quantum;
                }
                if(temp[i] == 0 && counter == 1)
                {
                    x--;
                    printf("\nProcess[%d]\t\t%d\t\t%d\t\t%d\t\t%d", i + 1, burst_time[i], total - arrival_time[i], total - arrival_time[i] - burst_time[i]);
                    wait_time = wait_time + total - arrival_time[i] - burst_time[i];
                    turnaround_time = turnaround_time + total - arrival_time[i];
                    counter = 0;
                }
                if(i == limit - 1)
                {
                    i = 0;
                }
                else if(arrival_time[i + 1] <= total)
                {
                    i++;
                }
                else
                {
                    i = 0;
                }
            }

            average_wait_time = wait_time * 1.0 / limit;
            average_turnaround_time = turnaround_time * 1.0 / limit;
            printf("\n\nAverage Waiting Time:\t%f", average_wait_time);
            printf("\nAvg Turnaround Time:\t%f\n", average_turnaround_time);
            return 0;
        }
    }
}
```

```

amogh@Amogh:~/Desktop/Practical Experiments$ vi rr.c
amogh@Amogh:~/Desktop/Practical Experiments$ gcc -o rr rr.c
amogh@Amogh:~/Desktop/Practical Experiments$ ./rr

Enter Total Number of Processes:      3

Enter Details of Process[1]
Arrival Time:t1
Burst Time:t2

Enter Details of Process[2]
Arrival Time:t2
Burst Time:t6

Enter Details of Process[3]
Arrival Time:t4
Burst Time:t7

Enter Time Quantum:      2

Process IDttBurst Timet Turnaround Timet Waiting Time

Process[1]          2          1          -1
Process[2]          6          10          4
Process[3]          7          11          4

Average Waiting Time:  2.333333
Avg Turnaround Time:  7.333333
amogh@Amogh:~/Desktop/Practical Experiments$

```


EXPERIMENT-8 (MFQS)

```
Open  [icon] mfqs.c ~/Desktop/Practical Experiments

1 #include<stdio.h>
2
3 struct process
4 {
5     char name;
6     int AT,BT,WT,TAT,RT,CT;
7 }Q1[10],Q2[10],Q3[10];/*Three queues*/
8
9 int n;
10 void sortByArrival()
11 {
12     struct process temp;
13     int i,j;
14     for(i=0;i<n;i++)
15     {
16         for(j=i+1;j<n;j++)
17         {
18             if(Q1[i].AT>Q1[j].AT)
19             {
20                 temp=Q1[i];
21                 Q1[i]=Q1[j];
22                 Q1[j]=temp;
23             }
24         }
25     }
26 }
27
28 int main()
29 {
30     int i,j,k=0,r=0,time=0,tq1=5,tq2=8,flag=0;
31     char c;
32     printf("Enter no of processes:");
33     scanf("%d",&n);
34     for(i=0,c='A';i<n;i++,c++)
35     {
36         Q1[i].name=c;
37         printf("\nEnter the arrival time and burst time of process %c: ",Q1[i].name);
38         scanf("%d%d",&Q1[i].AT,&Q1[i].BT);
39         Q1[i].RT=Q1[i].BT;/*save burst time in remaining time for each process*/
40     }
41 }
42 sortByArrival();
43 time=Q1[0].AT;
44 printf("Process in first queue following RR with qt=5");
45 printf("\nProcess\t\tRT\t\tWT\t\tTAT\t\t");
46 for(i=0;i<n;i++)
47 {
48     if(Q1[i].RT<=tq1)
49     {
50         time+=Q1[i].RT;/*from arrival time of first process to completion of this process*/
51         Q1[i].RT=0;
52         Q1[i].WT=time-Q1[i].AT-Q1[i].BT;/*amount of time process has been waiting in the first queue*/
53         Q1[i].TAT=time-Q1[i].AT;/*amount of time to execute the process*/
54         printf("\n%c\t\t%d\t\t%d\t\t%d",Q1[i].name,Q1[i].BT,Q1[i].WT,Q1[i].TAT);
55     }
56     else/*process moves to queue 2 with qt=8*/
57     {
58         Q2[k].WT=time;
59         time+=tq1;
60         Q1[i].RT-=tq1;
61         Q2[k].BT=Q1[i].RT;
62         Q2[k].RT=Q2[k].BT;
63         Q2[k].name=Q1[i].name;
64         k=k+1;
65         flag=1;
66     }
67 }
68 if(flag==1)
69 {printf("\nProcess in second queue following RR with qt=8");
70   printf("\nProcess\t\tRT\t\tWT\t\tTAT\t\t");
71   for(i=0;i<k;i++)
72   {
73       if(Q2[i].RT<=tq2)
74       {
75           time+=Q2[i].RT;/*from arrival time of first process +BT of this process*/
76           Q2[i].RT=0;
77           Q2[i].WT=time-tq1-Q2[i].BT;/*amount of time process has been waiting in the ready queue*/
78           Q2[i].TAT=time-Q2[i].AT;/*amount of time to execute the process*/
79           printf("\n%c\t\t%d\t\t%d\t\t%d",Q2[i].name,Q2[i].BT,Q2[i].WT,Q2[i].TAT);
80       }
81       else/*process moves to queue 3 with FCFS*/
82       {
83           Q3[r].AT=time;
84           time+=tq2;
85           Q2[i].RT-=tq2;
86       }
87   }
88 }
```

```

78     time+=Q2[i].RT; /*from arrival time of first process +BT of this process*/
79     Q2[i].RT=0;
80     Q2[i].WT=time-tq1-Q2[i].BT; /*amount of time process has been waiting in the ready queue*/
81     Q2[i].TAT=time-Q2[i].AT; /*amount of time to execute the process*/
82     printf("\n%c\t\t%d\t\t%d\t\t%d", Q2[i].name, Q2[i].BT, Q2[i].WT, Q2[i].TAT);
83
84 }
85 else /*process moves to queue 3 with FCFS*/
86 {
87     Q3[r].AT=time;
88     time+=tq2;
89     Q2[i].RT-=tq2;
90     Q3[r].BT=Q2[i].RT;
91     Q3[r].RT=Q3[r].BT;
92     Q3[r].name=Q2[i].name;
93     r=r+1;
94     flag=2;
95 }
96 }
97
98 {if(flag==2)
99 printf("\nProcess in third queue following FCFS ");
100 }
101 for(i=0; i<r; i++)
102 {
103     if(i==0)
104         Q3[i].CT=Q3[i].BT+time-tq1-tq2;
105     else
106         Q3[i].CT=Q3[i-1].CT+Q3[i].BT;
107 }
108 }
109
110 for(i=0; i<r; i++)
111 {
112     Q3[i].TAT=Q3[i].CT;
113     Q3[i].WT=Q3[i].TAT-Q3[i].BT;
114     printf("\n%c\t\t%d\t\t%d\t\t%d\t\t", Q3[i].name, Q3[i].BT, Q3[i].WT, Q3[i].TAT);
115 }
116 }
117
118 }

```

EXPERIMENT-9 (DEADLOCK AVOIDANCE)

```
Open  [icon]

deadlock_avoidance.c
~/Desktop/Practical Experiments

1 // Banker's Algorithm
2 #include <stdio.h>
3 int main(){
4     // P0, P1, P2, P3, P4 are the Process names here
5     int n, m, i, j, k;
6     n = 5; // Number of processes
7     m = 3; // Number of resources
8     int alloc[5][3] = { { 0, 1, 0 }, // P0 // Allocation Matrix
9                          { 2, 0, 0 }, // P1
10                         { 3, 0, 2 }, // P2
11                         { 2, 1, 1 }, // P3
12                         { 0, 0, 2 } }; // P4
13
14     int max[5][3] = { { 7, 5, 3 }, // P0 // MAX Matrix
15                      { 3, 2, 2 }, // P1
16                      { 9, 0, 2 }, // P2
17                      { 2, 2, 2 }, // P3
18                      { 4, 3, 3 } }; // P4
19
20     int avail[3] = { 3, 3, 2 }; // Available Resources
21
22     int f[n], ans[n], ind = 0;
23     for (k = 0; k < n; k++) {
24         f[k] = 0;
25     }
26     int need[n][m];
27     for (i = 0; i < n; i++) {
28         for (j = 0; j < m; j++)
29             need[i][j] = max[i][j] - alloc[i][j];
30     }
31     int y = 0;
32     for (k = 0; k < 5; k++) {
33         for (i = 0; i < n; i++) {
34             if (f[i] == 0) {
35
36                 int flag = 0;
37                 for (j = 0; j < m; j++) {
38                     if (need[i][j] > avail[j]){
39                         flag = 1;
40                         break;
41                     }
42                 }
43
44                 if (flag == 0) {
45                     ans[ind++] = i;
46                     for (y = 0; y < m; y++)
47                         avail[y] += alloc[i][y];
48                     f[i] = 1;
49                 }
50             }
51         }
52     }
53
54     int flag = 1;
55     for(int i=0;i<n;i++)
56     {
57         if(f[i]==0)
58         {
59             flag=0;
60             printf("The following system is not safe\n");
61             break;
62         }
63     }
64     if(flag==1)
65     {
66         printf("Following is the SAFE Sequence\n");
67         for (i = 0; i < n - 1; i++)
68             printf(" P%d ->", ans[i]);
69         printf(" P%d", ans[n - 1]);
70     }
71     printf("\n");
72     return (0);
73 }
74 }
75 }
```

```
amogh@Amogh: ~/Desktop/Practical Experiments
amogh@Amogh:~/Desktop/Practical Experiments$ vi deadlock_avoidance.c
amogh@Amogh:~/Desktop/Practical Experiments$ gcc -o deadlock_avoidance deadlock_avoidance.c
amogh@Amogh:~/Desktop/Practical Experiments$ ./deadlock_avoidance
Following is the SAFE Sequence
P1 -> P3 -> P4 -> P0 -> P2
amogh@Amogh:~/Desktop/Practical Experiments$
```

EXPERIMENT-10 (DEADLOCK DETECTION)

```
1 #include <stdio.h>
2 static int mark[20];
3 int i,j,np,nr;
4
5 int main()
6 {
7     int alloc[10][10],request[10][10],avail[10],r[10],w[10];
8
9     printf("\nEnter the no of process: ");
10    scanf("%d",&np);
11    printf("\nEnter the no of resources: ");
12    scanf("%d",&nr);
13    for(i=0;i<nr;i++)
14    {
15        printf("\nTotal Amount of the Resource R%d: ",i+1);
16        scanf("%d",&r[i]);
17    }
18
19
20
21
22    printf("\nEnter the request matrix:");
23
24    for(i=0;i<np;i++)
25    for(j=0;j<nr;j++)
26    scanf("%d",&request[i][j]);
27
28    printf("\nEnter the allocation matrix:");
29    for(i=0;i<np;i++)
30    for(j=0;j<nr;j++)
31    scanf("%d",&alloc[i][j]);
32    /*Available Resource calculation*/
33    for(j=0;j<nr;j++)
34    {
35        avail[j]=r[j];
36        for(i=0;i<np;i++)
37        {
38            avail[j]-=alloc[i][j];
39        }
40    }
41
42
43    //marking processes with zero allocation
44
45    for(i=0;i<np;i++)
46    {
```

```
66    int canbeprocessed=0;
67    if(mark[i]!=1)
68    {
69        for(j=0;j<nr;j++)
70        {
71            if(request[i][j]<=w[j])
72                canbeprocessed=1;
73            else
74            {
75                canbeprocessed=0;
76                break;
77            }
78        }
79        if(canbeprocessed)
80        {
81            mark[i]=1;
82
83            for(j=0;j<nr;j++)
84                w[j]+=alloc[i][j];
85        }
86    }
87
88
89    //checking for unmarked processes
90    int deadlock=0;
91    for(i=0;i<np;i++)
92    if(mark[i]!=1)
93        deadlock=1;
94
95
96    if(deadlock)
97        printf("\n Deadlock detected");
```

```
47    int count=0;
48    for(j=0;j<nr;j++)
49    {
50        if(alloc[i][j]==0)
51            count++;
52        else
53            break;
54    }
55    if(count==nr)
56        mark[i]=1;
57 }
58 // initialize W with avail
59
60 for(j=0;j<nr;j++)
61     w[j]=avail[j];
62
63 //mark processes with request less than or equal to W
64 for(i=0;i<np;i++)
65 {
66     int canbeprocessed=0;
67     if(mark[i]!=1)
68     {
69         for(j=0;j<nr;j++)
70         {
71             if(request[i][j]<=w[j])
72                 canbeprocessed=1;
73             else
74             {
75                 canbeprocessed=0;
76                 break;
77             }
78         }
79         if(canbeprocessed)
80         {
81             mark[i]=1;
82
83             for(j=0;j<nr;j++)
84                 w[j]+=alloc[i][j];
85         }
86     }
87 }
88
89 //checking for unmarked processes
90 int deadlock=0;
91 for(i=0;i<np;i++)
```

amogh@Amogh:~/Desktop/Practical Experiments\$./deadlock_detection

Enter the no of process: 4

Enter the no of resources: 5

Total Amount of the Resource R1: 2

Total Amount of the Resource R2: 1

Total Amount of the Resource R3: 1

Total Amount of the Resource R4: 2

Total Amount of the Resource R5: 1

Enter the request matrix:0 1 0 0 1

0 0 1 0 1

0 0 0 0 1

1 0 1 0 1

Enter the allocation matrix:1 0 1 1 0

1 1 0 0 0

0 0 0 1 0

0 0 0 0 0

Deadlock detectedamogh@Amogh:~/Desktop/Practical Experiments\$

EXPERIMENT-11 (BEST-FIT)

```
1 #include<stdio.h>
2
3 void main()
4 {
5     int fragment[20],b[20],p[20],i,j,nb,np,temp,lowest=9999;
6     static int barray[20],parray[20];
7     printf("\n\t\t\tMemory Management Scheme - Best Fit");
8     printf("\nEnter the number of blocks:");
9     scanf("%d",&nb);
10    printf("Enter the number of processes:");
11    scanf("%d",&np);
12    printf("\nEnter the size of the blocks:-\n");
13    for(i=1;i<=nb;i++)
14    {
15        printf("Block no.%d:",i);
16        scanf("%d",&b[i]);
17    }
18    printf("\nEnter the size of the processes :-\n");
19    for(i=1;i<=np;i++)
20    {
21        printf("Process no.%d:",i);
22        scanf("%d",&p[i]);
23    }
24    for(i=1;i<=np;i++)
25    {
26        for(j=1;j<=nb;j++)
27        {
28            if(barray[j]!=1)
29            {
30                temp=b[j]-p[i];
31                if(temp>=0)
32                if(lowest>temp)
33                {
34                    parray[i]=j;
35                    lowest=temp;
36                }
37            }
38        }
39        fragment[i]=lowest;
40        barray[parray[i]]=1;
41        lowest=10000;
42    }
43    printf("\nProcess_no\tProcess_size\tBlock_no\tBlock_size\tFragment");
44    for(i=1;i<=np && parray[i]!=0;i++)
45    printf("\n%d\t\t%d\t\t%d\t\t%d\t\t%d",i,p[i],parray[i],b[parray[i]],fragment[i]);
32 if(lowest>temp)
33 {
34     parray[i]=j;
35     lowest=temp;
36 }
37 }
38 }
39 fragment[i]=lowest;
40 barray[parray[i]]=1;
41 lowest=10000;
42 }
43 printf("\nProcess_no\tProcess_size\tBlock_no\tBlock_size\tFragment");
44 for(i=1;i<=np && parray[i]!=0;i++)
45 printf("\n%d\t\t%d\t\t%d\t\t%d\t\t%d",i,p[i],parray[i],b[parray[i]],fragment[i]);
```

```
amogh@Amogh:~/Desktop/Practical Experiments$ vi best_fit.c
amogh@Amogh:~/Desktop/Practical Experiments$ gcc -o best_fit best_fit.c
Thunderbird Mail esktop/Practical Experiments$ ./best_fit
```

Memory Management Scheme - Best Fit

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

Enter the size of the blocks:-

Block no.1:10
Block no.2:15
Block no.3:5
Block no.4:9
Block no.5:3

Enter the size of the processes :-

Process no.1:1
Process no.2:4
Process no.3:7
Process no.4:12

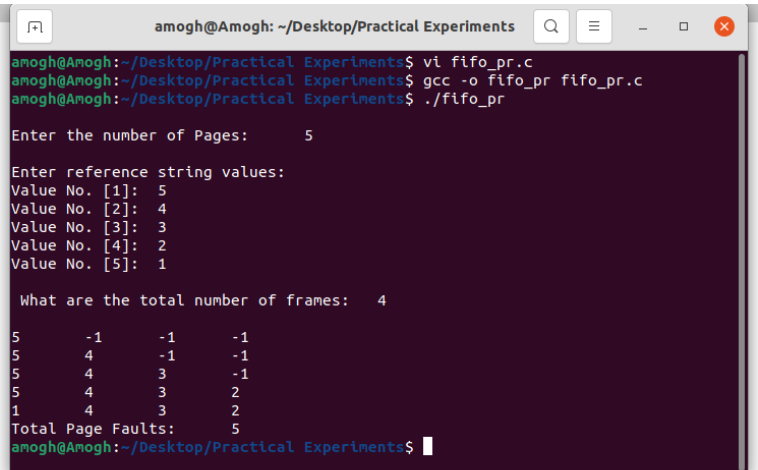
Process_no	Process_size	Block_no	Block_size	Fragment
1	1	5	3	2
2	4	3	5	1
3	7	4	9	2
4	12	2	15	

amogh@Amogh:~/Desktop/Practical Experiments\$

EXPERIMENT-12 (FIFO PAGE-REPLACEMENT)

```
1#include <stdio.h>
2int main()
3{
4    int referenceString[10], pageFaults = 0, m, n, s, pages, frames;
5    printf("\nEnter the number of Pages:\t");
6    scanf("%d", &pages);
7    printf("\nEnter reference string values:\n");
8    for(m = 0; m < pages; m++)
9    {
10        printf("Value No. [%d]:\t", m + 1);
11        scanf("%d", &referenceString[m]);
12    }
13    printf("\n What are the total number of frames:\t");
14    {
15        scanf("%d", &frames);
16    }
17    int temp[frames];
18    for(m = 0; m < frames; m++)
19    {
20        temp[m] = -1;
21    }
22    for(m = 0; m < pages; m++)
23    {
24        s = 0;
25        for(n = 0; n < frames; n++)
26        {
27            if(referenceString[m] == temp[n])
28            {
29                s++;
30                pageFaults--;
31            }
32        }
33        pageFaults++;
34        if((pageFaults <= frames) && (s == 0))
35        {
36            temp[m] = referenceString[m];
37        }
38        else if(s == 0)
39        {
40            temp[(pageFaults - 1) % frames] = referenceString[m];
41        }
42        printf("\n");
43        for(n = 0; n < frames; n++)
44        {
45            printf("%d\t", temp[n]);
```

```
24    s = 0;
25    for(n = 0; n < frames; n++)
26    {
27        if(referenceString[m] == temp[n])
28        {
29            s++;
30            pageFaults--;
31        }
32    }
33    pageFaults++;
34    if((pageFaults <= frames) && (s == 0))
35    {
36        temp[m] = referenceString[m];
37    }
38    else if(s == 0)
39    {
40        temp[(pageFaults - 1) % frames] = referenceString[m];
41    }
42    printf("\n");
43    for(n = 0; n < frames; n++)
44    {
45        printf("%d\t", temp[n]);
46    }
47 }
48 printf("\nTotal Page Faults:\t%d\n", pageFaults);
49 return 0;
50 }
```



```
amogh@Amogh: ~/Desktop/Practical Experiments
amogh@Amogh:~/Desktop/Practical Experiments$ vi fifo_pr.c
amogh@Amogh:~/Desktop/Practical Experiments$ gcc -o fifo_pr fifo_pr.c
amogh@Amogh:~/Desktop/Practical Experiments$ ./fifo_pr

Enter the number of Pages:      5

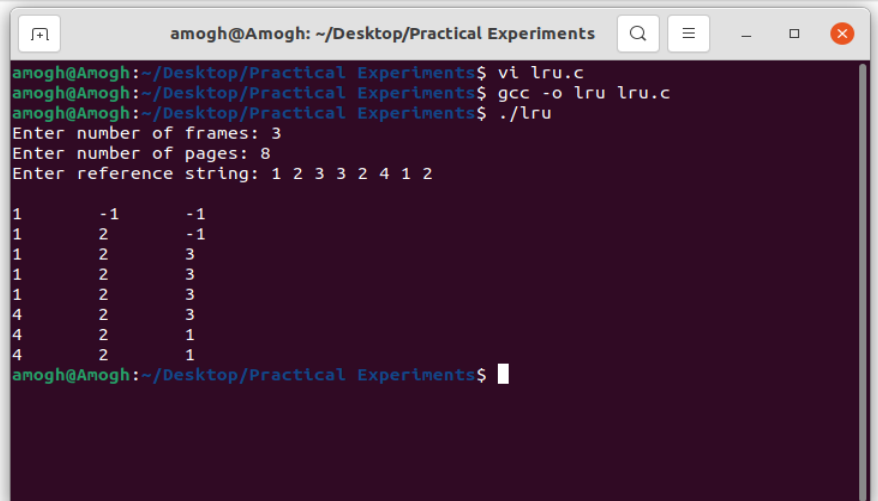
Enter reference string values:
Value No. [1]: 5
Value No. [2]: 4
Value No. [3]: 3
Value No. [4]: 2
Value No. [5]: 1

What are the total number of frames:  4

5      -1      -1      -1
5      4      -1      -1
5      4      3      -1
5      4      3      2
1      4      3      2
Total Page Faults: 5
amogh@Amogh:~/Desktop/Practical Experiments$
```

EXPERIMENT-13 (LRU PAGE REPLACEMENT)

```
1 //LRU
2 #include <stdio.h>
3 int findLRU(int time[], int n)
4 {
5     int i, minimum = time[0], pos = 0;
6
7     for (i = 1; i < n; ++i)
8     {
9         if (time[i] < minimum)
10         {
11             minimum = time[i];
12             pos = i;
13         }
14     }
15
16     return pos;
17 }
18
19 //main function
20 int main()
21 {
22     int no_of_frames, no_of_pages, frames[10], pages[30], counter = 0, time[10], flag1, flag2, i, j, pos, faults = 0;
23     printf("Enter number of frames: ");
24     scanf("%d", &no_of_frames);
25
26     printf("Enter number of pages: ");
27     scanf("%d", &no_of_pages);
28
29     printf("Enter reference string: ");
30
31     for (i = 0; i < no_of_pages; ++i)
32     {
33         scanf("%d", &pages[i]);
34     }
35
36     for (i = 0; i < no_of_frames; ++i)
37     {
38         frames[i] = -1;
39     }
40
41     for (i = 0; i < no_of_pages; ++i)
42     {
43         flag1 = flag2 = 0;
44
45         for (j = 0; j < no_of_frames; ++j)
46         {
47             for (j = 0; j < no_of_frames; ++j)
48             {
49                 if (frames[j] == pages[i])
50                 {
51                     counter++;
52                     time[j] = counter;
53                     flag1 = flag2 = 1;
54                     break;
55                 }
56             }
57
58             if (flag1 == 0)
59             {
60                 for (j = 0; j < no_of_frames; ++j)
61                 {
62                     if (frames[j] == -1)
63                     {
64                         counter++;
65                         faults++;
66                         frames[j] = pages[i];
67                         time[j] = counter;
68                         flag2 = 1;
69                         break;
70                     }
71                 }
72             }
73
74             if (flag2 == 0)
75             {
76                 pos = findLRU(time, no_of_frames);
77                 counter++;
78                 faults++;
79                 frames[pos] = pages[i];
80                 time[pos] = counter;
81             }
82
83             printf("\n");
84
85             for (j = 0; j < no_of_frames; ++j)
86             {
87                 printf("%d\t", frames[j]);
88             }
89
90             printf("\nTotal Page Faults = %d", faults);
91             return 0;
92 }
```



```
amogh@Amogh: ~/Desktop/Practical Experiments
amogh@Amogh:~/Desktop/Practical Experiments$ vi lru.c
amogh@Amogh:~/Desktop/Practical Experiments$ gcc -o lru lru.c
amogh@Amogh:~/Desktop/Practical Experiments$ ./lru
Enter number of frames: 3
Enter number of pages: 8
Enter reference string: 1 2 3 3 2 4 1 2

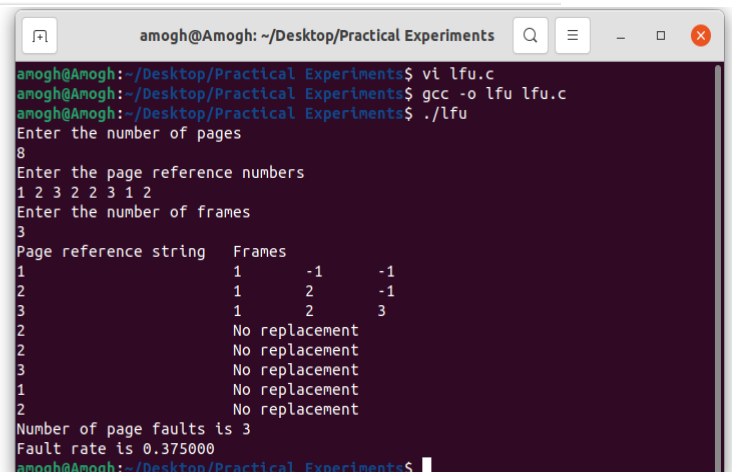
1      -1      -1
1      2      -1
1      2      3
1      2      3
1      2      3
4      2      3
4      2      1
4      2      1
amogh@Amogh:~/Desktop/Practical Experiments$
```


EXPERIMENT-14 AND 15 (SECOND CHANCE)

```
1 #include<stdio.h>
2 int n,nf;
3 int in[100];
4 int p[50];
5 int hit=0;
6 int i,j,k;
7 int pgfaultcnt=0;
8
9 void getData()
10 {
11     printf("\nEnter length of page reference sequence:");
12     scanf("%d",&n);
13     printf("\nEnter the page reference sequence:");
14     for(i=0; i<n; i++)
15         scanf("%d",&in[i]);
16     printf("\nEnter no of frames:");
17     scanf("%d",&nf);
18 }
19
20 void initialize()
21 {
22     pgfaultcnt=0;
23     for(i=0; i<nf; i++)
24         p[i]=9999;
25 }
26
27 int isHit(int data)
28 {
29     hit=0;
30     for(j=0; j<nf; j++)
31     {
32         if(p[j]==data)
33         {
34             hit=1;
35             break;
36         }
37     }
38 }
39
40 return hit;
41 }
42
43 int getHitIndex(int data)
44 {
45     int hitind;
46     for(k=0; k<nf; k++)
47     {
48         if(p[k]==data)
49         {
50             hitind=k;
51             break;
52         }
53     }
54     return hitind;
55 }
56
57 void dispPages()
58 {
59     for (k=0; k<nf; k++)
60     {
61         if(p[k]!=9999)
62             printf(" %d",p[k]);
63     }
64 }
65
66
67 void dispPgFaultCnt()
68 {
69     printf("\nTotal no of page faults:%d",pgfaultcnt);
70 }
71
72 void secondchance()
73 {
74     int usedbit[50];
75     int victimptr=0;
76     initialize();
77     for(i=0; i<nf; i++)
78         usedbit[i]=0;
79     for(i=0; i<n; i++)
80     {
81         printf("\nFor %d:",in[i]);
82         if(isHit(in[i]))
83         {
84             printf("No page fault!");
85             int hitindex=getHitIndex(in[i]);
86             if(usedbit[hitindex]==0)
87                 usedbit[hitindex]=1;
88         }
89         else
90         {
91             pgfaultcnt++;
92             if(usedbit[victimptr]==1)
93             {
94                 do
95                 {
96                     usedbit[victimptr]=0;
97                     victimptr++;
98                     if(victimptr==nf)
99                         victimptr=0;
100                 }
101                 while(usedbit[victimptr]!=0);
102             }
103             if(usedbit[victimptr]==0)
104             {
105                 p[victimptr]=in[i];
106                 usedbit[victimptr]=1;
107                 victimptr++;
108             }
109             dispPages();
110         }
111         if(victimptr==nf)
112             victimptr=0;
113     }
114     dispPgFaultCnt();
115 }
116
117 int main(){
118     secondchance();
119     return 0;
120 }
```


EXPERIMENT-16 (LFU PAGE REPLACEMENT)

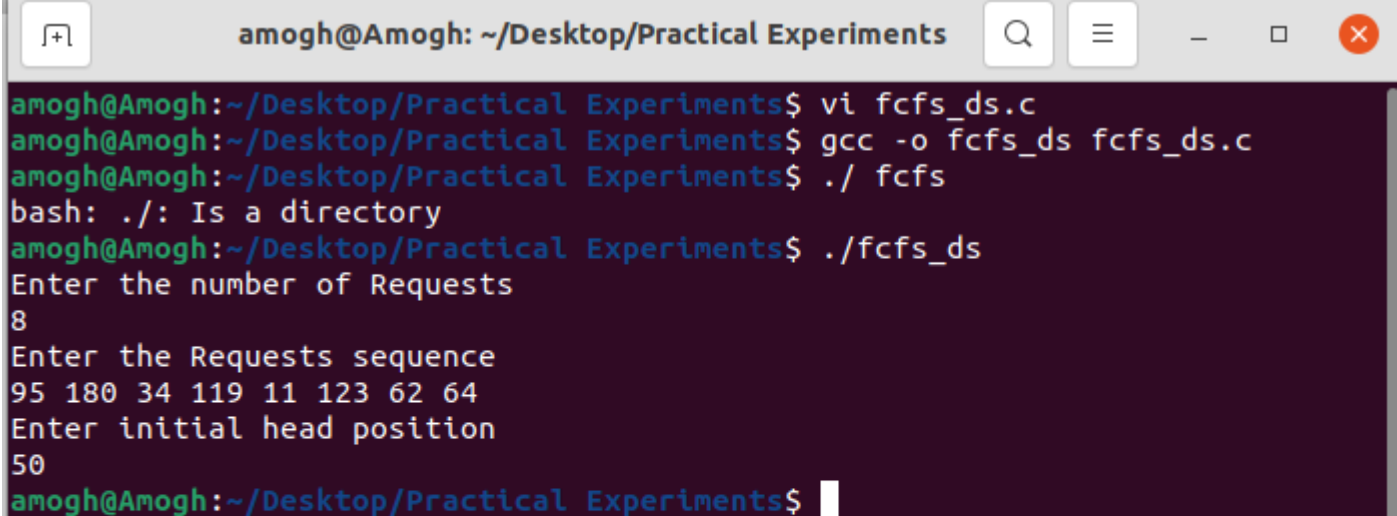
```
1 #include<stdio.h>
2 void print(int frameno,int frame[])
3 {
4     int j;
5     for(j=0;j<frameno;j++)
6         printf("%d\t",frame[j]);
7     printf("\n");
8 }
9 int main()
10 {
11     int i,j,k,n,page[50],frameno,frame[10],move=0,flag,count=0,count1[10]={0},
12         repindex,leastcount;
13     float rate;
14     printf("Enter the number of pages\n");
15     scanf("%d",&n);
16     printf("Enter the page reference numbers\n");
17     for(i=0;i<n;i++)
18         scanf("%d",&page[i]);
19     printf("Enter the number of frames\n");
20     scanf("%d",&frameno);
21     for(i=0;i<frameno;i++)
22         frame[i]=-1;
23     printf("Page reference string\tFrames\n");
24     for(i=0;i<n;i++)
25     {
26         printf("%d\t\t\t",page[i]);
27         flag=0;
28         for(j=0;j<frameno;j++)
29         {
30             if(page[i]==frame[j])
31             {
32                 flag=1;
33                 count1[j]++;
34                 printf("No replacement\n");
35                 break;
36             }
37         }
38         if(flag==0&&count<frameno)
39         {
40             frame[move]=page[i];
41             count1[move]=1;
42             move=(move+1)%frameno;
43             count++;
44             print(frameno,frame);
45         }
46     }
47     printf("%d\t\t\t",page[i]);
48     flag=0;
49     for(j=0;j<frameno;j++)
50     {
51         if(page[i]==frame[j])
52         {
53             flag=1;
54             count1[j]++;
55             printf("No replacement\n");
56             break;
57         }
58     }
59     if(flag==0&&count<frameno)
60     {
61         frame[move]=page[i];
62         count1[move]=1;
63         move=(move+1)%frameno;
64         count++;
65         print(frameno,frame);
66     }
67     else if(flag==0)
68     {
69         repindex=0;
70         leastcount=count1[0];
71         for(j=1;j<frameno;j++)
72         {
73             if(count1[j]<leastcount)
74             {
75                 repindex=j;
76                 leastcount=count1[j];
77             }
78         }
79         frame[repindex]=page[i];
80         count1[repindex]=1;
81         count++;
82         print(frameno,frame);
83     }
84 }
85 rate=(float)count/(float)n;
86 printf("Number of page faults is %d\n",count);
87 printf("Fault rate is %f\n",rate);
88 return 0;
89 }
```



```
amogh@Amogh: ~/Desktop/Practical Experiments
amogh@Amogh:~/Desktop/Practical Experiments$ vi lfu.c
amogh@Amogh:~/Desktop/Practical Experiments$ gcc -o lfu lfu.c
amogh@Amogh:~/Desktop/Practical Experiments$ ./lfu
Enter the number of pages
8
Enter the page reference numbers
1 2 3 2 2 3 1 2
Enter the number of frames
3
Page reference string    Frames
1          1          -1          -1
2          1          2          -1
3          1          2          3
2          No replacement
2          No replacement
3          No replacement
1          No replacement
2          No replacement
Number of page faults is 3
Fault rate is 0.375000
amogh@Amogh:~/Desktop/Practical Experiments$
```

EXPERIMENT-17 (FCFS DISK SCHEDULING)

```
1 #include<stdio.h>
2 #include<stdlib.h>
3 int main()
4 {
5     int RQ[100],i,n,TotalHeadMoment=0,initial;
6     printf("Enter the number of Requests\n");
7     scanf("%d",&n);
8     printf("Enter the Requests sequence\n");
9     for(i=0;i<n;i++)
10         scanf("%d",&RQ[i]);
11     printf("Enter initial head position\n");
12     scanf("%d",&initial);
13
14     // logic for FCFS disk scheduling
15
16     for(i=0;i<n;i++)
17     {
18         TotalHeadMoment=TotalHeadMoment+abs(RQ[i]-initial);
19         initial=RQ[i];
20     }
21
22     printf("Total head moment is %d",TotalHeadMoment);
23     return 0;
24
25 }
```

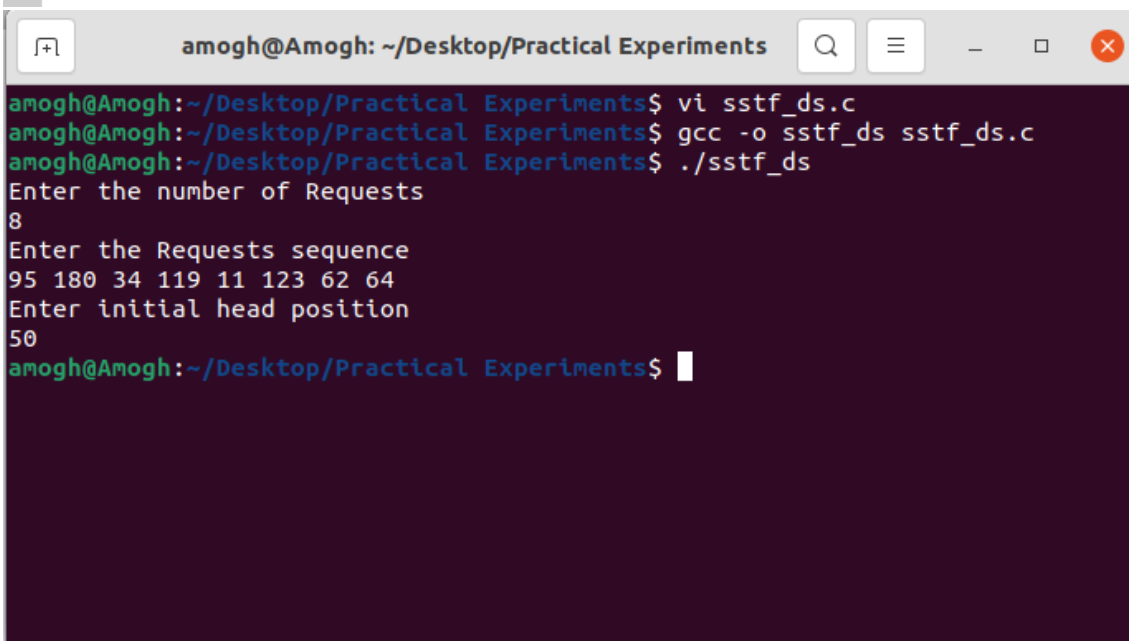


The terminal window shows the execution of the program. The user enters 8 for the number of requests and the sequence 95 180 34 119 11 123 62 64. The initial head position is 50. The program calculates the total head moment, which is 1000.

```
amogh@Amogh: ~/Desktop/Practical Experiments
amogh@Amogh:~/Desktop/Practical Experiments$ vi fcfs_ds.c
amogh@Amogh:~/Desktop/Practical Experiments$ gcc -o fcfs_ds fcfs_ds.c
amogh@Amogh:~/Desktop/Practical Experiments$ ./fcfs
bash: ./: Is a directory
amogh@Amogh:~/Desktop/Practical Experiments$ ./fcfs_ds
Enter the number of Requests
8
Enter the Requests sequence
95 180 34 119 11 123 62 64
Enter initial head position
50
amogh@Amogh:~/Desktop/Practical Experiments$
```

EXPERIMENT-18 (SSTF DISK SCHEDULING)

```
1 #include<stdio.h>
2 #include<stdlib.h>
3 int main()
4 {
5     int RQ[100],i,n,TotalHeadMoment=0,initial,count=0;
6     printf("Enter the number of Requests\n");
7     scanf("%d",&n);
8     printf("Enter the Requests sequence\n");
9     for(i=0;i<n;i++)
10         scanf("%d",&RQ[i]);
11     printf("Enter initial head position\n");
12     scanf("%d",&initial);
13
14     // logic for sstf disk scheduling
15
16     /* loop will execute until all process is completed*/
17     while(count!=n)
18     {
19         int min=1000,d,index;
20         for(i=0;i<n;i++)
21         {
22             d=abs(RQ[i]-initial);
23             if(min>d)
24             {
25                 min=d;
26                 index=i;
27             }
28         }
29         TotalHeadMoment=TotalHeadMoment+min;
30         initial=RQ[index];
31         // 1000 is for max
32         // you can use any number
33         RQ[index]=1000;
34         count++;
35     }
36
37     printf("Total head movement is %d",TotalHeadMoment);
38     return 0;
39 }
40 }
```

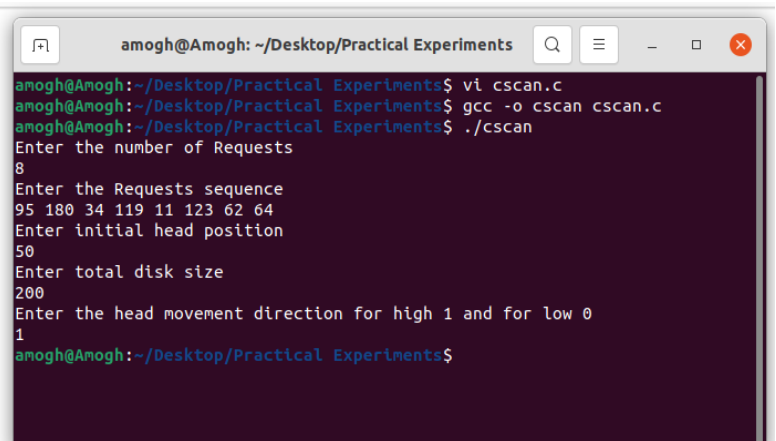


The screenshot shows a terminal window titled "amogh@Amogh: ~/Desktop/Practical Experiments". The user has compiled and run the program. The input provided is 8 requests (95, 180, 34, 119, 11, 123, 62, 64) and an initial head position of 50. The program's output is not yet visible in the screenshot.

```
amogh@Amogh:~/Desktop/Practical Experiments$ vi sstf_ds.c
amogh@Amogh:~/Desktop/Practical Experiments$ gcc -o sstf_ds sstf_ds.c
amogh@Amogh:~/Desktop/Practical Experiments$ ./sstf_ds
Enter the number of Requests
8
Enter the Requests sequence
95 180 34 119 11 123 62 64
Enter initial head position
50
amogh@Amogh:~/Desktop/Practical Experiments$
```

EXPERIMENT-19 (C-SCAN)

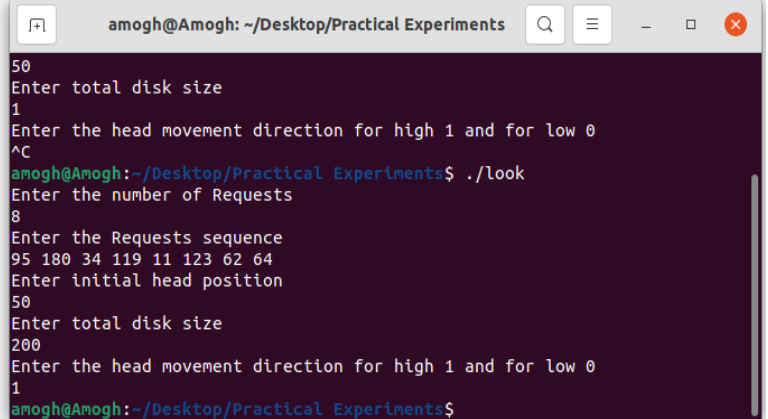
```
1 #include<stdio.h>
2 #include<stdlib.h>
3 int main()
4 {
5     int RQ[100],i,j,n,TotalHeadMoment=0,initial,size,move;
6     printf("Enter the number of Requests\n");
7     scanf("%d",&n);
8     printf("Enter the Requests sequence\n");
9     for(i=0;i<n;i++)
10         scanf("%d",&RQ[i]);
11     printf("Enter initial head position\n");
12     scanf("%d",&initial);
13     printf("Enter total disk size\n");
14     scanf("%d",&size);
15     printf("Enter the head movement direction for high 1 and for low 0\n");
16     scanf("%d",&move);
17
18     // logic for C-Scan disk scheduling
19
20     /*logic for sort the request array */
21     for(i=0;i<n;i++)
22     {
23         for( j=0;j<n-i-1;j++)
24         {
25             if(RQ[j]>RQ[j+1])
26             {
27                 int temp;
28                 temp=RQ[j];
29                 RQ[j]=RQ[j+1];
30                 RQ[j+1]=temp;
31             }
32         }
33     }
34
35     int index;
36     for(i=0;i<n;i++)
37     {
38         if(initial<RQ[i])
39         {
40             index=i;
41             break;
42         }
43     }
44
45     break;
46
47     // if movement is towards high value
48     if(move==1)
49     {
50         for(i=index;i<n;i++)
51         {
52             TotalHeadMoment=TotalHeadMoment+abs(RQ[i]-initial);
53             initial=RQ[i];
54         }
55         // last movement for max size
56         TotalHeadMoment=TotalHeadMoment+abs(size-RQ[i-1]-1);
57         /*movement max to min disk */
58         TotalHeadMoment=TotalHeadMoment+abs(size-1-0);
59         initial=0;
60         for( i=0;i<index;i++)
61         {
62             TotalHeadMoment=TotalHeadMoment+abs(RQ[i]-initial);
63             initial=RQ[i];
64         }
65     }
66     // if movement is towards low value
67     else
68     {
69         for(i=index-1;i>=0;i--)
70         {
71             TotalHeadMoment=TotalHeadMoment+abs(RQ[i]-initial);
72             initial=RQ[i];
73         }
74         // last movement for min size
75         TotalHeadMoment=TotalHeadMoment+abs(RQ[i+1]-0);
76         /*movement min to max disk */
77         TotalHeadMoment=TotalHeadMoment+abs(size-1-0);
78         initial =size-1;
79         for(i=n-1;i>=index;i--)
80         {
81             TotalHeadMoment=TotalHeadMoment+abs(RQ[i]-initial);
82             initial=RQ[i];
83         }
84     }
85 }
86
```



```
amogh@Amogh: ~/Desktop/Practical Experiments
amogh@Amogh:~/Desktop/Practical Experiments$ vi cscan.c
amogh@Amogh:~/Desktop/Practical Experiments$ gcc -o cscan cscan.c
amogh@Amogh:~/Desktop/Practical Experiments$ ./cscan
Enter the number of Requests
8
Enter the Requests sequence
95 180 34 119 11 123 62 64
Enter initial head position
50
Enter total disk size
200
Enter the head movement direction for high 1 and for low 0
1
amogh@Amogh:~/Desktop/Practical Experiments$
```

EXPERIMENT-20 (LOOK)

```
1 #include<stdio.h>
2 #include<stdlib.h>
3 int main()
4 {
5     int RQ[100],i,j,n,TotalHeadMoment=0,initial,size,move;
6     printf("Enter the number of Requests\n");
7     scanf("%d",&n);
8     printf("Enter the Requests sequence\n");
9     for(i=0;i<n;i++)
10         scanf("%d",&RQ[i]);
11     printf("Enter initial head position\n");
12     scanf("%d",&initial);
13     printf("Enter total disk size\n");
14     scanf("%d",&size);
15     printf("Enter the head movement direction for high 1 and for low 0\n");
16     scanf("%d",&move);
17
18     // logic for look disk scheduling
19
20     /*logic for sort the request array */
21     for(i=0;i<n;i++)
22     {
23         for(j=0;j<n-i-1;j++)
24         {
25             if(RQ[j]>RQ[j+1])
26             {
27                 int temp;
28                 temp=RQ[j];
29                 RQ[j]=RQ[j+1];
30                 RQ[j+1]=temp;
31             }
32         }
33     }
34
35     int index;
36     for(i=0;i<n;i++)
37     {
38         if(initial<RQ[i])
39         {
40             index=i;
41             break;
42         }
43     }
44
45     for(i=0;i<n;i++)
46     {
47         if(initial<RQ[i])
48         {
49             index=i;
50             break;
51         }
52     }
53
54     // if movement is towards high value
55     if(move==1)
56     {
57         for(i=index;i<n;i++)
58         {
59             TotalHeadMoment=TotalHeadMoment+abs(RQ[i]-initial);
60             initial=RQ[i];
61         }
62
63         for(i=index-1;i>=0;i--)
64         {
65             TotalHeadMoment=TotalHeadMoment+abs(RQ[i]-initial);
66             initial=RQ[i];
67         }
68
69         for(i=index;i<n;i++)
70         {
71             TotalHeadMoment=TotalHeadMoment+abs(RQ[i]-initial);
72             initial=RQ[i];
73         }
74     }
75
76     // if movement is towards low value
77     else
78     {
79         for(i=index-1;i>=0;i--)
80         {
81             TotalHeadMoment=TotalHeadMoment+abs(RQ[i]-initial);
82             initial=RQ[i];
83         }
84
85         for(i=index;i<n;i++)
86         {
87             TotalHeadMoment=TotalHeadMoment+abs(RQ[i]-initial);
88             initial=RQ[i];
89         }
90     }
91
92     printf("Total head movement is %d",TotalHeadMoment);
93     return 0;
94 }
```



```
amogh@Amogh: ~/Desktop/Practical Experiments
50
Enter total disk size
1
Enter the head movement direction for high 1 and for low 0
^C
amogh@Amogh:~/Desktop/Practical Experiments$ ./look
Enter the number of Requests
8
Enter the Requests sequence
95 180 34 119 11 123 62 64
Enter initial head position
50
Enter total disk size
200
Enter the head movement direction for high 1 and for low 0
1
amogh@Amogh:~/Desktop/Practical Experiments$
```