CSA0465 – OPERATING SYSTEMS FOR HANDLING DEADLOCKS

LAB EXPERIMENTS

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6.Producer and consumer

```
#include <stdio.h>
#include <stdlib.h>
int mutex = 1;
int full = 0;
int empty = 10, x = 0;
void producer()
{
--mutex;
++full;
--empty;
x++;
printf("\nProducerproduces""item %d",x);
++mutex;
}
void consumer()
{
--mutex;
--full;
++empty;
printf("\nConsumer consumes ""item %d",x);
x--;
++mutex;
}
int main()
```

```
{
int n, i;
printf("\n1. Press 1 for Producer""\n2. Press 2 for Consumer""\n3. Press 3 for Exit");
#pragma omp critical
for (i = 1; i> 0; i++)
{
printf("\nEnter your choice:");
scanf("%d", &n);
switch 👎
{
case 1:
if ((mutex == 1)
&& (empty != 0))
{
producer();
}
else {
printf("Buffer is full!");
}
break;
case 2:
if ((mutex == 1)&& (full != 0))
{
consumer();
}
else {
printf("Buffer is empty!");
}
break;
```

case 3:

exit(0);

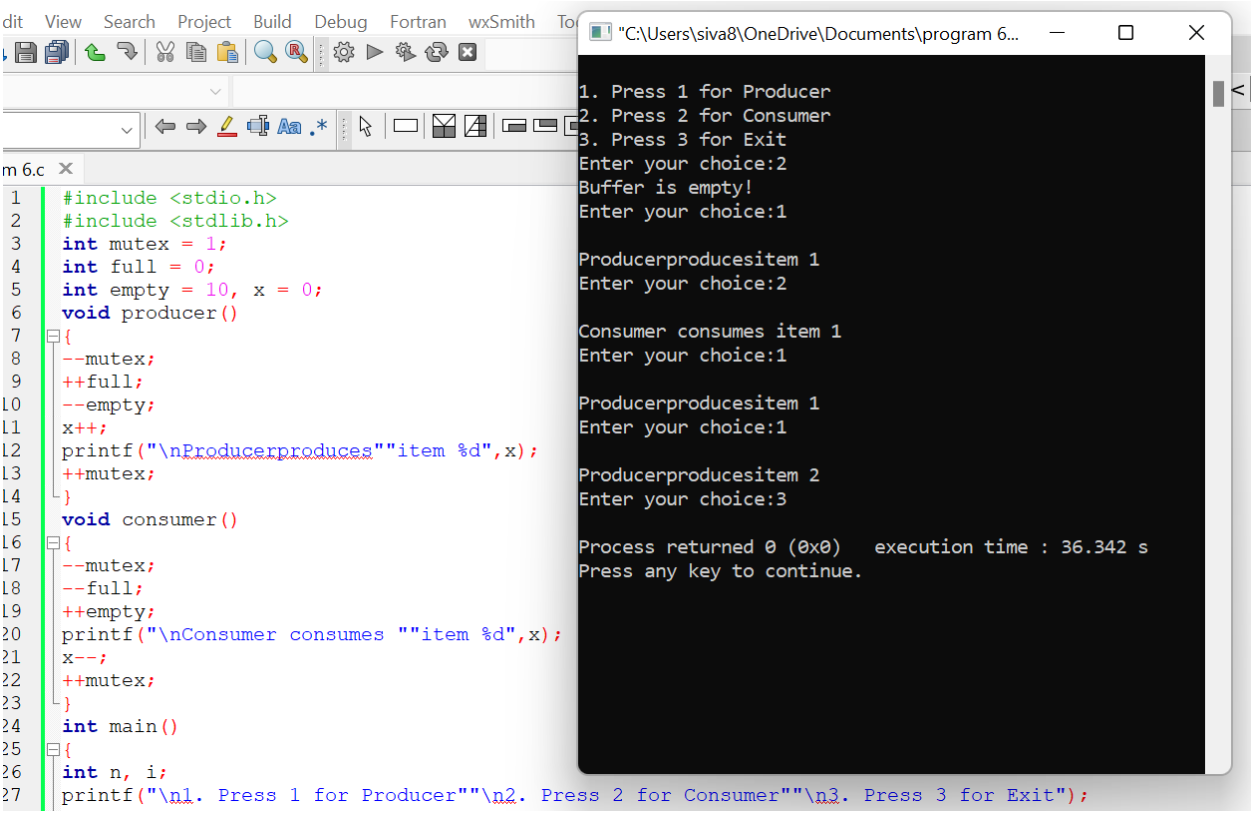
break;

}

}

}

Output :-



7. Paging FIFO

#include<stdio.h>

int main()

{

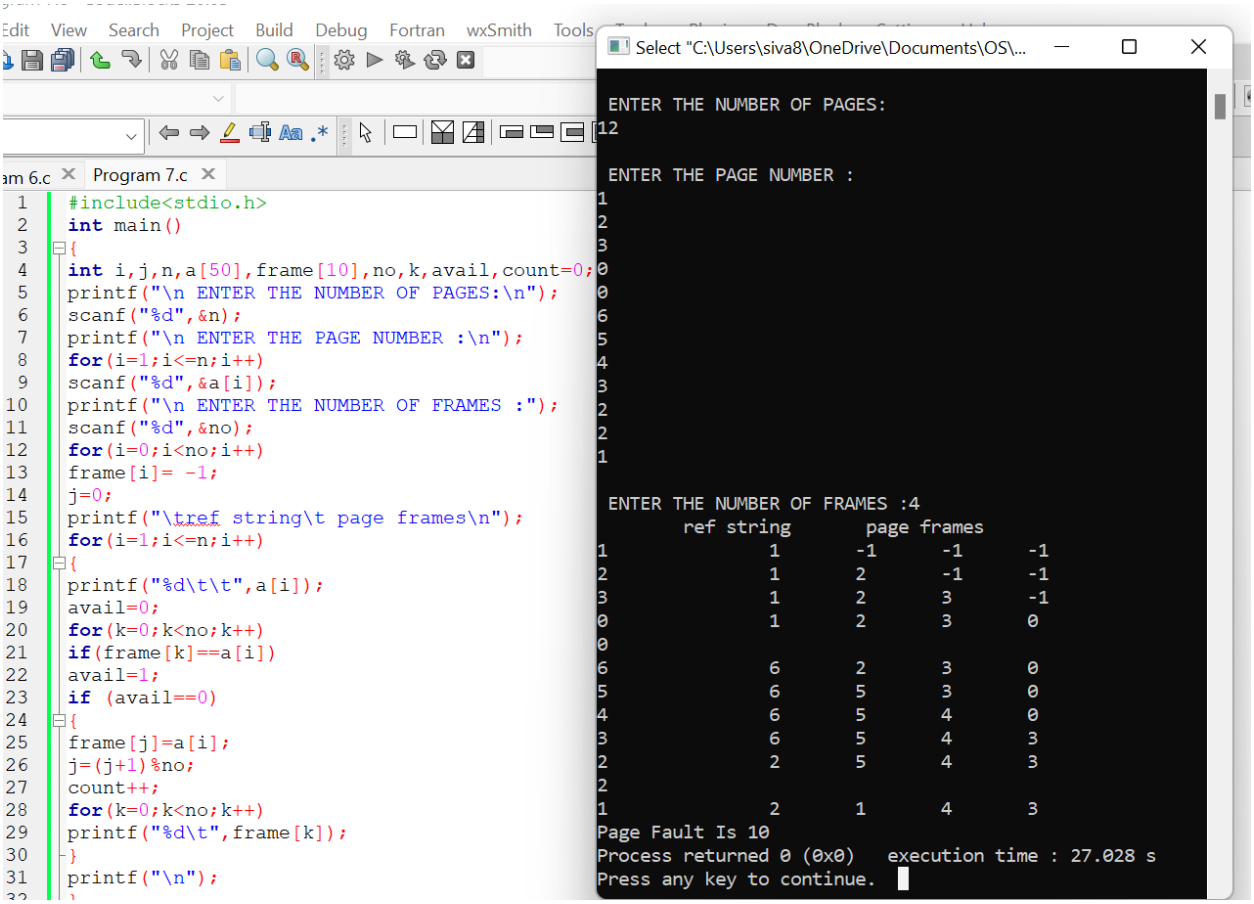
int i,j,n,a[50],frame[10],no,k,avail,count=0;

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

scanf("%d",&n);

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

```
for(i=1;i<=n;i++)
scanf("%d",&a[i]);
printf("\n ENTER THE NUMBER OF FRAMES :");
scanf("%d",&no);
for(i=0;i<no;i++)
frame[i]= -1;
j=0;
printf("\tref string\t page 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("Page Fault Is %d",count);
return 0;
}
```



8. Paging LRU

```
#include<stdio.h>

int main()

{

int q[20],p[50],c=0,c1,d,f,i,j,k=0,n,r,t,b[20],c2[20];

printf("Enter no of pages:");

scanf("%d",&n);

printf("Enter the reference string:");

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

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

printf("Enter no of frames:");

scanf("%d",&f);

q[k]=p[k];
```

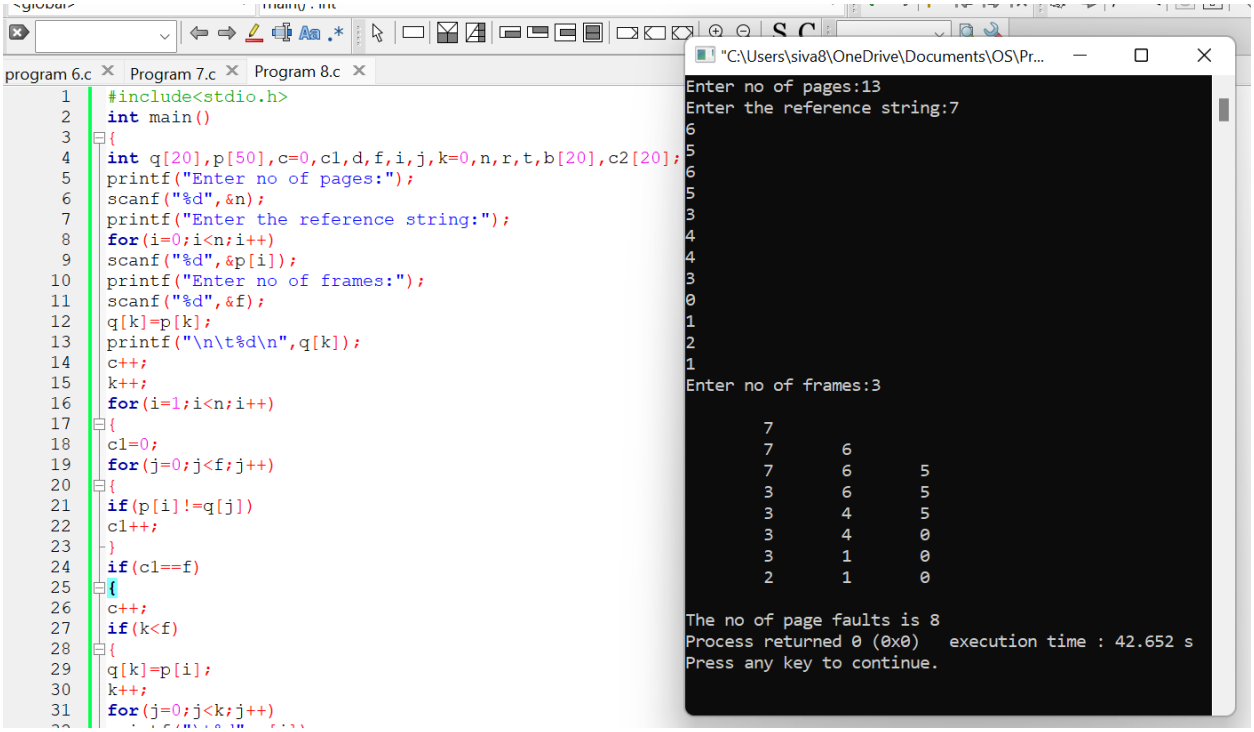
```
printf("\n\t%d\n",q[k]);
c++;
k++;
for(i=1;i<n;i++)
{
c1=0;
for(j=0;j<f;j++)
{
if(p[i]!=q[j])
c1++;
}
if(c1==f)
{
c++;
if(k<f)
{
q[k]=p[i];
k++;
for(j=0;j<k;j++)
printf("\t%d",q[j]);
printf("\n");
}
else
{
for(r=0;r<f;r++)
{
c2[r]=0;
for(j=i-1;j<n;j--)
{
```

```
if(q[r]!=p[j])
c2[r]++;
else
break;
}
}
for(r=0;r<f;r++)
b[r]=c2[r];
for(r=0;r<f;r++)
{
for(j=r;j<f;j++)
{
if(b[r]<b[j])
{
t=b[r];
b[r]=b[j];
b[j]=t;
}
}
}
for(r=0;r<f;r++)
{
if(c2[r]==b[0])
q[r]=p[i];
printf("\t%d",q[r]);
}
printf("\n");
}
}
```

}

printf("\nThe no of page faults is %d",c);

}



9. Paging optimal

#include<stdio.h>

int main()

{

int no_of_frames, no_of_pages, frames[10], pages[30], temp[10], flag1, flag2, flag3, i, j, k, pos,

max, faults = 0;

printf("Enter number of frames: ");

scanf("%d", &no_of_frames);

printf("Enter number of pages: ");

scanf("%d", &no_of_pages);

printf("Enter page reference string: ");

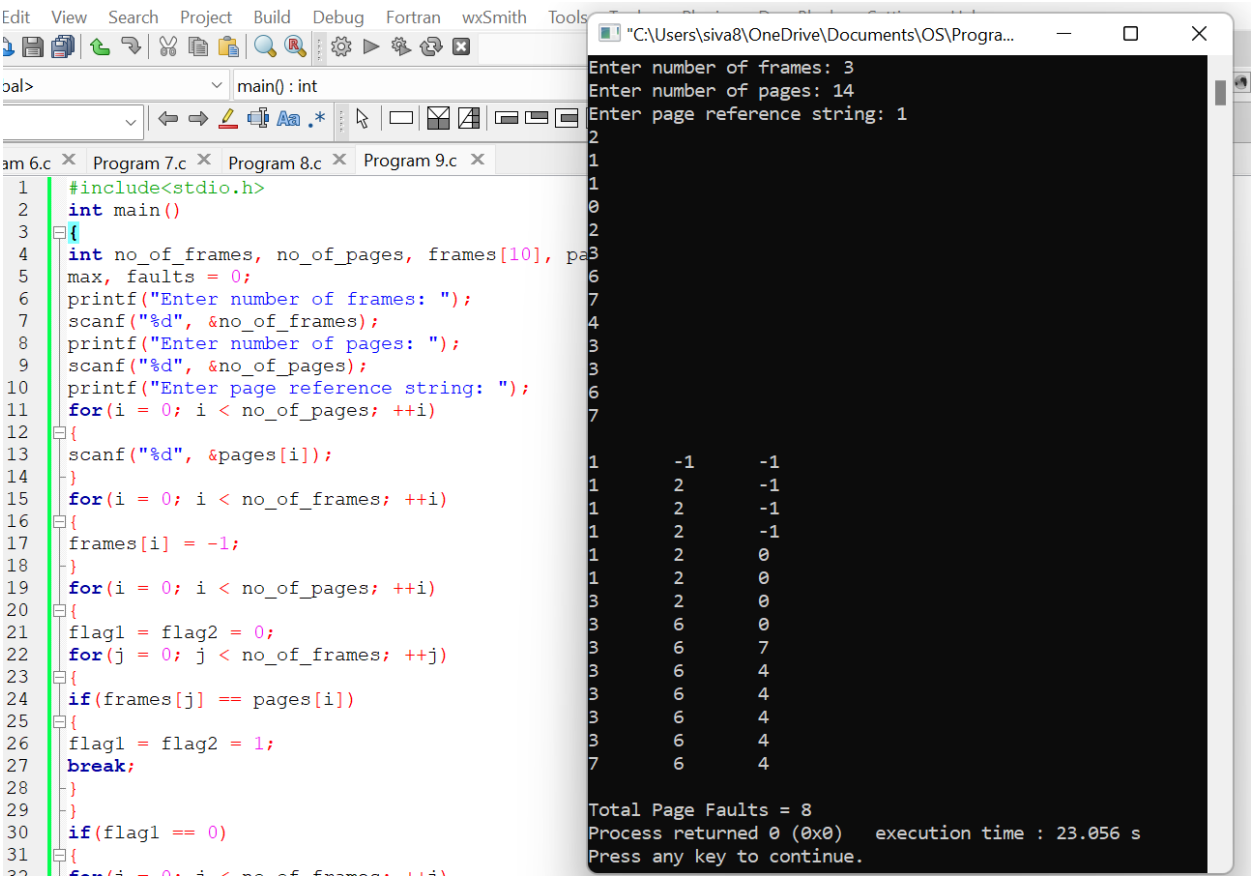
for(i = 0; i < no_of_pages; ++i)

{

```
scanf("%d", &pages[i]);
}
for(i = 0; i < no_of_frames; ++i)
{
frames[i] = -1;
}
for(i = 0; i < no_of_pages; ++i)
{
flag1 = flag2 = 0;
for(j = 0; j < no_of_frames; ++j)
{
if(frames[j] == pages[i])
{
flag1 = flag2 = 1;
break;
}
}
if(flag1 == 0)
{
for(j = 0; j < no_of_frames; ++j)
{
if(frames[j] == -1)
{
faults++;
frames[j] = pages[i];
flag2 = 1;
break;
}
}
```

```
}
if(flag2 == 0)
{
flag3 =0;
for(j = 0; j < no_of_frames; ++j)
{
temp[j] = -1;
for(k = i + 1; k < no_of_pages; ++k)
{
if(frames[j] == pages[k])
{
temp[j] = k;
break;
}
}
}
for(j = 0; j < no_of_frames; ++j)
{
if(temp[j] == -1)
{
pos = j;
flag3 = 1;
break;
}
}
if(flag3 ==0)
{
max = temp[0];
pos = 0;
```

```
for(j = 1; j < no_of_frames; ++j)
{
if(temp[j] > max)
{
max = temp[j];
pos = j;
}
}
}
frames[pos] = pages[i];
faults++;
}
printf("\n");
for(j = 0; j < no_of_frames; ++j)
{
printf("%d\t", frames[j]);
}
}
printf("\n\nTotal Page Faults = %d", faults);
return 0;
}
```



10. Sequential file allocation

#include <stdio.h>

typedef struct

{

int usn;

char name[25];

int m1,m2,m3;

}

STD;

STD s;

void display(FILE *);

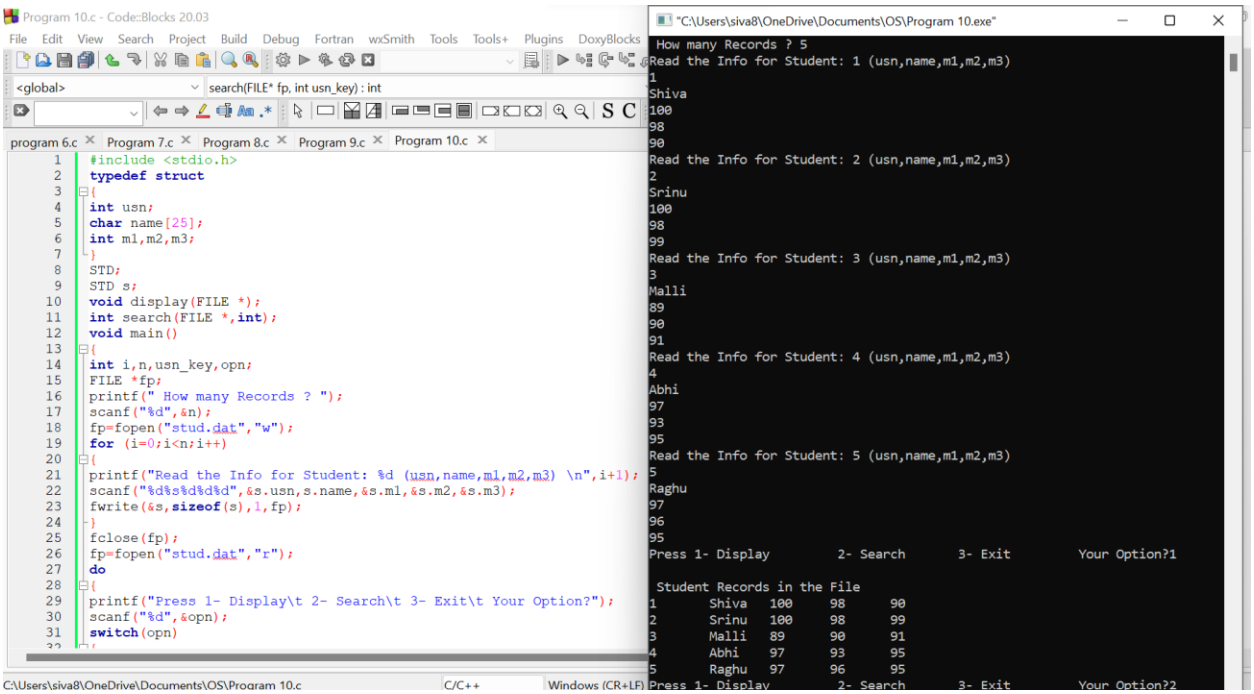
int search(FILE *,int);

void main()

{

```
int i,n,usn_key,opn;
FILE *fp;
printf(" How many Records ? ");
scanf("%d",&n);
fp=fopen("stud.dat","w");
for (i=0;i<n;i++)
{
printf("Read the Info for Student: %d (usn,name,m1,m2,m3) \n",i+1);
scanf("%d%s%d%d%d",&s.usn,s.name,&s.m1,&s.m2,&s.m3);
fwrite(&s,sizeof(s),1,fp);
}
fclose(fp);
fp=fopen("stud.dat","r");
do
{
printf("Press 1- Display\t 2- Search\t 3- Exit\t Your Option?");
scanf("%d",&opn);
switch(opn)
{
case 1: printf("\n Student Records in the File \n");
display(fp);
break;
case 2: printf(" Read the USN of the student to be searched ?");
scanf("%d",&usn_key);
if(search(fp,usn_key))
{
printf("Success ! Record found in the file\n");
printf("%d\t%s\t%d\t%d\t%d\n",s.usn,s.name,s.m1,s.m2,s.m3);
}
```

```
else
printf(" Failure!! Record with USN %d not found\n",usn_key);
break;
case 3: printf(" Exit!! Press a key . . .");
break;
default: printf(" Invalid Option!!! Try again !!!\n");
break;
}
}
while(opn != 3);
fclose(fp);
}
/* End of main() */
void display(FILE *fp)
{
rewind(fp);
while(fread(&s,sizeof(s),1,fp))
printf("%d\t%s\t%d\t%d\t%d\n",s.usn,s.name,s.m1,s.m2,s.m3);
}
int search(FILE *fp, int usn_key)
{
rewind(fp);
while(fread(&s,sizeof(s),1,fp))
if( s.usn == usn_key) return 1;
return 0;
}
```


Program 10.c - Code::Blocks 20.03
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks
program 6.c Program 7.c Program 8.c Program 9.c Program 10.c
#include <stdio.h>
typedef struct
{
int usn;
char name[25];
int m1,m2,m3;
}
STD;
STD s;
void display(FILE *);
int search(FILE *,int);
void main()
{
int i,n,usn_key,opn;
FILE *fp;
printf(" How many Records ? ");
scanf("%d",&n);
fp=fopen("stud.dat","w");
for (i=0;i<n;i++)
{
printf("Read the Info for Student: %d (usn,name,m1,m2,m3) \n",i+1);
scanf("%d%s%d%d%d",&s.usn,s.name,&s.m1,&s.m2,&s.m3);
fwrite(&s,sizeof(s),1,fp);
}
fclose(fp);
fp=fopen("stud.dat","r");
do
{
printf("Press 1- Display\t 2- Search\t 3- Exit\t Your Option?");
scanf("%d",&opn);
switch(opn)
"C:\Users\siva8\OneDrive\Documents\OS\Program 10.exe"
How many Records ? 5
Read the Info for Student: 1 (usn,name,m1,m2,m3)
1
Shiva
100
98
90
Read the Info for Student: 2 (usn,name,m1,m2,m3)
2
Srinu
100
98
99
Read the Info for Student: 3 (usn,name,m1,m2,m3)
3
Malli
89
90
91
Read the Info for Student: 4 (usn,name,m1,m2,m3)
4
Abhi
97
93
95
Read the Info for Student: 5 (usn,name,m1,m2,m3)
5
Raghu
97
96
95
Press 1- Display 2- Search 3- Exit Your Option?1
Student Records in the File
1 Shiva 100 98 90
2 Srinu 100 98 99
3 Malli 89 90 91
4 Abhi 97 93 95
5 Raghu 97 96 95
Press 1- Display 2- Search 3- Exit Your Option?2