Harsha Vardhinii.T
230701109

Ex. No.: 11a)
FIFO PAGE REPLACEMENT

Aim:

To find out the number of page faults that occur using First-in First-out(FIFO) page replacement technique.

```
def fifo():
global a,n,m
f = -1
page_faults = 0
page = []
for i in range(m):
page.append(-1)
for i in range(n):
flag = 0
for j in range(m):
if(page[j] == a[i]):
flag = 1
break
if flag == 0:
f=(f+1)%m
page[f] = a[i]
page_faults+=1
print "\n%d ->" % (a[i]),
for j in range(m):
if page[j] != -1:
print page[j],
else:
print "-",
else:
print "\n%d -> No Page Fault" % (a[i]),
print "\n Total page faults : %d." % (page_faults)
a = []
n = input("\n Enter the size of reference string : ")
for i in range(n):
a.append(input(" Enter [%2d] : " % (i+1))) m = input("\n Enter page frame size : ") fifo()
```

Output:

```
[root@localhost student]# python fifo.py
Enter the size of reference string : 20
Enter [ 1] : 7
Enter [ 2] : 0
Enter [ 3] : 1
Enter [ 4] : 2
Enter [ 5] : 0
Enter [ 6] : 3
Enter [ 7] : 0
Enter [ 8] : 4
Enter [ 9] : 2
Enter [10] : 3
Enter [11] : 0
Enter [12] : 3
Enter [13] : 2
Enter [14] : 1
Enter [15] : 2
Enter [16] : 0
Enter [17] : 1
Enter [18] : 7
Enter [19] : 0
Enter [20] : 1
Enter page frame size : 3
7 -> 7 - -
0 -> 7 0 -
1 -> 7 0 1
2 -> 2 0 1
0 -> No Page Fault
3 -> 2 3 1
0 -> 2 3 0
4 -> 4 3 0
2 -> 4 2 0
3 -> 4 2 3
0 -> 0 2 3
3 -> No Page Fault
2 -> No Page Fault
1 -> 0 1 3
2 -> 0 1 2
0 -> No Page Fault
1 -> No Page Fault
7 -> 7 1 2
0 -> 7 0 2
1 -> 7 0 1
Total page faults: 15. [root@localhost student]#
```

Ex. No.: 11b)
LRU

Aim:
To write a c program to implement LRU page replacement algorithm.

Program Code:

```
#include<stdio.h>
int findLRU(int time[], int n){
int i, minimum = time[0], pos = 0;
for(i = 1; i < n; ++i){
if(time[i] < minimum){
minimum = time[i];
pos = i;
}
}
return pos;
}
int main()
{
int no_of_frames, no_of_pages, frames[10], pages[30], counter = 0, time[10], flag1, flag2, i, j, pos,
faults = 0;
printf("Enter number of frames: ");
scanf("%d", &no_of_frames);
printf("Enter number of pages: ");
scanf("%d", &no_of_pages);
printf("Enter 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]){
counter++;
time[j] = counter;
flag1 = flag2 = 1;
break;
}
}
if(flag1 == 0){
for(j = 0; j < no_of_frames; ++j){
if(frames[j] == -1){
counter++;
faults++;
frames[j] = pages[i]; time[j] = counter;
flag2 = 1;
break;
}
}
}
if(flag2 == 0){
```

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

Output

```
Enter number of frames: 3
Enter number of pages: 6
Enter reference string: 5 7 5 6 7 3
5 -1 -1
5 7 -1
5 7 -1
5 7 6
5 7 6
3 7 6
Total Page Faults = 4
```

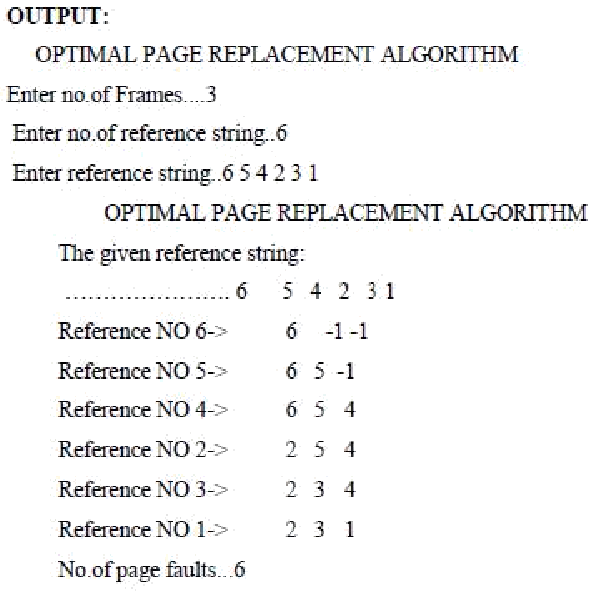
Ex. No.: 11c)
Optimal

Aim:
To write a c program to implement Optimal page replacement algorithm.

PROGRAM:

```
#include<stdio.h>
#include<conio.h>
int i,j,nof,nor,flag=0,ref[50],frm[50],pf=0,victim=-1; int recent[10],optcal[50],count=0;
int optvictim(); void main()
{ clrscr();
printf("\n OPTIMAL PAGE REPLACEMENT
ALGORITHN");
printf("\n..................... ");
...........
printf("\nEnter the no.of frames");
scanf("%d",&nof);
printf("Enter the no.of reference string");
scanf("%d",&nor);
printf("Enter the reference string");
for(i=0;i<nor;i++)
scanf("%d",&ref[i]);
clrscr();
printf("\n OPTIMAL PAGE REPLACEMENT ALGORITHM");
printf("\n................................");
printf("\nThe given string");
printf("\n....................\n");
for(i=0;i<nor;i++)
printf("%4d",ref[i]);
for(i=0;i<nof;i++)
{
frm[i]=-1;
optcal[i]=0;
}
for(i=0;i<10;i++)
recent[i]=0;
printf("\n");
for(i=0;i<nor;i++)
{
flag=0;
printf("\n\tref no %d ->\t",ref[i]);
for(j=0;j<nof;j++)
{
if(frm[j]==ref[i])
{
flag=1;
break;
}
}
if(flag==0)
{
count++;
if(count<=nof)
victim++; else
victim=optvictim(i);
pf++;
frm[victim]=ref[i];
for(j=0;j<nof;j++)
printf("%4d",frm[j]);
}
}
printf("\n Number of page faults: %d",pf); getch();
}
int optvictim(int index)
{
int i,j,temp,notfound; for(i=0;i<nof;i++)
{
notfound=1;
for(j=index;j<nor;j++)
if(frm[i]==ref[j])
{
notfound=0;
optcal[i]=j;
break;
}
if(notfound==1) return i;
}
temp=optcal[0];
for(i=1;i<nof;i++)
if(temp<optcal[i])

temp=optcal[i];
for(i=0;i<nof;i++)
if(frm[temp]==frm[i]) return i;
return 0;
}
```



```
OUTPUT:
    OPTIMAL PAGE REPLACEMENT ALGORITHM
Enter no.of Frames....3
 Enter no.of reference string..6
 Enter reference string..6 5 4 2 3 1
              OPTIMAL PAGE REPLACEMENT ALGORITHM
        The given reference string:
         ...................... 6     5  4  2  3 1
        Reference NO 6->        6    -1 -1
        Reference NO 5->        6  5  -1
        Reference NO 4->        6  5   4
        Reference NO 2->        2  5   4
        Reference NO 3->        2  3   4
        Reference NO 1->        2  3   1
        No.of page faults...6
```