EX NO: 10C	**OPTIMAL (LFU) PAGE REPLACEMENT ALGORITHM**
DATE:	

AIM:

To implement page replacement algorithms Optimal (The page which is not used for longest time)

ALGORITHM:

Optimal algorithm:

Here we select the page that will not be used for the longest period of time.

OPTIMAL:

1: Create an array

2: When the page fault occurs replace page that will not be used for the longest period of time.

PROGRAM:

/*OPTIMAL (LFU) page replacement algorithm*/

```
#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);
}
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:

```
mohamedinam@Mohamed-Inam-PC: ~
mohamedinam@Mohamed-Inam-PC:~$ gcc optimal.c -o opt
mohamedinam@Mohamed-Inam-PC:~$ ./opt

 OPTIMAL PAGE REPLACEMENT ALGORITHN
.................................
Enter the no.of frames3
Enter the no.of reference string6
Enter the reference string6
5
4
2
1
4

 OPTIMAL PAGE REPLACEMENT ALGORITHM
.................................
The given string
.................
   6   5   4   2   1   4

        ref no 6 ->        6  -1  -1
        ref no 5 ->        6   5  -1
        ref no 4 ->        6   5   4
        ref no 2 ->        2   5   4
        ref no 1 ->        1   5   4
        ref no 4 ->
 Number of page faults: 5mohamedinam@Mohamed-Inam-PC:~$
```

RESULT:

Thus the LFU page replacement algorithm is implemented successfully.