Ex. No.: 11b)
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Aim:

LRU

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

Algorithm:

1: Start the process
2: Declare the size
3: Get the number of pages to be inserted
4: Get the value
5: Declare counter and stack
6: Select the least recently used page by counter value
7: Stack them according the selection.
8: Display the values
9: Stop the process

Program Code:

```
#include <stdio.h>
int findLRU(int time[], int n){
    int i, min = time[0], pos = 0;
    for(i = 1; i < n; i++){
        if(time[i] < min){
            min = time[i];
            pos = i;
        }
    }
    return pos;
}
int main(){
    int frames, pages, i, j, counter = 0, flag1, flag2, page_faults = 0;
    printf("Enter number of frames: ");
    scanf("%d", &frames);
    printf("Enter number of pages: ");
    scanf("%d", &pages);
    int incoming[pages], temp[frames], time[frames];
```

```
printf("Enter Page reference string: ");
for(i=0; i<Pages; i++)
    scanf("%d", &incoming[i]);
for(i=0; i<frames; i++){
    temp[i]=-1;
    time[i]=0;
}
printf("\n Page \t Frame 1 \t Frame 2 \t Frame 3 \t Page Faults \n");
for(i=0; i<Pages; i++){
    flag1=flag2=0;
    for(j=0; j<frames; j++){
        if(temp[j]==incoming[i]){
            counter++;
            time[j]=counter;
            flag1=flag2=1;
            break;
        }
    }
    if(flag1==0){
        for(j=0; j<frames; j++){
            if(temp[j]==-1){
                counter++;
                Page-faults++;
                temp[j]=incoming[i];
                time[j]=counter;
                flag2=1;
                break;
            }
        }
    }
    if(flag2==0){
        int pos=findLRU(time, frames);
        counter++;
```

```
        page_faults++;
        temp[pos] = incoming[i];
        time[pos] = counter;
    }
    printf("%d\t", incoming[i]);
    for(j=0; j<frames; j++){
        if(temp[j]!=-1)
            printf("%d\t", temp[j]);
        else
            printf("-\t");
    }
    if(flag1==0){
        printf("1\n");
    }else{
        printf("0\n");
    }
    printf("\n Total Page Faults: %d\n", page_faults);
    return 0;
}
```

Sample 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

Enter no. of frames : 4
Enter no. of pages : 8
Enter page reference string :
4
1
6
3
1
5
6

Page	Frame 1	Frame 2	Frame 3	Page	Faults
1	1	-	-	-	1
4	1	4	-	-	1
1	1	4	-	-	0
6	1	4	6	-	1
3	1	4	6	3	1
1	1	4	6	3	0
5	1	5	6	3	1
6	1	5	6	3	0

Total Page Fault : 5

Result:

Thus the Program to find out the number of Page faults that occur using Least Recently Used (LRU) Page replacement technique has been executed successfully