Ex. No.: 11b)

LRU

Aim:

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, 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 frames[10], pages[30], time[10];
   int n, f, i, j, pos, faults = 0, counter = 0, flag1, flag2;

   printf("Enter number of pages: ");
   scanf("%d", &n);

   printf("Enter the reference string:\n");
   for(i = 0; i < n; ++i)
      scanf("%d", &pages[i]);

   printf("Enter number of frames: ");
```

```
    scanf("%d", &f);

    for(i = 0; i < f; ++i)
        frames[i] = -1;

    for(i = 0; i < n; ++i) {
        flag1 = flag2 = 0;

        for(j = 0; j < f; ++j) {
            if(frames[j] == pages[i]) {
                counter++;
                time[j] = counter;
                flag1 = flag2 = 1;
                break;
            }
        }

        if(flag1 == 0) {
            for(j = 0; j < f; ++j) {
                if(frames[j] == -1) {
                    counter++;
                    faults++;
                    frames[j] = pages[i];
                    time[j] = counter;
                    flag2 = 1;
                    break;
                }
            }
        }

        if(flag2 == 0) {
            pos = findLRU(time, f);
            counter++;
            faults++;
            frames[pos] = pages[i];
            time[pos] = counter;
        }
    }

    printf("\nTotal Page Faults = %d\n", 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
```

Output:

```
Enter number of pages: 12
Enter the reference string:
1 2 3 4 1 2 5 1 2 3 4 5
Enter number of frames: 3

Total Page Faults = 10
```

Result:

LRU page replacement algorithm has been successfully implemented and the output has been verified.