Ex. No: 11 B **LRU Page Replacement**

Date: 15.04.2025

Aim:

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

Algorithm:

1. Start the process.
2. Declare the size for page frames.
3. Get the number of pages and reference string.
4. Use a stack or counter array to track recent usage.
5. For each page:
    - If it is in memory → no page fault.
    - Else → check least recently used page and replace it.
6. Count page faults.
7. Display frame contents after each operation.
8. Stop the process.

C Program:

```
#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[50], time[10], counter = 0, pageFaults = 0;
    int n, f, i, j, pos, flag1, flag2;

    printf("Enter number of frames: ");
    scanf("%d", &f);

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

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

    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++;
         pageFaults++;
         frames[j] = pages[i];
         time[j] = counter;
         flag2 = 1;
         break;
      }
   }
}

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

for(j = 0; j < f; j++) {
   if(frames[j] != -1)
      printf("%d ", frames[j]);
   else
      printf("- ");
}
```

```
        printf("\n");
    }

    printf("\nTotal Page Faults = %d\n", pageFaults);
    return 0;
}
```

Sample Output:

Enter number of frames: 3

Enter number of pages: 6

Enter reference string: 5 7 5 6 7 3

5 - -

5 7 -

5 7 -

5 7 6

5 7 6

3 7 6

Total Page Faults = 4

Result:

Thus, the C program for LRU page replacement algorithm was written and executed successfully. The number of page faults was calculated and verified.