

Ex. No.: 11b)
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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, 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[10], pages[30], counter[10];
    int i, j, k, pos, max, faults = 0, time = 0;
    int n, f;
    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;
counter[i] = 0;
}
printf("\n");
for (i = 0; i < n; ++i) {
int flag1 = 0, flag2 = 0;
for (j = 0; j < f; ++j) {
if (frames[j] == pages[i]) {
    time++;
    counter[j] = time; // Update recent use time
    flag1 = flag2 = 1;
    break;
}
}
if (flag1 == 0) {
for (j = 0; j < f; ++j) {
    if (frames[j] == -1) {
        time++;
        faults++;
        frames[j] = pages[i];
        counter[j] = time;
        flag2 = 1;
        break;
    }
}
}
if (flag2 == 0) {
pos = findLRU(counter, f);
time++;
faults++;
frames[pos] = pages[i];
counter[pos] = time;
}
// Display current frame state
for (k = 0; k < f; ++k) {
if (frames[k] != -1)
    printf("%d ", frames[k]);
else
    printf("-1 ");
}
}

```

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

OUTPUT:

```
Enter number of frames: 3  
Enter number of pages: 10  
Enter reference string: 3  
2  
6  
8  
3  
4  
1  
2  
2  
6  
  
3 -1 -1  
3 2 -1  
3 2 6  
8 2 6  
8 3 6  
8 3 4  
1 3 4  
1 2 4  
1 2 4  
1 2 6  
  
Total Page Faults = 9
```

RESULT:

Hence, page faults that occur using LRU page replacement technique has been found.