

Ex. No.: 11b)

Date: 19/4/25

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[20], time[10], counter=0, faults=0;
```

```
    int n, f, i, j, flag1, flag2, pos;
```

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

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

```
    printf("Enter reference string: \n");
```

```
    for (i = 0; i < n; i++){  
        scanf("%d", &pages[i]);
```

```
    }  
    for (i = 0; i < f; i++){  
        frames[i] = -1;  
        time[i] = 0;
```

```
    }
```

```
    printf("Page Replacement Process: \n");
```

```
    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;
}

```

```

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

```

```

printf("\n");

```

```

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

```

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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

Result:

The LRU page replacement algorithm has been successfully implemented.