

Code 13

```
#include <stdio.h>

#define MAX_FRAMES 10
#define MAX_PAGES 100

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[MAX_FRAMES], pages[MAX_PAGES], time[MAX_FRAMES];
    int i, j, k, n, f, flag1, flag2, pos, faults = 0, counter = 0;

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

    printf("Enter the page reference string: ");
    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; // initialize empty frames
```

```
}
```

```
for(i = 0; i < n; ++i) {
```

```
    flag1 = flag2 = 0;
```

```
    for(j = 0; j < f; ++j) {
```

```
        if(frames[j] == pages[i]) {
```

```
            counter++;
```

```
            time[j] = counter; // update time of last use
```

```
            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("Frames after accessing page %d: ", pages[i]);
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;
}

```