31. Construct a C program to simulate the First in First Out paging technique of memory management.

```
#include <stdio.h>
int main() {
    int frames[10], pages[30];
    int num_frames, num_pages;
    int i, j, k = 0, flag, page_faults = 0;

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

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

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

    for (i = 0; i < num_frames; i++)
        frames[i] = -1;  // Initialize all frames as empty

    printf("\nPage Reference | Frame Content | Page Fault\n");
    printf("-----------------------------------------\n");

    for (i = 0; i < num_pages; i++) {
        flag = 0;

        // Check if page is already present
        for (j = 0; j < num_frames; j++) {
            if (frames[j] == pages[i]) {
                flag = 1;
```

```
            break;
        }
    }

    // Page not found -> Page Fault
    if (flag == 0) {
        frames[k] = pages[i];
        k = (k + 1) % num_frames; // Circular replacement
        page_faults++;
    }

    printf("%10d  | ", pages[i]);
    for (j = 0; j < num_frames; j++) {
        if (frames[j] != -1)
            printf("%d ", frames[j]);
        else
            printf("- ");
    }

    if (flag == 0)
        printf("|  Yes\n");
    else
        printf("|  No\n");
}

printf("\nTotal Page Faults = %d\n", page_faults);
printf("Page Fault Ratio = %.2f\n", (float)page_faults / num_pages);

return 0;
}
```

OUTPUT:

```c
#include <stdio.h>
int main() {
    int frames[10], pages[30];
    int num_frames, num_pages;
    int i, j, k = 0, flag, page_faults = 0;

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

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

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

    for (i = 0; i < num_frames; i++)
        frames[i] = -1;  // Initialize all frames as empty

    printf("\nPage Reference | Frame Content | Page Fault\n");
    printf("-----------------------------------------\n");

    for (i = 0; i < num_pages; i++) {
        flag = 0;
```

```
Enter number of pages: 8
Enter the page reference string:
1 2 3 4 3 2 4 1

Page Reference | Frame Content | Page Fault
-----------------------------------------
         1   | 1 - - - |  Yes
         2   | 1 2 - - |  Yes
         3   | 1 2 3 - |  Yes
         4   | 1 2 3 4 |  Yes
         3   | 1 2 3 4 |  No
         2   | 1 2 3 4 |  No
         4   | 1 2 3 4 |  No
         1   | 1 2 3 4 |  No

Total Page Faults = 4
Page Fault Ratio = 0.50

--------------------------------
```