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

```c
#include <stdio.h>


#define MAX_FRAMES 3// Number of frames in memory

#define MAX_PAGES 20// Number of pages to be referenced


// Function to simulate FIFO page replacement algorithm

void fifoPageReplacement(int pages[], int n, int frames) {

    int memory[frames];// Memory frames

    int page_faults = 0;// Number of page faults

    int front = 0;// Index to track the first inserted page (FIFO order)


    // Initialize memory with -1 (indicating empty frames)

    for (int i = 0; i < frames; i++) {

        memory[i] = -1;

    }


    // Traverse through the page reference string

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

        int page = pages[i];

        int found = 0;
```

```c
// Check if the page is already in memory

for (int j = 0; j < frames; j++) {

    if (memory[j] == page) {

        found = 1;// Page is already in memory, no page fault

        break;

    }

}


// If the page is not found in memory (page fault)

if (!found) {

    // Replace the first page (FIFO)

    memory[front] = page;

    front = (front + 1) % frames;// Move front to the next page slot


    page_faults++;// Increment page faults


    // Print current memory status

    printf("Page %d is not in memory. Replacing with: ", page);

    for (int k = 0; k < frames; k++) {

        if (memory[k] != -1) {

            printf("%d ", memory[k]);

        }

    }
```

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

        }

    }


    // Final output

    printf("\nTotal Page Faults: %d\n", page_faults);

}


int main() {

    int pages[MAX_PAGES] = { 1,2,3,4,2,5,3,4,2,6,7,8,7,9,7,8,2,5,4,9}; // Reference string

    int frames = MAX_FRAMES;


    printf("Page reference string: ");

    for (int i = 0; i < MAX_PAGES; i++) {

        printf("%d ", pages[i]);

    }

    printf("\n");


    // Call the FIFO page replacement function

    fifoPageReplacement(pages, MAX_PAGES, frames);


    return 0;

}
```

Sample Output

```
Page reference string: 1 2 3 4 2 5 3 4 2 6 7 8 7 9 7 8 2 5 4 9
Page 1 is not in memory. Replacing with: 1
Page 2 is not in memory. Replacing with: 1 2
Page 3 is not in memory. Replacing with: 1 2 3
Page 4 is not in memory. Replacing with: 4 2 3
Page 5 is not in memory. Replacing with: 4 5 3
Page 2 is not in memory. Replacing with: 4 5 2
Page 6 is not in memory. Replacing with: 6 5 2
Page 7 is not in memory. Replacing with: 6 7 2
Page 8 is not in memory. Replacing with: 6 7 8
Page 9 is not in memory. Replacing with: 9 7 8
Page 2 is not in memory. Replacing with: 9 2 8
Page 5 is not in memory. Replacing with: 9 2 5
Page 4 is not in memory. Replacing with: 4 2 5
Page 9 is not in memory. Replacing with: 4 9 5

Total Page Faults: 14


----------------------------------
Process exited after 2.853 seconds with return value 0
Press any key to continue . . .
```