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#include <limits.h>
#include <stdio.h>

#define MAX_FRAMES 3
#define MAX_PAGES 10

int frames[MAX_FRAMES], pages[MAX_PAGES];
int page_frequency[MAX_FRAMES];
int num_pages;

void initialize_frames() {
    for (int i = 0; i < MAX_FRAMES; i++) {
        frames[i] = -1;
        page_frequency[i] = 0;
    }
}

void print_frames() {
    for (int i = 0; i < MAX_FRAMES; i++) {
        if (frames[i] == -1) {
            printf("- ");
        } else {
            printf("%d ", frames[i]);
        }
    }
    printf("\n");
}

int find_lfu_index() {
    int min_freq = INT_MAX;
    int lfu_index = 0;

    for (int i = 0; i < MAX_FRAMES; i++) {
        if (page_frequency[i] < min_freq) {
            min_freq = page_frequency[i];
            lfu_index = i;
        }
    }
    return lfu_index;
}

void lfu_page_replacement() {
    for (int i = 0; i < num_pages; i++) {
        int page = pages[i];
        int found = 0;

        for (int j = 0; j < MAX_FRAMES; j++) {
            if (frames[j] == page) {
                page_frequency[j]++;
                found = 1;
                break;
            }
        }

        if (!found) {
            int lfu_index = find_lfu_index();
            frames[lfu_index] = page;
            page_frequency[lfu_index] = 1;
        }

        print_frames();
    }
}

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

    printf("Enter the page sequence: ");
    for (int i = 0; i < num_pages; i++) {
        scanf("%d", &pages[i]);
    }

    initialize_frames();
    lfu_page_replacement();
}

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    return 0;  
}
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