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#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 pages[50], frame[10], time[10];

    int n, f, i, j, pos, counter = 0, page_faults = 0, flag1, flag2;

    printf("Enter the number of pages: ");

    scanf("%d", &n);

    printf("Enter the page reference string: ");

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

        scanf("%d", &pages[i]);

    printf("Enter the number of frames (minimum 3): ");

    scanf("%d", &f);

    if (f < 3) {

        printf("Error: Minimum frame size must be 3!\n");

        return 0;
    }
```

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for (i = 0; i < f; ++i)

    frame[i] = -1;

printf("\nPage Replacement Process (LRU):\n");

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

    flag1 = flag2 = 0;

    // Check if page is already present in frame

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

        if (frame[j] == pages[i]) {

            counter++;

            time[j] = counter; // Update recent use time

            flag1 = flag2 = 1;

            break;
        }
    }

    // If page not found in frame

    if (flag1 == 0) {

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

            if (frame[j] == -1) {

                counter++;

                page_faults++;

                frame[j] = pages[i];

                time[j] = counter;

                flag2 = 1;

                break;
            }
        }
    }
}

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    }

// If all frames are full
if (flag2 == 0) {
    pos = findLRU(time, f);
    counter++;
    page_faults++;
    frame[pos] = pages[i];
    time[pos] = counter;
}

printf("Page %d -> Frames: ", pages[i]);
for (j = 0; j < f; ++j) {
    if (frame[j] != -1)
        printf("%d ", frame[j]);
    else
        printf("- ");
}
printf("\n");
}

printf("\nTotal Page Faults = %d\n", page_faults);
printf("Page Fault Rate = %.2f%%\n", ((float)page_faults / n) * 100);

return 0;
}

```

OUTPUT

Enter the number of pages: 12

Enter the page reference string: 1 2 3 4 1 2 5 1 2 3 4 5

Enter the number of frames (minimum 3): 3

Page Replacement Process (LRU):

Page 1 -> Frames: 1 --

Page 2 -> Frames: 1 2 -

Page 3 -> Frames: 1 2 3

Page 4 -> Frames: 4 2 3

Page 1 -> Frames: 4 1 3

Page 2 -> Frames: 4 1 2

Page 5 -> Frames: 5 1 2

Page 1 -> Frames: 5 1 2

Page 2 -> Frames: 5 1 2

Page 3 -> Frames: 3 1 2

Page 4 -> Frames: 3 4 2

Page 5 -> Frames: 3 4 5

Total Page Faults = 9

Page Fault Rate = 75.00%