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1  #include <stdio.h>
2  #include <stdlib.h>
3  #define MAX_FRAMES 3
4  void printFrames(int frames[], int n) {
5      for (int i = 0; i < n; i++) {
6          if (frames[i] == -1) {
7              printf(" - ");
8          } else {
9              printf(" %d ", frames[i]);
10         }
11     }
12     printf("\n");
13 }
14 int main() {
15     int frames[MAX_FRAMES];
16     int usageHistory[MAX_FRAMES];
17     for (int i = 0; i < MAX_FRAMES; i++) {
18         frames[i] = -1;
19         usageHistory[i] = 0;
20     }
21     int pageFaults = 0;
22     int referenceString[] = {7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2};
23     int n = sizeof(referenceString) / sizeof(referenceString[0]);
24     printf("Reference String: ");
25     for (int i = 0; i < n; i++) {
26         printf("%d ", referenceString[i]);
27     }
28     printf("\n\n");
29     printf("Page Replacement Order:\n");
30     for (int i = 0; i < n; i++) {
31         int page = referenceString[i];
32         int pageFound = 0;
33         for (int j = 0; j < MAX_FRAMES; j++) {
34             if (frames[j] == page) {
35                 pageFound = 1;
36                 for (int k = 0; k < MAX_FRAMES; k++) {
37                     if (k != j) {
38                         usageHistory[k]++;
39                     }
40                 }
41                 usageHistory[j] = 0;
42                 break;
43             }
44         }
45     }
46 }

```

```
45 if (!pageFound) {
46     printf("Page %d -> ", page);
47     int lruPage = 0;
48     for (int j = 1; j < MAX_FRAMES; j++) {
49         if (usageHistory[j] > usageHistory[lruPage]) {
50             lruPage = j;
51         }
52     }
53     int replacedPage = frames[lruPage];
54     frames[lruPage] = page;
55     usageHistory[lruPage] = 0;
56     for (int k = 0; k < MAX_FRAMES; k++) {
57         if (k != lruPage) {
58             usageHistory[k]++;
59         }
60     }
61     if (replacedPage != -1) {
62         printf("Replace %d with %d: ", replacedPage, page);
63     } else {
64         printf("Load into an empty frame: ");
65     }
66
67     printFrames(frames, MAX_FRAMES);
68     pageFaults++;
69 }
70 }
71 printf("\nTotal Page Faults: %d\n", pageFaults);
72 return 0;
73 }
```

Reference String: 7 0 1 2 0 3 0 4 2 3 0 3 2

Page Replacement Order:

Page 7 -> Load into an empty frame: 7 - -
Page 0 -> Load into an empty frame: 7 0 -
Page 1 -> Load into an empty frame: 7 0 1
Page 2 -> Replace 7 with 2: 2 0 1
Page 3 -> Replace 1 with 3: 2 0 3
Page 4 -> Replace 2 with 4: 4 0 3
Page 2 -> Replace 3 with 2: 4 0 2
Page 3 -> Replace 0 with 3: 4 3 2
Page 0 -> Replace 4 with 0: 0 3 2

Total Page Faults: 9

Process exited after 0.1343 seconds with return value 0
Press any key to continue . . . |