OPTIMAL PAGING

```
#include <stdio.h>
int main() {
    int n, frames, pages[50], temp[10];
    int i, j, k, pos, max, pageFaults = 0, pageHits = 0, flag1, flag2;
    printf("Enter number of pages: ");
   scanf("%d", &n);
    printf("Enter the reference string: ");
    for (i = 0; i < n; i++) {
        scanf("%d", &pages[i]);
    }
    printf("Enter number of frames: ");
    scanf("%d", &frames);
    for (i = 0; i < frames; i++) {
        temp[i] = -1;
    }
    printf("\nPage Replacement Process (Optimal):\n");
    for (i = 0; i < n; i++) {
        flag1 = flag2 = 0;
        for (j = 0; j < frames; j++) {
            if (temp[j] == pages[i]) {
                flag1 = flag2 = 1;
                pageHits++;   // count hit
                break;
            }
        }
        if (flag1 == 0) {
            for (j = 0; j < frames; j++) {
                if (temp[j] == -1) {
```

```
            temp[j] = pages[i];
            pageFaults++;
            flag2 = 1;
            break;
        }
    }
    if (flag2 == 0) {
        int future[10];
        for (j = 0; j < frames; j++) {
            future[j] = -1;
            for (k = i + 1; k < n; k++) {
                if (temp[j] == pages[k]) {
                    future[j] = k;
                    break;
                }
            }
        }
        pos = -1;
        max = -1;
        for (j = 0; j < frames; j++) {
            if (future[j] == -1) { // page not used again
                pos = j;
                break;
            } else if (future[j] > max) {
                max = future[j];
                pos = j;
            }
        }
        temp[pos] = pages[i];
        pageFaults++;
```

```
        }
        printf("For %d : ", pages[i]);
        for (k = 0; k < frames; k++) {
            if (temp[k] != -1)
                printf("%d ", temp[k]);
            else
                printf("- ");
        }
        printf("\n");
    }
    printf("\nTotal Page Faults = %d\n", pageFaults);
    printf("Total Page Hits   = %d\n", pageHits);
    return 0;
}
```