

```
#include <stdio.h>
```

```
#define N 100
```

```
int findoptimal(int time[], int frames) {
```

```
    int min = time[0], pos = 0;
```

```
    for (int i = 1; i < frames; i++) {
```

```
        if (time[i] < min) {
```

```
            min = time[i];
```

```
            pos = i;
```

```
        }
```

```
    }
```

```
    return pos;
```

```
}
```

```
void optimal(int pages[], int n, int frames) {
```

```
    int frame[frames], time[frames];
```

```
    int pageFaults = 0, counter = 0;
```

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

```
        frame[i] = -1;
```

```
        time[i] = 0;
```

```
    }
```

```
    printf("\n Page Replacement:\n");
```

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

```
        int page = pages[i], found = 0;
```

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

```
    if (frame[j] == page) {  
        found = 1;  
        time[j] = ++counter;  
        break;  
    }  
}
```

```
if (!found) {  
    int pos = -1;
```

```
    for (int j = 0; j < frames; j++) {  
        if (frame[j] == -1) {  
            pos = j;  
            break;  
        }  
    }  
}
```

```
if (pos == -1)  
    pos = findoptimal(time, frames);
```

```
frame[pos] = page;  
time[pos] = ++counter;  
pageFaults++;  
}
```

```
printf("After page %2d -> [ ", page);  
for (int j = 0; j < frames; j++) {  
    if (frame[j] != -1)
```

```

        printf("%2d ", frame[j]);
    else
        printf(" - ");
    }
    printf("]\n");
}

printf("\nTotal Page Faults = %d\n", pageFaults);
}

int main() {
    int pages[N], n, frames;

    printf("Enter number of pages: ");
    scanf("%d", &n);

    printf("Enter the page reference string:\n");
    for (int i = 0; i < n; i++)
        scanf("%d", &pages[i]);

    printf("Enter number of frames: ");
    scanf("%d", &frames);

    optimal(pages, n, frames);

    return 0;
}

```

C:\Users\Admin\Desktop\m.e X + v

Enter number of pages: 5  
Enter the page reference string:  
7 0 1 2 3  
Enter number of frames: 3

Page Replacement:  
After page 7 -> [ 7 - - ]  
After page 0 -> [ 7 0 - ]  
After page 1 -> [ 7 0 1 ]  
After page 2 -> [ 2 0 1 ]  
After page 3 -> [ 2 3 1 ]

Total Page Faults = 5

Process returned 0 (0x0) execution time : 18.845 s  
Press any key to continue.

|