

Page Faults in LRU

Submissions: 11518 (/problem_submissions.php?pid=2104) Accuracy: 37.76% Difficulty: Medium (https://practice.geeksforgeeks.org/Medium/0/0/) Marks: 4

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Problems

In operating systems that use paging for memory management, page replacement algorithm are needed to decide which page needs to be replaced when the new page comes in. Whenever a new page is referred and is not present in memory, the page fault occurs and Operating System replaces one of the existing pages with a newly needed page. Given a sequence of pages and memory capacity, your task is to find the number of page faults using Least Recently Used (LRU) Algorithm.

Input:

The first line of input contains an integer T denoting the number of test cases. Each test case contains n number of pages and next line contains space separated sequence of pages. The following line consist of the capacity of the memory.

Note: Pages are referred in the order left to right from the array (i.e index 0 page is referred first then index 1 and so on). Memory is empty at the start.

Output:

Output the number of page faults.

Constraints:

$1 \leq T \leq 100$

$1 \leq n \leq 1000$

$4 \leq \text{capacity} \leq 100$

Example:

Input:

```
2
9
5 0 1 3 2 4 1 0 5
4
8
3 1 0 2 5 4 1 2
4
```

Output:

```
8
7
```

Explanation:

Testcase 1:

memory allocated with 4 pages 5, 0, 1, 3: page fault = 4
page number 2 is required, replaces LRU 5: page fault = 4 + 1 = 5
page number 4 is required, replaces LRU 0: page fault = 5 + 1 = 6
page number 1 is required which is already present: page fault = 6 + 0 = 6
page number 0 is required which replaces LRU 1: page fault = 6 + 1 = 7
page number 5 is required which replaces LRU 3: page fault = 7 + 1 = 8.

**** For More Input/Output Examples Use 'Expected Output' option ****

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