import java.util.HashMap;

import java.util.HashSet;

import java.util.Iterator;

import java.util.Scanner;

class LRU{

static int pageFaults(int pages[], int n, int capacity) {

HashSet<Integer> s = new HashSet<>(capacity);

HashMap<Integer, Integer> indexes = new HashMap<>();

int page\_faults = 0;

int page\_hits = 0;

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

if (s.size() < capacity) {

if (!s.contains(pages[i])) {

s.add(pages[i]);

page\_faults++;

} else {

page\_hits++;

}

indexes.put(pages[i], i);

} else {

if (!s.contains(pages[i])) {

int lru = Integer.MAX\_VALUE, val = Integer.MIN\_VALUE;

Iterator<Integer> itr = s.iterator();

while (itr.hasNext()) {

int temp = itr.next();

if (indexes.get(temp) < lru) {

lru = indexes.get(temp);

val = temp;

}

}

s.remove(val);

indexes.remove(val);

s.add(pages[i]);

page\_faults++;

} else {

page\_hits++;

}

indexes.put(pages[i], i);

}

}

System.out.println("No. of hits = " + page\_hits);

return page\_faults;

}

public static void main(String args[]) {

Scanner scanner = new Scanner(System.in);

System.out.print("Enter the total number of pages: ");

int n = scanner.nextInt();

int pages[] = new int[n];

System.out.println("Enter the page references:");

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

pages[i] = scanner.nextInt();

}

System.out.print("Enter the memory capacity: ");

int capacity = scanner.nextInt();

int totalFaults = pageFaults(pages, n, capacity);

System.out.println("Total Page Faults: " + totalFaults);

}

}