import java.util.HashSet;

import java.util.LinkedList;

import java.util.Queue;

class Test

{

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

{

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

Queue<Integer> indexes = new LinkedList<>() ;

int page\_faults = 0;

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

{

if (s.size() < capacity)

{

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

{

s.add(pages[i]);

page\_faults++;

indexes.add(pages[i]);

}

}

else

{

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

{

int val = indexes.peek();

indexes.poll();

s.remove(val);

s.add(pages[i]);

indexes.add(pages[i]);

page\_faults++;

}

}

}

return page\_faults;

}

public static void main(String args[])

{

int pages[] = {7, 0, 1, 2, 0, 3, 0, 4,

2, 3, 0, 3, 2};

int capacity = 4;

System.out.println(pageFaults(pages, pages.length, capacity));