EAFIT Internal Programming Contest

August 15, 2014

General comments

- This set contains 6 problems

- The contest is 1 hour and 50 minutes in length

- Scoreboard will be frozen after 80 minutes

- The submissions will not be jugded if sent after 95 minutes (They will be judged at the end of the competition)

- The top teams will compete in the Colombian National Programming Contest

- If programming in Java, remember that the source file name as well as the class containing the Main method should be named as stated in each problem

- Good luck to all!

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Problem A. Keks

Input:	standard input
Output:	standard output
Time limit:	2 seconds
Source file name (java only):	`keks1.java`

Mirko and Slavko are bored at math class again so they came up with new game. Mirko writes down an n digit number, and Slavko's task is to obtain the largest possible number after having removed exactly k digits.

Input

The input contains several test cases.

The first line of each test case contains two space-separated integers n and k ($1 \leq k < n \leq 1000$).

The following line contains and n digit number. This number starts with non-zero digit.

The last line of the input contains two space-separated zeros and should not be processed.

Output

For each test case, output one integer number on a single line — The largest possible number Slavko can obtain by removing k digits from the given number n.

Sample input and output

standard input	standard output
4 2 1924 7 3 1231234 10 4 4177252841 0 0	94 3234 775841

Source: `http://www.hsin.hr/coci/archive/2011_2012/contest4_tasks.pdf`

Problem B. Keks Again?

Input:	standard input
Output:	standard output
Time limit:	3 seconds
Source file name (java only):	keks2.java

Mirko and Slavko are bored at math class again so they came up with new game. Mirko writes down an n digit number, and Slavko's task is to obtain the largest possible number after having removed exactly k digits.

Input

The input contains several test cases.
The first line of each test case contains two space-separated integers n and k ($1 \leq k < n \leq 500000$).
The following line contains and n digit number. This number starts with non-zero digit.
The last line of the input contains two space-separated zeros and should not be processed.

Output

For each test case, output one integer number on a single line — The largest possible number Slavko can obtain by removing k digits from the given number n.

Sample input and output

standard input	standard output
4 2	94
1924	3234
7 3	775841
1231234	
10 4	
4177252841	
0 0	

Source: http://www.hsin.hr/coci/archive/2011_2012/contest4_tasks.pdf

Problem C. Stamps

Input:	standard input
Output:	standard output
Time limit:	1 second
Source file name (java only):	stamps.java

Alice and Bob collect stamps. Alice has x stamps and Bob has y stamps. They want to know how many stamps they have together so they can sell their collection on ebay and make a lot of money. Can you help them?

Input

The input contains several test cases.

Each test case consists of a line containing two space-separated integers x and y, the number of stamps Alice and Bob have respectively $(1 \leq x, y \leq 100)$.

The last line of the input contains two space-separated zeros and should not be processed.

Output

For each test case, output one integer number on a single line — The number of stamps Alice and Bob have together.

Sample input and output

standard input	standard output
1 3	4
10 100	110
100 10	110
0 0	

Problem D. Balls Game

Input:	standard input
Output:	standard output
Time limit:	2 seconds
Source file name (java only):	balls1.java

Bob is playing the following game. There are n balls put in a row. Each ball is colored in one of k colors. Initially the row doesn't contain three or more contiguous balls with the same color. Bob has a single ball of color x.

He can insert his ball at any position in the row (probably, between two other balls). If at any moment there are three or more contiguous balls of the same color in the row, they are destroyed immediately. This rule is applied multiple times, until there are no more sets of 3 or more contiguous balls of the same color.

For example, if Bob has the row of balls [black, black, white, white, black, black] and a white ball, he can insert the ball between two white balls. Thus three white balls are destroyed, and then four black balls become contiguous, so all four balls are destroyed. The row will not contain any ball in the end, so Bob can destroy all 6 balls.

Bob wants to destroy as many balls as possible. You are given the description of the row of balls, and the color of Bob's ball. Help Bob by telling him the maximum number of balls from the row he can destroy.

Input

The input contains several test cases.

The first line of each case contains three integers: n the number of balls in the line ($1 \le n \le 100$), k the number of different colored balls ($1 \le k \le 100$) and x the color of Bob's ball ($1 \le x \le k$).

The next line contains n space-separated integers $c_1, c_2, \ldots, c_n$. Number c_i means that the i-th ball in the row is of color c_i ($1 \le c_i \le k$).

The last line of the input contains three space-separated zeros and should not be processed.

Output

For each test case, output one integer number on a single line — The maximum number of balls Bob can destroy.

Sample input and output

standard input	standard output
6 2 2	6
1 1 2 2 1 1	0
1 1 1	
1	
0 0 0	

Source: http://codeforces.com/problemset/problem/430/B

Problem E. Balls Game Again?

Input:	standard input
Output:	standard output
Time limit:	2 seconds
Source file name (java only):	balls2.java

Bob is playing the following game. There are n balls put in a row. Each ball is colored in one of k colors. Initially the row doesn't contain three or more contiguous balls with the same color. Bob has a single ball of color x.

He can insert his ball at any position in the row (probably, between two other balls). If at any moment there are three or more contiguous balls of the same color in the row, they are destroyed immediately. This rule is applied multiple times, until there are no more sets of 3 or more contiguous balls of the same color.

For example, if Bob has the row of balls [black, black, white, white, black, black] and a white ball, he can insert the ball between two white balls. Thus three white balls are destroyed, and then four black balls become contiguous, so all four balls are destroyed. The row will not contain any ball in the end, so Bob can destroy all 6 balls.

Bob wants to destroy as many balls as possible. You are given the description of the row of balls, and the color of Bob's ball. Help Bob by telling him the maximum number of balls from the row he can destroy.

Input

The input contains several test cases.

The first line of each case contains three integers: n the number of balls in the line ($1 \leq n \leq 5000$), k the number of different colored balls ($1 \leq k \leq 5000$) and x the color of Bob's ball ($1 \leq x \leq k$).

The next line contains n space-separated integers $c_1, c_2, \ldots, c_n$. Number c_i means that the i-th ball in the row is of color c_i ($1 \leq c_i \leq k$).

The last line of the input contains three space-separated zeros and should not be processed.

Output

For each test case, output one integer number on a single line — The maximum number of balls Bob can destroy.

Sample input and output

standard input	standard output
6 2 2	6
1 1 2 2 1 1	0
1 1 1	
1	
0 0 0	

Based on problem: http://codeforces.com/problemset/problem/430/B

Problem F. Clock

Input:	`standard input`
Output:	`standard output`
Time limit:	1 second
Source file name (java only):	`clock.java`

Every school morning Mirko is woken up by the sound of his alarm clock. Since he is a bit forgetful, quite often he leaves the alarm on on Saturday morning too. That's not too bad tough, since he feels good when he realizes he doesn't have to get up from his warm and cozy bed.

He likes that so much, that he would like to experience that on other days of the week too! His friend Slavko offered this simple solution: set his alarm clock 45 minutes early, and he can enjoy the comfort of his bed, fully awake, for 45 minutes each day.

Mirko decided to heed his advice, however his alarm clock uses 24-hour notation and he has issues with adjusting the time. Help Mirko and write a program that will take one time stamp, in 24-hour notation, and print out a new time stamp, 45 minutes earlier, also in 24-hour notation.

Note: If you are unfamiliar with 24-hour time notation yourself, you might be interested to know it starts with 0:00 (midnight) and ends with 23:59 (one minute before midnight).

Input

The input contains several test cases.

Each test case consists of a line containing two space-separated integers H and M ($0 \leq H \leq 23, 0 \leq M \leq 59$), the input time in 24-hour notation. H denotes hours and M minutes.

The last line of the input contains two space-separated -1 and should not be processed.

Output

For each test case, output two integer numbers on a single line separated by a single space — the time 45 minutes before input time.

Sample input and output

standard input	standard output
10 10	9 25
0 30	23 45
23 40	22 55
1 46	1 1
-1 -1	

Source: `http://www.hsin.hr/coci/archive/2009_2010/contest7_tasks.pdf`