Balanced Brackets

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	256 megabytes

Given a string of length N, find the length of longest *sub-string* which is a *balanced bracket* sequence. The string has upto K shapes of brackets, and each bracket shape is represented with 2 integers. For i-th bracket shape, **i** is used to represent opening bracket and **-i** is used to represent closing bracket.

A balanced bracket sequence is a sequence which is either :

1. Empty.
2. Concatenation of 2 balanced bracket sequences, i.e. if A and B are balanced bracket sequences, AB is also balanced.
3. **i** X **-i**, where X represents a balanced bracket sequence.

Input

First line contains T, number of test cases. Second line contains 2 integers N and K denoting the length of bracket sequence and number of brackets in the bracket sequence. Third line contains the sequence with i representing an opening bracket of shape i, and $-i$ representing the corresponding closing bracket.
$1 \leq N, K \leq 10^5$.
All input files are atmost 4MB in size.

Output

Output a single integer, which is the length of longest bracket sequence

Examples

standard input	standard output
1 4 1 1 -1 1 -1	4
1 2 2 2 -1	0
1 10 1 1 -1 -1 1 1 -1 -1 -1 1 -1	4