Problem A. Fail or Success?

Input file:	standard input
Output file:	standard output
Time limit:	3 seconds
Memory limit:	256 megabytes

Sarah is a really busy student. She usually takes so many credits every semester and at end cannot handle the pressure so doesn't do well as she supposed to do in her exams and assignments. Therefore this time she decided to calculate average hours she can study a week based on different factors like hanging out with friends, workout times and etc. and make sure the hours need to study each week don't exceed her average free hours per week. Your task is based on her decision on adding/dropping a course and the course's study hours would she have a successful or failure semester. She might add and drop a course several times during the semester.

Input

The input consists of several test cases. Each test case describes a set of courses and gives a sequence of taking/drop operations for these courses. The first line of each test case contains three integers n, m and c, where n is the number of avaibale courses ($n \leq 20$), m the number of operations performed on these courses and c is the capacity of Sarah to study per week (in hours). The following n lines contain one positive integer c_i each, the study time need for the course I (in hours). This is followed by m lines also containing one integer each, between 1 and n inclusive. They describe a sequence of taking/drop operations performed on the course. For every number, the state of that particular course is toggled, i.e. if it is currently taking, it is droped, and if it is currently not taken, it will be taken. At the beginning no course is taken. The input will be terminated by a test case starting with $n = m = c = 0$. This test case should not be processed.

Output

For each test case, first output the number of the test case. Then output whether the semester was a fail during the operation sequence. The sameser will be a fail if the sum of the hours for taking courses exceeds Sarah's capacity for studying per week. If the semster is not a fail, output the maximal hours of study per week by courses that occurred during the sequence. Output a blank line after each test case.

Example

standard input	standard output
2 2 10	Semester 1 was a fail.
5	Semester 2 was a success.
7	Maximal hours was 9.
1	
2	
3 6 10	
2	
5	
7	
2	
1	
2	
3	
1	
3	
0 0 0	