***Practice Questions – Level: 800***

**Task – 01**

You work in the quality control department of technical support for a large company. Your job is to make sure all client issues have been resolved.

Today you need to check a copy of a dialog between a client and a technical support manager. According to the rules of work, each message of the client must be followed by **one or several** messages, which are the answer of a support manager. However, sometimes clients ask questions so quickly that some of the manager's answers to old questions appear after the client has asked some new questions.

Due to the privacy policy, the full text of messages is not available to you, only the order of messages is visible, as well as the type of each message: a customer question or a response from the technical support manager. **It is guaranteed that the dialog begins with the question of the client.**

You have to determine, if this dialog may correspond to the rules of work described above, or the rules are certainly breached.

**Input**

Each test contains multiple test cases. The first line contains the number of test cases tt (1≤t≤5001≤t≤500). Description of the test cases follows.

The first line of each test case contains one integer nn (1≤n≤1001≤n≤100) — the total number of messages in the dialog.

The second line of each test case consists of nn characters "Q" and "A", describing types of messages in the dialog in chronological order. Character "Q" denotes the message with client question, and character "A" — the message with technical support manager answer. It is guaranteed that the first character in the line equals to "Q".

**Output**

For each test case print "Yes" (without quotes) if dialog may correspond to the rules of work, or "No" (without quotes) otherwise.

**Example**

**input**

5

4

QQAA

4

QQAQ

3

QAA

1

Q

14

QAQQAQAAQQQAAA

**output**

Yes

No

Yes

No

Yes

**Note**

In the first test case the two questions from the client are followed with two specialist's answers. So this dialog may correspond to the rules of work.

In the second test case one of the first two questions was not answered.

In the third test case the technical support manager sent two messaged as the answer to the only message of the client.

**Task – 02**

There's a chessboard of size n×nn×n. mm rooks are placed on it in such a way that:

* no two rooks occupy the same cell;
* no two rooks attack each other.

A rook attacks all cells that are in its row or column.

Is it possible to move **exactly one** rook (you can choose which one to move) into a different cell so that no two rooks still attack each other? A rook can move into any cell in its row or column if no other rook stands on its path.

**Input**

The first line contains a single integer tt (1≤t≤20001≤t≤2000) — the number of testcases.

The first line of each testcase contains two integers nn and mm (1≤n,m≤81≤n,m≤8) — the size of the chessboard and the number of the rooks.

The ii-th of the next mm lines contains two integers xixi and yiyi (1≤xi,yi≤n1≤xi,yi≤n) — the position of the ii-th rook: xixi is the row and yiyi is the column.

No two rooks occupy the same cell. No two rooks attack each other.

**Output**

For each testcase, print "YES" if it's possible to move exactly one rook into a different cell so that no two rooks still attack each other. Otherwise, print "NO".

**Example**

**input**

2

2 2

1 2

2 1

3 1

2 2

**output**

NO

YES

**Note**

In the first testcase, the rooks are in the opposite corners of a 2×22×2 board. Each of them has a move into a neighbouring corner but moving there means getting attacked by another rook.

In the second testcase, there's a single rook in a middle of a 3×33×3 board. It has 44 valid moves, and every move is fine because there's no other rook to attack it.

**Task – 03**

You have an array aa of size nn consisting only of zeroes and ones. You can do the following operation:

* choose two indices 1≤i,j≤n1≤i,j≤n, i≠ji≠j,
* add aiai to ajaj,
* remove aiai from aa.

Note that elements of aa can become bigger than 11 after performing some operations. Also note that nn becomes 11 less after the operation.

What is the minimum number of operations needed to make aa non-decreasing, i. e. that each element is not less than the previous element?

**Input**

Each test contains multiple test cases. The first line contains the number of test cases tt (1≤t≤1041≤t≤104). The description of the test cases follows.

The first line of each test case contains an integer nn (1≤n≤1051≤n≤105), the size of array aa.

Next line contains nn integers a1,a2,…ana1,a2,…an (aiai is 00 or 11), elements of array aa.

It's guaranteed that sum of nn over all test cases doesn't exceed 2⋅1052⋅105.

**Output**

For each test case print a single integer, minimum number of operations needed to make aa non-decreasing.

**Example**

**input**

4

8

0 0 1 1 1 1 1 1

5

1 0 0 1 1

2

1 0

11

1 1 0 0 1 0 0 1 1 1 0

**output**

0

1

1

3

**Note**

In the first test case, aa is already non-decreasing, so you don't need to do any operations and the answer is 00.

In the second test case, you can perform an operation for i=1i=1 and j=5j=5, so aa will be equal to [0,0,1,2][0,0,1,2] and it becomes non-decreasing.

In the third test case, you can perform an operation for i=2i=2 and j=1j=1, so aa will be equal to [1][1] and it becomes non-decreasing.