> Note： Examples are not translated!

Problem A Welcome to The 23-rd TMREC

Problem Description

Alice and Bob are having a **True Man Rice Eating Competition (TMREC)**.

They will have a total of n rounds of meals. In the $i-th$ round, the team plans for Alice to eat a_i bowls of rice and Bob to eat b_i bowls of rice.

After each round, the total number of bowls of rice eaten by both Alice and Bob up until that round will be counted.

If Alice has eaten more bowls of rice, she earns 1 point; if Bob has eaten more, he earns 1 point. If both have eaten the same amount of rice, they each earn 1 point.

Now, the competition organizers give Alice and Bob a fair chance to compete. They can rearrange the rounds in any order they wish. Alice can choose any round to be the first round, then Bob can choose the next round, and they alternate choosing rounds until all rounds are selected.

After all rounds are completed, the total points for both Alice and Bob will be counted. Whoever has more points wins the competition.

Alice realizes that for some sets of rounds, no matter how she arranges them, she might not win. Therefore, she wants to delete as few rounds as possible so that she is guaranteed not to lose (i.e., her total score will be greater than or equal to Bob's score).

Input Format

- The first line contains an integer T, representing the number of test cases.
- For each test case:
  - The first line contains an integer n, representing the number of rounds.
  - The next n lines each contain two integers a_i and b_i, representing the number of bowls of rice Alice and Bob eat in the $i-th$ round.

Constraints

- $1 \leq T \leq 10^5$
- $1 \leq n \leq 10^5$
- $1 \leq a_i, b_i \leq 10^9$
- The sum of `n` over all test cases is at most 10^5

Output Format

For each test case, output a single integer, representing the minimum number of rounds Alice must delete to guarantee she doesn't lose to Bob.

Problem B 排列

Problem Description

Given a positive integer n, construct two permutations of n, denoted as $\{a\}$ and $\{b\}$, such that the following expression is maximized:

$$\sum_{i=1}^{n} \operatorname{lcm}(a_i, b_i)$$

The input consists of a single integer n.

Input Format

The first line contains a single integer, n, representing the size of the permutations.

Constraints

- $1 \le n \le 10^5$

Output Format

The first line outputs an integer, which is the maximum value that the expression can achieve.

The second line outputs n integers $a_1, a_2, \ldots, a_n$, separated by a single space.

The third line outputs n integers $b_1, b_2, \ldots, b_n$, separated by a single space.

You must ensure that the sequences $\{a\}$ and $\{b\}$ are both permutations of integers from 1 to n.

If there are multiple valid solutions, output any one of them.

Problem C 兹因克索斯 & 奥赫奥博

Problem Description

Zinkxos and Oheobobo are playing a game.

At the beginning of the game, there is a positive integer n. The two players will take turns performing operations on `n`, with Zinkxos going first. In each round, the player must perform the following operation:

- The player can choose any integer k between 2 and 16 (inclusive), and represent `n` in base `k` (it must have at least two digits for the operation to be valid).
- The player then multiplies all the digits of n in base k and sets the result as the new value of n.
- The game continues until no operation can be performed. Clearly, when no operation can be done, n will either be 0 or 1.

The game ends when n becomes 0, in which case Oheobobo wins; otherwise, Zinkxos wins.

For example:

- Suppose the initial value of n is 479.
- Zinkxos chooses $k = 10$ (decimal), so n becomes $4 \times 7 \times 9 = 252$.
- Oheobobo then chooses $k = 16$, and the hexadecimal representation of 252 is FC, so n becomes $15 \times 12 = 180$.
- At this point, Zinkxos cannot select $k = 10$ anymore, because $1 \times 8 \times 0 = 0$, and if Zinkxos chooses decimal, Oheobobo will win.

Now, Oheobobo has already written down some numbers, and Zinkxos has to choose one of them to start the game.

Zinkxos wants to know which numbers will allow him to win if he selects them to start the game.

Given the numbers written by Oheobobo, determine for each number if Zinkxos can win the game by choosing it as the starting number.

Input Format

- The first line contains an integer T, representing the number of numbers written by Oheobobo.
- The next T lines each contain an integer n, representing a number written by Oheobobo in decimal.

Constraints

- $1 \leq T \leq 10^5$
- $1 \leq n \leq 10^{18}$

Output Format

For each number n, output `Win` if Zinkxos can win the game by selecting this number as the starting value, otherwise output `Lose`.Pay attention to case sensitivity.

Problem D 完美区间II

Problem Description

We define a number string as a string composed only of digit characters $\mathbf{1} \sim \mathbf{9}$.

Senior Ni Hao thinks that an array of a number string is "perfect" if and only if the following condition is met:

- The product of all the digits in the array equals the length of the array.

Now, Senior Ni Hao wants to challenge you. Given a number string of length n denoted as s, how many "perfect" intervals `[l, r]` (where $1 \le l \le r \le n$) exist?

But Senior Ni Hao thinks this problem is too simple, so in addition to the number string, an **exponent array** p_i is also given, representing the power of each digit.

Now, the "real value" of each digit in the number string is defined as ${s_i}^{p_i}$. The condition for a "perfect" interval is now:

- The product of the "real values" of all digits in the interval equals the length of the interval.

Input Format

- The first line contains an integer T, representing the number of test cases.
- For each test case:
  - The first line contains an integer n, representing the length of the number string.
  - The second line contains a string s of length n, which contains the digits of the number string.
  - The third line contains an integer array $p_1, p_2, \ldots, p_n$, representing the power of each corresponding digit in the string.

Constraints

- $1 \le T \le 10^4$
- $1 \le n \le 10^5$
- The string s consists only of digits $1 \sim 9$.
- $-10^9 \le p_i \le 10^9$
- The sum of n over all test cases is at most 10^5.

Output Format

For each test case, output a single integer representing the number of "perfect" intervals.

Problem E 彩蛋大寻宝

Problem Description

Easter has arrived! The people of Stardew Valley are preparing for the annual Easter egg hunt.

Please note that the rules of this game are different from the ones in the real "Stardew Valley"!

This Easter egg hunt takes place on a number line, and you will compete against Ni Hao. There are a total of n eggs, and the position of the `i`-th egg is at a_i.

- Initially, you are at position X, and Ni Hao is at position Y, with the condition that $X \neq Y$.
- Both players take turns to move, **you go first**. On each turn, a player can choose to move to an adjacent position.
  - If you are currently at position p, you can move to either position $p-1$ or $p+1$.
- Both players can choose to collect all the eggs at any position they land on, and **once an egg is collected, it disappears**.
- **Note that during the game, you and Ni Hao are allowed to appear at the same position.**
- The game ends automatically once all the eggs have been collected.

Since you and Ni Hao are both masters of Easter egg hunting and extremely smart, you both will always follow the optimal strategy.

Now, you want to know who will collect more eggs **by the end of the game**.

Input Format

- The first line contains three integers n, X, Y.
- The second line contains n integers $a_1, a_2, \ldots, a_n$, which represent the positions of the eggs.

Constraints

- $1 \leq n \leq 2 \times 10^5$
- $-10^9 \leq X, Y \leq 10^9$
- $X \neq Y$
- $-10^9 \leq a_i \leq 10^9$

Output Format

After the game ends, if you collect more eggs, output `win`. **Otherwise**, output `lose`. In other words, if you and Ni Hao collect the same number of eggs, you should also output `lose`.Pay attention to case sensitivity.

Problem F 倪浩老师爱构造

Problem Description

Given a positive integer m, your task is to construct **as many different** positive integers $x_1, x_2, \ldots, x_n$ as possible such that:

1. The sum of these integers does not exceed m.
2. **None of the integers** can be obtained by adding **at least two different** integers from the set.

In more formal terms, the following constraints must be satisfied:

- $\sum\limits_{i=1}^{n} x_i \le m$
- For any k $(k \ge 2)$ distinct integers $p_1, p_2, \ldots, p_k$ $(1 \le p_1 < p_2 < \cdots < p_k \le n)$ and any integer j $(1 \le j \le n)$, it must hold that $x_{p_1} + x_{p_2} + \cdots + x_{p_k} \ne x_j$.

Input Format

The input consists of a single integer m.

Constraints

- $1 \le m \le 10^5$

Output Format

The first line should output an integer n, representing the maximum number of integers that can be constructed.

The second line should output n different positive integers $x_1, x_2, \ldots, x_n$, separated by spaces.

Problem G diff『』

Problem Description

As we all know, Ni Hao likes programming in the Linux environment, and the `diff` command can be used to compare two files for differences.

Given two 10×10 canvases, each with exactly one `L` shaped pattern, you can perform any number of translations, rotations, and reflections on the `L` shaped pattern.

Question: Is it possible to apply some operations so that the two canvases become identical?

The basic `L` shaped pattern can be defined in the following four ways:

```
#.    .#    ##    ##
##    ##    .#    #.
```

We extend these four cases, allowing the two edges of the `L` shape to be extended arbitrarily. For example, the following two cases are also considered `L` shaped patterns:

```
###    ###
#..    #..
...    #..
```

However, the following are not considered `L` shaped patterns:

```
.#.    ###    ###
...    ...    .#.
```

Input Format

The input consists of 20 lines, where each line contains 10 characters. The first 10 lines represent the first canvas, and the next 10 lines represent the second canvas.

Constraints

- The characters in the canvas consist only of `.` and `#`.
- Each canvas contains exactly one valid `L` shaped pattern, and all other positions are `.`.

Output Format

Output a single line. If it is possible to apply some operations to make the two canvases identical, output `Yes`; otherwise, output `No`.Pay attention to case sensitivity.

Problem H 倪浩的字符串II

Problem Description

Ni Hao has recently developed a fondness for strings, so he is testing your string-handling skills with a problem.

Ni Hao has a string S of length n, consisting only of lowercase letters.

You need to find two substrings of S that have the same length (the substrings may overlap but must not be completely identical), and after sorting these substrings, they should become identical.

However, Ni Hao does not need you to find the exact positions of these substrings. Instead, he wants you to output the **maximum length** of the longest substrings that satisfy this condition.

- A substring of string S: A substring $S_{i,j}$ $(i \le j)$ represents the portion of the string from index i to index j, inclusive. For example, for the string "abcde", the substring from $[2,4]$ is "bcd".
- Sorting: This operation sorts the characters of the string in alphabetical order. For instance, "baca" when sorted becomes "aabc".

However, Ni Hao has made the problem more difficult. He will perform q operations, each of which could be one of the following two types:

- `1 l r`: Query operation, asking for the answer for the substring $S_{l,r}$.
- `2 x c`: Modify operation, where the character at position x in the string is changed to the letter c.

Input Format

The input consists of the following:

- The first line contains two integers n and q, representing the length of the string and the number of operations.
- The second line contains a string of length n consisting only of lowercase letters.
- For each query operation, output an integer representing the answer.
- The next q lines contain three integers each, describing the operations as described above.

Constraints

- $1 \le n, q \le 10^5$
- The string only contains lowercase letters.
- $1 \le l \le r \le n$
- $1 \le x \le n$
- c is a lowercase letter.

Output Format

For each query operation, output a single integer representing the length of the longest valid substring.

Problem I 倪浩的消除区间

Problem Description

Ni Hao has recently developed a deep interest in deleting things, especially deleting duplicate elements.

Ni Hao has an array of length n, denoted by $a_1, a_2, \ldots, a_n$. You can perform the following operation multiple times:

- Choose two integers l and r such that $1 \le l < r \le n$ and $a_l = a_r$, and then delete all the elements in the subarray from index l to index r.

For example, for the array $a = \{2, 1, 6, 1, 2, 3\}$:

- Since $a_1 = a_5 = 2$, if you choose $l = 1$ and $r = 5$, the array will become $\{3\}$.
- Since $a_2 = a_4 = 1$, if you choose $l = 2$ and $r = 4$, the array will become $\{2, 2, 3\}$.

Ni Hao asks if it is possible to delete all elements of the array in several operations.

Input Format

The input consists of:

- The first line contains an integer n, representing the size of the array.
- The second line contains n integers $a_1, a_2, \ldots, a_n$, representing the given array.

Constraints

- $1 \le n \le 10^5$
- $1 \le a_i \le 10^5$

Output Format

If it is possible to delete all elements of the array in several operations, output `Yes`. Otherwise, output `No`.Pay attention to case sensitivity.

Problem J 倪皓的社交秘诀 Easy-Version

Problem Description

Guan Dan is a popular card game played in Jiangsu and surrounding regions. The game uses **two standard decks of cards, totaling 108 cards** (two jokers, and eight of each other card), and is played by **four players**. The players are divided into two teams, with opposite players on the same team. Each player receives **27 cards**.

1 - Cards

The game uses **four suits**:

- **Spades (S)**, **Hearts (H)**, **Clubs (C)**, **Diamonds (D)**, and the **Jokers** represented as `-` (without a suit).

Each card has a **rank**, represented by the numbers `2` to `10`, and the face cards `J`, `Q`, `K`, `A`, with the jokers being `X` (small joker) and `Y` (big joker).

2 - Card Types

1. **Royal Bomb**: Two big jokers + two small jokers.
2. **Straight Flush**: **Five cards** of consecutive ranks with the same suit. The cards must be in a sequence, and **A** can only be at the start or end of the sequence. Example: `5432A` (smallest straight flush) or `AKQJ10` (largest straight flush).
3. **Bomb**: Four or more cards of the same rank. A larger bomb can only be defeated by a bomb of the same number of cards but of a higher rank, or a bomb with more cards.
4. **Steel Plate**: Two sets of three consecutive cards. Example: `222AAA` (smallest steel plate) or `AAAKKK` (largest steel plate).
5. **Straight**: Five consecutive cards, not more or fewer. **A** can be used at the start or end of a straight. Example: `5432A` or `AKQJ10`.
6. **Three Consecutive Pairs**: Three pairs of consecutive cards. Example: `3322AA` (smallest three consecutive pairs) or `AAKKQQ` (largest).
7. **Three with Two**: Three of the same rank plus a pair. Example: `55566` or `AAAXX`.
8. **Three of a Kind**: Three cards of the same rank. Example: `AAA`.
9. **Pair**: Two cards of the same rank, including a pair of jokers.
10. **Single**: Any single card.

3 - Special Rules

3.1 - Level Cards

Each round of the game randomly chooses a **level card** (from 2 to 10), which can act as any card of the same rank (except for the big and small jokers). This level card can be used in any combination like a normal card in a straight, steel plate, etc.

3.2 - Huangyi Match

The **Hearts Level Card** can be used as any non-joker card and will be treated as a regular card unless played alone. When played alone, it is treated as a normal level card.

4 - Card Rank Hierarchy

- **Royal Bomb** > **Six or More Card Bomb** > **Straight Flush** > **Five or Fewer Card Bomb** > **Other Card Types**.

5 - Card Ranking Order

Cards are ranked in the order of: `2, 3, ..., 10, J, Q, K, A, X (small joker), Y (big joker)`. In sequences like straight flushes, straights, three consecutive pairs, and steel plates, **A** can be used as `1`, meaning it is the smallest card.

6 - Problem Statement

For each test case, the task is to calculate the **maximum number of Straights (include Straight Flush)** that can be played before the host (Ni Hao) goes offline, given the current deck and level card. Each test case contains a set of hands and a level card, and we need to determine how many Straights (include Straight Flush) can be played by each player.

Input Format

- The first line contains an integer `T`, the number of test cases.
- For each test case:
  - The first line contains a string `C`, representing the **level card** for the round.
  - The second line contains an integer `n`, the number of cards in the hand.
  - The next `n` lines each contain two strings: `S_i`, representing the suit, and `P_i`, representing the rank of the card.

Constraints

- $1 \leq T \leq 100$
- $C \in \{2 \sim 10\}$
- $1 \leq n \leq 27$
- $S_i \in \{\text{S, H, C, D, -}\}$
- $P_i \in \{2 \sim 10, \text{J}, \text{Q}, \text{K}, \text{A}, \text{X}, \text{Y}\}$
- The hands will always be valid and formed from two decks of cards, with no more than 108 cards in total.

Output Format

For each test case, output a single integer, representing the **maximum number of Straights (include Straight Flush)** that can be played before Ni Hao goes offline.

Problem K 倪皓的社交秘诀 Hard-Version

Problem Description

Guan Dan is a popular card game played in Jiangsu and surrounding regions. The game uses **two standard decks of cards, totaling 108 cards** (two jokers, and eight of each other card), and is played by **four players**. The players are divided into two teams, with opposite players on the same team. Each player receives **27 cards**.

1 - Cards

The game uses **four suits**:

- **Spades (S)**, **Hearts (H)**, **Clubs (C)**, **Diamonds (D)**, and the **Jokers** represented as `-` (without a suit).

Each card has a **rank**, represented by the numbers `2` to `10`, and the face cards `J`, `Q`, `K`, `A`, with the jokers being `X` (small joker) and `Y` (big joker).

2 - Card Types

1. **Royal Bomb**: Two big jokers + two small jokers.
2. **Straight Flush**: **Five cards** of consecutive ranks with the same suit. The cards must be in a sequence, and **A** can only be at the start or end of the sequence. Example: `5432A` (smallest straight flush) or `AKQJ10` (largest straight flush).
3. **Bomb**: Four or more cards of the same rank. A larger bomb can only be defeated by a bomb of the same number of cards but of a higher rank, or a bomb with more cards.
4. **Steel Plate**: Two sets of three consecutive cards. Example: `222AAA` (smallest steel plate) or `AAAKKK` (largest steel plate).
5. **Straight**: Five consecutive cards, not more or fewer. **A** can be used at the start or end of a straight. Example: `5432A` or `AKQJ10`.
6. **Three Consecutive Pairs**: Three pairs of consecutive cards. Example: `3322AA` (smallest three consecutive pairs) or `AAKKQQ` (largest).
7. **Three with Two**: Three of the same rank plus a pair. Example: `55566` or `AAAXX`.
8. **Three of a Kind**: Three cards of the same rank. Example: `AAA`.
9. **Pair**: Two cards of the same rank, including a pair of jokers.
10. **Single**: Any single card.

3 - Special Rules

3.1 - Level Cards

Each round of the game randomly chooses a **level card** (from 2 to 10), which can act as any card of the same rank (except for the big and small jokers). This level card can be used in any combination like a normal card in a straight, steel plate, etc.

3.2 - Huangyi Match

The **Hearts Level Card** can be used as any non-joker card and will be treated as a regular card unless played alone. When played alone, it is treated as a normal level card.

4 - Card Rank Hierarchy

- **Royal Bomb** > **Six or More Card Bomb** > **Straight Flush** > **Five or Fewer Card Bomb** > **Other Card Types**.

5 - Card Ranking Order

Cards are ranked in the order of: `2, 3, ..., 10, J, Q, K, A, X (small joker), Y (big joker)`. In sequences like straight flushes, straights, three consecutive pairs, and steel plates, **A** can be used as `1`, meaning it is the smallest card.

6 - Problem Statement

In this game, the task is to calculate the **minimum number of plays** required to discard all the cards in hand. Each player must try to discard all the cards, and the number of plays corresponds to the number of valid plays they can make.

Input Format

- The first line contains an integer `T`, the number of test cases.
- For each test case:
  - The first line contains a string `C`, representing the **level card** for the round.
  - The second line contains an integer `n`, the number of cards in the hand.
  - The next `n` lines each contain two strings: `S_i`, representing the suit, and `P_i`, representing the rank of the card.

Constraints

- $1 \leq T \leq 1000$
- $C \in \{2 \sim 10\}$
- $1 \leq n \leq 27$
- $S_i \in \{\text{S, H, C, D, -}\}$
- $P_i \in \{2 \sim 10, \text{J}, \text{Q}, \text{K}, \text{A}, \text{X}, \text{Y}\}$
- The hands will always be valid and formed from two decks of cards, with no more than 108 cards in total.

Output Format

For each test case, output a single integer, representing the **minimum number of plays** required to discard all the cards in hand.

Problem L Welcome to The 23-rd ZJNUCPC

Problem Description

Welcome to the 23rd ZJNUCPC contest site.

Welcome everyone to the 23rd Zhejiang Normal University University Student Programming Contest and Lanqiao Cup Selection. We wish everyone good results here.

(Let's all thank Teacher Nihao)

Output Format

Output according to the sample.

Sample Input #1

None

Sample Output #1

```
.#####.#...#.......#####.#...#.
.....#.#...#.........#...#...#.
.#####.#####.#####...#...#####.
.#.........#.........#...#...#.
.#####.....#.........#...#...#.
```