17th JOI Selection Practice Tasks (2018)

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**1. Card Game**

JOI is playing a card game. He plays the game for 5 rounds, and the total score will determine if he wins.

**QUESTION**

Given the integers of JOI's score for each round, create a program to find out JOI's total score.

**INPUT**

In the ith row, where 1 ≦ i ≦ 5, an integer Ai is written. This represents JOI's score in the ith round.

**OUTPUT**

Output one row, containing JOI's total score.

**CONSTRAINTS**

All input data must fulfil the following condition:

* 0 ≦ Ai ≦ 1 000 000 000, where 1 ≦ i ≦ 5.

**SUBTASKS**

**Subtask 1 [20 points]**

Fulfil the following condition:

* 0 ≦ Ai ≦ 10, where 1 ≦ i ≦ 5.

**Subtask 2 [40 points]**

Fulfil the following condition:

* 0 ≦ Ai ≦ 1 000 000, where 1 ≦ i ≦ 5.

**Subtask 3 [40 points]**

No additional constraints.

**INPUT/OUTPUT EXAMPLES**

|  |  |
| --- | --- |
| INPUT 1 | OUTPUT 1 |
| 1  2  3  4  5 | 15 |

|  |  |
| --- | --- |
| INPUT 2 | OUTPUT 2 |
| 0  100  0  10  100 | 210 |

**2. Result**

A and B are playing a game. The game has N rounds. The player who earns the higher score in each round is the winner of that round. In other words, if A's score is higher than B's score in Round i, where 1 ≦ i ≦ N, A is the winner. If B's score is higher than A's score, then B is the winner. If they have the same score, no one is the winner.

**QUESTION**

Given A and B's scores for N rounds, create a program to find out how many times A and B won each.

**INPUT**

In the first row, an integer N is written. This represents the number of rounds in the game.

For the next N rows, in the ith row, where 1 ≦ i ≦ N, 2 integers are written with a space between them.

* Ai. This represents A's score in Round i.
* Bi. This represents B's score in Round i.

**OUTPUT**

Output the number of times A and B won respectively in one row, with a space between them.

**CONSTRAINTS**

All input data must fulfil the following conditions:

* 1 ≦ N ≦ 1 000 000.
* 0 ≦ Ai ≦ 100, where 1 ≦ i ≦ N.
* 0 ≦ Bi ≦ 100, where 1 ≦ i ≦ N.

**SUBTASKS**

**Subtask 1 [60 points]**

Fulfil the following condition:

* N ≦ 100.

**Subtask 2 [40 points]**

No additional limits.

**INPUT/OUTPUT EXAMPLES**

|  |  |
| --- | --- |
| INPUT 1 | OUTPUT 1 |
| 4  100 0  5 6  40 50  74 75 | 1 3 |

|  |  |
| --- | --- |
| INPUT 2 | OUTPUT 2 |
| 5  20 20  3 95  60 59  40 40  20 19 | 2 1 |

**3. Record**

JOI Company keeps a record of who enters the office, so everyone who enters the office has their name logged as a list of records. However, the records are hard to read because it contains both uppercase and lowercase letters.

**QUESTION**

To make the records easier to read, create a program that will change all the names so that they contain only lowercase letters. Note that the records may contain multiple entries for the same name.

**INPUT**

In the first row, an integer N is written. This represents the number of names in the record.

For the next N rows, in the ith row, where 1 ≦ i ≦ N, a string of 1-20 characters, Si, is written. Each character is either an uppercase or a lowercase letter of the english alphabet. This represents the name of the ith person entering the office.

**OUTPUT**

Output the name of the ith person entering the office in lowercase letters in the ith row, where 1 ≦ i ≦ N.

**CONSTRAINTS**

All input data must fulfil the following condition:

* 1 ≦ N ≦ 100.

**SUBTASKS**

**Subtask 1 [60 points]**

Fulfil the following condition:

* N ≦ 10.

**Subtask 2 [40 points]**

No additional constraints.

**INPUT/OUTPUT EXAMPLES**

|  |  |
| --- | --- |
| INPUT 1 | OUTPUT 1 |
| 3  WatanabE  ITO  YamaMoto | watanabe  ito  yamamoto |

|  |  |
| --- | --- |
| INPUT 2 | OUTPUT 2 |
| 4  SUZUKI  tanaka  tAkAhAshi  SuZuKi | suzuki  tanaka  takahashi  suzuki |

**4. IOIOI**

For any integer N, where 1 ≤ N, a string of characters, PN, is created. PN is made up of (N + 1) letter times the letter I, and N times the letter O, written in an alternating pattern starting with I.

|  |  |
| --- | --- |
| P1 | IOI |
| P2 | IOIOI |
| P3 | IOIOIOI |
| .  .  . | .  .  . |
| PN | IOIOIO · · · OI |
|  | (N letter O's) |

Diagram 1: String of characters PN

**QUESTION**

Given an integer N and a string of characters S, create a program to find out how many PNs can be found within S.

**INPUT**

In the first row, the integer N is written.

In the second row, the integer M is written. This represents how many characters S contains.

In the third row, a string of characters containing M characters is written.

**OUTPUT**

Output the number of PNs found within S. If S does not contain PN, output 0.

**CONSTRAINTS**

All input data must fulfil the following conditions:

* 1 ≦ N ≦ 1 000 000.
* 2N + 1 ≦ M ≦ 1 000 000.
* S only contains the letters I and O.

**SUBTASKS**

**Subtask 1 [50 points]**

Fulfil the following conditions:

* N ≦ 100.
* M ≦ 10 000.

**Subtask 2 [50 points]**

No additional constraints.

**INPUT/OUTPUT EXAMPLES**

|  |  |
| --- | --- |
| INPUT 1 | OUTPUT 1 |
| 1  13  OOIOIOIOIIOII | 4 |

P1 is IOI, and it is found in 4 locations, as shown in Diagram 2. Therefore, the output is 4.

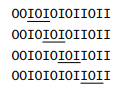


Diagram 2: When N = 1 and S is OOIOIOIOIIOII.

|  |  |
| --- | --- |
| INPUT 2 | OUTPUT 2 |
| 2  13  OOIOIOIOIIOII | 2 |

P2 is IOIOI, and it is found in 2 locations, as shown in Diagram 3. Therefore, the output is 2.



Diagram 3: When N = 2 and S is OOIOIOIOIIOII.

**5. Darts**

You play a game of darts, following the rules below:

You can throw up to 4 darts at a dartboard. You can choose to throw any number of darts, from 0 to 4. The dartboard is divided into N sections, written with points P1, . . . , PN. Your total score S is determined by which sections you hit with your dart(s). If S is lower than a predetermined score M, that will be your final score. If S is higher than M, your final score is 0.

**QUESTION**

Given the points written on the dartboard and the value of M, create a program to find out the maximum score you can achieve in the game.

**INPUT**

In the first row, two integers are written with a space between them.

* N. This represents the number of sections on the dartboard.
* M. This represents the predetermined score.

For the next N rows, in the ith row, where 1 ≦ i ≦ N, one integer is written.

* Pi. This represents the points written on the ith section of the dartboard.

**OUTPUT**

Output one row, containing the maximum score you can achieve in the game.

**CONSTRAINTS**

All input data must fulfil the following conditions:

* 1 ≦ N ≦ 1 000.
* 1 ≦ M ≦ 200 000 000.
* 1 ≦ Pi ≦ 100 000 000, where 1 ≦ i ≦ N.

**SUBTASKS**

**Subtask 1 [20 points]**

Fulfil the following condition:

* N ≦ 100.

**Subtask 2 [30 points]**

Fulfil the following condition:

* N ≦ 300.

**Subtask 3 [50 points]**

No additional constraint.

**INPUT/OUTPUT EXAMPLES**

|  |  |
| --- | --- |
| INPUT 1 | OUTPUT 1 |
| 4 50  3  14  15  9 | 48 |

In this example, you will achieve maximum score of 48 by throwing 3 darts at the section with 15 points, and 1 dart at the section with 3 points.

|  |  |
| --- | --- |
| INPUT 2 | OUTPUT 2 |
| 3 21  16  11  2 | 20 |

In this example, you will achieve maximum score of 20 by throwing 1 dart at the section with 16 points, and 2 darts at the section with 2 points.