

LATIHAN SOAL PRE – UTS 2025

ALGORITHM AND PROGRAMMING

PROBLEM 1 – Let's Play Roblox!

You promised your friends you'd join a roblox night tonight. You've been waiting for this moment with excitement as this is your biggest chance to enjoy the party with your friends! Unfortunately, your professor just dropped a pile of assignments that could power literally a small sun.

Unwilling to miss the roblox night, you start working at 08:00 AM, and for each task, you know:

- That one task requires A minutes to be finished
- B number of exact task

You'll unable to play if the total amount of time to complete everything starting at 08:00 AM exceed 09:00 PM. Can you create a program that can automate this task of determining whether you're going to smash or pass the party?

FORMAT INPUT :

The first line will be Q which represents the number of distinct tasks followed by Q lines where each lines consist of A_i minutes needed to complete that one task and B_i number of copies of the task.

FORMAT OUTPUT :

The output will be “LET'S PARTY BOIZZZZ!” if the total time needed doesn't exceed 09:00 PM. Otherwise, the output will be “Awww man! Life is not daijoubu...”

CONSTRAINTS :

$$0 < Q \leq 10$$

$$0 < A_i \leq 120$$

$$0 \leq B_i \leq 10$$

SAMPLE INPUT #1

```
4
30 4
20 2
10 2
60 0
```

SAMPLE OUTPUT #1

```
LET'S PARTY BOIZZZZ!
```

SAMPLE INPUT #2

```
3
90 7
50 2
70 1
```

SAMPLE OUTPUT #2

```
Awww man! Life is not daijoubu...
```

PROBLEM 2 – Trading

Your friend is a profesional trader in the class. He has almost never suffered from loss in any kind of stock market trading. One day, you decided to ask your friend his secret behind his success. Your kind hearted friend then tells you this simple yet powerful technique for a flawless trading! You need to make sure that the chart is stable! You can determine whether it's stable or not if the numbers keep increasing or decreasing. If both happens on the same chart, then the chart is not stable. You accept you friend's tricks and decided to create an algorithm that can automate this problem. Remember!

- If the price of the stock market keeps increasing or decreasing, then the chart is stable
- If the price of the stock market is increasing but also decreasing, then the chart is unstable.

FORMAT INPUT :

The first line will be Q which represents the number of stock market price available each time. The second line consists of Q

numbers of a_i which represents the price of the stock market each time. It's guaranteed that the price of the stock market each time won't be the same.

FORMAT OUTPUT :

The output will be "Stable" if the price of the stock market keeps increasing or decreasing. Otherwise, the output will be "unstable".

CONSTRAINTS :

$0 < Q \leq 50$

$0 < a_i \leq 1,000,000$

SAMPLE INPUT #1

```
5
123 342 566 798 1021
```

SAMPLE OUTPUT #1

```
Stable
```

EXPLANATION #1

The output is "Stable" because the price keeps increasing. The numbers for each iteration are bigger compared to the numbers on the previous iterations

SAMPLE INPUT #2

```
4
193 728 102 128
```

SAMPLE OUTPUT #2

```
Unstable
```

EXPLANATION #2

The output is “Untable” because the price both increase and decrease. The number increases from iteration 1 to iteration 2, but decreases when it comes to iteration 3, and increases when it comes to iteration 4 (last iteration).

PROBLEM 3 – Hollow Hourglass

You are challenged to make an hourglass by your friends. At first, you agreed with confidence as you seek that making an hourglass is a piece of cake. Unfortunately, your friend want yourglass to be in a form of program, not physically. Your friend also wants a hollow hourglass which leaves a hole/gap in the middle. Can you beat your friend’s challenge?

FORMAT INPUT :

The input will be Q which represents the size of the hourglass

FORMAT OUTPUT :

The output will be a shape of a hollow hourglass whose size determined by Q

CONSTRAINTS :

$0 < Q \leq 10$

SAMPLE INPUT #1

3

SAMPLE OUTPUT #1

```
* * * * *
*   *
*
*   *
* * * * *
```

SAMPLE INPUT #2

5

SAMPLE OUTPUT #2

PROBLEM 4 – The Loud Word: Revenge of the Caps Lock

Your friend just discovered the *Caps Lock* key, and now every sentence they send looks like a war crime against grammar. To restore order, you've been hired as the official Case Corrector for the *Grammatical Peacekeepers*.

Your mission is simple (but tedious, obviously):
Given Q editing requests, each consisting of a target word S_t
and a sentence S_m , you must transform the sentence so that:

- Every occurrence of the target word (case-insensitive) becomes UPPERCASE.
 - Every other word must be lowercase, because you're enforcing peace, not chaos.

FORMAT INPUT :

The first line will be Q which represents the number of editing requests followed by $Q \times 2$ lines where on every 2 lines, the first line is the target word S_t while the second line is the Sentence S_m .

FORMAT OUTPUT :

The output will consist of Q lines which is the new sentence after editing

CONSTRAINTS :

$\theta \wedge Q \leq 100$

$0 < |S_m| \leq 10,000$

$0 < |S_t| \leq |S_m|$

SAMPLE INPUT #1

```
2
apple
I like Apple pie and apple juice
world
HELLO world WORLD
```

SAMPLE OUTPUT #1

```
i like APPLE pie and APPLE juice
hello WORLD WORLD
```

SAMPLE INPUT #2

```
3
fire
Fire burns brighter when the fire is pure
cat
The Cat chased another cat under the catalog
ai
AI will change the WORLD but ai still needs humans
```

SAMPLE OUTPUT #2

```
fire burns brighter when the FIRE is pure
the CAT chased another CAT under the catalog
AI will change the world but AI still needs humans
```

PROBLEM 5 – LET'S GO GAMBLING!

Your friend is known as a God of Gamblers. He knew almost every tricks and strategies to win money enough to afford one Bugatti. One day, you decided to ask your friend on how to ace slot machine gambles. Your friend doesn't tell you exactly how to win every slot machine in this world. But instead, he told you one fixed sign to tell whether you're going to leave with a handfull worth of Bugatti or live on the streets. He told you that no matter how big the size of the slot Machine, a diagonally dominant slot Machine will guarantee your big win! A slot machine is diagonally dominant if every absolute elements of the

main diagonal are greater than the absolute sum of the other elements within the same row (without switching positions of rows and columns)! To ease things up, you decided to create an algorithm that can determine the end result!

FORMAT INPUT :

The first line will be N which represents the size of the slot Machine, followed by the numbers A_{ij} that matches the size of the slot machine

FORMAT OUTPUT :

The output will be “JACKPOT!” if the slot machine is diagonally dominant, otherwise the output will be “Loss!”

CONSTRAINTS :

$0 < N \leq 10$

$-2,000,000 < A_{ij} \leq 2,000,000$

SAMPLE INPUT #1

```
3
1 4 3
5 6 7
9 2 1
```

SAMPLE OUTPUT #1

```
Loss!
```

EXPLANATION #1

The slot machine is not diagonally dominant because none of the absolute elements of the main diagonal are not greater than the sum of the absolute elements within the same row

$|1| > |4| + |3|$ **False**

$|6| > |5| + |7|$ **False**

$|1| > |2| + |9|$ **False**

SAMPLE INPUT #2

```
4
10 1 4 2
1 4 1 1
2 4 13 5
2 4 3 10
```

SAMPLE OUTPUT #2

```
JACKPOT!
```

EXPLANATION #2

The slot machine is not diagonally dominant because none of the absolute elements of the main diagonal are not greater than the sum of the absolute elements within the same row

$|10| > |1| + |4| + |2|$ True

$|4| > |1| + |1| + |1|$ True

$|13| > |2| + |4| + |5|$ True

$|10| > |2| + |4| + |3|$ True