Create a program that **checks** if **inputs** have a **valid command and string** and **translates** it. You will receive **n** count of strings. For each string, check if it's valid.

A string is **valid** when:

- The command is **surrounded by "!"**, **starts** with an **uppercase** letter, **followed only** by **lowercase** letters.
- The command Is **minimum 3 characters** long
- There is a **colon** after the command.
- There is a string **consisting of alphabetical letters** between square brackets **"["** and **"]"**.
- It must be **minimum 8** characters long.

Example for a valid string:

"!Send!:[IvanisHere]"

You must **check** if the **string** is **valid** and if it **is - translates** it. If it **isn't - print** the following **message:**

"The message is invalid"

Translating a **string** means taking **all letters** from the string and **turn** them **into ASCII numbers**. After successful translation, print it in the following format:

"{command}:{number1} {number2} … {numberN}"

Note: Translate only the text in the string. If you have "[Ivan is Here]", the part that you need to translate is "Ivan is Here".

Input

- On the **first** line, you will receive an integer **n** - the count of inputs.
- On the next **n** lines - **input** that you must **check** if it has a **valid string.**

Output

- **Print the result in format described above.**

Examples

Input	Output
2 !Send!:[IvanisHere] *Time@:[Itis5amAlready]	Send: 73 118 97 110 105 115 72 101 114 101 The message is invalid