Bracket Flips

Mr. Panda is trying to generate test cases for the task “Brackets” for Take Home Lab 3. In order to make the test cases more random, he creates each test case by starting off with an empty string and then repeatedly performs one of these 3 operations:

|  |  |
| --- | --- |
| **Operation** | **Description** |
| FRONT **[bracket]** | Adds **[bracket]** to the front of the string  For example, applying the operation “**FRONT )**“ to “**[}**” gives “**)[}**” |
| BACK **[bracket]** | Adds **[bracket]** to the back of the string  For example, applying the operation “**BACK ]**” to “**((**“ gives “**((]**” |
| ROTATE | Rotates the string clockwise by 180o.  It is guaranteed the string is not empty.  For example, applying the operation “**ROTATE**” to “**)[}**” gives “**{](**“ |

The only brackets that will be added are **(, ), [, ], {** and **}**.

After applying all the operations, it is guaranteed there is at least one bracket in the string. Mr. Panda wants you to print the final string after all the operations are run.

**Input**

The first line of input contains an integer **Q**. **Q** lines will follow, representing an operation each. The operations should be executed in order and the format would be as described in the table above. (See sample)

**Output**

At the end of all **Q** operations, output the final string of brackets.

**Limits**

* 1 ≤ **Q** ≤ 400,000
* All the brackets will either be **(, ), [, ], {** or **}**.
* It is guaranteed there is at least one bracket in the string when a **ROTATE** operation happens.
* It is guaranteed there is at least one bracket in the string after all the operations.

|  |  |
| --- | --- |
| Sample Input (**bracketflips1.in**) | Sample Output (**bracketflips1.out**) |
| 8  FRONT (  FRONT }  BACK [  ROTATE  BACK {  BACK )  FRONT )  ROTATE | (}}([( |

**Explanation**

|  |  |
| --- | --- |
| **Operation** | **String** |
| FRONT ( | ( |
| FRONT } | }( |
| BACK [ | }([ |
| ROTATE | ]){ |
| BACK { | ]){{ |
| BACK ) | ]){{) |
| FRONT ) | )]){{) |
| ROTATE | (}}([( |