D - Min Max Repetition

Editorial (/contests/agc020/tasks/agc020_d/editorial)

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Time Limit: 2 sec / Memory Limit: 512 MB

Score : 1100 points

Problem Statement

Let $f(A, B)$, where A and B are positive integers, be the string satisfying the following conditions:

- $f(A, B)$ has length $A + B$;
- $f(A, B)$ contains exactly A letters `A` and exactly B letters `B`;
- The length of the longest substring of $f(A, B)$ consisting of equal letters (ex., `AAAAA` or `BBBB`) is as small as possible under the conditions above;
- $f(A, B)$ is the lexicographically smallest string satisfying the conditions above.

For example, $f(2, 3)$ = `BABAB`, and $f(6, 4)$ = `AABAABAABB`.

Answer Q queries: find the substring of $f(A_i, B_i)$ from position C_i to position D_i (1-based).

Constraints

- $1 \leq Q \leq 10^3$
- $1 \leq A_i, B_i \leq 5 \times 10^8$
- $1 \leq C_i \leq D_i \leq A_i + B_i$
- $D_i - C_i + 1 \leq 100$
- All input values are integers.

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Partial Score

- 500 points will be awarded for passing the testset satisfying $1 \leq A_i, B_i \leq 10^3$.

Input

Input is given from Standard Input in the following format:

$$
\begin{array}{l}
Q \\
A_1 \ \ B_1 \ \ C_1 \ \ D_1 \\
A_2 \ \ B_2 \ \ C_2 \ \ D_2 \\
: \\
A_Q \ \ B_Q \ \ C_Q \ \ D_Q
\end{array}
$$

Output

For each query i in order of input, print a line containing the substring of $f(A_i, B_i)$ from position C_i to position D_i (1-based).

Sample Input 1 Copy

Copy

```
5
2 3 1 5
6 4 1 10
2 3 4 4
6 4 3 7
8 10 5 8
```

Sample Output 1 Copy

Copy

```
BABAB
AABAABAABB
A
BAABA
ABAB
```

#telegram)

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