

ABCD – Colours A, B, C, D

Source : <http://www.spoj.com/problems/ABCD/>

Consider a table with 2 rows and $2N$ columns (a total of $4N$ cells). Each cell of the first row is coloured by one of the colours A, B, C, D such that there are no two adjacent cells of the same colour. You have to colour the second row using colours A, B, C, D such that:

- There are exactly N cells of each colour (A, B, C and D) in the table.
- There are no two adjacent cells of the same colour. (Adjacent cells share a vertical or a horizontal side.)

For each test case, it is guaranteed that a solution, not necessarily unique, will always exist.

Input

[a natural number $T \leq 100$, the number of test cases]

Then T pairs of lines with:

[a natural number $N \leq 50000$ on the first line]

[a string of $2N$ letters from the set {A, B, C, D}, representing the first row of the table, on the second line]

Output

T lines each containing:

[a string of $2N$ letters from the set {A, B, C, D}, representing the second row of the table]

Example

Input :

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2
1
CB
2
ABAD
```

Output :

```
AD
BCDC
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