Median Solve Order

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	256 megabytes

The students at Rubgers University are organizing a programming contest. Since a lot of strong teams will participate, they expect some of them to solve all problems. To distinguish between them, a special prize will be awarded to the team with a special solve order.

The contest consists of $N \leq 26$ problems labelled A, B, etc: the first N letters of the English alphabet.

A *solve order* for a team is a sequence of letters denoting the order in which it solved all the problems: e.g., for $N = 3$, a possible solve order is BAC — B solved first, then A, then C. We only consider teams which solve every problem exactly once, so, e.g., AC or ABAC are not valid solve orders.

Solve order a is *lexicographically smaller* than solve order b if, at the first position where they differ, the character in a comes in the alphabet before the character in b. E.g., ACB is lexicographically smaller than BAC, which is lexicographically smaller than BCA.

Consider all possible solve orders of the N problems. Let their number be M. Sort the M solve orders from lexicographically smallest to largest. In this list, the *median* solve order is located at position $\lceil \frac{M}{2} \rceil$ ($\frac{M}{2}$ rounded up).

Any team with the median solve order will get a special prize. Help Rubgers students decide what the order is!

Input

The problem consists of T independent test cases.

The first line contains a single integer T ($1 \leq T \leq 26$) — the number of independent test cases to process.

Each of the next T lines contains a single integer N ($1 \leq N \leq 26$) — the number of problems in the contest.

Output

For each test case, output a single line containing the median solve order for the contest with N problems.

Example

standard input	standard output
3 1 2 3	A AB BAC

Note

In the first test case, $N = 1$, so the only solve order is A.

In the second test case, the solve orders in lexicographical order are AB, BA. The median is AB.

In the third test case, the solve orders in lexicographical order are ABC, ACB, BAC, BCA, CAB, CBA. The median is BAC.