

Bumping Race

July 2025

C++ — 2 SEC — 512 MB

The river in Oxbridge is very long and narrow, and the residents have invented an exhilarating rowing competition called a Bumping Race.

In this race, n boats are lined up along the river, labelled alphabetically. When the cannon is fired, all the boats begin racing, trying to catch the boat in front. If a boat is successful, a bump occurs; the 2 boats exit the race and their order is switched. For example, suppose there are 4 boats and boats B & C bump. The final order is ACBD.

However, after a bump all other boats continue to race. In the above example, after B & C bump, boats A & D can then bump, giving the final order: DCBA. Since the river is narrow, overtaking another boat is not possible, so D cannot bump A without C bumping B first.

With 4 boats, there are six possible final orders, given below in alphabetical order:

- ABCD – No boats bump
- ABDC – Boats C & D bump
- ACBD – Boats B & C bump
- BACD – Boats A & B bump
- BADC – Boats A & B and C & D bump
- DCBA – Boats B & C then A & D bump

INPUT You will be given two integers, n and i , denoting the number of boats and the desired alphabetical ordering, respectively.

$$1 \leq n \leq 26$$

OUTPUT Output a permutation of the first n letters of the alphabet, giving the i th alphabetical possible final order of n boats.

INPUT

4 3

5 10

12 500

OUTPUT

ACBD

DCBAE

BACDFEGHIKJL