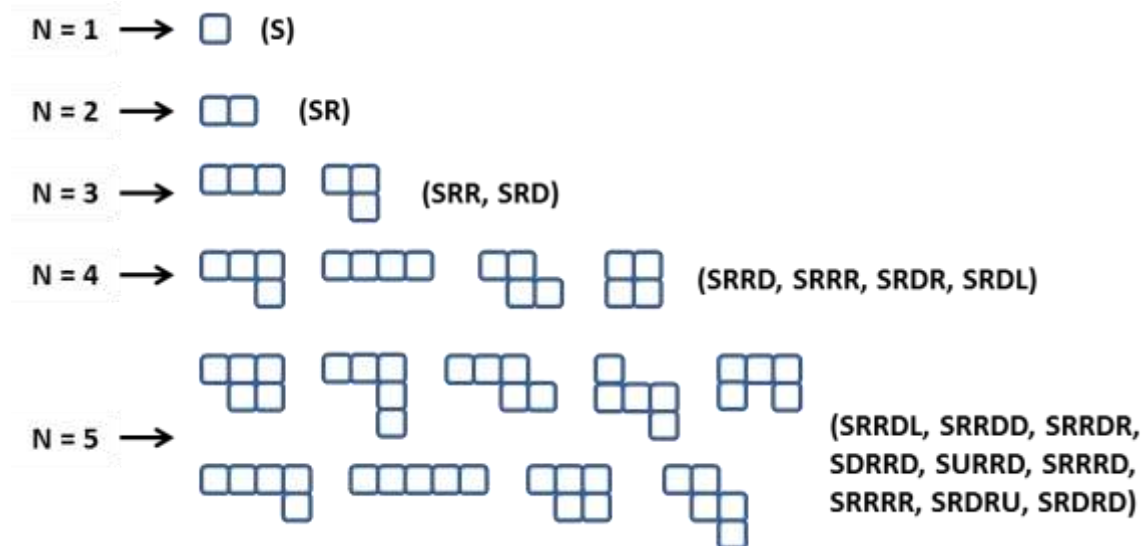


Problem 2 – Snakes

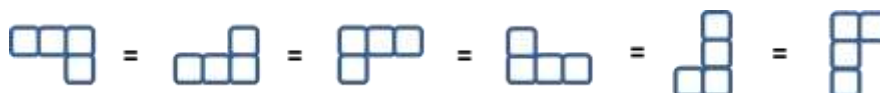
A **snake** is a sequence of several square blocks, attached one after another. A snake starts with a block at some position and continues with another block to the left, right, up or down, then again with another block to the left, right, up or down, etc. A snake of size **N** consists of a sequence of **N** blocks and is not allowed to cross itself.

You are given a number **N** and you should find all possible snakes of **N** blocks, represented as sequences of moves denoted as: **S** (start), **L** (move left), **R** (move right), **U** (move up) and **D** (move down). Examples (for **N** = 1, 2, 3, 4, and 5):



Note: some figures could look visually the same but represent different snakes, e.g. **SRRDL** and **SRDRU**.

Some snakes (sequences of blocks) are the same and should be printed only once. If after a number of rotations and/or flips two snakes are equal they are considered the same and should be printed only once. For example the snakes **SRRD**, **SRRU**, **SLLD**, **SLLU**, **SRUU** and **SUUR** are the same:



Not all forms consisting of **N** blocks are snakes of size **N**. Examples of non-snake forms:



Note: When generating the snakes, there may be different correct answers. When testing your solution, priority should be as follows: **R** -> **D** -> **L** -> **U**. The visual example above for **n** = 5 does NOT follow this priority.

Input

- The input should be read from the console.
- It will contain an integer number **N** in the range [1 ... 15].
- The input data will always be valid and in the format described. There is no need to check it explicitly.

Output

- The output should be printed on the console. It should consist of a variable number of lines:

- Each line should hold a snake represented as a sequence of moves.
- On the last line, print the number of snakes in format: "**Snakes count = {0}**".

Constraints

- Allowed working time for your program: 10 seconds. Allowed memory: 512 MB.

Examples

Input	Sample Output	Comments
2	SR Snakes count = 1	Note that SU , SL and SD are also correct outputs. However, SR takes precedence because R has priority over all other directions.
4	SRRR SRRD SRDR SRDL Snakes count = 4	Note that there are many other correct outputs for N = 4, but this is the expected output according to the priority of directions (right, down, left, up).