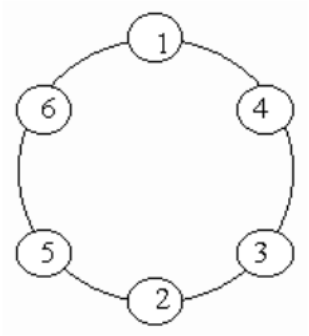
B - Prime Ring Problem

Source file name: `ring.py`
Time limit: 1 seconds

A ring is composed of n (even number) circles as shown in diagram. Put natural numbers $1, 2, \ldots, n$ into each circle separately, and the sum of numbers in two adjacent circles should be a prime.



Note: the number of first circle should always be 1.

Input

The input consists of several test cases. Each line contains a single integer n ($0 < n \leq 14$).

Output

The output format is shown as sample below. Each row represents a series of circle numbers in the ring beginning from 1 clockwisely and anticlockwisely. The order of numbers must satisfy the above requirements.

The outputs of two consecutive cases will be separated by a blank line.

You are to write a program that completes above process.

It's not allowed to include the test cases solutions in the source code. The code sent to the judge should calculate the solutions for all test cases at least once, probably, implementing a backtracking algorithm.

Sample Input

```
6
8
```

Sample Output

```
Case  1:
1  4  3  2  5  6
1  6  5  2  3  4

Case  2:
1  2  3  8  5  6  7  4
1  2  5  8  3  4  7  6
1  4  7  6  5  8  3  2
1  6  7  4  3  8  5  2
```