The degree of a vertex in a graph is the number of edges adjacent to the vertex. A graph is 3-regular if all of its vertices have degree 3. Given an integer n, you are to build a simple undirected 3-regular graph with n vertices. If there are multiple solutions, any one will do.

Input

For each test case, the input will be a single integer n as described above. End of input will be denoted by a case where $n = 0$. This case should not be processed.

Output

If it is possible to build a simple undirected 3-regular graph with n vertices, print a line with an integer e which is the number of edges in your graph. Each of the following e lines describes an edge of the graph. An edge description contains two integers a and b, the two endpoints of the edge. Note that the vertices are indexed from 1 to n. If it is not possible to build a simple undirected 3-regular graph with n vertices, print '`Impossible`' in a single line.

Constraints

- $1 \leq n \leq 100$

Sample Input

```
4
3
0
```

Sample Output

```
6
1 2
1 3
1 4
2 3
2 4
3 4
Impossible
```