You are given an integer $n$. A set, $S$, of triples $(x_i, y_i, z_i)$ is *beautiful* if and only if:

- $0 \leq x_i, y_i, z_i$
- $x_i + y_i + z_i = n, \forall i : 1 \leq i \leq |S|$
- Let $X$ be the set of different $x_i$'s in $S$, $Y$ be the set of different $y_i$'s in $S$, and $Z$ be the set of different $z_i$ in $S$. Then $|X| = |Y| = |Z| = |S|$.

The third condition means that all $x_i$'s are pairwise distinct. The same goes for $y_i$ and $z_i$.

Given $n$, find any *beautiful* set having a maximum number of elements. Then print the cardinality of $S$ (i.e., $|S|$) on a new line, followed by $|S|$ lines where each line contains $3$ space-separated integers describing the respective values of $x_i$, $y_i$, and $z_i$.

**Input Format**

A single integer, $n$.

**Constraints**

- $1 \leq n \leq 300$

**Output Format**

On the first line, print the cardinality of $S$ (i.e., $|S|$).
For each of the $|S|$ subsequent lines, print three space-separated numbers per line describing the respective values of $x_i$, $y_i$, and $z_i$ for triple $i$ in $S$.

**Sample Input**

```
3
```

**Sample Output**

```
3
0 1 2
2 0 1
1 2 0
```

**Explanation**

In this case, $n = 3$. We need to construct a set, $S$, of non-negative integer triples $(x_i, y_i, z_i)$ where $x_i + y_i + z_i = n$. $S$ has the following triples:

1. $(x_1, y_1, z_1) = (0, 1, 2)$
2. $(x_2, y_2, z_2) = (2, 0, 1)$
3. $(z_3, y_3, z_3) = (1, 2, 0)$

We then print the cardinality of this set, $|S| = 3$, on a new line, followed by $3$ lines where each line contains three space-separated values describing a triple in $S$.