

House of Cards

Some people with too much time on their hands build houses from playing cards. One house of cards style is made from leaning two cards against each other as a “pillar” for the top level. The next level down has two of these pillars with a single card placed horizontally on top of them to make a roof for this level, which is the floor for the top level. Each level down adds another pair of cards as a pillar and another roof card. See Figure 1.

In this problem you will calculate the tallest possible house of cards that can be made with a given number of cards.

Input

Each line in the input file will contain one integer value, NUM CARDS, representing the number of cards available to build a house. A value of -1 will indicate the end of the input file. The file will contain no more than 1000 lines. NUM CARDS will be less than 1000000.

Output

Each line in the output file will consist of two integer values separated by a single space. The first value is the number of cards available for building a house. The second value is the maximum number of complete levels that can be made in a house of cards.

input.txt:

```
1$
2$
8$
357565$
-1$
```

output.txt:

```
1 0$
2 1$
8 2$
357565 488$
```

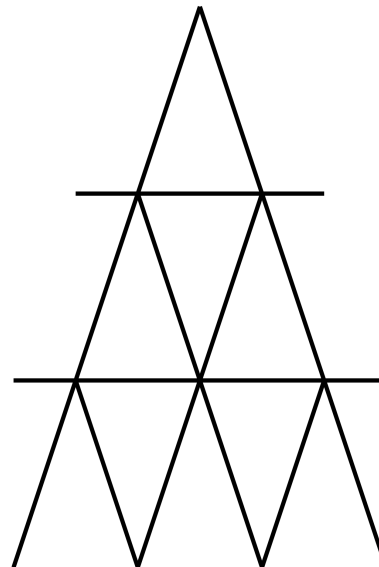


Figure 1: A three level house of cards. Note that there are two overlapping roof cards between the bottom level and the middle level.