

# Three Buckets

## Problem description

There are three buckets filled with water. In one move you are allowed to pour water from bucket  $A$  into bucket  $B$  if  $A$  contains at least as much water as  $B$ . You pour as much water *until the content of  $B$  has doubled*. Performing pourings like that it is always possible to arrive at a state where one bucket is completely empty.

For an amount of  $l$  liters we define  $p(a, b, c)$  to be the minimal number of pourings if the buckets contain initially  $a$ ,  $b$ , and  $c$  liters of water. The *pouring number*  $P(l)$  is the maximum over all  $p(a, b, c)$  where  $a + b + c = l$  for all non-negative integers  $a, b, c$ . The pouring number tells us how many pourings you need in the worst case to empty some bucket if they contain  $l$  liters together.

The input to your program consists of a single number  $0 \leq n \leq 300$ . Your program should output  $n + 1$  lines containing  $i$  and  $p(i)$  for  $i = 0, \dots, n$ .

## Sample input/output

Input	Output
7	0 0 1 0 2 0 3 1 4 1 5 1 6 2 7 2