Problem I
IXth Problem
Time limit: 1 second

Emily recently learned about the Roman Empire and its civilization at school. One aspect that was especially fascinating to her is the number system that they used, the *Roman numerals*. The Roman number system uses seven distinct digits, each representing a different value and denoted by a letter, where `I` is 1, `V` is 5, `X` is 10, `L` is 50, `C` is 100, `D` is 500 and `M` is 1 000. Multiples of 1, 10, 100 and 1 000 are then written according to the following table:

×	1	2	3	4	5	6	7	8	9
1	I	II	III	IV	V	VI	VII	VIII	IX
10	X	XX	XXX	XL	L	LX	LXX	LXXX	XC
100	C	CC	CCC	CD	D	DC	DCC	DCCC	CM
1 000	M	MM	MMM						

Most of the numerals in this table are formed additively, i.e. by summing the values of the digits. For example, `LXX` is $50 + 10 + 10 = 70$. Columns 4 and 9, however, use so-called subtractive notation, where `IV` is read as $5 - 1$, `IX` is read as $10 - 1$, and so on.

Each number from 1 to 3 999 is written as a combination of numerals from the table, using at most one numeral from each row and going from bottom to top. For instance, 2 021 is `MMXXI` and 594 is `DXCIV`. Note that in this number system it is not possible to write numbers greater than 3 999 and also that subtractive notation can only be used in the six cases above (e.g. `IC` is not considered a valid Roman numeral).

Emily found a bunch of old Scrabble sets in her attic. She threw out all the tiles with letters other than the Roman digits and started forming Roman numerals from the remaining tiles. It is easy to form valid numerals from the tiles by using just one tile per numeral, but what is the minimal number of numerals that can be formed while still using all the available tiles?

Input

The input consists of:

- One line with seven integers m, d, c, ℓ, x, v and i ($0 \leq m, d, c, \ell, x, v, i \leq 10^{18}$), which respectively are the number of `M`, `D`, `C`, `L`, `X`, `V` and `I` tiles that must be used.

There is at least one tile, that is $m + d + c + \ell + x + v + i \geq 1$.

Output

Output an integer n, the minimal possible number of Roman numerals that can be formed while using all of the tiles in the input. Then output an optimal solution in the following format.

- An integer k, the number of distinct Roman numerals used in this solution.
- k pairs of a Roman numeral and a positive integer indicating how often this numeral is used in this solution.

The solution must consist of exactly n numerals in total and must use exactly the specified number of each letter. The k Roman numerals in the solution must be distinct. You do not need to minimize k. If there is more than one optimal solution, any one of them will be accepted.

Sample Input 1	Sample Output 1
4 1 7 1 3 1 3	2 2 MMDCCCLXX 1 MMCCCXCVIII 1

Sample Input 2	Sample Output 2
0 0 0 300 2000 1000 2100	1000 2 XXVIII 700 LXXV 300