

In Star Craft, there are two main resources: minerals and vespene gas (“gas” for short).

You can ask SCVs to mine minerals and collect gas.

- If a “mineral” command is given to an SCV, it can get 8 units of minerals after  $t_1$  unit time.
- If a “gas” command is given to an SCV, it can get 8 units of gas after  $t_2$  unit time.

You can only give a command to an SCV after its previous command is finished.

You can build new SCVs, each costing 50 units of mineral and takes  $t_3$  unit time. Those minerals are consumed at the beginning of the process, and you can build at most one SCV at a time (i.e. you cannot start building another SCV before the previous SCV is finished).

Initially, you have 50 units of minerals and 4 SCVs. Your task is to have at least  $p_1$  units of minerals and at least  $p_2$  units of gas, as soon as possible.

## Input

Each test case contains 5 integers  $t_1, t_2, t_3, p_1, p_2$  ( $1 \leq t_1, t_2, t_3 \leq 10, 0 \leq p_1, p_2 \leq 100$ ). The last case is followed by  $t_1 = t_2 = t_3 = p_1 = p_2 = 0$ , which should not be processed. There will be at most 1000 test cases, all are randomly generated.

## Output

For each test case, print the shortest time  $T$  in the first line, followed by the plan (if multiple optimal plans exist, any will do). Each line in the plan has 3 kinds of format:

- $t \ 0$  — build a new SCV at time  $t$
- $t \ i \ 1$  — give “mineral” command to the  $i$ -th SCV.
- $t \ i \ 2$  — give “gas” command to the  $i$ -th SCV.

Print a blank line after each test case, including the last test case.

SCVs are numbered 1, 2, 3, ... Initial SCVs are numbered 1..4, newly built SCVs are numbered in the same order they're built.

**Important:** At time  $T$ , all the SCVs must be idle, and there should be no SCV being built.

## Sample Input

```
10 9 8 0 10
4 10 9 32 72
0 0 0 0 0
```

## Sample Output

Case 1: 9

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

Case 2: 24

```
0 0
0 1 1
0 2 1
0 3 1
0 4 1
4 1 2
4 2 2
4 3 2
4 4 2
14 1 2
14 2 2
14 3 2
14 4 2
14 5 2
```