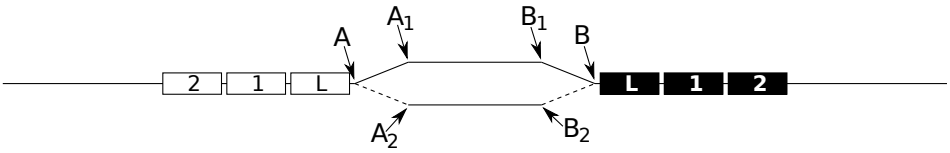
Problem: PAS
Passing Loop

Qualifications, 11.10.2014

The Limonia city is crossed by a railway line. In general this line consists of a single track, however in the city center there is a passing loop, that is a two-track section which allows two trains traveling in the opposite directions to pass each other. Two freight trains are approaching from both sides to the passing loop. They are very long, longer than the passing loop; thus it will be necessary to split the trains into parts and perform complicated maneuvers. Your goal is to perform the maneuvers in such a way that the trains will pass each other in the shortest time possible.



The situation is presented on the above figure. The first train (white, coming from the left side) consists of a locomotive and m cars, and the second train (black, coming from the right side) consists of a locomotive and n cars. In both trains the locomotives are located at the very beginning. The head of the first train has just approached point A, and the head of the second train has approached point B. Each car and locomotive has length 1. The two-track section has length k (this is the distance between points A_1 and B_1, as well as between points A_2 and B_2).

Additionally, to the right of point A there is a turnout, which can be connected either with point A_1 or with point A_2. The distance between points A and A_1 as well as between points A and A_2 is equal to 1. The turnout can be switched only when no car nor locomotive is placed on it. A similar turnout connects point B with one of points B_1 or B_2.

To keep things in order, we partition the maneuvers into turns. In each turn each of the locomotives can move covering distance 1; a locomotive can both pull cars and push them. Detaching and attaching cars, as well as switching the turnouts of the passing loop can be performed in negligibly short time, between turns. At the end of the maneuvers, the first train should be located to the right of point B, with its end precisely in point B, and the second train to the left of point A, with its end precisely in point A. The order of cars and locomotives at the end of the maneuvers should be the same as at the beginning (of course during the maneuvers it can be changed). For the purpose of the maneuvers, the trains are allowed to use the section of tracks between the point located $m+n+2$ to the left of point A, and the point located $m+n+2$ to the right of point B; no car nor locomotive may be moved outside of this section.

You should schedule the maneuvers in a way which minimizes the number of turns needed.

Input

In the only one line of the input file there are three integers k, m and n ($1 \leqslant k, m, n \leqslant 1000$) specifying the length of the two-track section, the number of cars in the first train, and the number of cars in the second train.

Output

When the plan of maneuvers consists of t turns, the output file should contain $t+1$ lines. In the first t lines there should be placed descriptions of moves performed in consecutive turns, one turn per line, and the last line should contain only the number 0. Each of the first t lines should consist of six integers: z_1, z_2, d_1, p_1, d_2, p_2. For $i \in \{1, 2\}$, the number z_i should be equal to 1, if the i-th turnout in the described turn should be connected with the first point (A_1 for the first turnout, B_1 for the second), or 2, if it should be connected with the second point (A_2 or B_2). The number $d_i \in \{-1, 0, 1\}$ describes the direction in which the i-th locomotive moves: -1 means that it moves left, 1 that it moves right, and 0 means that the locomotive does not move. Finally, p_i specifies the number of cars pulled by the i-th locomotive; additionally the locomotive pushes all cars placed directly in front of it. When $d_i = 0$, then also p_i should be equal to 0. In the special case when we want to move a train containing two locomotives, for both of them d_i should be the same, and p_i should contain the number of cars and locomotives located behind the i-th locomotive.

Scoring

In case of the correct plan of maneuvers, the score for a test equals the number of turns t. This is a minimization problem, therefore, the smaller the number of turns, the better. The percentage of guaranteed points is 40%.

Example

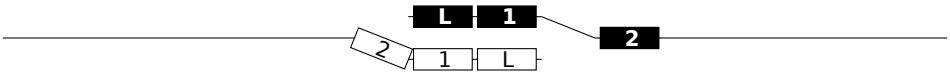
For the input data:

```
2 2 2
```

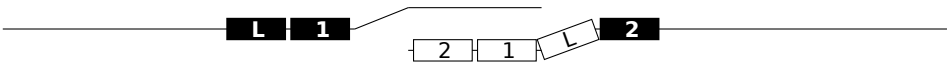
the correct result is:

```
2 1 1 2 -1 2
2 1 1 2 -1 2
2 1 1 2 -1 1
2 2 1 2 0 0
1 2 0 0 -1 1
1 2 0 0 -1 1
1 2 0 0 -1 1
2 2 -1 1 0 0
2 2 -1 1 -1 5
2 2 -1 1 -1 5
2 2 -1 0 -1 4
1 1 1 4 1 0
1 1 1 4 1 0
1 1 1 4 1 0
1 1 1 2 0 0
2 1 1 2 1 0
2 1 1 2 -1 2
2 1 1 2 -1 2
0
```

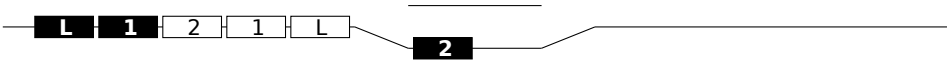
Explanation of the example: In the first two turns, the second train (black) starts to enter on the first track of the passing loop, and the first train (white) on the second track. In the meantime, the left turnout is connected with point A_2, and the right with point B_1. Next, the whole white train moves farther right by 1; and from the black train the last car is detached, and the locomotive continues pulling only the first car. We reach the situation as on the figure.



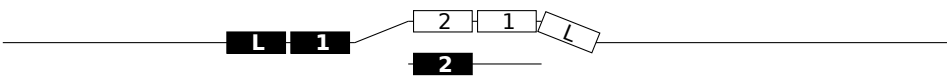
Now, we switch the right turnout (it is possible, as nothing is placed on it). The white train moves farther by 1, connecting itself to the last car of the black train. We switch the left turnout and the beginning of the black train in three turns leaves the passing loop to its left side.



Next, we switch the left turnout down; the white locomotive moves to the left, pushing two cars and pulling one. At this moment, all cars are connected into one train. In the next two turns, the train moves left (let us observe the way of outputting this move: the black locomotive pulls five cars, and the white pulls one), after which the last car of the black train is detached and the rest moves by 1 to the left.



The left turnout is switched, and in the next three turns our train, consisting of two locomotives and three cars, is moving to the right using the upper track. Later, we detach the white part of the train from the black part; the white part continues moving right.



The white train can now freely leave the passing loop (what requires three turns). The black train, in the meantime, retracts to take its last car, and during two turns it moves left. The whole maneuvers have taken 18 turns.