Problem I. Third Group Exam

Time limit: 1 second
Memory limit: 512 megabytes

One teacher came up with a new format for an exam.

- The exam consists of n blocks, each corresponding to one of the topics; a student receives a grade c_i for the i-th block for all i from 1 to n, all grades are independent;
- A grade for each block is an integer value from 0 to 100 both inclusive. A student chooses one way to get the grade for a block: to answer a *theoretical question* or to solve a *practical problem*;
- An exam is successfully passed if at least a blocks were graded by answering a theoretical question and at least b blocks were graded by solving a practical problem;
- If the previous condition is satisfied, the final grade for the exam C is calculated as the sum of grades for all blocks, that is $C = \sum_{i=1}^{n} c_i$.

Ilya is about to take the exam. He has a pretty good idea of his knowledge for each topic, and he is sure that passing the i-th block by theory will get him a grade of x_i, and passing it by practice — a grade of y_i. Help him determine which blocks (at least a of them) he should pass by theory and which blocks (at least b) he should pass by practice, to get the maximum possible total score for the exam.

Input

The first line of input contains three integers n, a and b — the total number of topics, the minimum number of topics to pass by theory, and the minimum number of topics to pass by practice, respectively ($1 \leqslant n \leqslant 2 \cdot 10^5$; $0 \leqslant a, b \leqslant n$). It is guaranteed that $a + b \leqslant n$.

The second line consists of n space-separated integers x_i — the grades Ilya will get if he passes the blocks by answering the theory questions ($0 \leqslant x_i \leqslant 100$).

The third line consists n of integers y_i in the same format — the grades he will get by solving practice problems ($0 \leqslant y_i \leqslant 100$).

Output

The first line of output must contain a single integer C — the maximum total grade that Ilya can get for the exam.

The second line must contain n space-separated characters, the i-th of which is '`T`' if Ilya should answer theory in the i-th block, and '`P`' if he should solve practice. At least a of the characters must be equal to '`T`', and at least b of them must be equal to '`P`'.

Examples

standard input	standard output
4 1 1 10 30 50 70 80 60 40 20	260 P P T T
4 1 1 30 40 60 90 10 25 50 85	215 T T T P
4 2 1 0 17 70 13 2 21 55 99	190 T P T P