A Pair of Graphs

Please click here to download a PDF version of the contest problems. The problem is problem A in the PDF. Remember that you must use stdin/stdout at SPOJ.

We say that two graphs are equivalent if and only if a one-to-one correspondence between their nodes can be established and under such a correspondence their edges are exactly the same. Given A and B, two undirected simple graphs with the same number of vertexes, you are to find a series of operations with the minimum cost that will make the two graphs equivalent. An operation may be one of the following two types:

- Add an arbitrary edge (x, y), provided that (x, y) does not exist before such an operation. Such an operation costs I_A and I_B on two graphs, respectively.
- Delete an existing edge (x, y), which costs D_A and D_B on two graphs, respectively.

Input

There are multiple test cases in the input file.

Each test case starts with three integers, N, M_A and M_B, ($1 \le N \le 8$, $0 \le M_A, M_B \le \frac{N(N-1)}{2}$), the total number of vertexes, the number of edges in graph A, and the number of edges in graph B, respectively. Four integers I_A, I_B, D_A, and D_B come next, ($0 \le I_A, I_B, D_A, D_B \le 32767$), representing the costs as stated in the problem description. The next $M_A + M_B$ lines describe the edges in graph A followed by those in graph B. Each line consists of exactly two integers, X and Y ($X \ne Y$, $0 \le X, Y < N$).

Two successive test cases are separated by a blank line. A case with $N = 0$, $M_A = 0$, and $M_B = 0$ indicates the end of the input file, and should not be processed by your program.

Output

Please print the minimum cost in the format as illustrated below.

Example

Sample Input

```
1 0 0
1 2 3 7

4 2 3
1 6 5 1
0 1
0 3
0 2
1 2
1 0

0 0 0
```

Output for the Sample Input

Case #1: 0