Waterloo 2017 Fall B - Biology

Time limit: 2.0s **Memory limit:** 512M

2017 Fall Waterloo Local ACM Contest, Problem B

Vera has $A \times B$ cards. Each card has a rank, an integer between 0 and $A-1$, and a suit, an integer between 0 and $B-1$. All cards are distinct. A set of five different cards is known as a *hand*. Each hand is in exactly one of nine categories numbered from 1 to 9. If a hand satisfies the conditions for membership in multiple categories, it is considered to be in the lowest-numbered such category. The rules for each category are:

1. Straight flush: is a Straight and a Flush.
2. Four of a kind: four of the cards have the same rank.
3. Full house: three of the cards have the same rank and the remaining two have the same rank.
4. Flush: all five cards have the same suit.
5. Straight: the ranks of the cards in increasing order are $x, x+1, x+2, x+3, x+4$ for some integer x.
6. Three of a kind: three of the cards have the same rank.
7. Two pair: two cards have the same rank and two other cards have the same rank.
8. One pair: two cards have the same rank.
9. High card: if a hand does not satisfy any other category.

Currently, Vera has two cards with ranks a_1, a_2 and suits b_1, b_2. Of the remaining cards, Vera will choose three more cards and form a hand with her two current cards. Compute the number of different hands formed in this way that belong in each category.

Input

Line 1 contains integers A and B $(5 \leq A \leq 25, 1 \leq B \leq 4)$.

Line 2 contains integers a_1, b_1, a_2, b_2 $(0 \leq a_1, a_2 \leq A-1, 0 \leq b_1, b_2 \leq B-1, (a_1, b_1) \neq (a_2, b_2))$.

Output

Print one line with nine integers, the number of different hands that belong in each category in increasing order of categories (from Straight flush to High card).

Sample Input 1

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5 2
1 0 3 1
```

Sample Output 1

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0 0 0 0 8 0 12 36 0
```

Sample Input 2

```
13 4
0 0 1 0
```

Sample Output 2

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1 2 18 164 63 308 792 7920 10332
```

Note

Let (a, b) denote a card with rank a and suit b.

For the first example, Vera currently has cards $(1, 0)$ and $(3, 1)$. If she chooses additional cards $(3, 0), (4, 0), (4, 1)$, her hand will be a Two pair as there are two cards with rank 3 and two other cards with rank 4. Note that this hand also satisfies being a One pair, but Two pair is the lower-numbered category.