

Heisenberg's Game

Problem Statement :



Skyler lied to Marie. A good plan it seemed, but it backfired to the amazement of Walter White, because now Marie wants to see Walter's prodigious gambling skills for herself.

Not knowing how to count cards either, Walt comes up with a game to fool Marie. Both the players, Walt and Marie get X cards at the start. Each card has its value printed on it. The game proceeds as each player chooses a random card and shows its value. The player having card with higher value wins. As Walter came up with this game, he wants to ensure his win. So he starts to increase the value of some cards using an algorithm. To increase the value of a card by 1, the running time of the algorithm is N seconds. Walter feels incapacitated at this moment to come up with a strategy, as he's preoccupied in dealing with the tantrums thrown by Jessie Pinkman.

Help him by finding the minimum running time of algorithm, ensuring his win and keeping his surreptitious identity intact.

Input Format

First line of input contains an integer T denoting the number of TestCases. It is followed by 3 lines of input for each testcase.

First line of Each testcase contains two Integers X and N .

Next two lines of each TestCase contains X integers, each denoting value of cards of Walt and Skyler respectively.

Constraints

$$1 \leq T \leq 100$$

$$1 \leq X \leq 10^5$$

$$1 \leq N \leq 20$$

$$0 \leq \text{value on every card} \leq 10^6$$

Output Format

Print a single line for each TestCase, running time of algorithm to ensure the win for Walt.

Sample Input 0

```
3
3 4
1 2 3
4 5 6
6 3
99 24 6 7 88 14
23 16 21 46 34 26
4 2
11 12 13 14
15 6 9 24
```

Sample Output 0

```
60
411
100
```

Explanation 0

In Test Case $T = 1$, both have $X = 3$ cards with time $N = 4$. Walt's cards are 1 2 3 and his opponent's cards are 4 5 6. In order to ensure a win, walt must convert his cards to 7 7 7. For this he takes the time $6*4=24$, $5*4=20$ and $4*4=16$, which in total is 60.

In Test Case $T = 2$, both have $X = 6$ cards with time $N = 3$. Walt's cards are 99 24 6 7 88 14 and his opponent's cards are 23 16 21 46 34 26. In order to ensure a win, walt must convert his cards to 99 47 47 47 88 47. For this he takes the time 0, $23*3=69$, $41*3=123$, $40*3=120$, 0 and $33*3=99$, which in total is 411.

Expected Solution :

```
for _ in range(int(input())):
    x,n=map(int,input().split())
    a=list(map(int,input().split()))
    b=list(map(int,input().split()))
    c=max(b)+1

    ans=0
    for e in a:
        if(c-e>0):
            ans+=c-e
    print(ans*n)
```