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Exercise Sheet 4

ACM Programming Challenges Lab

Exercise 1 – *Towers*

Assume that n maidens are sitting in n different 50m-high towers. The maidens have respective hair length $h_1, h_2, \ldots, h_n$, i.e., the i-th maiden has hair of length h_i (given in cm). There are m princes, of respctive heights $p_1, p_2, \ldots, p_m$ (also in cm).

The j-th prince is able to reach the i-th maiden if and only if $p_j \geq 5000 - h_i$. Only if this condition is satisfied, he is able to climb up into the tower room using the hair as rope.

Every maiden chooses one (and only one) prince among those able to reach them. Of course, no two maidens may choose the same prince. The maidens have asked you to write a program to determine if it is possible that every maiden gets a prince. If yes, the program should compute the maximum possible total height of the chosen princes.

Input The first line of the input contains the number of test cases $t \leq 50$. Every test case consists of a three lines. The first line specifies two integers $1 \leq n, m \leq 100000$. The second line contains n integers $h_1, \ldots, h_n$, separated by spaces. The third line contains m integers $p_1, \ldots, p_m$.

Output For every test case you should output (on a separate line) the total height of the princes in an optimal maiden/prince arrangement. If it is not possible for every maiden to get a prince, you should output "Impossible!".

Sample Input

```
3
3 5
4860 4866 4829
182 181 170 152 163
3 3
4868 4834 4827
170 164 193
3 3
4848 4848 4911
137 151 159
```

Sample Output

```
533
527
Impossible!
```