# Ishaan's Trouble

**Assignment 3**
Computer Programming

**Problem:**
Ishaan is the coach of IIIT's football team. He isn't sure about his team and thus wants to test them. Ishaan conducts an experiment where he takes N bins and tells each player to shoot in that bin. He gives points for each shot in the range (0-9). The final score is given by the concatenation of points in each bin. For eg: if there are three bins, if the first person has 2 points in first bin, second person has 5 points in second bin and third has 9 points in third bin. The final score is 259. We can see that for different values of N there exists various such scores.
Shubhankar, Ishaan's star player, on the other hand convinced Ishaan that a score is good only if there are more than 3 non-zero values in the score. Ishaan is now worried whether his score would be good or not and wants to know various possible scores that aren't good. Help Ishaan by calculating such scores for a given range (S1, S2).
Note: The first bin is always hit by Shubhankar and he never gets zero points for the first bin.

**Input**
First line contains an integer Q, number of Queries.
First line of each query contains 2 integers S1, S2.

First line contains an integer Q, number of Queries.
Print a number P. P is the number of not good scores S ($S1 <= S <= S2$).

**Constraints**
$1 <= Q <= 10000$
$1 <= N <= 18$
$S1 <= S2$

**Sample Test Case**

| Input | Output |
|---|---|
| 3<br>3 10<br>5 9<br>100 2000 | <br>8<br>5<br>1172 |

# Submatrix Sum

**Assignment 3**
Computer Programming

**Problem Statement:** Given an $N \times M$ matrix $A$, find the $n \times m$ submatrix in $A$ whose sum of elements is the highest of all the possible $n \times m$ submatrix in $A$

**Input**
The first line has 4 integers $N$,$M$,$n$ and $m$ denoting the number of rows and columns respectively. The next $N$ lines of input has $M$ space separated integers denoting the entries in the matrix.
**Output**
Print a single integer, the maximum possible sum achievable

**Constraints**
$1 \leq N, M \leq 1000$
$1 \leq n \leq N$
$1 \leq m \leq M$

**Sample Test Case**

| Input | Output |
|---|---|
| 4 4 2 2<br>1 2 3 4<br>5 6 7 8<br>9 10 11 12<br>13 14 15 16 | 54 |