**DESCRETE MATHEMATICS**

ASSIGNMENT 2

(LATE SUBMISSION)

**Question 1**

11,7

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0,0

Total number of paths to go from (0,0) to (11,7) by only going up and right

There are 18 steps total (11 right, 7 up), which can be traversed in any possible way.

Therefore, total number of ways = all possible combinations of 11 right steps and 7 up steps from a total of 18 steps, i.e.

Total ways = 18C7 =

Hence, there are 31,824 total possible ways.

**Question 2**

If in IPL there were 10 teams, each team would have a match with every other team twice in the league stages. Hence, there would be total 10 times 9 times 2 = 180 matches. But, this would have repetetions(each entry twice), therefore, we need to divide this number by 2. Hence, the total number of matches in league stages will be 180 / 2 = 90.

Finally, we have 4 other matches in the end (which are the qualifiers and eliminators). Hence the total number of matches adds up to 94.

Generalizing: let there be ‘n’ teams in an IPL tournament. Then the total number of matches will be

**Question 3:**

Case 1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 0 | 0 |

Case 2

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 |  |  |  |  |  |  |  |  |  |  |  |  |  | 1 | 1 |

Possible values in empty boxes = 2 (either 0 or 1)

Possible options in case 1:

Possible options in case 2:

Therefore, total = 4096 + 8192 = 12288