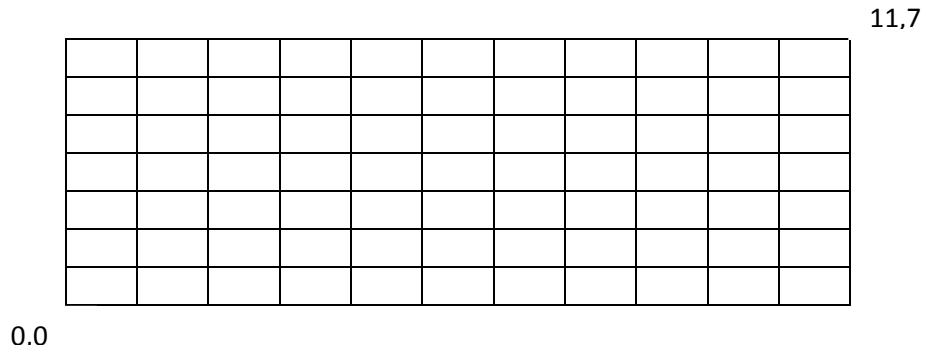


# DESCRETE MATHEMATICS

## ASSIGNMENT 2

(LATE SUBMISSION)

### Question 1



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.

$$\text{Total ways} = {}^{18}C_7 = \frac{18!}{11!7!} = 31824$$

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 repetitions(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

$$n * (n - 1) + 4$$

**Question 3:**

Case 1

1													0	0	0
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Case 2

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

Possible options in case 1:  $2^{16-4} = 2^{12} = 4096$

Possible options in case 2:  $2^{16-3} = 2^{13} = 8192$

Therefore, total =  $4096 + 8192 = 12288$