**PROBABILITY and STATISTICS**

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**ASSIGNMENT-1**

**Data Science Fall-21 Score:100**

**Question-1: It is required to seat 5 men and 4 women in a row so that the women occupy the even places. How many such arrangements are possible? (20 points)**

**Question-2: In a small village, there are 87 families, of which 52 families have at most 2 children. In a rural development program, 20 families are to be chosen for assistance, of which at least 18 families must have at most 2 children. In how many ways can the choice be made? (20 points)**

**Question-3: Two dies are thrown simultaneously and the sum of the numbers obtained is found to be 7. What is the probability that the number 3 has appeared at least once? (20 points)**

**Question-4**: There are 10 red and 20 blue balls in a box. A ball is chosen at random and it is noted whether it is red. The process repeats, returning the ball 10 times. Calculate the expected value and the standard deviation of this game. (**20 points)**

**Question-5:** It has been determined that 5% of drivers checked at a road stop show traces of alcohol and 10% of drivers checked do not wear seat belts. In addition, it has been observed that the two infractions are independent from one another. If an officer stops five drivers at random: (**20 points)**

1. Calculate the probability that exactly three of the drivers have committed any one of the two offenses. (**10points)**

2.Calculate the probability that at least one of the drivers checked has committed at least one of the two offenses. (**10 points)**