1. An industrial salesman wants to know average and variance number of units he sell per call. He checks his past records and comes up with the following probabilities.

Sales in units	0	1	2	3	4	5
Probability	0.15	0.20	0.10	0.05	0.30	0.20

   What is the average number of units he sells per sales call?
   Also calculate the variance.

2. Let X is the random variable which represents the total score when two dice are rolled once. Construct the probability distribution for X and find its 'Expected value'.

3. Let X is the random variable which represents the number of heads when 3 coins are tossed simultaneously. Construct the probability distribution for X and also calculates its 'Expected value' and 'Variance'.

4. The HR department of a company has records which show the following of its 200 engineers

AGE	BACHELOR'DEGREE	MASTER'S DEGREE	TOTAL
Under 30	90	10	100
30 to 40	20	30	50
Over 40	40	10	50
TOTAL	150	50	200

   If one engineer is selected at random from the company, find

   (i)   The probability he has only a bachelor's degree.

   (ii)   The probability he has a master's degree, given that he is over 40.

   (iii) The probability he is under 30, given that he has only bachelor's degree.

5. Two urns contain 4 white, 6 blue and 4 white, 5 blue balls .One urn is selected at random and a ball is drawn from it. Find the probability that the ball drawn is white.

6. The probabilities of X, Y and Z becoming managers are 4/9, 2/9 and 1/3 respectively. The probabilities that the bonus scheme will be introduced if X, Y and Z becoming managers are 3 /10, 1/ 2 and 4 / 5 respectively.

   (i)   What is the probability that the bonus scheme will be introduced?

   (ii)   If the bonus scheme has been introduced, what is the probability that the manager appointed was X?

7. A factory produces a certain types of output by three machines. The respectively daily production figures are:

   Machine X: 1500 units,   Machine Y: 3000 units,   Machine Z: 4500 units

   Past experience shows that 1.5% of the output produced by machine X, 2% of the output produced by machine Y and 2.2% of the output produced by machine Z is defective. An item is drawn at random and found to be defective. What is the probability that it comes from the output of machine Y?

8. Two urns contain 1 white, 6 red and 4 white, 3 red balls. One of the urns is selected at random and a ball is drawn from it. Find

   (i)   The probability of drawing a white ball.

   (ii)   The probability of drawing the ball from first urn if the ball drawn is white.

9. Assume that a factory has two machines. Past records shows that machine I produces 20% of the items of output and machine II produces 80% of the items. Further, 6% of the items produced by machine I were defective and only 1 % produced by machine II were defective. If a defective item is drawn at random. What is the probability that it was produced by machine I?

10. In 2000, there will be three candidates for the position of principal – C1 C2 and C3. The chances of their selection are in the proportion 4: 2:3 respectively. The probability that C1, if selected, will introduce co-education in the college is 0.3. The probabilities of C2 and C3 doing the same are respectively 0.5 and 0.8. What is the probability that there will be co-education in the college in 2000

    Also, find the probability than principal C2 introduces co-education in the college.

End of Tutorial