1. Define the Bayesian interpretation of probability.

Bayesian probability is an interpretation of the concept of probability, in which, instead of frequency or propensity of some phenomenon, probability is interpreted as reasonable expectation representing a state of knowledge or as quantification of a personal belief.

1. Define probability of a union of two events with equation.

P(A or B) = P(A) + P(B). The chance of any (one or more) of two or more events occurring is called the union of the events. The probability of the union of disjoint events is the sum of their individual probabilities.

1. What is joint probability? What is its formula?

Probabilities are combined using multiplication, therefore the joint probability of independent events is calculated as the probability of event A multiplied by the probability of event B. This can be stated formally as follows: Joint Probability: P(A and B) = P(A) \* P(B)What is chain rule of probability?

1. What is conditional probability means? What is the formula of it?

Conditional probability: p(A|B) is the probability of event A occurring, given that event B occurs. For example, given that you drew a red card, what's the probability that it's a four (p(four|red))=2/26=1/13. So out of the 26 red cards (given a red card), there are two fours so 2/26=1/13.

1. What are continuous random variables?

A random variable X is continuous if possible values comprise either a single interval on the number line or a union of disjoint intervals. Example: If in the study of the ecology of a lake, X, the r.v. may be depth measurements at randomly chosen locations.

1. What are Bernoulli distributions? What is the formula of it?

Bernoulli distribution is a discrete probability distribution where the Bernoulli random variable can have only 0 or 1 as the outcome. p is the probability of success and 1 - p is the probability of failure. The mean of a Bernoulli distribution is E[X] = p and the variance, Var[X] = p(1-p).

1. What is binomial distribution? What is the formula?

The binomial distribution is a probability distribution that summarizes the likelihood that a value will take one of two independent values under a given set of parameters or assumptions.

P(x) = nCx · px (1 − p)n−x

1. What is Poisson distribution? What is the formula?

The Poisson Distribution formula is: P(x; μ) = (e-μ) (μx) / x! Let's say that that x (as in the prime counting function is a very big number, like x = 10100. If you choose a random number that's less than or equal to x, the probability of that number being prime is about 0.43 percent.

1. Define covariance.

Covariance is a measure of the relationship between two random variables, in statistics. The covariance indicates the relation between the two variables and helps to know if the two variables vary together. In the covariance formula, the covariance between two random variables X and Y can be denoted as Cov(X, Y).

1. Define correlation

Ans. Correlation refers to a process for establishing the relationships between two variables.

1. Define sampling with replacement. Give example.

When a sampling unit is drawn from a finite population and is returned to that population, after its characteristic(s) have been recorded, before the next unit is drawn, the sampling is said to be “with replacement”. In the contrary case the sampling is “without replacement”.

1. What is sampling without replacement? Give example.

When we sample without replacement, the items in the sample are dependent because the outcome of one random draw is affected by the previous draw. For example, the probability of choosing the name Tyler is 1/5 on the first draw and the probability of choosing the name Ando is 1/4 on the second draw.

1. What is hypothesis? Give example.

Hypotheses are usually written as if/then statements, such as if someone eats a lot of sugar, then they will develop cavities in their teeth. These statements identify specific variables (in this case, eating a large amount of sugar) and propose a result (in this case, teeth developing cavities).