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| 1 | Define the Bayesian interpretation of probability. |
| Ans. | Bayesian probability is the study of subjective probabilities or belief in an outcome, compared to the frequentist approach where probabilities are based purely on the past occurrence of the event. A Bayesian Network captures the joint probabilities of the events represented by the model. |
| 2 | Define the probability of a union of two events with the equation. |
| Ans. | The general probability addition rule for the union of two events states that P(A∪B)=P(A)+P(B)−P(A∩B), where A∩B is the intersection of the two sets. |
| 3 | What is joint probability? What is its formula? |
| Ans. | 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) |
| 4 | What is the chain rule of probability? |
| Ans. | The chain rule, or general product rule, calculates any component of the joint distribution of a set of random variables using only conditional probabilities. This probability theory is used as a foundation for backpropagation and in creating Bayesian networks. |
| 5 | What is conditional probability means? What is the formula for it? |
| Ans. | Conditional probability is defined as the likelihood of an event or outcome occurring, based on the occurrence of a previous event or outcome.  Conditional probability is calculated by multiplying the probability of the preceding event by the updated probability of the succeeding, or conditional, event.  Let's take a real-life example. The probability of selling a TV on a given normal day may be only be 30%. But if we consider that the given day is Diwali, then there are much more chances of selling a TV. The conditional Probability of selling a TV on a day given that Day is Diwali might be 70%.  **P(A|B) = N(A∩B)/N(B)**  **Or**  **P(B|A) = N(A∩B)/N(A)** |
| 6 | What are continuous random variables? |
| Ans. | A continuous random variable X takes all values in a given interval of numbers.   * The probability distribution of a continuous random variable is shown by a density curve. * The probability that X is between an interval of numbers is the area under the density curve between the interval endpoints. |
| 7 | What are Bernoulli distributions? What is the formula for it? |
| Ans. | Bernoulli distribution is a discrete probability distribution for a Bernoulli trial — a random experiment that has only two outcomes (usually called a Succes or a Failure). The expected value for a random variable, X. For a Bernoulli distribution is: E[X] = p. For example, if p = 0.04, then E[X] = 0.4 |
| 8 | What is binomial distribution? What is the formula? |
| Ans. | The binomial is a type of distribution that has two possible outcomes (the prefix “bi” means two, or twice). For example, a coin toss has only two possible outcomes: heads or tails, and taking a test could have two possible outcomes: pass or fail.  A Binomial Distribution shows either (S)uccess or (F)ailure. |
| 9 | What is Poisson distribution? What is the formula? |
| Ans. | A Poisson distribution is defined as a discrete frequency distribution that gives the probability of the number of independent events that occur in the fixed time.  In statistics, a Poisson distribution is a probability distribution that is used to show how many times an event is likely to occur over a specified period. ... The Poisson distribution is a discrete function, meaning that the variable can only take specific values in a (potentially infinite) list. |
| 10 | Define covariance. |
| Ans. | Covariance is a measure of how much two random variables vary together. It's similar to variance, but where variance tells you how a single variable varies, covariance tells you how two variables vary together. |
| 11 | Define correlation |
| Ans. | Correlation explains how one or more variables are related to each other. These variables can be input data features that have been used to forecast our target variable. It's a bi-variate analysis measure that describes the association between different variables. |
| 12 | Define sampling with replacement. Give example. |
| Ans. | If you sample with replacement, you would choose one person's name, put that person's name back in the hat, and then choose another name. The possibilities for your two-name sample are John, John. John, Jack. |
| 13 | What is sampling without replacement? Give example. |
| Ans. | In sampling without replacement, each sample unit of the population has only one chance to be selected in the sample. For example, if one draws a simple random sample such that no unit occurs more than one time in the sample, the sample is drawn without replacement. |
| 14 | What is the hypothesis? Give example. |
| Ans. | A hypothesis (plural hypotheses) is a proposed explanation for a phenomenon. For a hypothesis to be a scientific hypothesis, the scientific method requires that one can test it. ... Even though the words "hypothesis" and "theory" are often used synonymously, a scientific hypothesis is not the same as a scientific theory.  Examples of hypothesis statements: If garlic repels fleas, then a dog that is given garlic every day will not get fleas. Bacterial growth may be affected by moisture levels in the air. If sugar causes cavities, then people who eat a lot of candy may be more prone to cavities. |