▾ 1. What is prior probability? Give an example.

Answer:---->Prior probability, in Bayesian statistics, is the probability of an event before new data is collected. This is the best rational assessment of the probability of an outcome based on the current knowledge before an experiment is performed. Prior probability can be compared with posterior probability.A posterior probability is the probability of assigning observations to groups given the data. A prior probability is the probability that an observation will fall into a group before you collect the data.Prior Probability. Prior Probability is the probability of occurring an event before the collection of new data. It is the best logical evaluation of the probability of an outcome which is based on the present knowledge of the event before the inspection is performed.

▾ 2. What is posterior probability? Give an example.

Answer--->A posterior probability, in Bayesian statistics, is the revised or updated probability of an event occurring after taking into consideration new information. The posterior probability is calculated by updating the prior probability using Bayes' theorem. The posterior probability refers to the updated probability of an event obtained by applying the new evidence formed. ... The formula for calculations is $P(A|B)$ = $P(B|A)*P(A)/P(B)$ The important elements are prior probability $P(A)$, evidence $P(B)$, $P(B|A)$ is the likelihood function.Posterior probability = prior probability + new evidence (called likelihood). For example, historical data suggests that around 60% of students who start college will graduate within 6 years.

▾ 3. What is likelihood probability? Give an example.

Answer:-->Likelihood function is a fundamental concept in statistical inference. It indicates how likely a particular population is to produce an observed sample. Let $P(X; T)$ be the distribution of a random vector X, where T is the vector of parameters of the distribution.Thus the likelihood principle implies that likelihood function can be used to compare the plausibility of various parameter values. For example, if $L(\theta2|x)=2L(\theta1|x)$ and $L(\theta|x) \propto L(\theta|y) \forall \theta$, then $L(\theta2|y)=2L(\theta1|y)$. Therefore, whether we observed x or y we would come to the conclusion that $\theta2$ is twice as plausible as $\theta1$.

▾ 4. What is Naïve Bayes classifier? Why is it named so?

aNSWER:-->Naive Bayes is called naive because it assumes that each input variable is independent. This is a strong assumption and unrealistic for real data; however, the technique is very effective on a large range of complex problems.Naive Bayes classifiers are a collection of classification algorithms based on Bayes' Theorem. It is not a single algorithm but a family of algorithms where all of them share a common principle, i.e. every pair of features being classified is independent of each other.The Naive Bayes classifier works on the principle of conditional probability, as given by the Bayes theorem. While calculating the math on probability, we usually denote probability as P. Some of the probabilities in this event would be as follows: The probability of getting two heads = 1/4.

▾ 5. What is optimal Bayes classifier?

Answer:---.Bayes Optimal Classifier is a probabilistic model that finds the most probable prediction using the training data and space of hypotheses to make a prediction for a new data instance.It can be shown that of all classifiers, the Optimal Bayes classifier is the one that will have the lowest probability of miss classifying an observation, i.e. the lowest probability of error. So if we know the posterior distribution, then using the Bayes classifier is as good as it gets.Optimal classification refers to any method of classification, which inexclusively minimizes the number of queries necessary to identify a particular element within a bounded class

▾ 6. Write any two features of Bayesian learning methods.

Answer:-->Bayesian methods aid in understanding other learning algorithms. Training examples have an incremental effect on estimated probabilities of hypothesis correctness. Prior knowledge and observed data combined to determine probabilities of hypotheses. Hypotheses can make probabilistic predictions.Generally speaking, the goal of Bayesian ML is to estimate the posterior distribution ($p(\theta|x)$p(θ|x)) given the likelihood ($p(x|\theta)$p(x|θ)) and the prior distribution, $p(\theta)$p(θ). The likelihood is something that can be estimated from the training data.There are two components involved in learning a Bayesian network: (i) structure learning, which involves discovering the DAG that best describes the causal relationships in the data, and (ii) parameter learning, which involves learning about the conditional probability distributions.

▾ 7. Define the concept of consistent learners.

Answer:-->Learning can be viewed as a search through the space of all sentences in a concept description language for a sentence that best describes the data. Alternatively, it can be viewed as a search through all hypotheses in a hypothesis space.Learning is "a process that leads to change, which occurs as a result of experience and increases the potential for improved performance and future learning" (Ambrose et al, 2010, p. 3). The change in the learner may happen at the level of knowledge, attitude or behavior.Three concepts or types of learning, in the science classroom particularly, are the inquiry-based approach, the activity-based approach and the learning cycle

▾ 8. Write any two strengths of Bayes classifier.

Answer:-->This algorithm works very fast and can easily predict the class of a test dataset. You can use it to solve multi-class prediction problems as it's quite useful with them. Naive Bayes classifier performs better than other models with less training data if the assumption of independence of features holds.Naive Bayes classifier algorithm gives the best type of results as desired compared to other algorithms like classification algorithms like Logistic Regression, Tree-Based Algorithms, Support Vector Machines.Descriptive Classifier. Descriptive classifiers are used to describe shape, size, texture, or a pattern of a noun. ... Instrument Classifier. The handshapes of instrument classifiers describe how an object is handled. ... Element Classifiers.

▾ 9. Write any two weaknesses of Bayes classifier.

Answer:-->The greatest weakness of the naïve Bayes classifier is that it relies on an often-faulty assumption of equally important and independent features which results in biased posterior probabilities. Although this assumption is rarely met, in practice, this algorithm works surprisingly well.Naive Bayes is the assumption of independent predictor features. Naive Bayes implicitly assumes that all the attributes are mutually independent. In real life, it's almost impossible that we get a set of predictors that are completely independent or one another.The most significant disadvantage is that there is no universally acknowledged method for constructing networks from data. There have been many developments in this regard, but there hasn't been a conqueror in a long time. The design of Bayesian Networks is hard to make compared to other networks

10. Explain how Naïve Bayes classifier is used for

11. Text classification

12. Spam filtering

13. Market sentiment analysis

Answer:--->1.

1. Text classification--->Text classification also known as text tagging or text categorization is the process of categorizing text into organized groups. By using Natural Language Processing (NLP), text classifiers can automatically analyze text and then assign a set of

pre-defined tags or categories based on its content.Classifying large textual data helps in standardizing the platform, make search easier and relevant, and improves user experience by simplifying navigation. Remarkably, machine intelligence and deep learning are planting roots at most unimaginable and orthodox areas as well.

2.Spam filtering--->A spam filter is a program used to detect unsolicited, unwanted and virus-infected emails and prevent those messages from getting to a user's inbox. Like other types of filtering programs, a spam filter looks for specific criteria on which to base its judgmentsAs described above, email filtering works by analyzing incoming emails for red flags that signal spam or phishing content and then automatically moving those emails to a separate folder. Spam filters use multiple criteria to assess an incoming email.Implementing spam filtering is extremely important for any organization. Not only does spam filtering help keep garbage out of email inboxes, it helps with the quality of life of business emails because they run smoothly and are only used for their desired purpose.

3.Market sentiment analysis--->Market sentiment refers to the overall attitude of investors toward a particular security or financial market. It is the feeling or tone of a market, or its crowd psychology, as revealed through the activity and price movement of the securities traded in that market.