1. What is prior probability? Give an example.

Prior probability shows the likelihood of an outcome in a given dataset. For example, in the mortgage case, P(Y|X) is called the conditional probability, which provides the probability of an outcome given the evidence, that is, when the value of X is known

2. What is posterior probability? Give an example.

Posterior probability is a revised probability that takes into account new available information. For example, let there be two urns, urn A having 5 black balls and 10 red balls and urn B having 10 black balls and 5 red balls. Now if an urn is selected at random, the probability that urn A is chosen is 0.5.

3. What is likelihood probability? Give an example.

If we flip the coin one time, the probability that it will land on heads is 0.5. Now suppose we flip the coin 100 times and it only lands on heads 17 times. We would say that the likelihood that the coin is fair is quite low. If the coin was actually fair, we would expect it to land on heads much more often

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

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.

5. What is optimal Bayes classifier?

Bayes Optimal Classifier is a probabilistic framework that finds the most probable prediction using the training data and space of hypotheses to make a prediction for a new data instance

6. Write any two features of Bayesian learning methods.

In Bayesian learning, prior knowledge is provided by asserting (1) a prior probability for each candidate hypothesis, and (2) a probability distribution over observed data for each possible hypothesis

7. Define the concept of consistent learners.

Consistent Learners. • A learner L using a hypothesis H and training data D is said to be a consistent learner if it always outputs a hypothesis with zero error on D whenever H contains such a hypothesis. • By definition, a consistent learner must produce a hypothesis in the version space for H given D

8. Write any two strengths of Bayes classifier.

* It is simple and easy to implement.
* It doesn't require as much training data.
* It handles both continuous and discrete data.
* It is highly scalable with the number of predictors and data points.
* It is fast and can be used to make real-time predictions.

9. Write any two weaknesses of Bayes classifier.

* If your test data set has a categorical variable of a category that wasn't present in the training data set, the Naive Bayes model will assign it zero probability and won't be able to make any predictions
* This algorithm is also notorious as a lousy estimator.

10. Explain how Naïve Bayes classifier is used for

1. Text classification

Text classification is a machine learning technique that assigns a set of predefined categories to open-ended text. Text classifiers can be used to organize, structure, and categorize pretty much any kind of text – from documents, medical studies and files, and all over the web.

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 judgments.

3. Market sentiment analysis

An investor can use market sentiment analysis to determine whether the market is driven by feelings and emotions or by rational decision-making. Market sentiment analysis is considered valuable as it can help you determine the opinion of investors