**1.What is the difference between simple linear regression and multiple linear regression?**

Linear regression has one independent variable impacting the slope of relationship. It has one X and one Y variable.

Multiple regression is broader class regression that encompasses linear and non linear regression. It has a one Y and two or more X.

**2.Explain the concept of the cost function in linear regression.**

Cost function quantifies the error between predicted and expected values and presents that error in the form of a single real number

**3.How do you interpret the coefficients in a linear regression model?**

Positive coefficient indicates that value of the independent variable increases, mean if dependent variable also tends to increase.

**4.What are the assumptions of linear regression?**

Independence, Linearity, Homoscedasticity, normality, No endogeneity, No multicollinearity

**1.How does logistic regression differ from linear regression?**

Linear regression gives continuous output, but logistic regression gives discreet output

**2.Explain the sigmoid function and its role in logistic regression.**

Sigmoid function used to predict the probability of a binary variable.

**3.What are the key performance metrics used to evaluate a logistic regression model?**

Accuracy score is we can evaluate the regression model..

**4.How do you handle multicollinearity in logistic regression?**

By recognizing the collinearity drop one or more of the variable from model and interpret the regression model.

**1.What is the Naive Bayes algorithm based on?**

It is based on NLP problems. Naïve Bayes is a probabilities ML algorithm based on the bayes used on wide variety of classification.

**2.Explain the concept of conditional probability in the context of Naive Bayes.**

Calculating by multiplying the probability of the preeding event by the updated probabi;ity of the succeeding event.

**3.What are the advantages and disadvantages of Naive Bayes?**

Advantage is that, it’s simplicity and efficient

And disadvantage is the assumption of independence between features.

**4.How does Naive Bayes handle missing values and categorical features?**

NBI is used to missing values by replacing the attribute information according to the probability estimate.

**1.How does a decision tree make decisions?**

It works on recursively spitting the data into subset based on the most significant feature at each node of the tree.

**2.What are the main criteria for splitting nodes in a decision tree?**

It uses entropy and information gain to select feature which gives the best split.

**3.How do decision trees handle categorical variables?**

Decision tree can handel bith categorical and numerical features, they may require different splitting stratergy for each type.

**4.What are some common techniques to prevent overfitting in decision trees?**

Feature selection, regularization, train with data etc.

**1.What is the basic idea behind SVM?\**

To transfor the input data into a higher dimensional feature space. It makes it easier to find a linear separation or more effective classify data set.

**2.Explain the concepts of margin and support vectors in SVM.**

Margin is distance between the hyperplane and observation closest to the hyperplane .

Support vectors are points are closest to the hyperplane , separating line wil define with help of these data points.

**3.What are the different kernel functions used in SVM, and when would you use each?**

Linear kernel, polynomial kernel, gaussian kernel, exponential kernel etc

**4.How does SVM handle outliers?**

SVM handels out;iers very well by letting support vector machine to cut some slack.