1)What is Elastic Net Regression and how does it differ from other regression techniques?

Ans- Elastic net regression is a linear regression technique that uses a penalty term to shrink the coefficients of the predictors. The penalty term is a combination of the l1-norm (absolute value) and the l2-norm (square) of the coefficients, weighted by a parameter called alpha.

Elastic net linear regression uses the penalties from both the lasso and ridge techniques to regularize regression models. The technique combines both the lasso and ridge regression methods by learning from their shortcomings to improve the regularization of statistical models.

2) How do you choose the optimal values of the regularization parameters for Elastic Net Regression?

Ans- Import the data and use scikit-learn to split into train-val-test (60-20-20)

Estimate and validate the OLS regression with all inputs.

Search for the best ridge model.

References.

3) What are the advantages and disadvantages of Elastic Net Regression?

Ans- The advantage of the elastic net is that it keeps the feature selection quality from the lasso penalty as well as the effectiveness of the ridge penalty. And it deals with highly correlated variables more effectively.

disadvantage of the classical elastic net is that the sequential cross-validation procedure used to determine the penalty parameters results in overshrinkage of the coefficients.

4) What are some common use cases for Elastic Net Regression?

Ans- Elastic net linear regression uses the penalties from both the lasso and ridge techniques to regularize regression models. The technique combines both the lasso and ridge regression methods by learning from their shortcomings to improve the regularization of statistical models.

5) How do you interpret the coefficients in Elastic Net Regression?

Ans- A positive coefficient indicates that as the value of the independent variable increases, the mean of the dependent variable also tends to increase. A negative coefficient suggests that as the independent variable increases, the dependent variable tends to decrease.

6) How do you handle missing values when using Elastic Net Regression?

Ans- One way of handling missing values is the deletion of the rows or columns having null values. If any columns have more than half of the values as null then you can drop the entire column. In the same way, rows can also be dropped if having one or more columns values as null.

7) How do you use Elastic Net Regression for feature selection?

Ans- LASSO and ELASTIC NET both perform feature selection and that's their whole purpose, so yes you can use them for this. You don't need to select top n features, since you can play with the arguments α and λ to get an arbitrary number of non-negative coefficients.

8) How do you pickle and unpickle a trained Elastic Net Regression model in Python?

Ans- # evaluate an elastic net model on the dataset

from numpy import mean

from numpy import std

from numpy import absolute

from pandas import read\_csv

from sklearn.model\_selection import cross\_val\_score

from sklearn.model\_selection import RepeatedKFold

from sklearn.linear\_model import ElasticNet

# load the dataset

url = 'https://raw.githubusercontent.com/jbrownlee/Datasets/master/housing.csv'

dataframe = read\_csv(url, header=None)

data = dataframe.values

X, y = data[:, :-1], data[:, -1]

# define model

model = ElasticNet(alpha=1.0, l1\_ratio=0.5)

# define model evaluation method

cv = RepeatedKFold(n\_splits=10, n\_repeats=3, random\_state=1)

# evaluate model

scores = cross\_val\_score(model, X, y, scoring='neg\_mean\_absolute\_error', cv=cv, n\_jobs=-1)

# force scores to be positive

scores = absolute(scores)

print('Mean MAE: %.3f (%.3f)' % (mean(scores), std(scores)))

9) What is the purpose of pickling a model in machine learning?

Ans- Pickle is a useful Python tool that allows you to save your ML models, to minimise lengthy re-training and allow you to share, commit, and re-load pre-trained machine learning models. Most data scientists working in ML will use Pickle or Joblib to save their ML model for future use.