MACHINE LEARNING

1. Which of the following methods do we use to find the best fit line for data in Linear Regression?
A) Least Square Error B) Maximum Likelihood
C) Logarithmic Loss D) Both A and B

Ans- Option- A) Least Square Error

2. Which of the following statement is true about outliers in linear regression?
A) Linear regression is sensitive to outliers B) linear regression is not sensitive to outliers
C) Can't say D) none of these

Ans- Option- A) Linear regression is sensitive to outliers

3. A line falls from left to right if a slope is _____?
A) Positive B) Negative
C) Zero D) Undefined

Ans- Option- B)Negative

4. Which of the following will have symmetric relation between dependent variable and independent variable?
A) Regression B) Correlation
C) Both of them D) None of these

Ans- Option- A) Regression

5. Which of the following is the reason for over fitting condition?
A) High bias and high variance B) Low bias and low variance
C) Low bias and high variance D) none of these

Ans- Option-C) Low bias and high variance

6. If output involves label then that model is called as:
A) Descriptive model B) Predictive modal
C) Reinforcement learning D) All of the above

Ans- Option- B) Predictive modal

7. Lasso and Ridge regression techniques belong to _____?
A) Cross validation B) Removing outliers
C) SMOTE D) Regularization

Ans- Option- D) Regularization

8. To overcome with imbalance dataset which technique can be used?
A) Cross validation B) Regularization
C) Kernel D) SMOTE

Ans- Option- B) Regularization

9. The AUC Receiver Operator Characteristic (AUCROC) curve is an evaluation metric for binary classification problems. It uses _____ to make graph?
A) TPR and FPR B) Sensitivity and precision
C) Sensitivity and Specificity D) Recall and precision

Ans- Option-

10. In AUC Receiver Operator Characteristic (AUCROC) curve for the better model area under the curve should be less.
A) True B) False

Ans- Option- A) True

11. Pick the feature extraction from below:
A) Construction bag of words from a email
B) Apply PCA to project high dimensional data
C) Removing stop words
D) Forward selection

Option- B) Apply PCA to project high dimensional data

12. Which of the following is true about Normal Equation used to compute the coefficient of the Linear Regression?
A) We don't have to choose the learning rate.
B) It becomes slow when number of features is very large.
C) We need to iterate.
D) It does not make use of dependent variable

Ans- Option- A), B),D).

13. Explain the term regularization?

Ans- Regularization is like the gentle nudge that keeps our machine learning models in line, preventing them from going off the rails and overfitting. But what exactly does that mean? Well, picture this: you've got a model that's acing its tests, but when you throw some new data its way, it falters. It's like a student who's memorized the textbook but can't think on their feet in the exam. That's overfitting in a nutshell – the model has gotten too cozy with the training data and struggles when faced with the real world.

Now, enter regularization, our trusty tool to keep things balanced. It's all about finding that sweet spot between accuracy and generalization. You see, while we want our model to be accurate, we also want it to be able to handle new situations with grace – that's where generalization comes in. Think of it as teaching a kid to ride a bike not just on one street but on any street. Regularization helps our model become that adaptable bike rider.

So, how does it work? Well, imagine our model as a big equation with lots of variables – those are our features. Regularization steps in and says, "Hey, let's not get too carried away with any one variable." It's like having a coach who reminds you to stay balanced and not lean too far to one side.

But how does it do that? By dialing down the magnitude of those variables. It's like turning down the volume on the features, so no single one drowns out the others. That way, our model doesn't become too fixated on any particular feature, keeping its focus broad and adaptable.

But here's the clever bit: even though we're toning down the features, we're not kicking any of them out of the equation. It's like rearranging the seating plan at a dinner party – everyone's still invited, but no one's hogging the spotlight. This way, we maintain the richness of our model while ensuring it doesn't get too hung up on minor details.

Now, there are different flavors of regularization – like Lasso and Ridge – each with its own way of nudging those variables back into line. Lasso, for instance, has a knack for zeroing in on the most important features, like a spotlight shining on the main act. Meanwhile, Ridge prefers to gently rein in all the variables, making sure no one gets too carried away. It's like having two different styles of coaches – one who's all about tough love and the other who's more laid-back.

But no matter the flavor, the goal remains the same: to strike that delicate balance between accuracy and adaptability. It's like walking a tightrope – one wrong step, and our model could tumble into overfitting or underfitting territory. Regularization helps us find our footing and stay steady, no matter what challenges come our way.

So, the next time you're training a model, remember the power of regularization. It's not just about crunching numbers – it's about finding harmony in complexity, ensuring our models are not just accurate but also resilient in the face of the unknown. It's the secret sauce that turns a good model into a great one, capable of navigating the twists and turns of real-world data with confidence.

14. Which particular algorithms are used for regularization?

Ans- 1. **L1 Regularization (Lasso)**: Imagine you're trying to fit a line to some data points, but you want to keep things simple. L1 regularization helps by making some parts of the line zero, which means it's like saying some features or factors don't matter much.

2. **L2 Regularization (Ridge):** Similar to L1, but instead of making things exactly zero, L2 just makes them very small. It's like saying all features matter, but some matter less than others.

3. **Elastic Net**: This one is like a mix of L1 and L2. It's good when you want to both choose only important features and make them small.

4. **Dropout**: Imagine training a team of players for a game, but during practice, you randomly send some players home. This helps prevent the team from relying too much on any one player.

5. **Early Stopping**: You're learning something new, but instead of studying until you're tired, you stop just before you start forgetting things. In machine learning, you stop training your model when it's learned enough to avoid forgetting what it's learned before.

6. **Data Augmentation**: Think of it as adding more examples to your homework by slightly changing the questions. It helps you learn better because you've seen more variations of the same thing.

15. Explain the term error present in linear regression equation?

Ans- In a linear regression equation, the "error" is the difference between the actual values of the data points and the values predicted by the regression line.

Imagine you're trying to predict people's heights based on their ages. You collect some data and draw a line that represents the trend - taller people as they get older. But not everyone fits perfectly on that line. Some people might be taller or shorter than predicted by the line.

The "error" is the difference between where someone actually is on the height scale and where the line predicts they should be based on their age. We use these errors to adjust the line to fit the data better. The goal is to minimize these errors, so our line can make better predictions.