SUPERVISED LEARNING - TEST 1 (20 to 30 mins)

15-Question Test on Linear Regression, Gradient Descent, Bias & Variance

Topics:

 Linear Regression:

 Gradient Descent:

 Bias & Variance:



Section 1: Linear Regression

Q1. What is Linear Regression?   
Answer: Linear regression is a type of supervised Machine Learning which is used to predict the continuous values. It assumes linear relationship between feature and target variable.

Q2. Write the formula for simple linear regression. Answer: y = mx+c

Q3. What is the purpose of the cost function in linear regression? Answer: Cost function is used to get the errors made by the model.

Q4. How do you interpret the coefficients in a multiple linear regression model?

Answer:

Q5. What are the assumptions of Linear Regression? Answer: It assumes data to follow linear pattern.



Section 2: Gradient Descent

Q6. What is Gradient Descent?

Answer: Gradient descent is an optimization algorithm to find minimum value for m,c.

Q7. Write the formula for parameter update in Gradient Descent. Answer:

Q8. What is the role of the learning rate in Gradient Descent? Answer:



Q9. What is the primary purpose of regularization in machine learning models?

A) To increase the complexity of the model to fit the training data better.

B) To minimize the training error without regard to generalization.

C) To prevent overfitting by penalizing large coefficients in the model.

D) To ensure that all features are included in the final model regardless of their importance.

Q10. What happens if the learning rate is too small or too large? Answer: GD will not converge leading to exploding or vanishing GD.



Section 3: Bias & Variance

Q11. Define Bias and Variance in the context of machine learning models. Answer:

Bias : It is difference between predicted value and expected value.

Variance : Variance defines how model behaves with unseen data.

Q12. What is the Bias-Variance tradeoff?

Answer:

Q13. How does increasing the complexity of a model affect bias and variance?

Answer: It will increase bias and decrease variance leading model to overfit.

Q14. What is underfitting and overfitting in machine learning? Answer: Underfitting : Training and testing accuracy of a model is less.

Overfitting : Training accuracy of model is high but test accuracy is less.

Q15. How can you reduce overfitting in a model? Answer: We can use regularization method along with feature engineering to reduce overfitting of a model.