Linear Regression

Practice: Theoretical Questions

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Question 1

In linear regression, X is the independent variable with Y being the dependent variable.

- True
- False

Question 2

In linear regression, the value of what shows the point where the estimated regression crosses the y axis?

- f
- b_0
- y
- b_1

Question 3

Why do we need regularisation?

- To penalise the model
- To avoid overfitting
- To generate better or unseen data
- All of the above

Question 4

Which of the following corresponds to the equation of LASSO?

- $\frac{1}{n}\Sigma_{i=1}^{n}|y_i - \hat{y}|^2 + \lambda\Sigma_{j=1}^{J}|\beta_j|$
- $\frac{1}{n}\Sigma_{i=1}^{n}|y_i - \hat{y}|$
- $\frac{1}{n}\Sigma_{i=1}^{n}|y_i - \hat{y}|^2 - \lambda\Sigma_{j=1}^{J}|\beta_j|$
- $\frac{1}{n}\Sigma_{i=1}^{n}|y_i - \hat{y}|^2 \times \lambda\Sigma_{j=1}^{J}|\beta_j|$

Question 5

Minimising the MSE is equivalent to Maximum Likelihood Estimator for Linear Regression

- True
- False

Question 6

Following our example with a Housing dataset to implement a linear regression model to predict house price. Given a date feature in our dataset, how can we feature engineer it to assist our model in better predicting the house price?

- Ensure the date column is in string data type
- Ensure the date column is in DateTime format
- Drop the date column completely
- Extract year, month, day as separate columns

Question 7

Why do we square the errors in linear regression loss function instead of taking the absolute value?

- Because in ML, the bigger the better
- Because squaring ensures we account for all values and edge cases
- Because x^2 is differentiable compared to the non differentiable $|x|$ at $x = 0$
- None of the above

Question 8

Undercutting occurs when a model can’t accurately capture the dependencies among data, usually as a consequence of its own simplicity.

- True
- False

Question 9

Overfitting happens when a model learns both data dependencies and random fluctuations, meaning that the model learns the data too well.

- True
- False

Question 10

What can be said about an overfitting model with respect to bias and variance?

- High bias and High variance
- High bias and Low variance
- Low bias and High variance
- Low bias and Low variance

Thank You!