Machine Learning Answers

1. Option A
2. Option A
3. Option B
4. Option C
5. Option C
6. Option B
7. Option D
8. Option D
9. Option A
10. Option B
11. Option B
12. Option A , B and D

13. **Regularization**

When we use regression models to train some data , there is a good chance that the model will overfit the given training data set. Regularization helps sort this overfiiting problem by restricting the degrees of freedom of a given equation i.e. simply reducing the number of degrees of a polynomial function by reducing their corresponding weights.

In a Linear equation , we do not want huge weights/coefficients as a small change in weights can make a large difference for the dependent variable. So regularization constraints the weights of such features to avoid overfitting.

To regularize the model a shrinkage penalty is added to the cost function. Let's see different types of regularizations in regression.

a. <u>LASSO (Least Absolute Shrinkage and Selection Operator) Regression (L1 form)</u>

LASSO regression penalizes the model based on the sum of magnitude of the coefficients .
LASSO check each feature with the label whether there is a relationship between them or not , if not then it will give 0 importance to that feature and will never consider it to predict the label.

b. <u>Ridge Regression (L2 form)</u>

Ridge regression penalizes the model based on the sum of squares of magnitude of the coefficients . It does the same thing as LASSO but instead of 0 it will give some or very less importance to that feature.

14. The Algorithms used for regularization are

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15. **Error term present in linear regression equation**

An error term is a residual variable produced by a statistical or mathematical model, which is created when the model does not fully represent the actual relationship between the independent variables and the dependent variables.

The error term is also known as the residual, disturbance, or remainder term and it is represented by 'e' in the equation.

An error term represents the margin of error within a statistical model .It refers to the sum of the deviations within the regression line, which provides an explanation for the difference between the theoretical value of the model and the actual observed results. The regression line is used as a point of analysis when attempting to determine the correlation between one independent variable and one dependent variable.