

MACHINE LEARNING

Ans1- R-squared is better measure than RSS in terms of determining goodness of fit model in regression, as it provides overall measure of variance in that dependent variable which is given by that model and R-squared is standard measure which ranges from 0 to 1 which makes it so comfortable to compare different models.

Ans2- Total sum of square- It is total variability in dependent variable around its mean.

Explained sum of squares- It is variability in dependent value explained by regression model.

Residual Sum of squares- It is unexplained variability in the dependent variable that left after fitting the regression model.

$$TSS = ESS + RSS$$

Ans3- Regularization in machine learning is used to properly fit a model into our test set, it lowers the chances of overfitting and helps us to get perfect model.

Ans4- It is the measurement to build decision making trees to determine how the features of the dataset should split nodes to form the tree.

Ans5- Yes the unregularized decision-trees are prone to overfitting because of lack of regularization and high variance the unregularized decision-trees are prone to overfitting.

Ans6- Ensemble technique is a technique in machine learning that enhances accuracy in forecasting by merging predictions from multiple models. It eliminates errors that may exist in that particular model.

Ans7- Bagging: . Bagging attempts to tackle the over-fitting issue.

- . If classifier is high variance, then bagging applied
- . Each model is made independently

Boosting: . Boosting reduces bias

- . If the classifier is steady then we apply boosting

Ans9- K-fold cross-validation is used for evaluating models and their validation when their dataset size is limited. In this dataset partitioned into k-folds.

Ans12- We cannot use logistic regression for classification of non-linear data because it is linear classification algorithm and works when decision boundary between classes is linear

Ans13- Gradient boosting: .It identifies complex observations by huge residuals calculated in prior iterations.

.Classifiers are weighted precisely and their prediction capacity is constrained to learning rate and increasing accuracy.

.It develops a tree with the help of previous classifier residuals by capturing variances in data.

Adaboost: .It is made by up weighting the observations that are miscalculated prior

.Classifier has different weight assumptions to its final prediction that depend on the performance

.It gives values to classifiers by observing determined variance with data.

Ans14- Bias-variance tradeoff is the relationship between model complexity, the accuracy of its predictions, and how good it can make predictions on previously unseen data that were not used to train the model.

Ans15- Polynomial kernel: It is used to capture non-linear relationships by mapping the input feature into a higher-dimensional space

RBF(Radial Basis Function): It is also known as gaussian kernel, it has flexibility in capturing non-linear decision boundaries. It transforms input feature space into infinite-dimensional space

Linear Kernel: It is the simplest form of kernel used in SVM. It is suitable for linearly separable datasets.