

1. A,B
2. A
3. A
4. A
5. A
6. A
7. B
8. B
9. The Entropy for Class A is 0.4 and for Class B is 0.6 where as Gini index for Class A is 0.6 and For Class B is 0.4.
10. Random forest algorithm avoids and prevents overfitting by using multiple trees. The results are not accurate. This gives accurate and precise results. Decision trees require low computation, thus reducing time to implement and carrying low accuracy.
11. Some times the numerical features are all not in the same range. If all the features are in the same range it is better for the algorithm to learn so we apply scaling techniques before fitting the data. Some of the scaling techniques are StandardScaler and MinMaxScaler.
12. We can use fixed learning rate during training without worrying about learning rate decay. It has straight trajectory towards the minimum and it is guaranteed to converge in theory to the global minimum if the loss function is convex and to a local minimum if the loss function is not convex. It has unbiased estimate of gradients. The more the examples, the lower the standard error
13. Accuracy is not a good metric for imbalanced datasets. This model would receive a very good accuracy score as it predicted correctly for the majority of observations, but this hides the true performance of the model which is objectively not good as it only predicts for one class
14. The F1 score is the harmonic mean of the precision and recall

$$F_1 = \frac{2}{\text{recall}^{-1} + \text{precision}^{-1}} = 2 \frac{\text{precision} \cdot \text{recall}}{\text{precision} + \text{recall}} = \frac{2\text{tp}}{2\text{tp} + \text{fp} + \text{fn}}$$

15. The fit() method helps in fitting the data into a model, transform() method helps in transforming the data into a form that is more suitable for the model. Fit_transform()

method, on the other hand, combines the functionalities of both `fit()` and `transform()` methods in one step.