MACHINE LEARNING SOLUTION

1. A) High R-squared value for train-set and High R-squared value for test-set.
2. B) Decision trees are highly prone to overfitting.
3. D) Decision tree
4. C) Precision
5. B) Model B
6. A) Ridge
   D) Lasso
7. B) Decision Tree C) Random Forest
8. A) Pruning
9. A) We initialize the probabilities of the distribution as 1/n, where n is the number of data-points B) A tree in the ensemble focuses more on the data points on which the previous tree was not performing well C) It is example of bagging technique
10.

The adjusted R-squared compensates for the addition of variables and only increases if the new predictor enhances the model above what would be obtained by probability. Conversely, it will decrease when a predictor improves the model less than what is predicted by chance.

11.

ridge regression puts a similar constraint on the coefficients by introducing a penalty factor. However, while lasso regression takes the magnitude of the coefficients, ridge regression takes the square. Ridge regression is also referred to as L2 Regularization.

12.

A variance inflation factor(VIF) detects multicollinearity in regression analysis. Multicollinearity is when there's correlation between predictors (i.e. independent variables) in a model; it's presence can adversely affect your regression results. The VIF estimates how much the variance of a regression coefficient is inflated due to multicollinearity in the model.

VIFs are usually calculated by software, as part of regression analysis. You'll see a VIF column as part of the output. VIFs are calculated by taking a predictor, and regressing it against every other predictor in the model. This gives you the R-squared values, which can then be plugged into the VIF formula. "i" is the predictor you're looking at (e.g. x_1 or x_2):

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13.

To ensure that the gradient descent moves smoothly towards the minima and that the steps for gradient descent are updated at the same rate for all the features, we scale the data before feeding it to the model.

14.

There are three error metrics that are commonly used for evaluating and reporting the performance of a regression model; they are: Mean Squared Error (MSE). Root Mean Squared Error (RMSE). Mean Absolute Error (MAE