Trends-

As asked, if we increase the depth of the tree to get the varied accuracies and model becomes complex as the depth increases. Hence, we can see that the depth has direct effect on the accuracy of the model.

As the depth increases, we get the accuracies at each depth level until accuracy reaches 1 and remains the same for the cumulative depths and results in overfitting. This trend of reaching accuracy to 1.0 and stopping its growth followed for first 7 datasets. However, last 3 dataset follows the trend of decrease in the accuracy in test set after few depth levels.

Findings-

If we set depth very low, model can’t predict well for the test data. We can see that the accuracy increases with the increase in the depth level until it reaches 1.0 in certain dataset and stops after 1.0

Train and Test set follows the same pattern in accuracies at depth level for first 7 datasets, can be seen from accuracies at each depth level which tells us how we can tune the model to avoid overfitting by choosing a proper value for depth.

Depth level = 2, works well for train and test data of first dataset.

Surprising-

For the last 3 datasets, though it seems that the model fits well for the training data looking the growing trend of the accuracies at each depth. But test set seems to give lower accuracies after certain depth level as a result of overfitting in training data.