| **Aspect** | **Regression Trees** | **Classification Trees** |
| --- | --- | --- |
| Outcome variable type | Continuous | Categorical |
| Goal | To predict a numerical value | To predict a class label |
| Splitting criteria | Mean Squared Error, Mean Absolute Error, etc. | Gini Impurity, Entropy, etc. |
| Leaf node prediction | Mean or median of the target variable in that region | Mode or majority class of the target variable in that region |
| Tree visualization | Trees can be visualized as a sequence of splits leading to a numerical prediction at each leaf node | Trees can be visualized as a sequence of splits leading to a categorical prediction at each leaf node |
| Examples of use cases | Predicting housing prices, predicting stock prices | Predicting customer churn, predicting the likelihood of a disease |
| Evaluation metric | Mean Squared Error, Mean Absolute Error, R-squared, etc. | Accuracy, Precision, Recall, F1-score, etc. |
| Overfitting | Can suffer from overfitting if the tree is too deep or has too many branches | Can suffer from overfitting if the tree is too deep or has too many branches |
| Pruning | Regression trees can be pruned to reduce overfitting | Classification trees can be pruned to reduce overfitting |
| Ensemble methods | Random Forest, Gradient Boosting, etc. | Random Forest, Gradient Boosting, etc. |

Common aspects:

* Both types of trees are a type of decision tree and are built using a top-down greedy approach
* Both types of trees can suffer from overfitting if the tree is too deep or has too many branches
* Both types of trees can be pruned to reduce overfitting
* Both types of trees can be used as a base model in ensemble methods such as Random Forest and Gradient Boosting

Distinct aspects:

* Regression trees predict a continuous value, while classification trees predict a categorical value
* The splitting criteria used in regression trees are typically based on mean squared error or mean absolute error, while the splitting criteria used in classification trees are typically based on Gini impurity or entropy
* The leaf node prediction in regression trees is typically the mean or median of the target variable in that region, while the leaf node prediction in classification trees is typically the mode or majority class of the target variable in that region
* The evaluation metrics used to assess the performance of regression trees are typically based on measures of the difference between the predicted and actual values (such as mean squared error or R-squared), while the evaluation metrics used to assess the performance of classification trees are typically based on measures of how accurately the model classifies examples (such as accuracy, precision, recall, or F1-score)
* Trees can be visualized differently depending on whether they are regression trees or classification trees