

Decision Tree

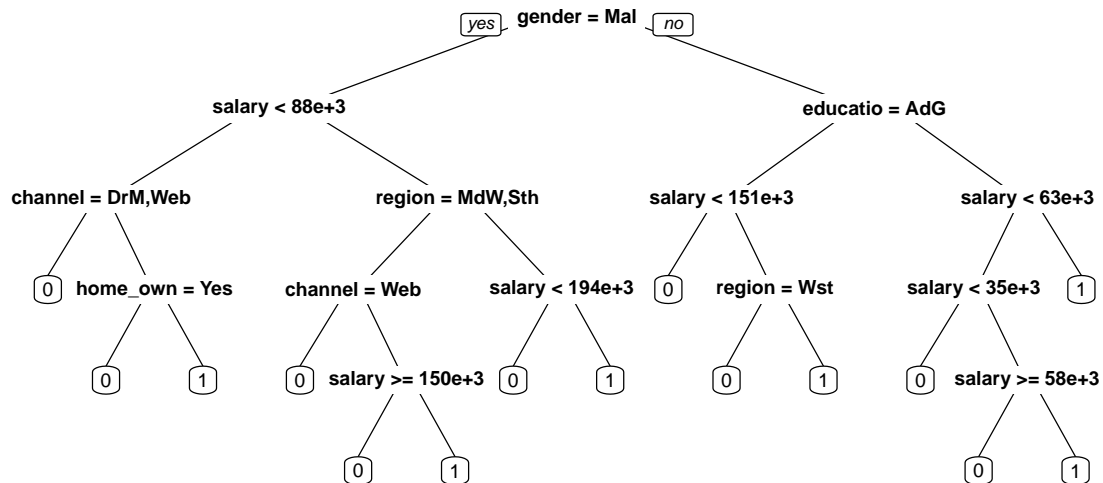
Decision trees are commonly used in operations research, specifically in decision analysis, to help identify a strategy most likely to reach a goal, but are also a popular tool in machine learning.

Split data into training and testing chunks

```
[1] 975 8
```

```
[1] 325 8
```

Create and plot the decision tree



Generate predictions on the training set and check the accuracy with a confusion matrix

Confusion Matrix and Statistics

| | Reference | |
|------------|-----------|-----|
| Prediction | 0 | 1 |
| 0 | 551 | 180 |
| 1 | 38 | 206 |

```

        Accuracy : 0.7764
          95% CI : (0.7489, 0.8022)
    No Information Rate : 0.6041
    P-Value [Acc > NIR] : < 2.2e-16

        Kappa : 0.5009
    McNemar's Test P-Value : < 2.2e-16

        Sensitivity : 0.9355
        Specificity : 0.5337
    Pos Pred Value : 0.7538
    Neg Pred Value : 0.8443
        Prevalence : 0.6041
    Detection Rate : 0.5651
    Detection Prevalence : 0.7497
    Balanced Accuracy : 0.7346

    'Positive' Class : 0

```

Validate the accuracy with the testing dataset

Confusion Matrix and Statistics

```

      Reference
Prediction  0   1
    0 189   69
    1   22   45

        Accuracy : 0.72
          95% CI : (0.6678, 0.7682)
    No Information Rate : 0.6492
    P-Value [Acc > NIR] : 0.003966

        Kappa : 0.3209
    McNemar's Test P-Value : 1.42e-06

        Sensitivity : 0.8957
        Specificity : 0.3947
    Pos Pred Value : 0.7326
    Neg Pred Value : 0.6716
        Prevalence : 0.6492
    Detection Rate : 0.5815
    Detection Prevalence : 0.7938
    Balanced Accuracy : 0.6452

    'Positive' Class : 0

```

Create cross validation, trainControl object and view model

CART

975 samples
7 predictor
2 classes: '0', '1'

No pre-processing

Resampling: Cross-Validated (10 fold, repeated 2 times)

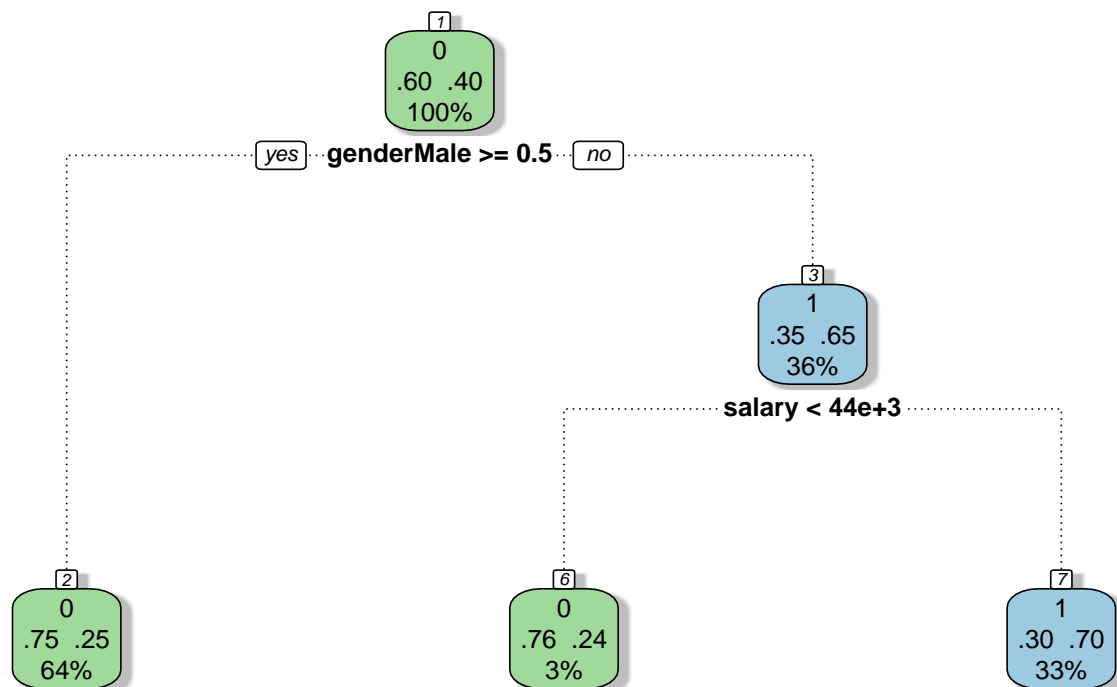
Summary of sample sizes: 878, 877, 879, 877, 878, 877, ...

Resampling results:

| Accuracy | Kappa |
|-----------|-----------|
| 0.7215037 | 0.3989268 |

Tuning parameter 'cp' was held constant at a value of 0.001

Fancy decision tree



Rattle 2016-Apr-27 15:27:51 admin