

# Ordinal Logistic Regression or Proportional Odds Logistic Regression

```
##  
## 0 1 2  
## 228 79 29
```

## Randomforest base model

```
##
## Call:
##  randomForest(formula = SR ~ NP + H + AGR + TA + NASA + RS, data = train,      proximity = TRUE)
##              Type of random forest: classification
##              Number of trees: 500
## No. of variables tried at each split: 2
##
##      OOB estimate of  error rate: 31.17%
## Confusion matrix:
##      0  1 2 class.error
## 0 146 13 2   0.0931677
## 1  46  7 0   0.8679245
## 2   8  3 6   0.6470588
```

## Randomforest extended model

```
##
## Call:
##  randomForest(formula = SR ~ NASA + H + NP + NT + AGR + TA + EM +      DWH + DS + Rank + WH, data =
##                Type of random forest: classification
##                Number of trees: 500
## No. of variables tried at each split: 3
##
##                OOB estimate of  error rate: 26.41%
## Confusion matrix:
##      0  1 2 class.error
## 0 151  9 1    0.0621118
## 1  39 13 1    0.7547170
## 2  10  1 6    0.6470588
```

## Prediction on test data

```
## Confusion Matrix and Statistics
##
##           Reference
## Prediction  0   1   2
##           0 65 17   7
##           1   2   7   5
##           2   0   2   0
##
## Overall Statistics
##
##           Accuracy : 0.6857
##           95% CI : (0.5878, 0.7728)
##           No Information Rate : 0.6381
##           P-Value [Acc > NIR] : 0.1808210
##
##           Kappa : 0.2587
##
## Mcnemar's Test P-Value : 0.0001597
##
## Statistics by Class:
##
##           Class: 0 Class: 1 Class: 2
## Sensitivity      0.9701  0.26923  0.00000
## Specificity      0.3684  0.91139  0.97849
## Pos Pred Value   0.7303  0.50000  0.00000
## Neg Pred Value   0.8750  0.79121  0.88350
## Prevalence       0.6381  0.24762  0.11429
## Detection Rate   0.6190  0.06667  0.00000
## Detection Prevalence 0.8476  0.13333  0.01905
## Balanced Accuracy 0.6693  0.59031  0.48925
```

## Sensitivity-Specificity-Precision-Recall-F1

```
##          Sensitivity Specificity Pos Pred Value Neg Pred Value Precision
## Class: 0    0.9701493    0.3684211    0.7303371    0.8750000 0.7303371
## Class: 1    0.2692308    0.9113924    0.5000000    0.7912088 0.5000000
## Class: 2    0.0000000    0.9784946    0.0000000    0.8834951 0.0000000
##          Recall          F1 Prevalence Detection Rate
## Class: 0 0.9701493 0.8333333 0.6380952    0.61904762
## Class: 1 0.2692308 0.3500000 0.2476190    0.06666667
## Class: 2 0.0000000      NaN 0.1142857    0.00000000
##          Detection Prevalence Balanced Accuracy
## Class: 0          0.84761905          0.6692852
## Class: 1          0.13333333          0.5903116
## Class: 2          0.01904762          0.4892473
```

```
## Multi-class area under the curve: 0.6841
```