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**Semester 6**

**Lab Submission 12**

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**1.** Which is the best model: Decision Tree, Naïve Bayes, Rules, or Neural Net? Try them all and find out which one has the highest accuracy. USE cross validation

## Decision tree

**accuracy: 77.40% +/- 1.08% (micro average: 77.40%)**

| | true Yes | true No | class precision |
|---|---|---|---|
| pred. Yes | 245 | 103 | 70.40% |
| pred. No | 104 | 464 | 81.69% |
| class recall | 70.20% | 81.83% | |

## Naïve Bayes

**accuracy: 78.38% +/- 0.93% (micro average: 78.38%)**

| | true Yes | true No | class precision |
|---|---|---|---|
| pred. Yes | 227 | 76 | 74.92% |
| pred. No | 122 | 491 | 80.10% |
| class recall | 65.04% | 86.60% | |

## Rule model

**accuracy: 79.04% +/- 0.93% (micro average: 79.04%)**

| | true Yes | true No | class precision |
|---|---|---|---|
| pred. Yes | 242 | 85 | 74.01% |
| pred. No | 107 | 482 | 81.83% |
| class recall | 69.34% | 85.01% | |

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**Conclusion:**

The accuracy of Rule Induction Model is higher than other models. Because in the growing phase of Rule Induction Model, for each rule greedily conditions are added to the rule until it is perfect (i.e. 100% accurate). The procedure tries every possible value of each attribute and selects the condition with highest information gain. In the prune phase, for each rule any final sequences of the antecedents is pruned with the pruning metric $p/(p+n)$. It is a technique that tries to overcome overfitting.