**Part 1.**

SVM classification using Libsvm on promoters’ dataset

1. Linear Kernel 85.7143%

2. Polynomial Kernel 74.2857%

3. Radial Kernel 77.1429%

4. Sigmoid Kernel 45.7143%

The accuracy decreases as we move from linear classifier to higher dimensional classifier. Thus, we conclude that the accuracy decreases if the data is linearly separable and we map it to a higher dimensional space for classification.

The accuracy of the same data set using perceptron is also 85.71%.

This is because the data is linearly separable.

**Part 2.**

Below is shown the accuracy for multiple datasets. The accuracy is rounded of to the nearest percent:

**Dataset 1: Iris**

No of Iterations: **30**

**Base Learner Vanilla Bagging Boosting**

**Naïve Bayes** 87 86 90

**Logistic Regression** 93 93 93

**J48** 96 94 96

No of Iterations: **100**

**Base Learner Vanilla Bagging Boosting**

**Naïve Bayes** 87 86 90

**Logistic Regression** 93 93 93

**J48** 96 93 96

No of Iterations: **150**

**Base Learner Vanilla Bagging Boosting**

**Naïve Bayes** 87 86 91

**Logistic Regression** 93 93 93

**J48** 96 94 97

**Dataset 2: Chess (King rook vs king)**

No of Iterations: **30**

**Base Learner Vanilla Bagging Boosting**

**Naïve Bayes** 85 87 87

**Logistic Regression** 86 87 88

**J48** 70 88 92

No of Iterations: **100**

**Base Learner Vanilla Bagging Boosting**

**Naïve Bayes** 85 87 87

**Logistic Regression** 87 87 88

**J48** 70 89 92

No of Iterations: **150**

**Base Learner Vanilla Bagging Boosting**

**Naïve Bayes** 86 86 87

**Logistic Regression** 87 90 87

**J48** 70 90 92

**Dataset 3: Car Evaulation**

No of Iterations: **30**

**Base Learner Vanilla Bagging Boosting**

**Naïve Bayes** 87 85 90

**Logistic Regression** 95 93 93

**J48** 95 93 97

No of Iterations: **100**

**Base Learner Vanilla Bagging Boosting**

**Naïve Bayes** 87 85 90

**Logistic Regression** 95 93 93

**J48** 95 93 96

No of Iterations: **150**

**Base Learner Vanilla Bagging Boosting**

**Naïve Bayes** 87 85 90

**Logistic Regression** 95 93 93

**J48** 95 93 96

Question 1 : Which algorithms+data set combination is improved by Bagging?

1. Naïve Bayes , Chess
2. Logistic Regression, Chess
3. J48, Chess

Question 2 : Which algorithms+data set combination is improved by Boosting?

1. Naïve Bayes , Iris
2. J48, Iris
3. Naïve Bayes, Chess
4. Logistic Regression, Chess
5. J48, Chess

Question 1 : Can you explain these results in terms of the bias and variance of the learning algorithms applied to these domains? Are some of the learning algorithms unbiased for some of the domains? Which ones?

For all datasets, the data probably does not show much variance because we do not see change in accuracy with respect to the number of iterations