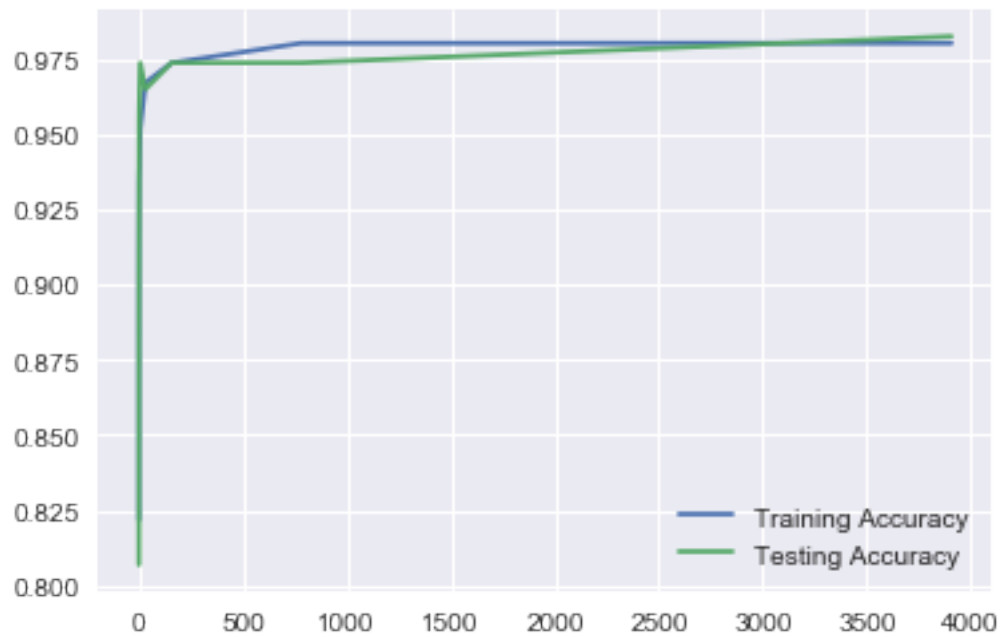


ALL

September 27, 2017

```
In [13]: exec(open('bc.py').read())
```

Maximum accuracy using Logistic Regression = 98.2456 with C = 3906.250000
Time taken for LogReg = 0.03 seconds



Neural Network with one hidden layer :

Number of Hidden Units = 2
Training Accuracy: 90.5494505495
Test Accuracy: 85.9649122807

Number of Hidden Units = 4
Training Accuracy: 90.5494505495

Test Accuracy: 92.9824561404

Number of Hidden Units = 6

Training Accuracy: 92.0879120879

Test Accuracy: 87.7192982456

Number of Hidden Units = 8

Training Accuracy: 95.3846153846

Test Accuracy: 92.9824561404

Number of Hidden Units = 10

Training Accuracy: 92.5274725275

Test Accuracy: 92.1052631579

Number of Hidden Units = 12

Training Accuracy: 93.1868131868

Test Accuracy: 93.8596491228

Number of Hidden Units = 14

Training Accuracy: 92.3076923077

Test Accuracy: 92.1052631579

Number of Hidden Units = 16

Training Accuracy: 92.7472527473

Test Accuracy: 88.5964912281

Number of Hidden Units = 18

Training Accuracy: 93.1868131868

Test Accuracy: 91.2280701754

Number of Hidden Units = 20

Training Accuracy: 92.5274725275

Test Accuracy: 90.350877193

Number of Hidden Units = 22

Training Accuracy: 92.967032967

Test Accuracy: 88.5964912281

Number of Hidden Units = 24

Training Accuracy: 92.3076923077

Test Accuracy: 90.350877193

Number of Hidden Units = 26

Training Accuracy: 92.3076923077

Test Accuracy: 92.1052631579

Number of Hidden Units = 28

Training Accuracy: 92.967032967

Test Accuracy: 95.6140350877

Number of Hidden Units = 30

Training Accuracy: 92.5274725275

Test Accuracy: 94.7368421053

Number of Hidden Units = 32

Training Accuracy: 92.5274725275

Test Accuracy: 93.8596491228

Number of Hidden Units = 34

Training Accuracy: 92.7472527473

Test Accuracy: 92.1052631579

Number of Hidden Units = 36

Training Accuracy: 91.6483516484

Test Accuracy: 93.8596491228

Number of Hidden Units = 38

Training Accuracy: 93.4065934066

Test Accuracy: 92.9824561404

Number of Hidden Units = 40

Training Accuracy: 92.0879120879

Test Accuracy: 94.7368421053

Number of Hidden Units = 42

Training Accuracy: 92.3076923077

Test Accuracy: 94.7368421053

Number of Hidden Units = 44

Training Accuracy: 91.6483516484

Test Accuracy: 88.5964912281

Number of Hidden Units = 46

Training Accuracy: 92.3076923077

Test Accuracy: 91.2280701754

Number of Hidden Units = 48

Training Accuracy: 94.9450549451

Test Accuracy: 91.2280701754

Number of Hidden Units = 50

Training Accuracy: 91.8681318681

Test Accuracy: 90.350877193

Number of Hidden Units = 52

Training Accuracy: 91.2087912088

Test Accuracy: 96.4912280702

Number of Hidden Units = 54
Training Accuracy: 91.8681318681
Test Accuracy: 93.8596491228

Number of Hidden Units = 56
Training Accuracy: 92.5274725275
Test Accuracy: 90.350877193

Number of Hidden Units = 58
Training Accuracy: 91.8681318681
Test Accuracy: 92.9824561404

Number of Hidden Units = 60
Training Accuracy: 91.6483516484
Test Accuracy: 94.7368421053

Number of Hidden Units = 62
Training Accuracy: 92.0879120879
Test Accuracy: 92.1052631579

Number of Hidden Units = 64
Training Accuracy: 92.0879120879
Test Accuracy: 93.8596491228

Number of Hidden Units = 66
Training Accuracy: 93.4065934066
Test Accuracy: 89.4736842105

Number of Hidden Units = 68
Training Accuracy: 90.989010989
Test Accuracy: 95.6140350877

Number of Hidden Units = 70
Training Accuracy: 91.8681318681
Test Accuracy: 94.7368421053

Number of Hidden Units = 72
Training Accuracy: 92.0879120879
Test Accuracy: 92.9824561404

Number of Hidden Units = 74
Training Accuracy: 91.8681318681
Test Accuracy: 92.9824561404

Number of Hidden Units = 76
Training Accuracy: 92.5274725275

Test Accuracy: 92.9824561404

Number of Hidden Units = 78
Training Accuracy: 91.6483516484
Test Accuracy: 90.350877193

Number of Hidden Units = 80
Training Accuracy: 93.1868131868
Test Accuracy: 92.1052631579

Number of Hidden Units = 82
Training Accuracy: 93.6263736264
Test Accuracy: 91.2280701754

Number of Hidden Units = 84
Training Accuracy: 93.4065934066
Test Accuracy: 91.2280701754

Number of Hidden Units = 86
Training Accuracy: 92.7472527473
Test Accuracy: 92.9824561404

Number of Hidden Units = 88
Training Accuracy: 92.967032967
Test Accuracy: 89.4736842105

Number of Hidden Units = 90
Training Accuracy: 92.5274725275
Test Accuracy: 92.9824561404

Number of Hidden Units = 92
Training Accuracy: 93.1868131868
Test Accuracy: 88.5964912281

Number of Hidden Units = 94
Training Accuracy: 92.0879120879
Test Accuracy: 91.2280701754

Number of Hidden Units = 96
Training Accuracy: 91.8681318681
Test Accuracy: 93.8596491228

Number of Hidden Units = 98
Training Accuracy: 91.8681318681
Test Accuracy: 91.2280701754

Number of Hidden Units = 100
Training Accuracy: 91.6483516484

Test Accuracy: 92.9824561404

Number of Hidden Units = 102
Training Accuracy: 92.967032967
Test Accuracy: 90.350877193

Number of Hidden Units = 104
Training Accuracy: 92.5274725275
Test Accuracy: 92.9824561404

Number of Hidden Units = 106
Training Accuracy: 92.7472527473
Test Accuracy: 88.5964912281

Number of Hidden Units = 108
Training Accuracy: 94.2857142857
Test Accuracy: 93.8596491228

Number of Hidden Units = 110
Training Accuracy: 92.0879120879
Test Accuracy: 91.2280701754

Number of Hidden Units = 112
Training Accuracy: 92.5274725275
Test Accuracy: 94.7368421053

Number of Hidden Units = 114
Training Accuracy: 92.0879120879
Test Accuracy: 92.9824561404

Number of Hidden Units = 116
Training Accuracy: 92.5274725275
Test Accuracy: 88.5964912281

Number of Hidden Units = 118
Training Accuracy: 91.2087912088
Test Accuracy: 96.4912280702

Number of Hidden Units = 120
Training Accuracy: 92.0879120879
Test Accuracy: 90.350877193

Number of Hidden Units = 122
Training Accuracy: 93.1868131868
Test Accuracy: 88.5964912281

Number of Hidden Units = 124
Training Accuracy: 92.0879120879

Test Accuracy: 90.350877193

Number of Hidden Units = 126
Training Accuracy: 93.8461538462
Test Accuracy: 90.350877193

Number of Hidden Units = 128
Training Accuracy: 92.3076923077
Test Accuracy: 92.1052631579

Number of Hidden Units = 130
Training Accuracy: 92.0879120879
Test Accuracy: 93.8596491228

Number of Hidden Units = 132
Training Accuracy: 92.3076923077
Test Accuracy: 92.9824561404

Number of Hidden Units = 134
Training Accuracy: 92.0879120879
Test Accuracy: 92.9824561404

Number of Hidden Units = 136
Training Accuracy: 92.0879120879
Test Accuracy: 92.9824561404

Number of Hidden Units = 138
Training Accuracy: 92.3076923077
Test Accuracy: 93.8596491228

Number of Hidden Units = 140
Training Accuracy: 91.8681318681
Test Accuracy: 91.2280701754

Number of Hidden Units = 142
Training Accuracy: 94.0659340659
Test Accuracy: 90.350877193

Number of Hidden Units = 144
Training Accuracy: 92.0879120879
Test Accuracy: 88.5964912281

Number of Hidden Units = 146
Training Accuracy: 92.0879120879
Test Accuracy: 89.4736842105

Number of Hidden Units = 148
Training Accuracy: 92.0879120879

Test Accuracy: 96.4912280702

Number of Hidden Units = 150
Training Accuracy: 92.5274725275
Test Accuracy: 88.5964912281

Number of Hidden Units = 152
Training Accuracy: 92.3076923077
Test Accuracy: 88.5964912281

Number of Hidden Units = 154
Training Accuracy: 91.6483516484
Test Accuracy: 98.2456140351

Number of Hidden Units = 156
Training Accuracy: 91.2087912088
Test Accuracy: 95.6140350877

Number of Hidden Units = 158
Training Accuracy: 92.3076923077
Test Accuracy: 92.9824561404

Number of Hidden Units = 160
Training Accuracy: 92.7472527473
Test Accuracy: 93.8596491228

Number of Hidden Units = 162
Training Accuracy: 91.4285714286
Test Accuracy: 93.8596491228

Number of Hidden Units = 164
Training Accuracy: 91.6483516484
Test Accuracy: 93.8596491228

Number of Hidden Units = 166
Training Accuracy: 91.4285714286
Test Accuracy: 92.1052631579

Number of Hidden Units = 168
Training Accuracy: 91.8681318681
Test Accuracy: 92.1052631579

Number of Hidden Units = 170
Training Accuracy: 91.8681318681
Test Accuracy: 92.9824561404

Number of Hidden Units = 172
Training Accuracy: 92.0879120879

Test Accuracy: 95.6140350877

Number of Hidden Units = 174
Training Accuracy: 91.8681318681
Test Accuracy: 93.8596491228

Number of Hidden Units = 176
Training Accuracy: 94.7252747253
Test Accuracy: 92.9824561404

Number of Hidden Units = 178
Training Accuracy: 92.7472527473
Test Accuracy: 87.7192982456

Number of Hidden Units = 180
Training Accuracy: 92.5274725275
Test Accuracy: 89.4736842105

Number of Hidden Units = 182
Training Accuracy: 92.3076923077
Test Accuracy: 92.1052631579

Number of Hidden Units = 184
Training Accuracy: 95.3846153846
Test Accuracy: 92.1052631579

Number of Hidden Units = 186
Training Accuracy: 91.8681318681
Test Accuracy: 92.9824561404

Number of Hidden Units = 188
Training Accuracy: 92.3076923077
Test Accuracy: 92.9824561404

Number of Hidden Units = 190
Training Accuracy: 87.6923076923
Test Accuracy: 83.3333333333

Number of Hidden Units = 192
Training Accuracy: 94.5054945055
Test Accuracy: 91.2280701754

Number of Hidden Units = 194
Training Accuracy: 87.9120879121
Test Accuracy: 83.3333333333

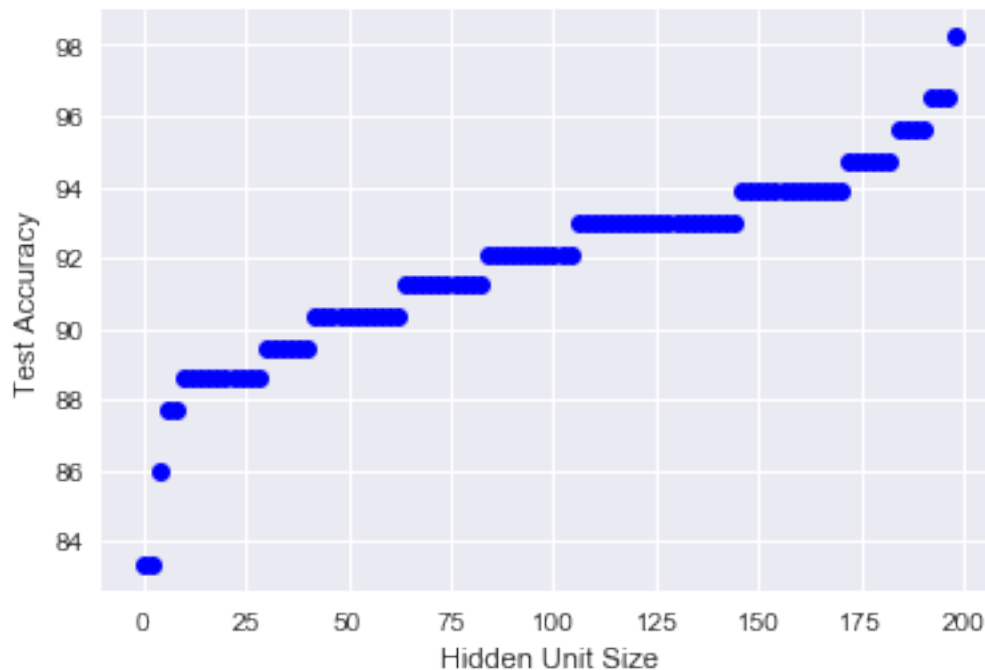
Number of Hidden Units = 196
Training Accuracy: 93.6263736264

Test Accuracy: 90.350877193

Number of Hidden Units = 198

Training Accuracy: 92.7472527473

Test Accuracy: 89.4736842105



Training Accuracy: 91.2087912088

Test Accuracy: 94.7368421053

Accuracy using SVM with rbf : 92.9824561404

Accuracy using SVM with linear : 98.2456140351

Accuracy using SVM with poly : 97.3684210526

Accuracy using SVM with sigmoid : 63.1578947368

Time taken for Random Forest Classifier = 2.1555 seconds

Accuracy with Random Forest Classifier = 96.4912280702

Time taken for RandomForestClassifier with GMM = 40.44 seconds

Accuracy with Random Forest Classifier using GMM = 94.7368

Logistic Regression = 98.2456140351

Two layer NN = 98.2456140351

Deep Neural Network = 94.7368421053

Random Forest with GMM = 94.7368421053

Random Forest = 96.4912280702

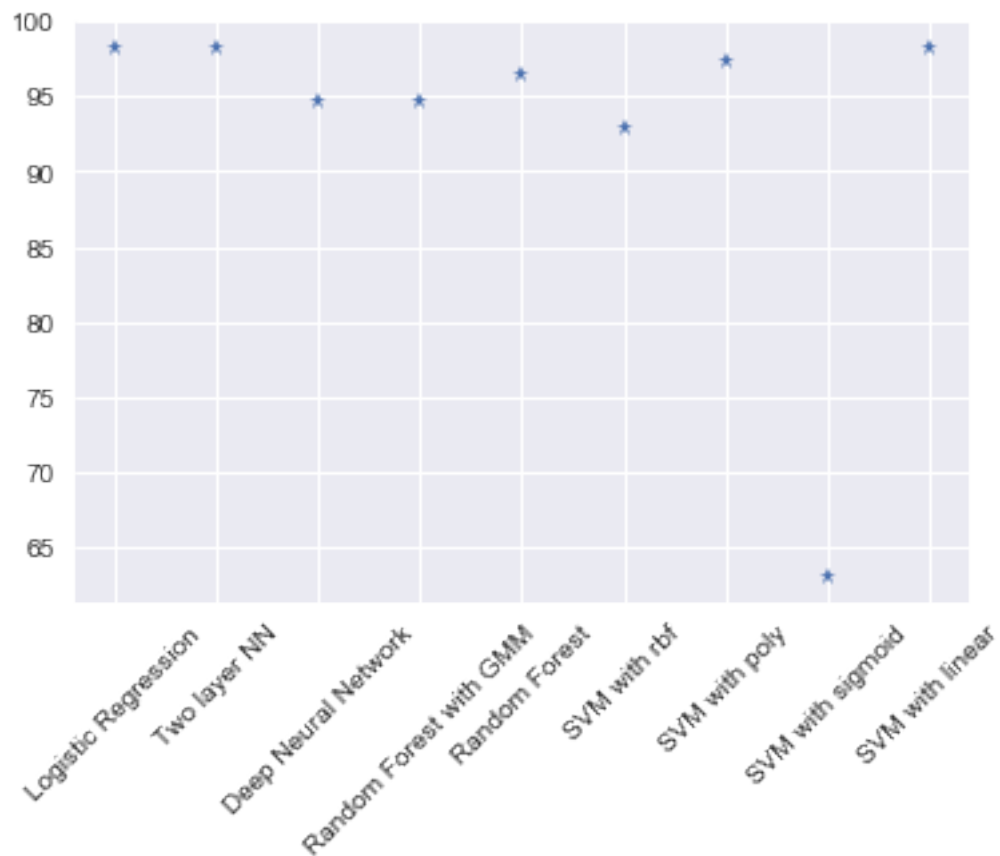
SVM with rbf = 92.9824561404

SVM with poly = 97.3684210526

SVM with sigmoid = 63.1578947368

SVM with linear = 98.2456140351

Total time taken = 1 hours, 47 minutes and 43.1277 seconds



In []: