HW9: AdaBoost and SVM Results

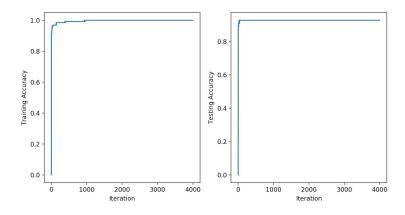
Data used: digits.csv (Training: 70%; Testing: 30%)

Programming Language: Python

1. AdaBoost Results (Training and Testing Accuracy):

```
# training 255
# testing 110
After iteration 100, Train Accuracy = 0.968627, Test Accuracy =
After iteration 200, Train Accuracy = 0.984314, Test Accuracy = 0.927273
After iteration 300, Train Accuracy = 0.984314, Test Accuracy = 0.927273
After iteration 400,
                               Train Accuracy
                                                                            Accuracy
After iteration 500,
After iteration 600,
                              Train Accuracy = 0.992157, Test Accuracy = 0.927273
Train Accuracy = 0.992157, Test Accuracy = 0.927273
After iteration 700,
After iteration 800,
                              Train Accuracy = 0.992157, Test Accuracy = 0.927273
Train Accuracy = 0.992157, Test Accuracy = 0.927273
After iteration 900, Train Accuracy = 0.992157, Test Accuracy = 0.927273
After iteration 1000, Train Accuracy = 1.000000, Test Accuracy = 0.927273
After iteration 1100, Train Accuracy =
                                                         1.000000, Test Accuracy = 0.927273
After iteration 1200,
After iteration 1300,
                                Train Accuracy = 1.000000, Test Accuracy = 0.927273
Train Accuracy = 1.000000, Test Accuracy = 0.927273
After iteration 1400,
                                Train Accuracy = 1.000000, Test Accuracy = 0.927273
Train Accuracy = 1.000000, Test Accuracy = 0.927273
After iteration 1500,
After iteration 1600,
After iteration 1700,
                                Train Accuracy = 1.000000, Test Accuracy = 0.927273
                                Train Accuracy = 1,000000. Test Accuracy = 0,927273
After iteration 1800,
                                Train Accuracy =
                                                         1.000000, Test Accuracy = 0.927273
                                                         1.000000, Test Accuracy = 0.927273
1.000000, Test Accuracy = 0.927273
After iteration 1900,
                                Train Accuracy =
After iteration 2000,
                                Train Accuracy =
                                Train Accuracy = Train Accuracy =
                                                         1.000000, Test Accuracy = 0.927273
1.000000, Test Accuracy = 0.927273
After iteration 2100,
After iteration 2200,
After iteration 2300,
After iteration 2400,
                                Train Accuracy =
                                                         1.000000, Test Accuracy = 0.927273
                                                          1.000000, Test Accuracy = 0.927273
                                Train Accuracy =
                                                                              Accuracy = 0.927273
After iteration 2500,
                                Train Accuracy
                                                          1.000000,Test
After iteration 2600,
After iteration 2700,
                                Train Accuracy =
                                                         1.000000, Test Accuracy = 0.927273
1.000000, Test Accuracy = 0.927273
                                Train Accuracy
                                Train Accuracy =
Train Accuracy =
                                                         1.000000, Test Accuracy = 0.927273
1.000000, Test Accuracy = 0.927273
After iteration 2800,
After iteration 2900,
After iteration 3000,
                                Train Accuracy =
                                                         1.000000, Test Accuracy = 0.927273
1.000000, Test Accuracy = 0.927273
After iteration 3100,
                                Train Accuracy =
After iteration 3200,
                                Train Accuracy =
                                                          1.000000, Test Accuracy = 0.927273
                                Train Accuracy = Train Accuracy =
                                                         1.000000, Test Accuracy = 0.927273
1.000000, Test Accuracy = 0.927273
After iteration 3300,
After iteration 3400,
After iteration 3500, Train Accuracy = 1.000000, Test Accuracy = 0.927273
After iteration 3600, Train Accuracy = 1.000000, Test Accuracy = 0.927273
After iteration 3700, Train Accuracy = 1.000000, Test Accuracy = 0.927273
After iteration 3800, Train Accuracy = 1.000000, Test Accuracy = 0.927273
After iteration 3900,
                                Train Accuracy = 1.000000, Test Accuracy = 0.927273
After iteration 4000, Train Accuracy = 1.000000, Test Accuracy = 0.927273
```

AdaBoost Plots (Training Accuracy and Testing Accuracy V/s. Iteration):



3. **SVM results**(Training and Testing Accuracy):

```
# training 255
# testing 110
After iteration 100, Train Accuracy = 0.976471, Test Accuracy =
                        Train Accuracy = 0.984314, Test Accuracy =
After iteration 200,
After iteration 300.
                        Train Accuracy = 0.984314, Test Accuracy
After iteration 400,
                        Train Accuracy = 0.984314, Test Accuracy
                                                                      = 0.981818
                                                                      = 0.981818
After iteration 500,
                        Train Accuracy = 0.984314, Test Accuracy
After iteration 600,
                        Train Accuracy = 0.984314, Test Accuracy = 0.981818
After iteration 700,
                        Train Accuracy = 0.992157, Test Accuracy = 0.981818
After iteration 800,
                        Train Accuracy = 0.992157, Test Accuracy = 0.981818
                        Train Accuracy = 0.992157, Test Accuracy = 0.981818
After iteration 900.
                         Train Accuracy = 1.000000, Test Accuracy = 0.981818 Train Accuracy = 1.000000, Test Accuracy = 0.981818
After iteration 1000,
After iteration 1100.
                         Train Accuracy = 1.000000, Test Accuracy = 0.981818
Train Accuracy = 1.000000, Test Accuracy = 0.981818
After iteration 1200.
After iteration 1300.
      iteration 1400,
                         Train Accuracy = 1.000000, Test Accuracy = 0.981818
After
                         Train Accuracy = 1.000000, Test Accuracy = 0.981818
After iteration 1500,
                         Train Accuracy = 1.000000, Test Accuracy = 0.981818
After iteration 1600.
After iteration 1700,
                         Train Accuracy = 1.000000, Test Accuracy = 0.981818
After iteration 1800,
                         Train Accuracy = 1.000000, Test Accuracy = 0.981818
After iteration 1900,
                         Train Accuracy = 1.000000, Test Accuracy = 0.981818
After iteration 2000.
                         Train Accuracy = 1.000000, Test Accuracy = 0.981818
After iteration 2100,
                         Train Accuracy = 1.000000, Test Accuracy = 0.981818
After iteration 2200,
                         Train Accuracy = 1.000000, Test Accuracy = 0.981818
                         Train Accuracy = 1.000000, Test Accuracy = 0.981818
Train Accuracy = 1.000000, Test Accuracy = 0.981818
After iteration 2300.
After iteration 2400.
                         Train Accuracy = 1.000000, Test Accuracy = 0.981818
Train Accuracy = 1.000000, Test Accuracy = 0.981818
After
      iteration 2500,
After iteration 2600,
After iteration 2700,
                         Train Accuracy = 1.000000, Test Accuracy = 1.000000
After iteration 2800,
                         Train Accuracy = 1.000000, Test Accuracy = 1.000000
                         Train Accuracy = 1.000000, Test Accuracy = 1.000000
After iteration 2900,
After iteration 3000,
                         Train Accuracy = 1.000000, Test Accuracy = 1.000000
After iteration 3100,
                         Train Accuracy = 1.000000, Test Accuracy = 1.000000
After iteration 3200,
                         Train Accuracy = 1.000000, Test Accuracy = 1.000000
After iteration 3300,
                         Train Accuracy = 1.000000, Test Accuracy = 1.000000
After iteration 3400,
                         Train Accuracy = 1.000000, Test Accuracy = 1.000000
After iteration 3500.
                         Train Accuracy = 1.000000, Test Accuracy = 1.000000
                         Train Accuracy = 1.000000, Test Accuracy = 1.000000
Train Accuracy = 1.000000, Test Accuracy = 1.000000
After iteration 3600,
After iteration 3700.
                         Train Accuracy = 1.000000, Test Accuracy = 1.000000
Train Accuracy = 1.000000, Test Accuracy = 1.000000
After iteration 3800.
After iteration 3900,
After iteration 4000, Train Accuracy = 1.000000, Test Accuracy = 1.000000
```

4. **SVM Plots** (Training and Testing Accuracy V/s. Iteration):

