The German University in Cairo

Department Computer Science and Engineering

CSEN 1067 Machine Learning Algorithms

Assignment 3 Report

Team Name:
Berliners

Team Members:
31-1020 Ahmed Hassan Abdou Gomaa Ouda
31-15420 Mohamed Atef Hussein Ahmed
31-626 Patrick Mounir Naeem Attia

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1 Optimal Configuration

1.1 Optimal Configuration of MLP

The number of hidden layers that shows optimal performance according to Figure 1 is (500,) with average mean of training score 1.0 and mean of valid score 0.93376555353.
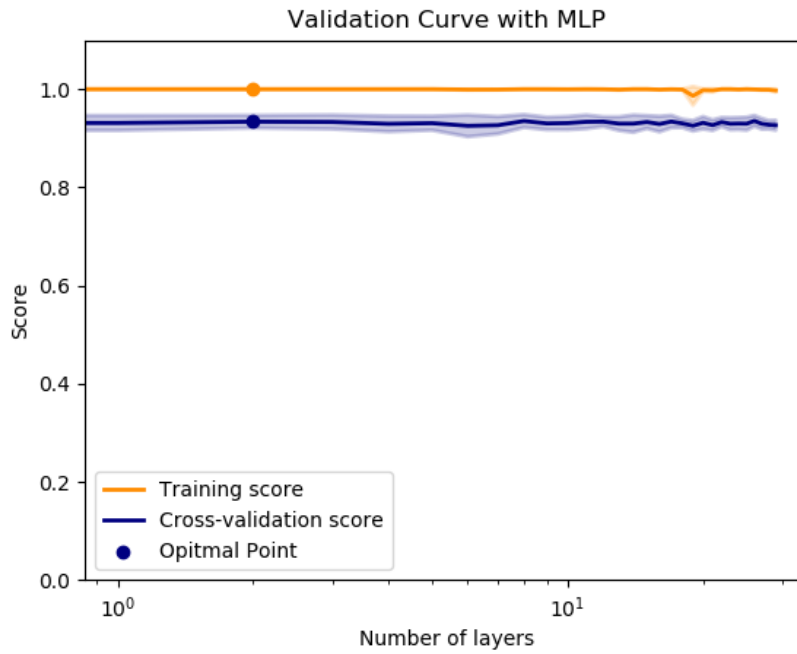

Figure 1: Number of Hidden vs Validation Curve.

The α that shows optimal performance according to Figure 2 is 0.001 with average mean of training score 1.0 and mean of valid score 0.934037884684.
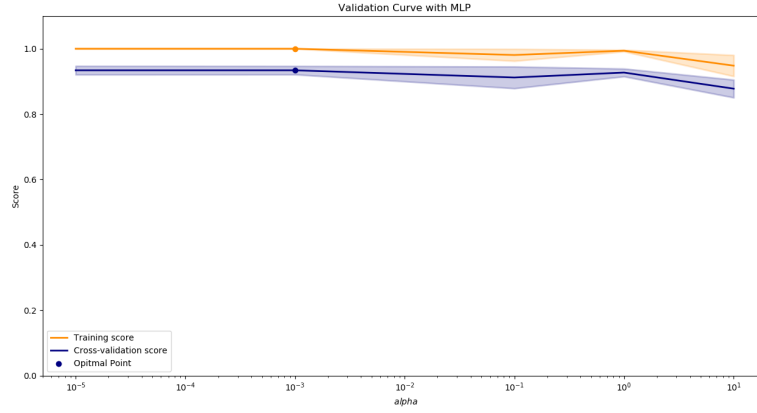
Figure 2: α vs Validation Curve.

1.2 Optimal Configuration of SVM

The γ that shows optimal performance according to Figure 3 is 0.001 with average mean of training score 0.983813685344 and mean of valid score 0.929549751748.
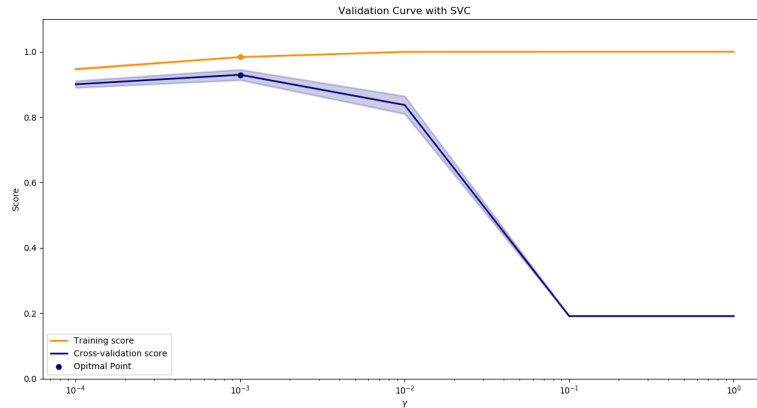

Figure 3: γ of the SVM vs Validation curve

The C that shows optimal performance according to Figure 4 is 1000 with average mean of training score 1.0 and mean of valid score 0.937031083958.
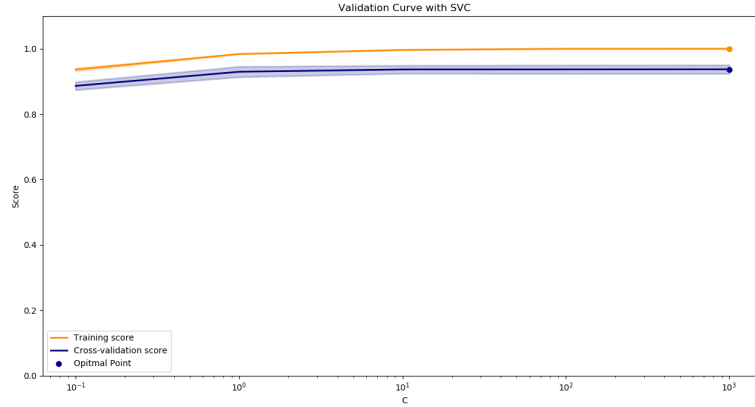
Figure 4: C of the SVM vs Validation Curve.

2   Optimal Performance Report

For the MLP, we used the optimal configuration from Section 1 which is 500 neurons in layer and α is 0.001, this would give precision of 0.95486935867.

For the SVC, we used the optimal configuration from Section 1 would be to set γ as 0.001 and C to 1000, this would give precision of 0.959280624364.

After applying PCA of 5:

- On the MLP, we used the optimal configuration from Section 1, this would give precision of 0.781133355955.

- On the SVC, we used the optimal configuration from Section 1, this would give precision of 0.792670512385.

After applying PCA of 50:

- On the MLP, we used the optimal configuration from Section 1, this would give precision of 0.913131998643.

- On the SVC, we used the optimal configuration from Section 1, this would give precision of 0.909399389209

After applying PCA of 200:

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- On the MLP, we used the optimal configuration from Section 1, this would give precision of 0.950458092976.

- On the SVC, we used the optimal configuration from Section 1, this would give precision of 0.951815405497.

After applying PCA of 500:

- On the MLP, we used the optimal configuration from Section 1, this would give precision of 0.956226671191.

- On the SVC, we used the optimal configuration from Section 1, this would give precision of 0.959280624364.