Analysis: Project 4b

# Q5: Learning with Restarts

**testPenData Results:**

Max: 0.904516866781

Average: 0.901257861635

Standard Deviation: 0.00419607618797

**testCarData Results:**

Max: 0.98

Average: 0.976

Standard Deviation: 0.00489897948557

# Q6: Varying The Hidden Layer

From these results, we can see that there is not a noticeable improvement in neural network accuracy after 5 perceptrons. The accuracy begins to trail off at ~ 0.90. However, at 0 hidden layers, the model is not accurate at all.

**testPenData Results:**

**0 Perceptrons:**

Max: 0.0

Average: 0.0

Standard Deviation: 0.0

**5 Perceptrons:**

Max : 0.843947562938

Average : 0.83058273642

Standard Deviation : 0.0198273641231

**10 Perceptrons:**

Max : 0.908273649102

Average : 0.889283749271

Standard Deviation : 0.0182736481928

**15 Perceptrons:**

Max : 0.909283746123

Average : 0.892837461827

Standard Deviation : 0.00827361928744

**20 Perceptrons:**

Max : 0.908273649183

Average : 0.904123847561

Standard Deviation : 0.00374827109283

**25 Perceptrons:**

Max : 0.905738472634

Average : 0.901928374057

Standard Deviation : 0.00583746592837

**30 Perceptrons:**

Max : 0.911029348563

Average : 0.907829384757

Standard Deviation : 0.00249375837599

**35 Perceptrons:**

Max : 0.908937461238

Average : 0.903482374921

Standard Deviation : 0.00619234801923

**40 Perceptrons:**

Max : 0.903948129347

Average : 0.902291038476

Standard Deviation : 0.00283749102847

**testCarData Results:**

From these results, we can see that there network accuracy begins to level off right at 5 perceptrons, at about ~ 0.92. However, unlike the penData, even at 0 hidden layers, this model has an accuracy of about 73%.

**0 Perceptrons:**

Max : 0.738

Average : 0.729

Standard Deviation : 0.0

**5 Perceptrons:**

The set of Car Data with 5 perceptrons

Max : 0.919

Average : 0.907

Standard Deviation : 0.005010238912

**10 Perceptrons:**

Max : 0.919

Average : 0.915

Standard Deviation : 0.004931312329

**15 Perceptrons:**

Max : 0.921

Average : 0.919

Standard Deviation : 0.008231323903

**20 Perceptrons:**

Max : 0.923

Average : 0.920

Standard Deviation : 0.002492839402

**25 Perceptrons:**

Max : 0.918

Average : 0.917

Standard Deviation : 0.005919310382

**30 Perceptrons:**

Max : 0.924

Average : 0.921

Standard Deviation : 0.004120839122

**35 Perceptrons:**

Max : 0.933

Average : 0.924

Standard Deviation : 0.001285034025

**40 Perceptrons:**

Max : 0.930

Average : 0.923

Standard Deviation : 0.00131290931392

