DTREG
Predictive Modeling Software
www.dtreg.com

Creating a Neural Network

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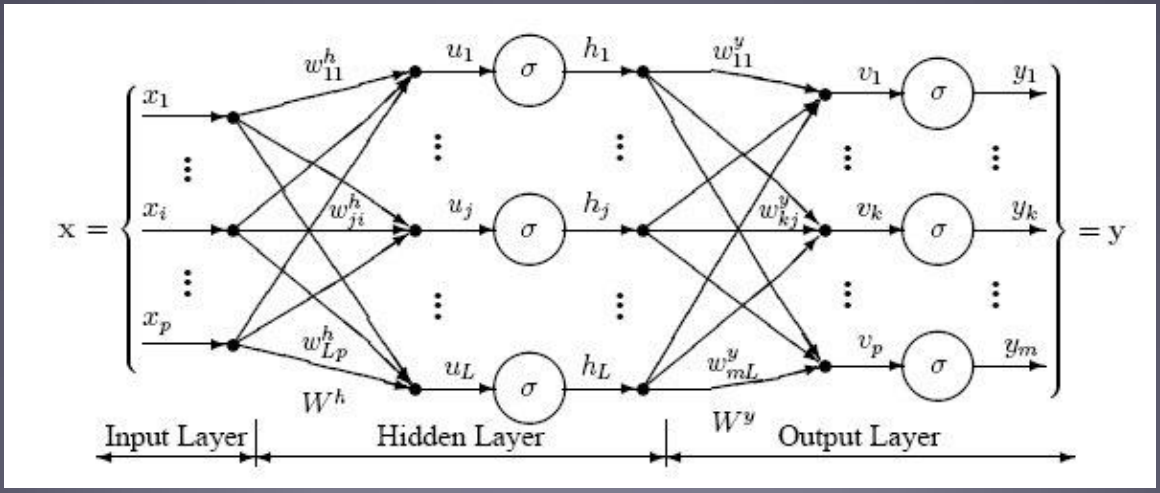
Introduction to Neural Networks

- Neural networks are compact models that are widely used for many applications.
- DTREG supports several types of neural networks: perceptrons, probabilistic, general regression, radial basis function and cascade. This tutorial will focus on creating a traditional, perceptron network.
- Perceptron neural networks have an input layer, an output layer and one or two hidden layers. Most commonly, one hidden layer is used.
- DTREG can determine automatically the optimum number of neurons in the hidden layer.

Perceptron Neural Network Structure

- This diagram shows an input layer on the left, a single hidden layer in the middle and an output layer on the right. The number of neurons in the hidden layer is adjustable depending on the problem.

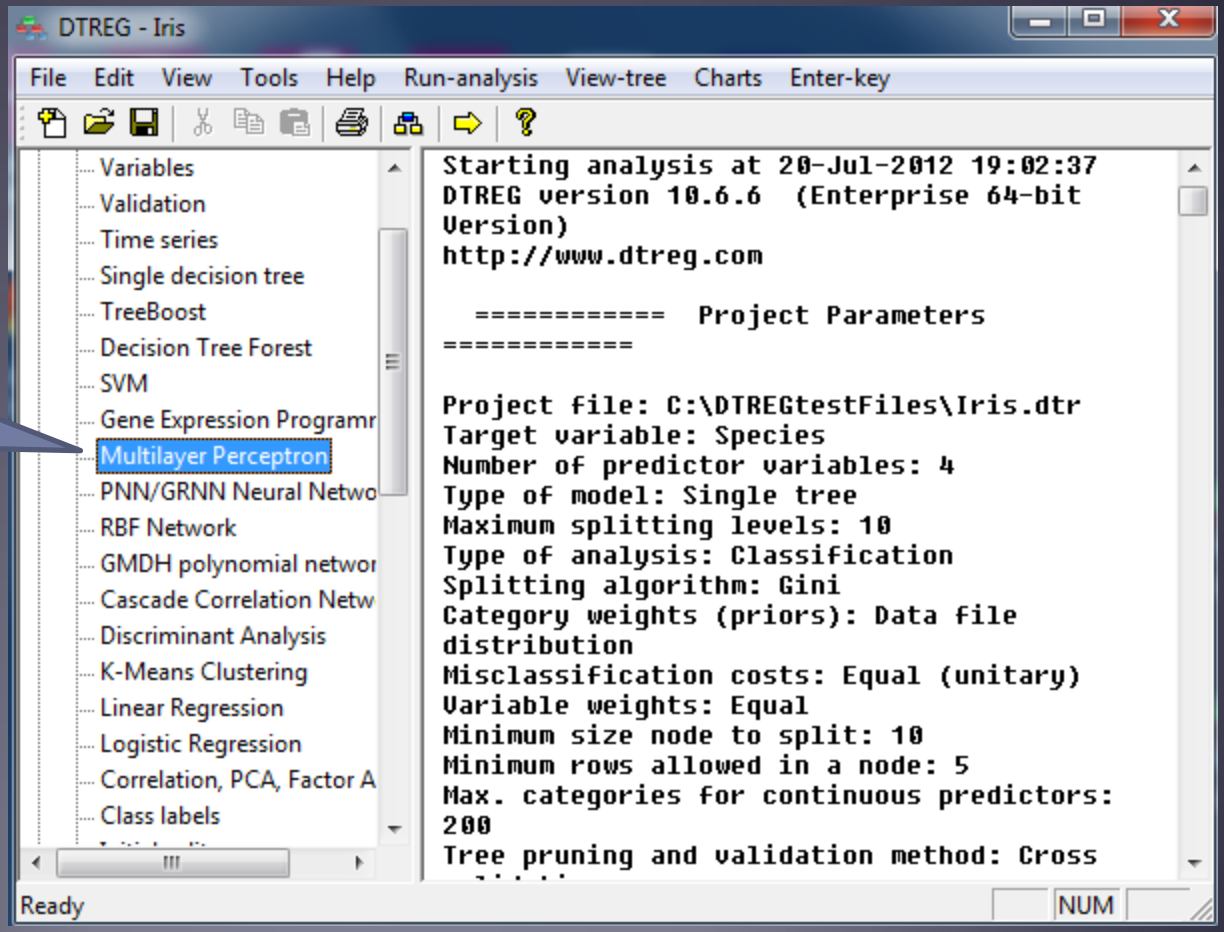


Outline of Steps to Train a Neural Network

- Create a new project, specify the input training file, and select the target and predictor variables. See the Getting-Started tutorial for information about doing this.
- Select "Multilayer perceptron" as the type of model.
- Set training parameters or use the default.
- Train the model.
- Examine the report with model statistics

Select Multilayer Perceptron in Left Panel

Click this to open the multilayer perceptron parameter screen



Change Training Parameters if Desired

Select Multilayer Perceptron

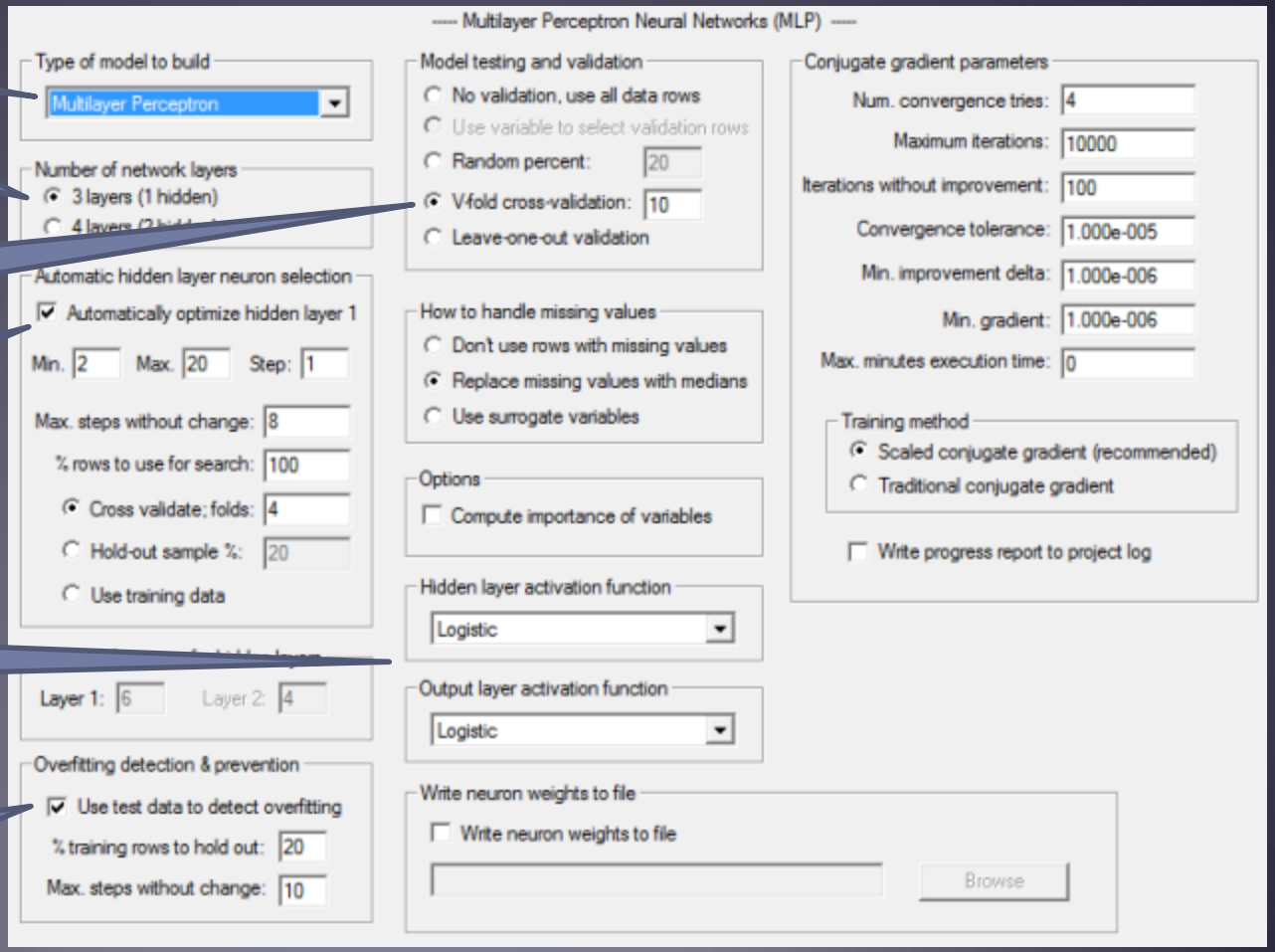
Number of hidden layers

Do cross-validation of model

Let DTREG automatically find optimum number of neurons

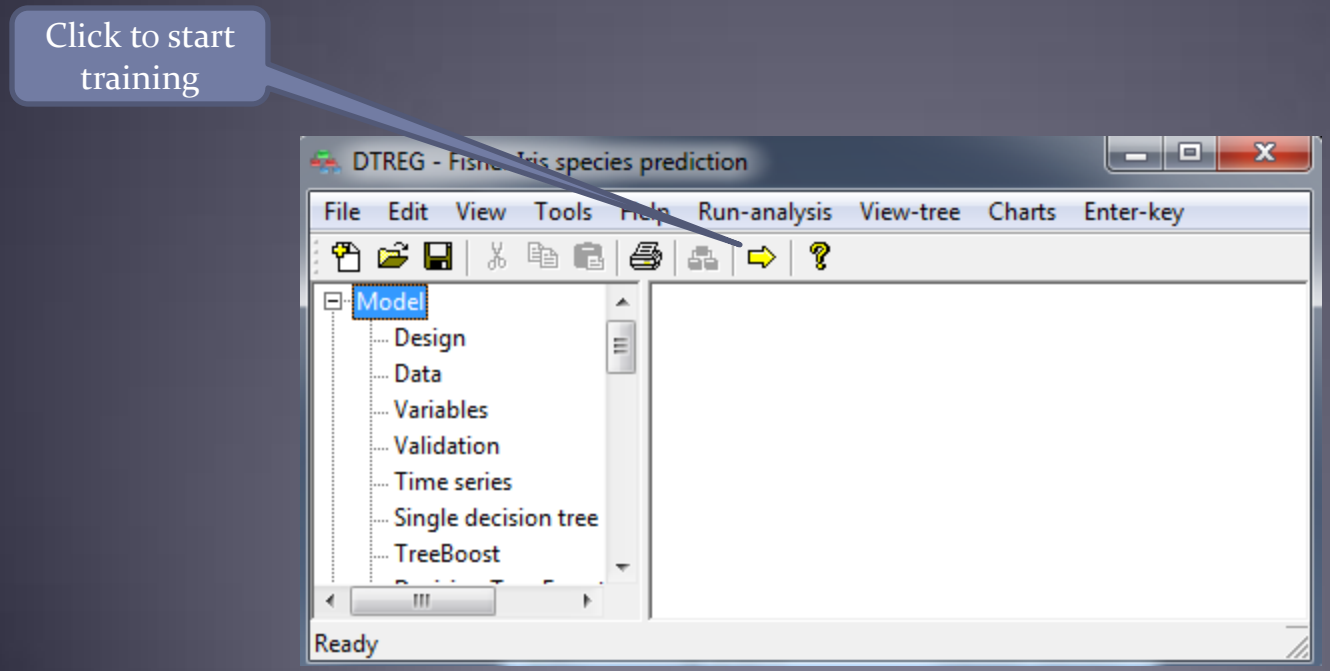
Type of transfer functions

Prevent over-fitting

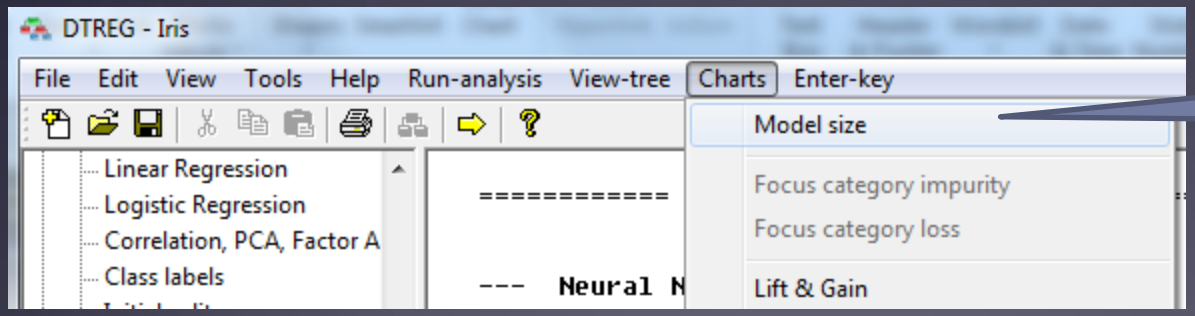


Tell DTREG to Train the Model

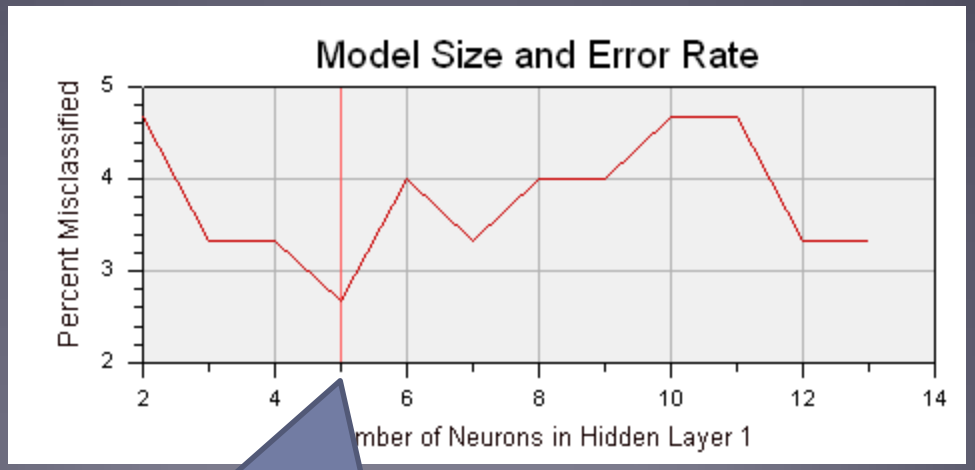
- Click the icon to start training the model.



View Chart of Errors vs. Number Neurons



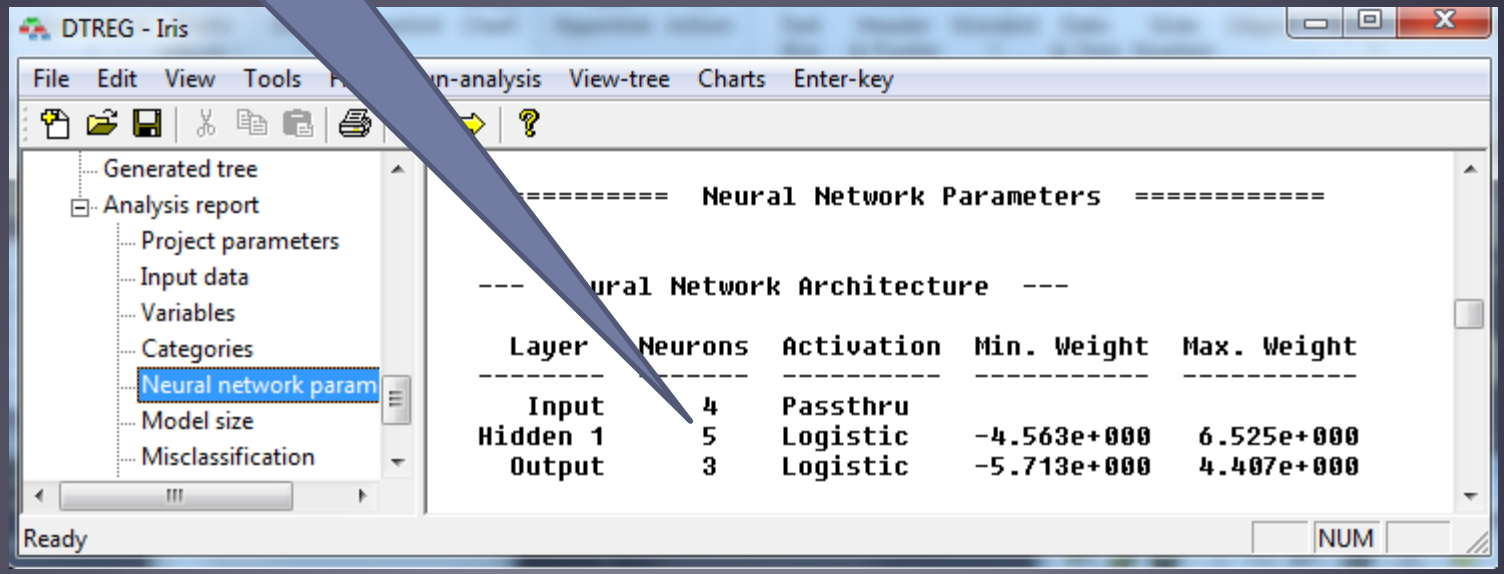
Click Charts/Model size



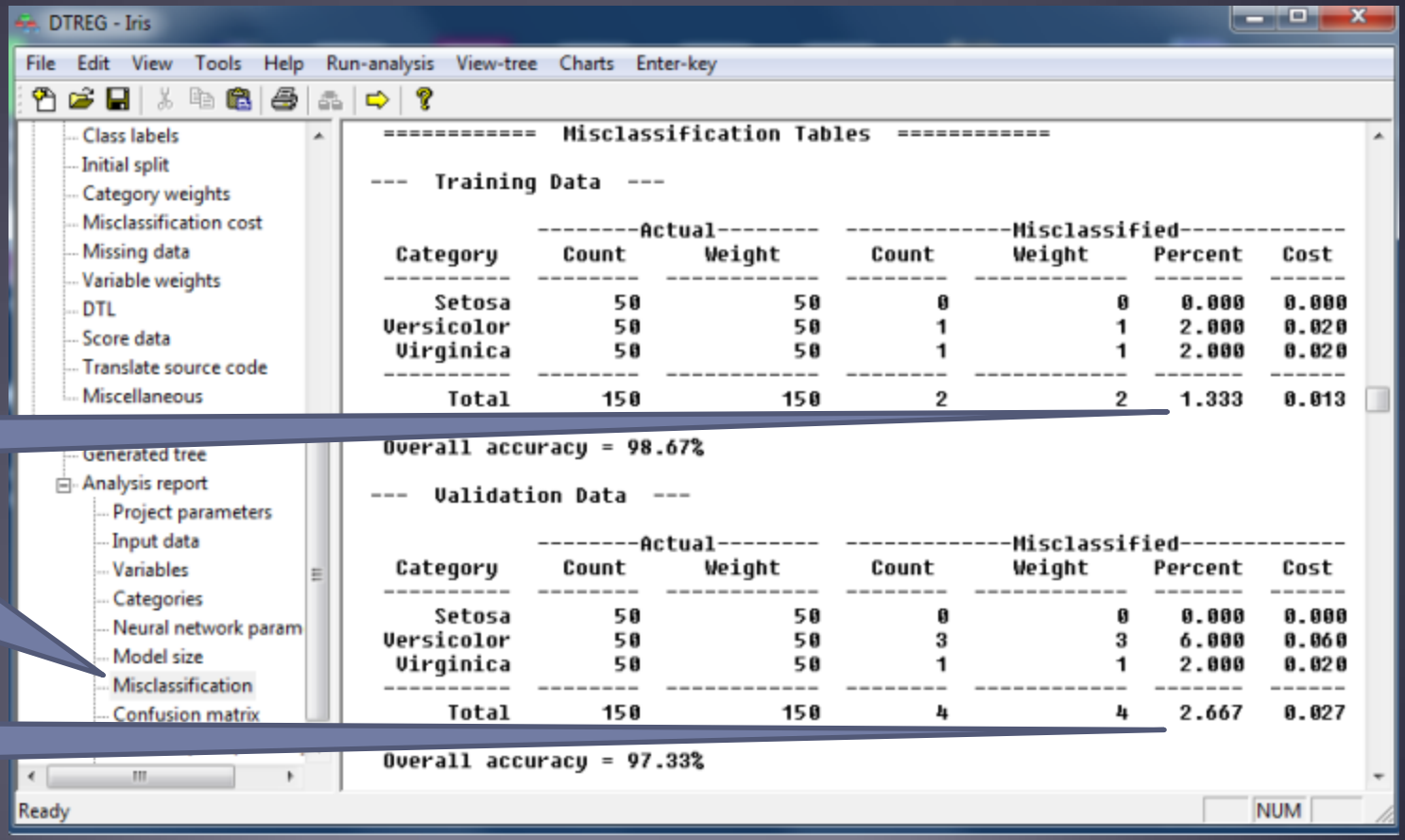
Minimum error with 5 neurons in hidden layer

View Summary of Neural Network

DTREG determined that 5 neurons were optimum for the hidden layer



View Misclassification Summary Table



1.333% error on training data

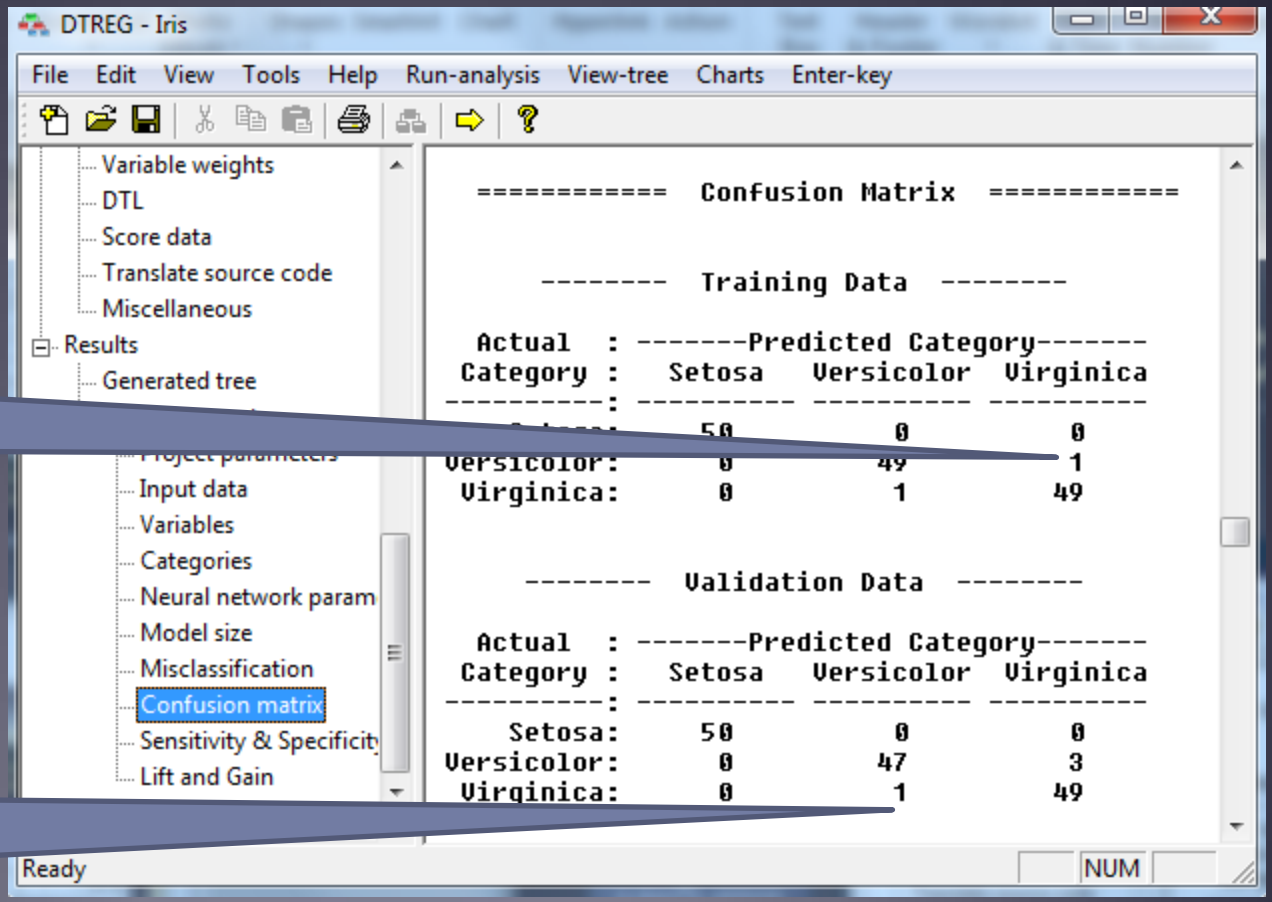
Click to select mis-classification table

2.667% error on validation

Viewing the Confusion Matrix

Training data: one Versicolor was misclassified as Virginica

Validation data: one Virginica was misclassified as Versicolor



End of Neural Network Tutorial

- This completes the DTREG neural network training tutorial