

Neural Networks

Build a network based model to describe the impact that multiple predictor variables have on an outcome and to make predictions of a categorical outcome (classify) or a continuous outcome.

Neural Networks

1. From an open JMP® data table, select **Analyze > Predictive Modeling > Neural**.
2. Select a response variable from **Select Columns** and click **Y, Response**. Here we chose 'Price'.
3. Select explanatory variable(s) from **Select Columns** and click **X, Factor**. Here we chose 6 variables ('Carat Weight' – 'Cut').
Note: JMP Pro allows you to specify a validation column.
4. Click **OK**.
5. In the resulting Model Launch window:

In JMP Pro (Dialog box shown top right):

- Specify the **Holdback Proportion** or the number of **Folds** if a validation column was not specified in the previous dialog box.
- Specify the **hidden layer structure** by entering the number of TanH, Linear and Gaussian functions to use in each layer.
- If using **boosting**, specify the number of models and the learning rate.
- Select the desired **fitting options**, and click **Go**.

In JMP (Second from top):

- Select the **validation** method (Excluded Rows Holdback, Holdback, KFold).
- Specify the **Holdback Proportion** or the number of **Folds**.
- Specify the number of **Hidden Nodes**, and click **Go**.

JMP and JMP Pro will generate fit statistics for both the training and validation data. For categorical responses, a **Confusion matrix** and **Confusion Rates matrix** are also generated. The cutoff values can be changed via the Decision Threshold tool for a binary outcome variable.

Tips:

- Use red triangle options (for the model) to view estimates, save formulas, display a plot of the Actual vs Predicted values, and display model profilers (shown here). To view a saved formula: In the **column panel** of the data table, click the **plus sign** next to the name of the desired hidden layer.

Diamonds Data.jmp (Help > Sample Data Folder)

Neural

Model Launch

Validation Method: Holdback
Holdback Proportion: 0.3333
Reproducibility: Random Seed: 0

Hidden Layer Structure
Number of nodes of each activation type
Activation: Sigmoid Identity Radial
Layer TanH Linear Gaussian
First 3 0 0
Second 0 0 0
Second layer is closer to X's in two layer models.

Boosting
Fit an additive sequence of models scaled by the learning rate.
Number of Models: 0
Learning Rate: 0.1

Fitting Options
☐ Transform Covariates
☐ Robust Fit
Penalty Method: Squared
Number of Tours: 1

Go

Neural

Model Launch

Validation Method: Holdback
Holdback Proportion: 0.3333
Reproducibility: Random Seed: 0
Hidden Nodes: 3

Go

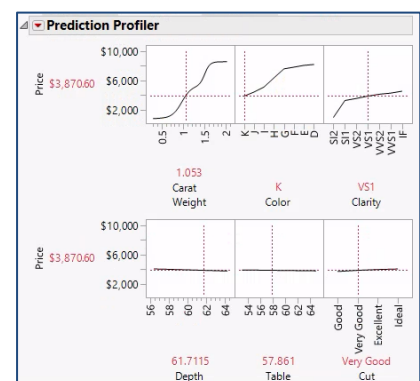
Neural

Validation: Random Holdback

Model Launch

Model NTanH(3)

Training		Validation	
Measures	Value	Measures	Value
RSquare	0.9723327	RSquare	0.9667997
RASE	403.18375	RASE	439.08932
Mean Abs Dev	287.9143	Mean Abs Dev	304.97217
-LogLikelihood	13301.067	-LogLikelihood	6730.7663
SSE	291464939	SSE	172941093
Sum Freq	1793	Sum Freq	897



Visit **Predictive and Specialized Models > Neural Networks** in **JMP Help** to learn more.