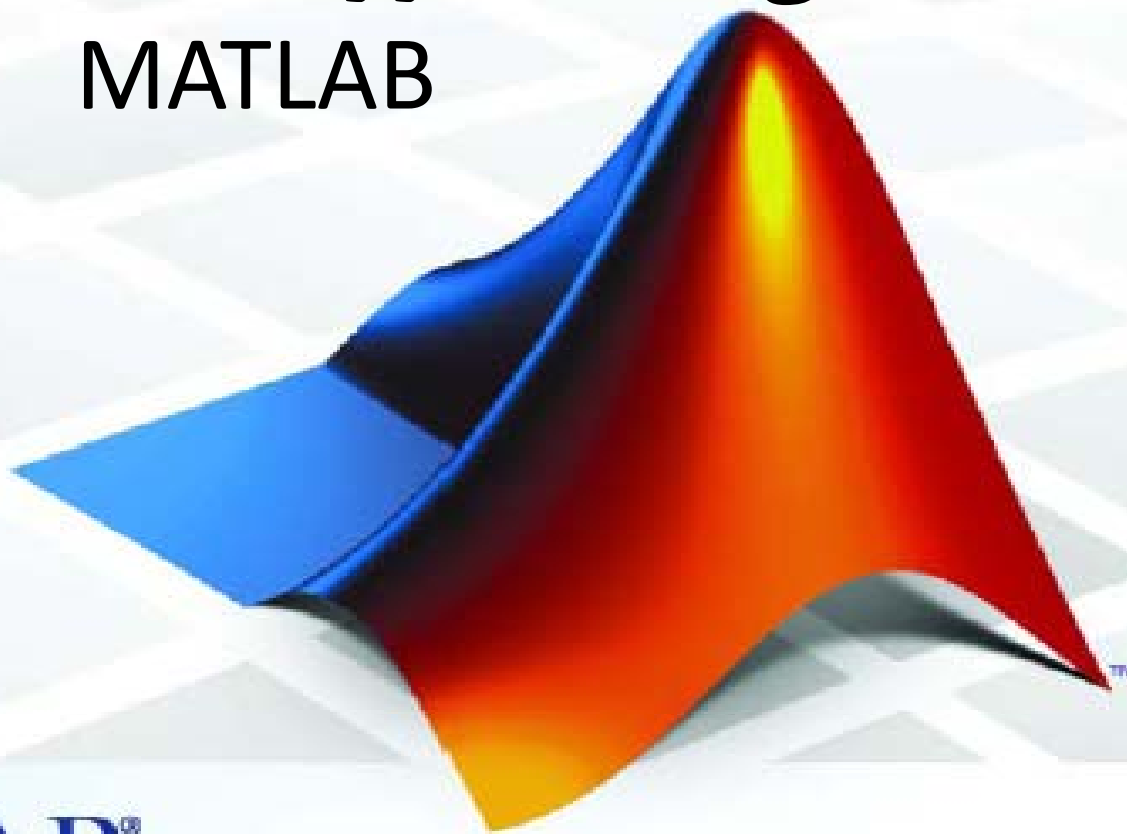
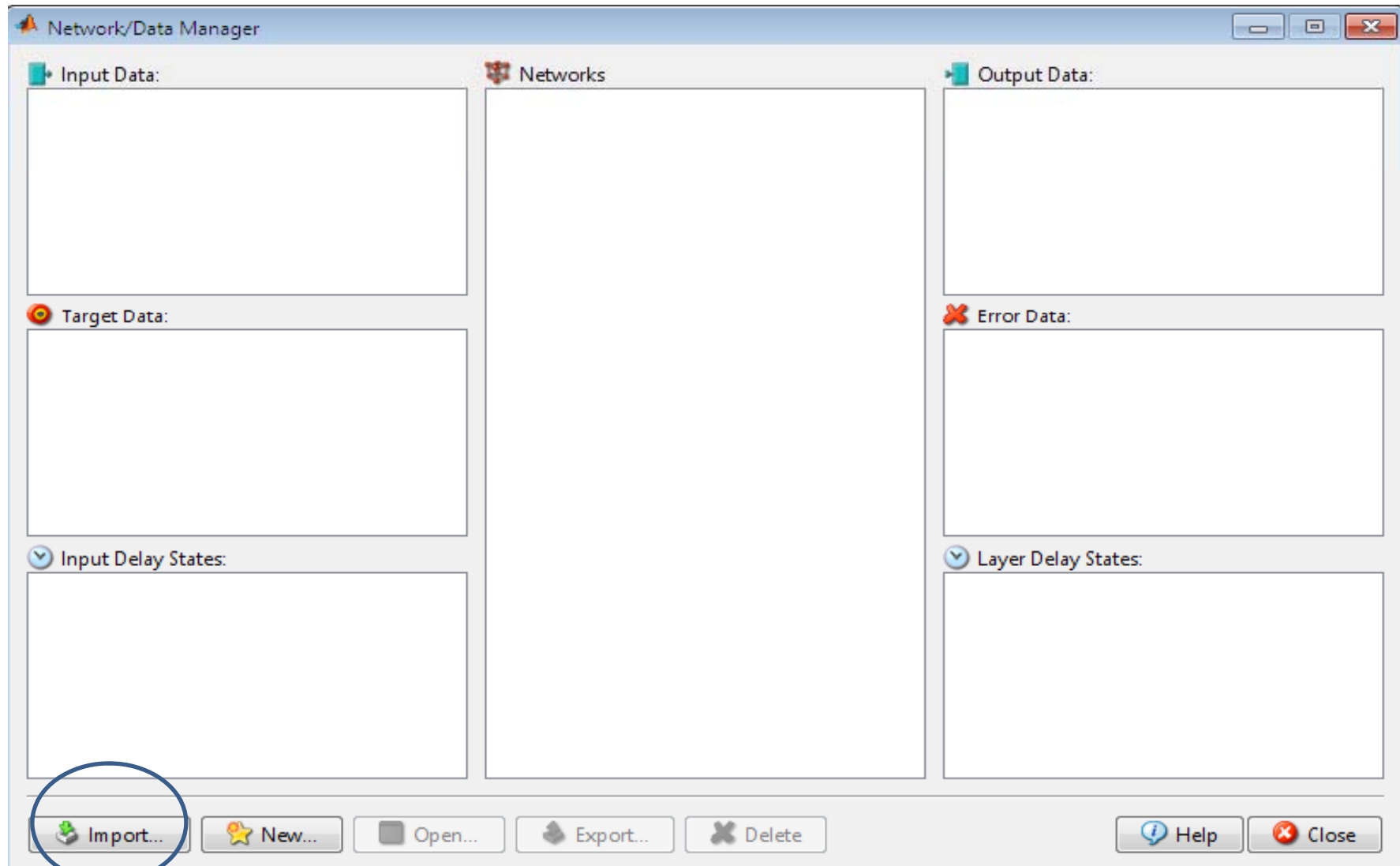


آشنایی با جعبه ابزار شبکه عصبی در نرم افزار MATLAB

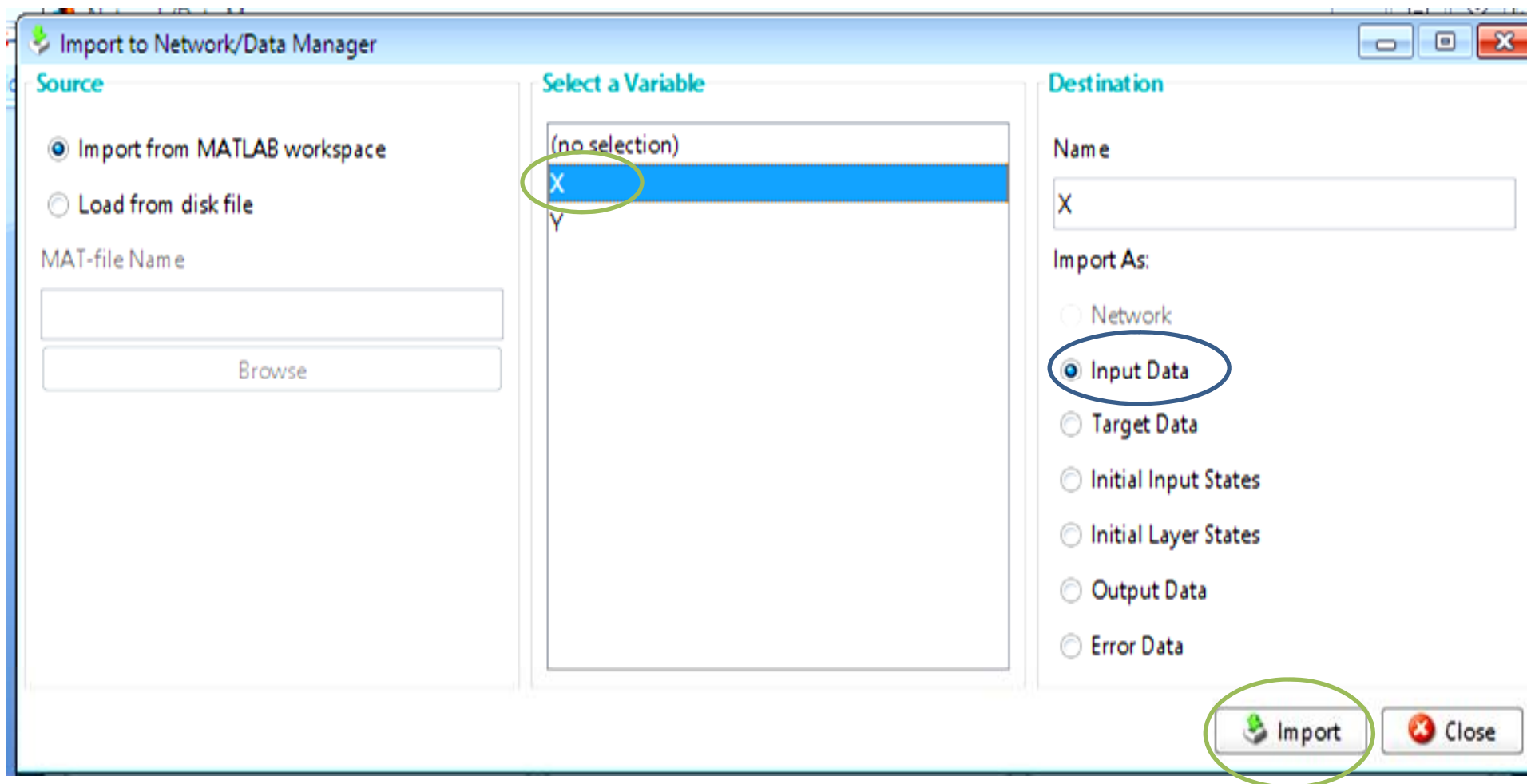


MATLAB®

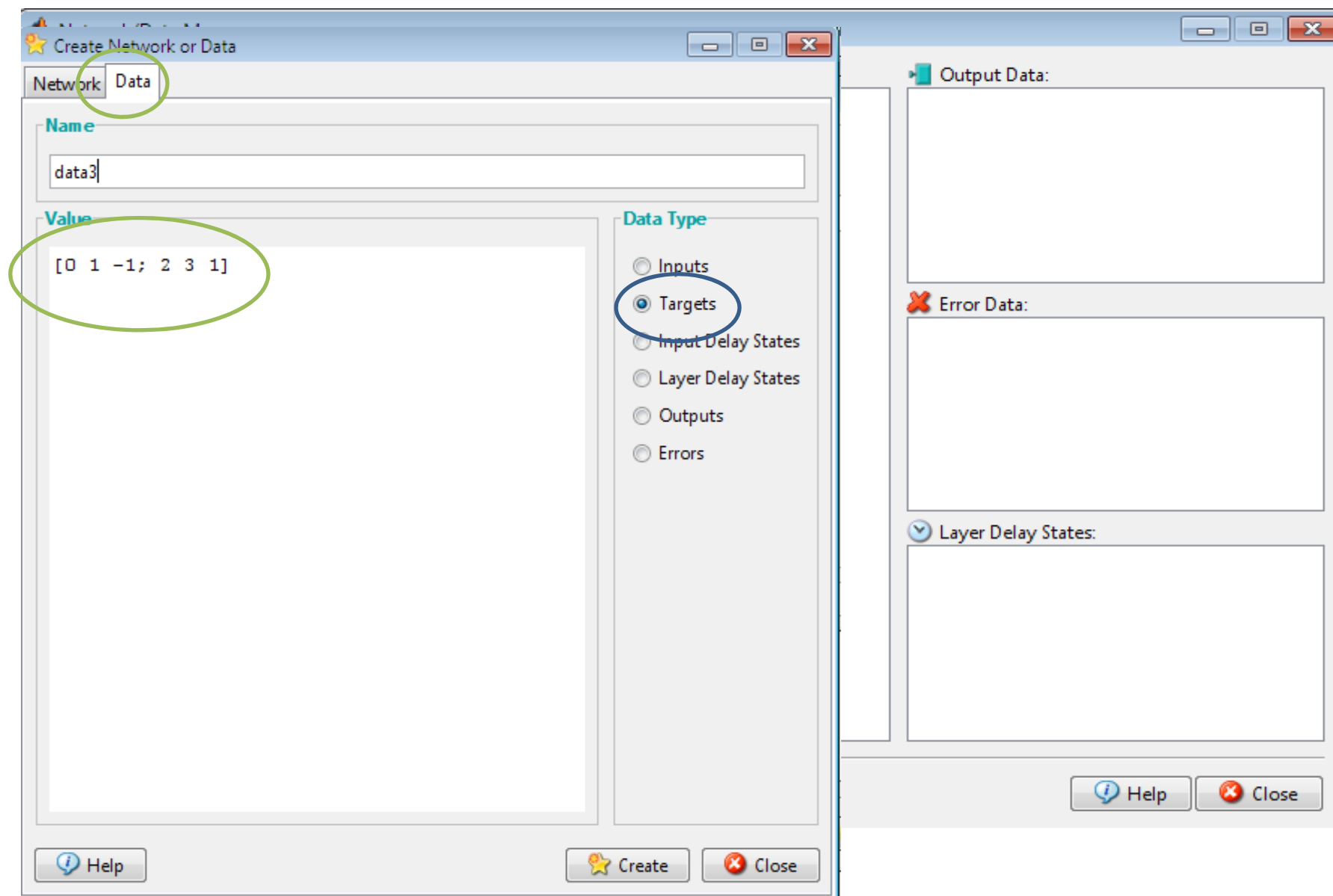
ابتدا در command window دستور nntool را اجرا کنید. محیط گرافیکی جعبه ابزار شبکه عصبی ظاهر می شود. گام اول انتخاب متغیرهای ورودی است. با انتخاب گزینه Import از منوی ظاهر شده می توانید متغیرهای مورد نظر را انتخاب کنید.



با انتخاب گزینه Import منوی زیر ظاهر می شود که می توانید متغیرهای ورودی، متغیرهای هدف و سایر متغیرها را وارد کنید. دقت کنید قبل از این گام باید متغیرها در workspace تعریف شده باشند. پس از انتخاب هر متغیر و نوع آن گزینه Import را انتخاب کنید



راه دیگر برای انتخاب و یا تعریف متغیرهای ورودی انتخاب گزینه New و سپس استفاده از زبانه data در منوی creat Network or data است



تعیین ویژگی های شبکه

Create Network or Data

Network Data

Name

network1

Network Properties

Network Type: Feed-forward backprop

Input data: inputdata1

Target data: targetdata

Training function: TRAINLM

Adaption learning function: LEARNGD

Performance function: MSE

Number of layers: 1

Properties for: Layer 1

Number of neurons: 10

Transfer Function: TANSIG

View Restore Defaults

Help Create Close

← نام شبکه

← تعیین نوع شبکه

← ماتریس ورودی و خروجی

← تابع آموزش

← تابع یادگیری

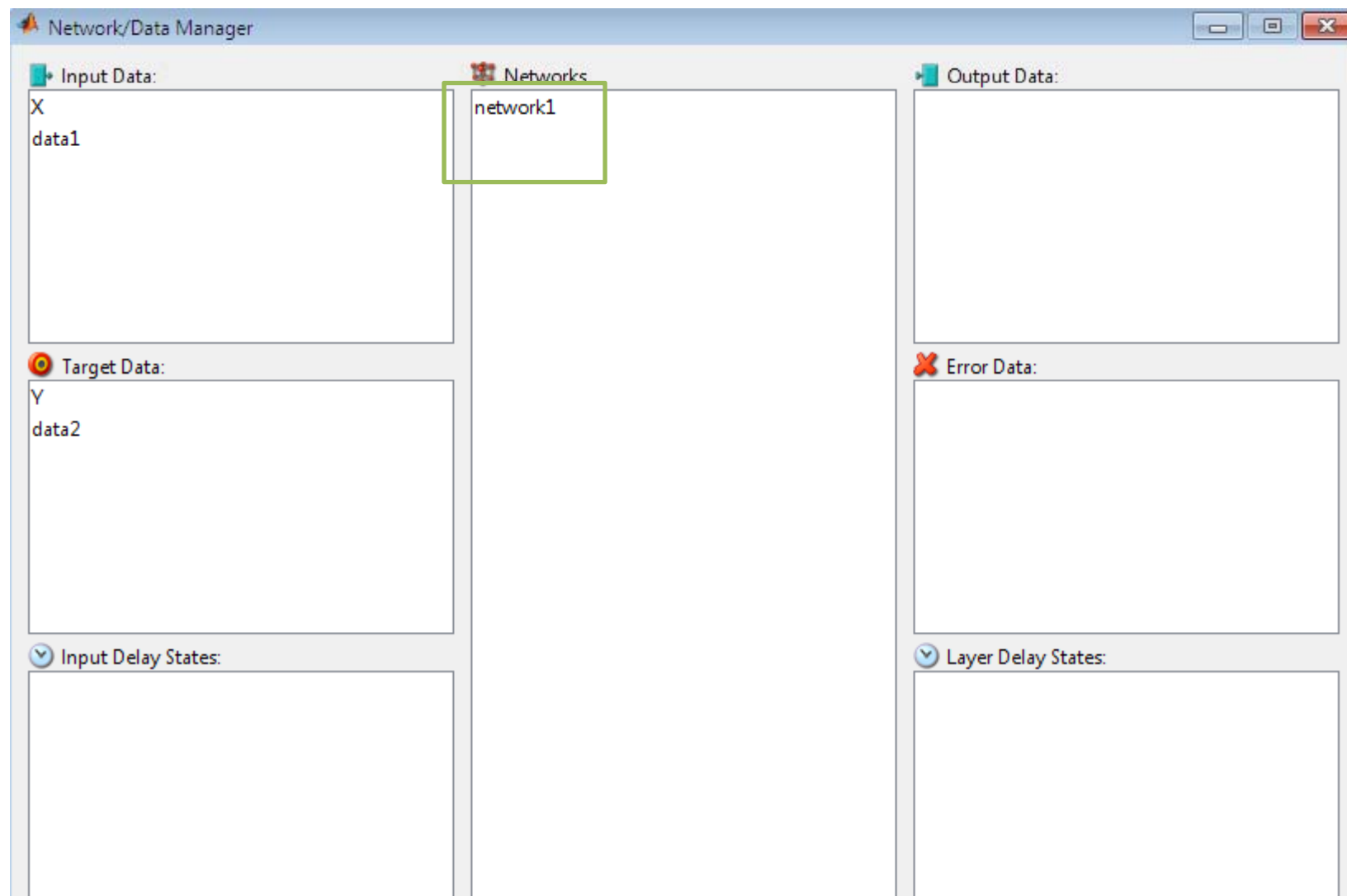
← نوع خطای شبکه

← تعداد لایه ها

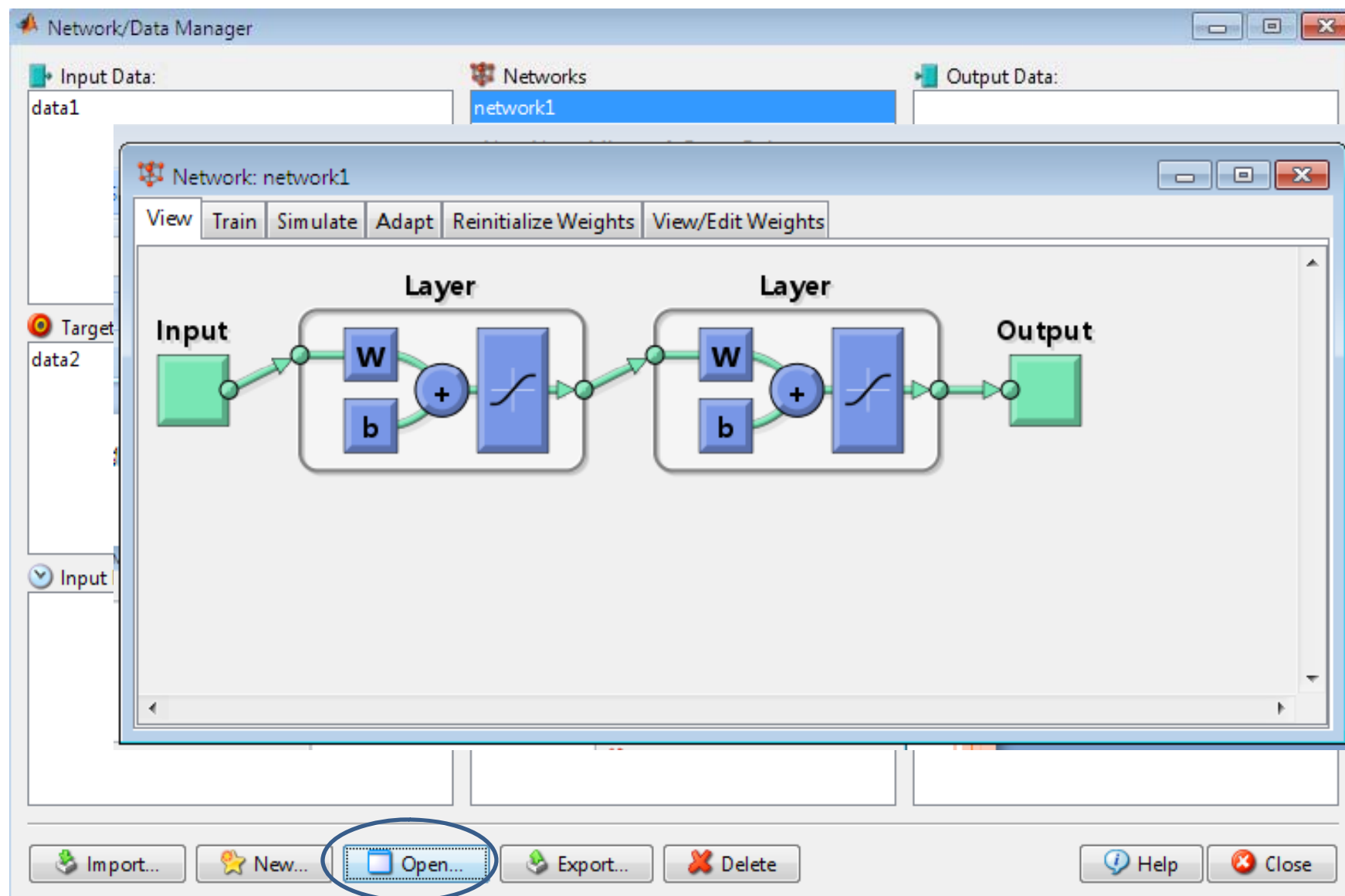
← ویژگی های هر لایه

← ساخت شبکه

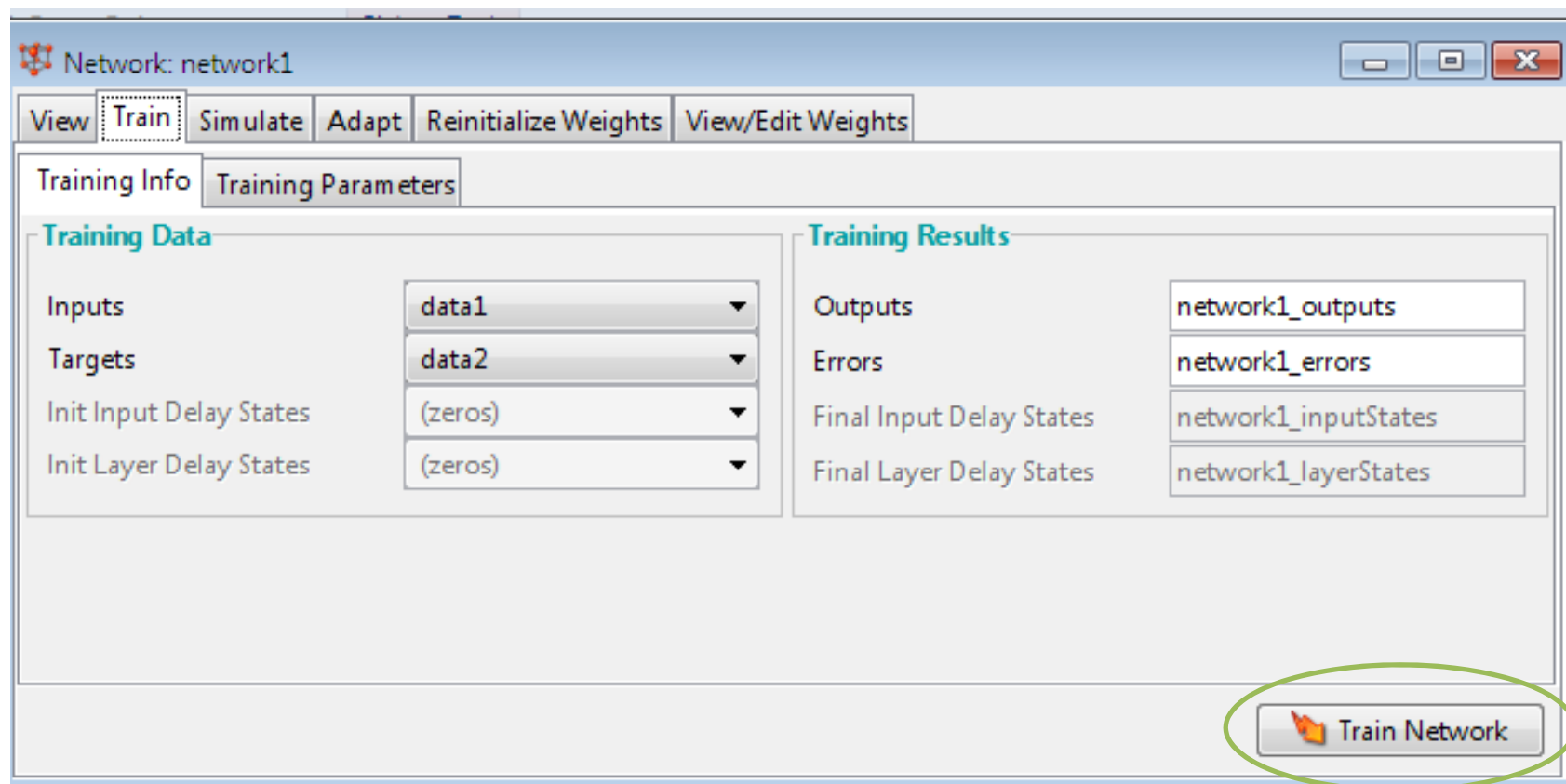
با انجام دستورات فوق شبکه با نام موردنظر در لیست Networks از منوی Network/data manager قرار می گیرد

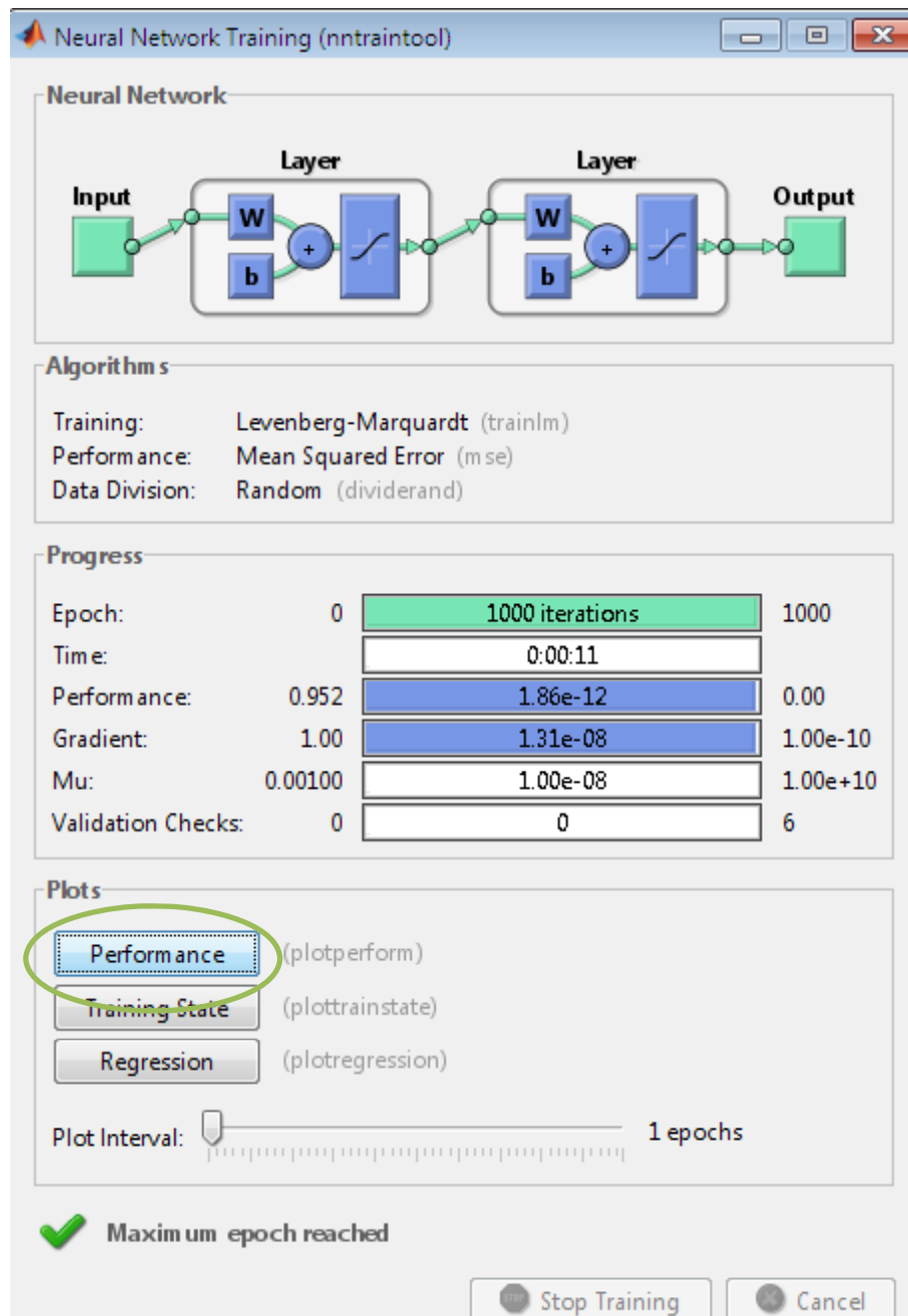


حال برای آموزش شبکه آن را از لیست فوق انتخاب نموده و گزینه open را انتخاب کنید منوی زیر ظاهر می شود

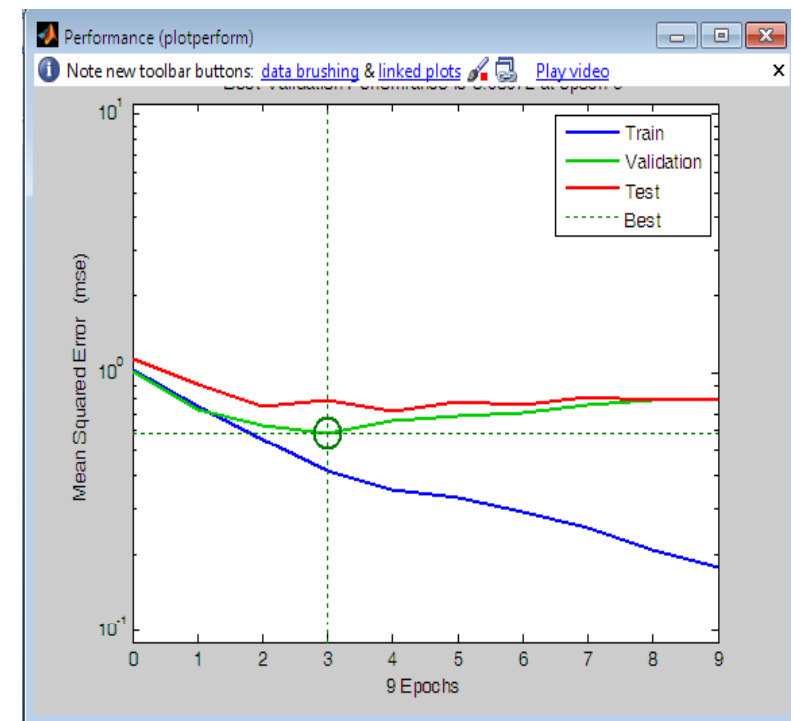


سپس با انتخاب زبانه Train متغیرهای ورودی و خروجی و سایر پارامترهای شبکه را تعیین نموده و گزینه Train network را انتخاب کنید.

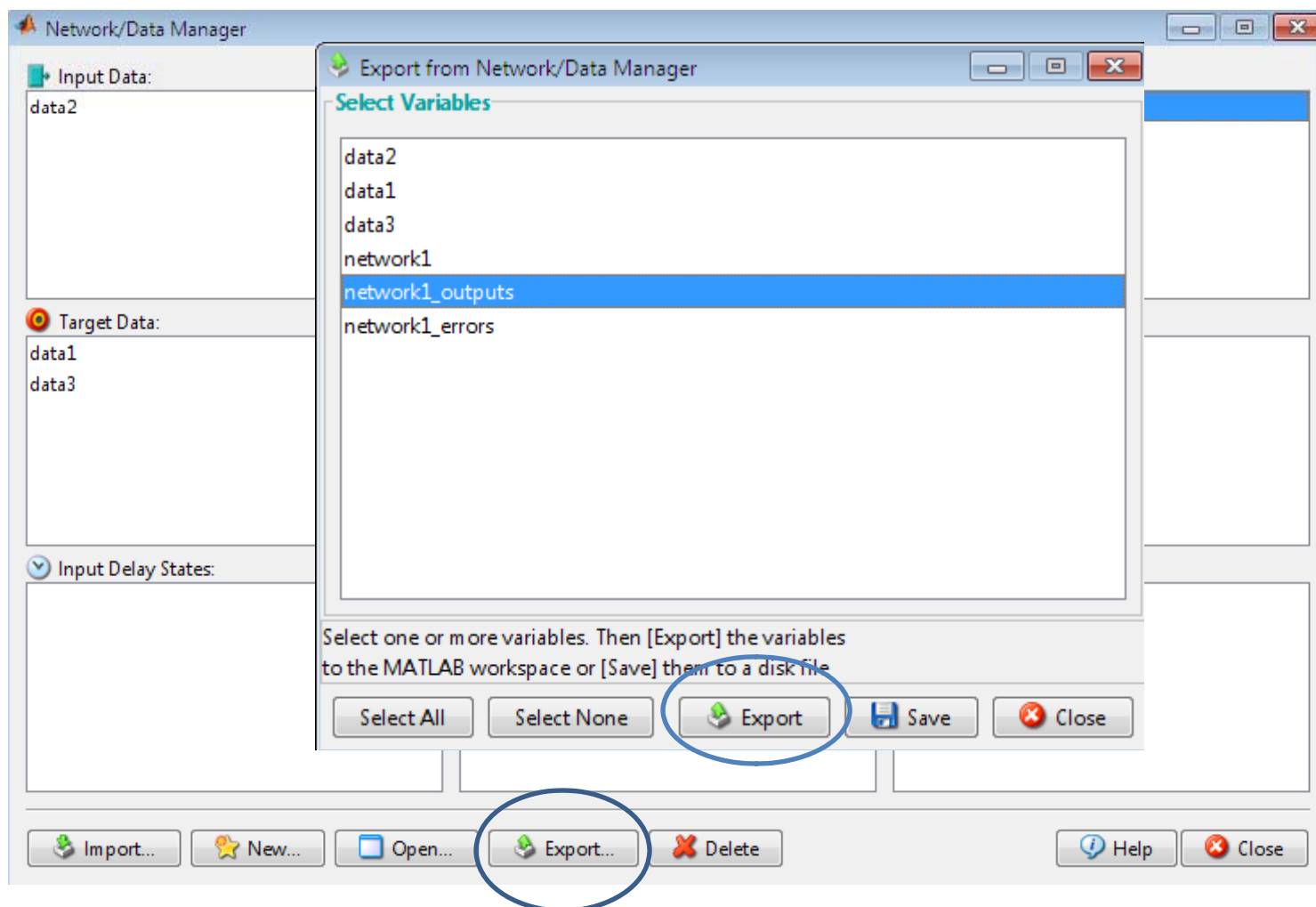




با انجام عملیات فوق شبکه آموزش می یابد و منوی زیر ظاهر می شود.
برای دیدن مراحل آموزش شبکه گزینه Performance را انتخاب کنید



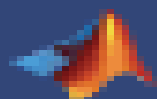
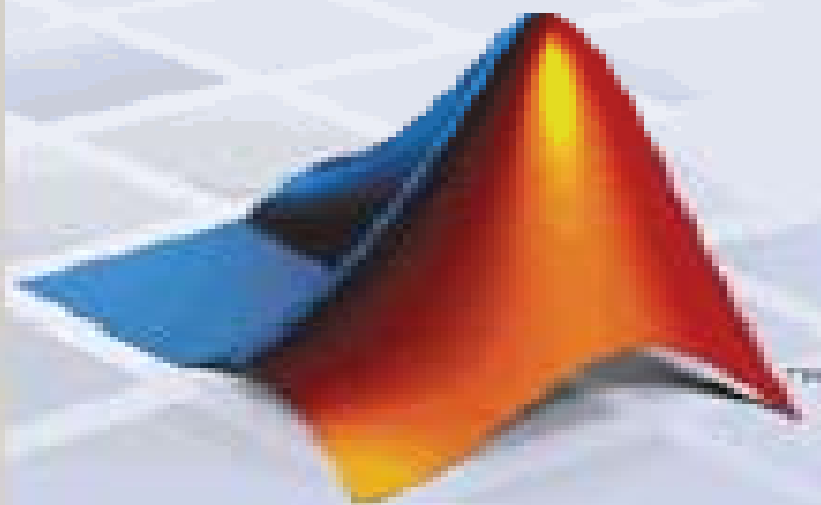
پس از آموزش شبکه برای انتقال متغیرها به محیط workspace در منوی Network/data manager با انتخاب متغیر و با استفاده از گزینه Export متغیر موردنظر را به workspace یا هر مکان دلخواهی دیگری می توان انتقال داد



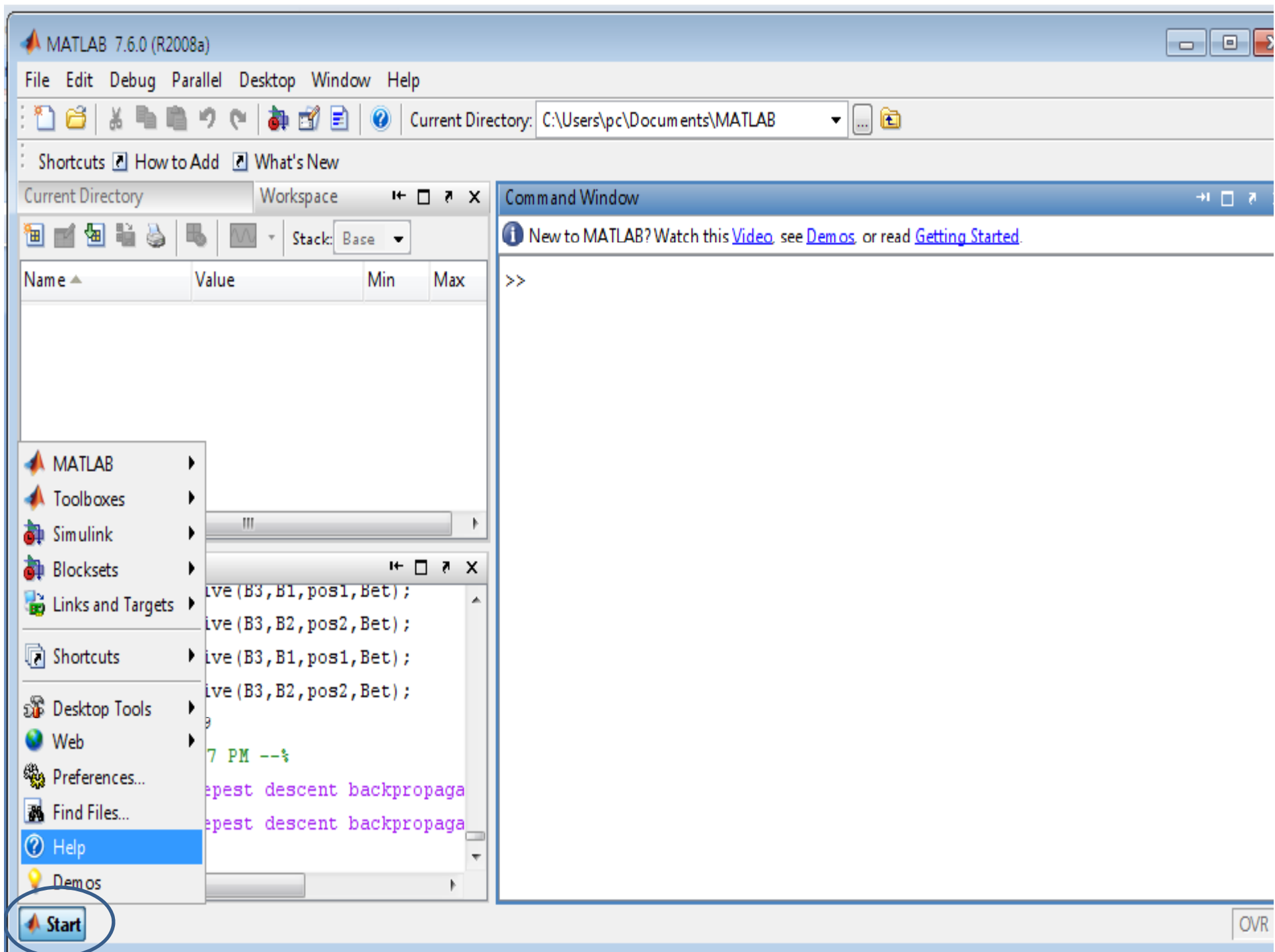
MATLAB
& SIMULINK

R2008a

استفاده از ToolboX شبکه عصبی در MATLAB Help نرم افزار



The MathWorks™



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Help Navigator

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Example: "plot tools" OR plot* tools

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Neural Network Toolbox

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0.0036 0.0036

0.0046 0.0046

0.0046 0.0046

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Documentation Set

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Introduces Neural Network Toolbox and gets you started using it

User's Guide

Provides tutorials and comprehensive information about Neural Network Toolbox

Product Demos

Neural Network Toolbox Demos

Presents a collection of demos that you can run from the Help browser to help you learn the product

What's New

Release Notes

Summarizes new features, bug fixes, upgrade issues, etc.

Printable (PDF) Documentation on the Web

PDF documents reflect the most recent version of Neural Network Toolbox and might describe features not available in earlier versions of the software.

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0.0036 0.0036
0.0036 0.0036 0.0036
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0.0036 0.0036

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 - Adaptive Filters and Adaptive
 - Applications
 - Advanced Topics
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 - Function Reference**
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 - Graphical Interface Function
 - Layer Initialization Functions
 - Learning Functions
 - Line Search Functions
 - Net Input Functions
 - Network Initialization Functions

Title: Function Reference (Neural Network Toolbox™)

Neural Network Toolbox™

[Provide feedback about this page](#)

Function Reference

[» Alphabetical List](#)

Analysis Functions	Analyze network properties
Distance Functions	Compute distance between two vectors
Graphical Interface Functions	Open GUIs for building neural networks
Layer Initialization Functions	Initialize layer weights
Learning Functions	Learning algorithms used to adapt networks
Line Search Functions	Line-search algorithms
Net Input Functions	Sum excitations of layer
Network Initialization Function	Initialize network weights
New Networks Functions	Create network architectures
Network Use Functions	High-level functions to manipulate networks
Performance Functions	Measure network performance
Plotting Functions	Plot and analyze networks and network performance
Processing Functions	Preprocess and postprocess data
Simulink® Support Function	Generate Simulink® block for network simulation
Topology Functions	Arrange neurons of layer according to specific topology
Training Functions	Train networks
Transfer Functions	Transform output of network layer
Utility Functions	Internal utility functions
Vector Functions	Internal functions for network computations
Weight and Bias Initialization Functions	Initialize weights and biases
Weight Functions	Convolution, dot product, scalar product, and distances weight functions

انواع تابع آموزش

The screenshot displays the MATLAB Help Navigator window. The 'Contents' pane on the left shows a tree structure with 'Neural Network Toolbox' expanded, and 'Function Reference' selected. The main pane on the right is titled 'Function Reference (Neural Network Toolbox™)' and is divided into two sections: 'Training Functions' and 'Transfer Functions'.

Training Functions

- [trainb](#) Batch training with weight and bias learning rules
- [trainbfg](#) BFGS quasi-Newton backpropagation
- [trainbfgc](#) BFGS quasi-Newton backpropagation for use with NN model reference adaptive controller
- [trainbr](#) Bayesian regularization
- [trainbuwb](#) Batch unsupervised weight/bias training
- [trainc](#) Cyclical order incremental update
- [traincgb](#) Powell-Beale conjugate gradient backpropagation
- [traincgf](#) Fletcher-Powell conjugate gradient backpropagation
- [traincgp](#) Polak-Ribière conjugate gradient backpropagation
- [traingd](#) Gradient descent backpropagation
- [traingda](#) Gradient descent with adaptive learning rule backpropagation
- [traingdm](#) Gradient descent with momentum backpropagation
- [traingdx](#) Gradient descent with momentum and adaptive learning rule backpropagation
- [trainlm](#) Levenberg-Marquardt backpropagation
- [trainoss](#) One step secant backpropagation
- [trainr](#) Random order incremental training with learning functions
- [trainrp](#) Resilient backpropagation (Rprop)
- [trains](#) Sequential order incremental training with learning functions
- [trainscg](#) Scaled conjugate gradient backpropagation

Transfer Functions

- [compet](#)  Competitive transfer function
- [hardlim](#)  Hard limit transfer function
- [hardlims](#)  Symmetric hard limit transfer function

انواع تابع یادگیری

The screenshot shows the MATLAB Help Navigator window. The 'Contents' pane on the left lists the 'Neural Network Toolbox' and its sub-topics, with 'Function Reference' selected. The main pane displays the 'Function Reference (Neural Network Toolbox™)' page, which is organized into three sections: 'Learning Functions', 'Line Search Functions', and 'Net Input Functions'. Each section lists various functions with their corresponding links.

Learning Functions

- [learncon](#) Conscience bias learning function
- [learnqgd](#) Gradient descent weight/bias learning function
- [learnqgdm](#) Gradient descent with momentum weight/bias learning function
- [learnh](#) Hebb weight learning function
- [learnhhd](#) Hebb with decay weight learning rule
- [learnis](#) Instar weight learning function
- [learnk](#) Kohonen weight learning function
- [learnlv1](#) LVQ1 weight learning function
- [learnlv2](#) LVQ2 weight learning function
- [learnos](#) Outstar weight learning function
- [learnp](#) Perceptron weight and bias learning function
- [learnpn](#) Normalized perceptron weight and bias learning function
- [learnsom](#) Self-organizing map weight learning function
- [learnsomb](#) Batch self-organizing map weight learning function
- [learnwh](#) Widrow-Hoff weight and bias learning rule

Line Search Functions

- [srchbac](#) 1-D minimization using backtracking search
- [srchbre](#) 1-D interval location using Brent's method
- [srchcha](#) 1-D minimization using Charalambous' method
- [srchgol](#) 1-D minimization using golden section search
- [srchhyb](#) 1-D minimization using hybrid bisection/cubic search

Net Input Functions

- [netprod](#) Product net input function
- [netsum](#) Sum net input function

انواع تابع انتقال

The screenshot displays the MATLAB Help Navigator window. On the left, the 'Contents' pane shows a tree structure with 'Function Reference' circled in blue. The 'Transfer Functions' category is highlighted in blue. The main pane on the right, titled 'Function Reference (Neural Network Toolbox™)', lists various transfer functions with their corresponding icons and descriptions. The 'ansig' function is circled in blue in the list.

Search for: Go

Example: "plot tools" OR plot* tools

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Competitive transfer function

Hard limit transfer function

Symmetric hard limit transfer function

Log-sigmoid transfer function

Inverse transfer function

Positive linear transfer function

Linear transfer function

Radial basis transfer function

Saturating linear transfer function

Symmetric saturating linear transfer function

Softmax transfer function

Hyperbolic tangent sigmoid transfer function

Triangular basis transfer function