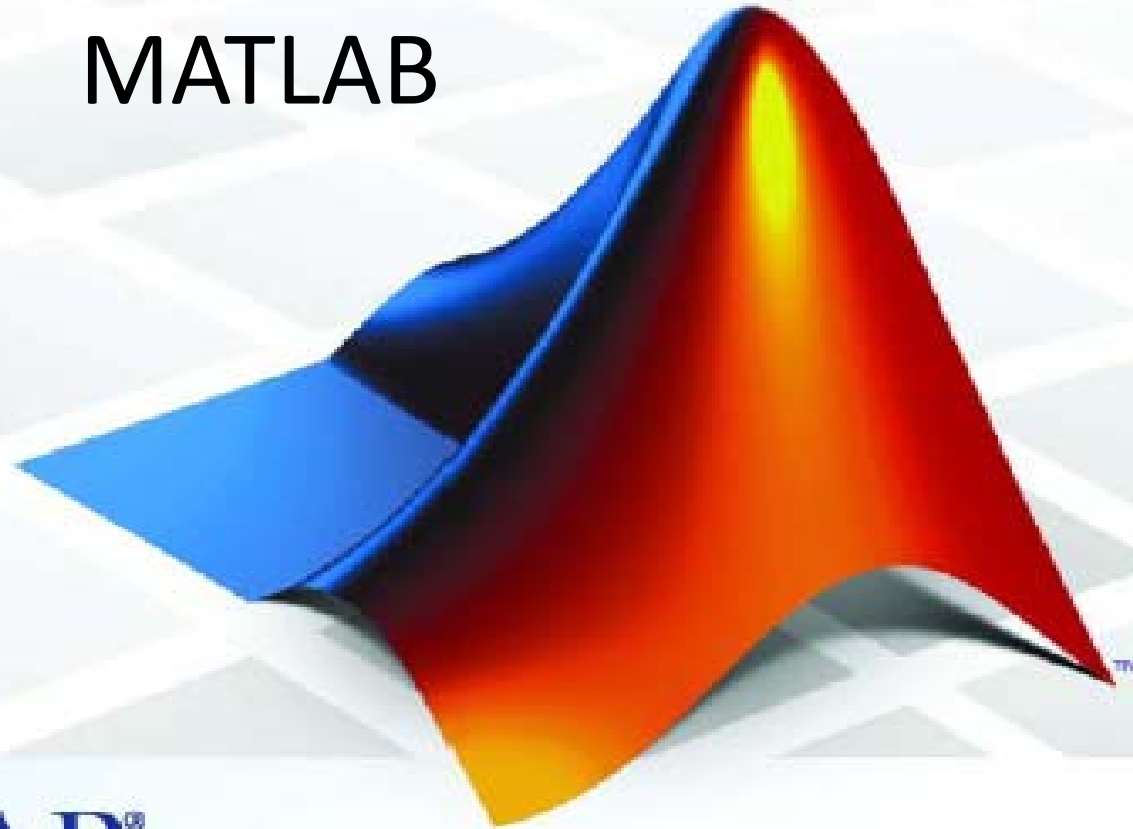
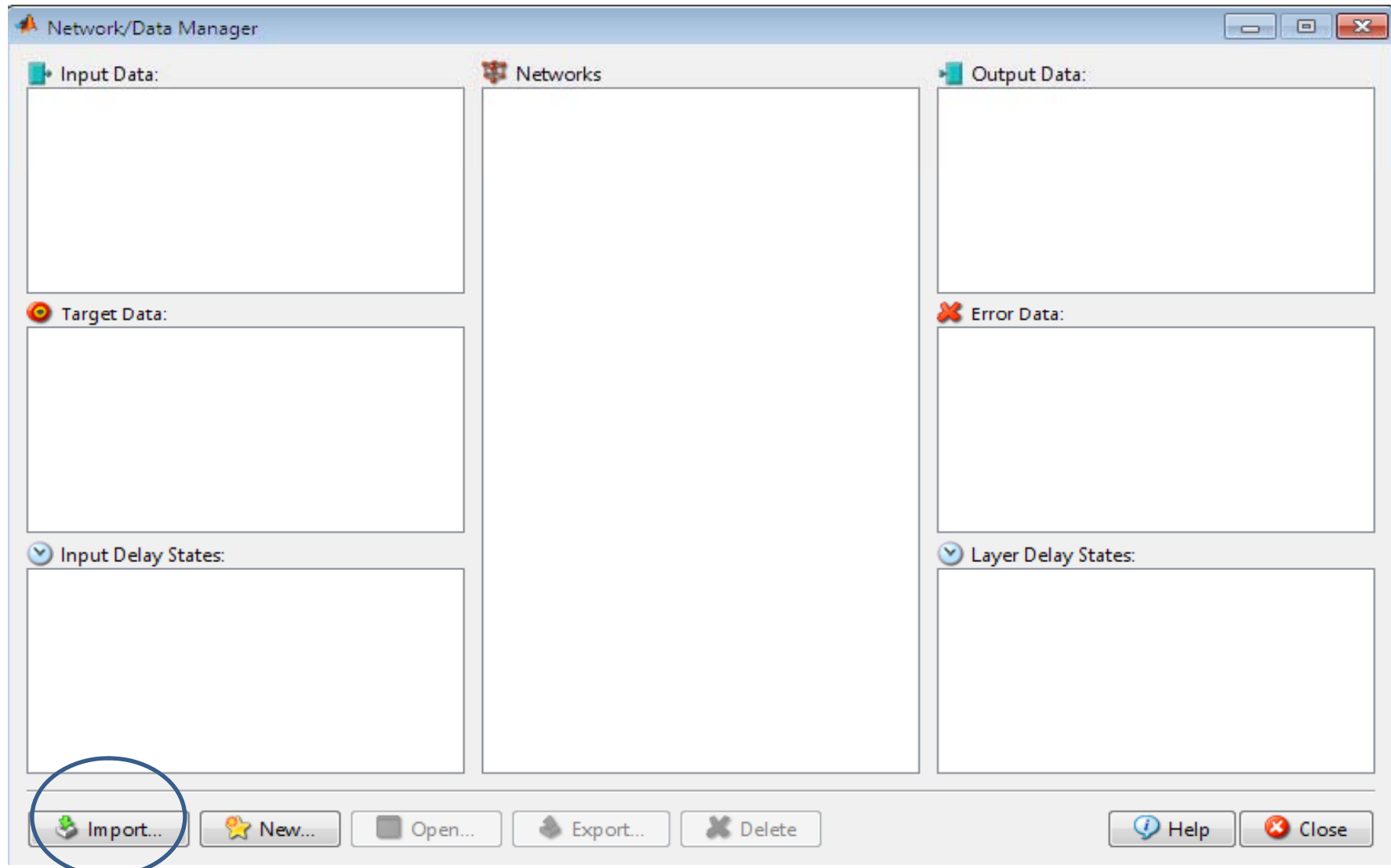


آشنایی با جعبه ابزار شبکه عصبی در نرم افزار
MATLAB

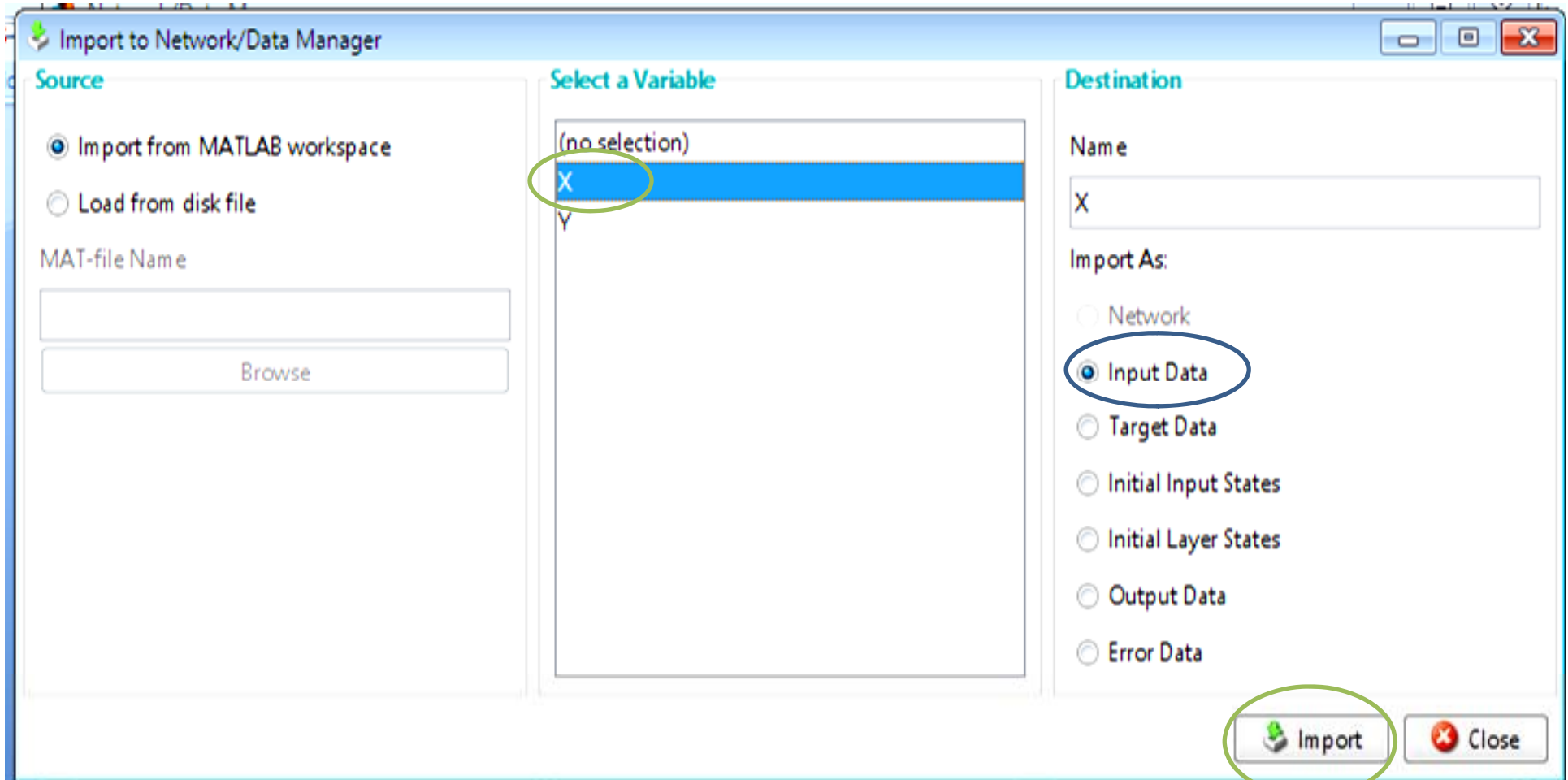


MATLAB[®]

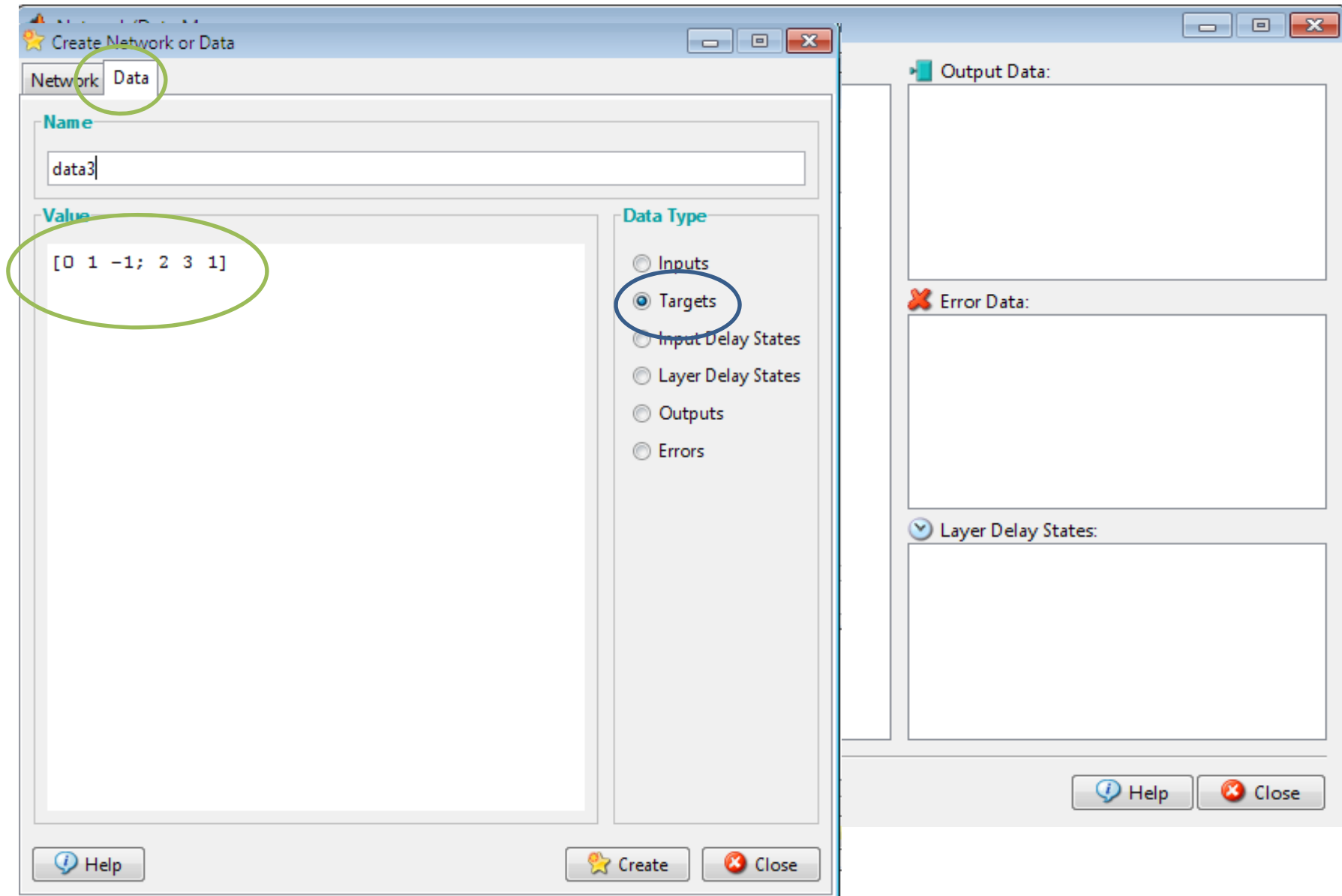
ابتدا در **command window** دستور **nntool** را اجرا کنید. محیط گرافیکی جعبه ابزار شبکه عصبی ظاهر می شود. گام اول انتخاب متغیرهای ورودی است. با انتخاب گزینه **Import** از منوی ظاهر شده می توانید متغیرهای مورد نظر را انتخاب کنید.



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

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

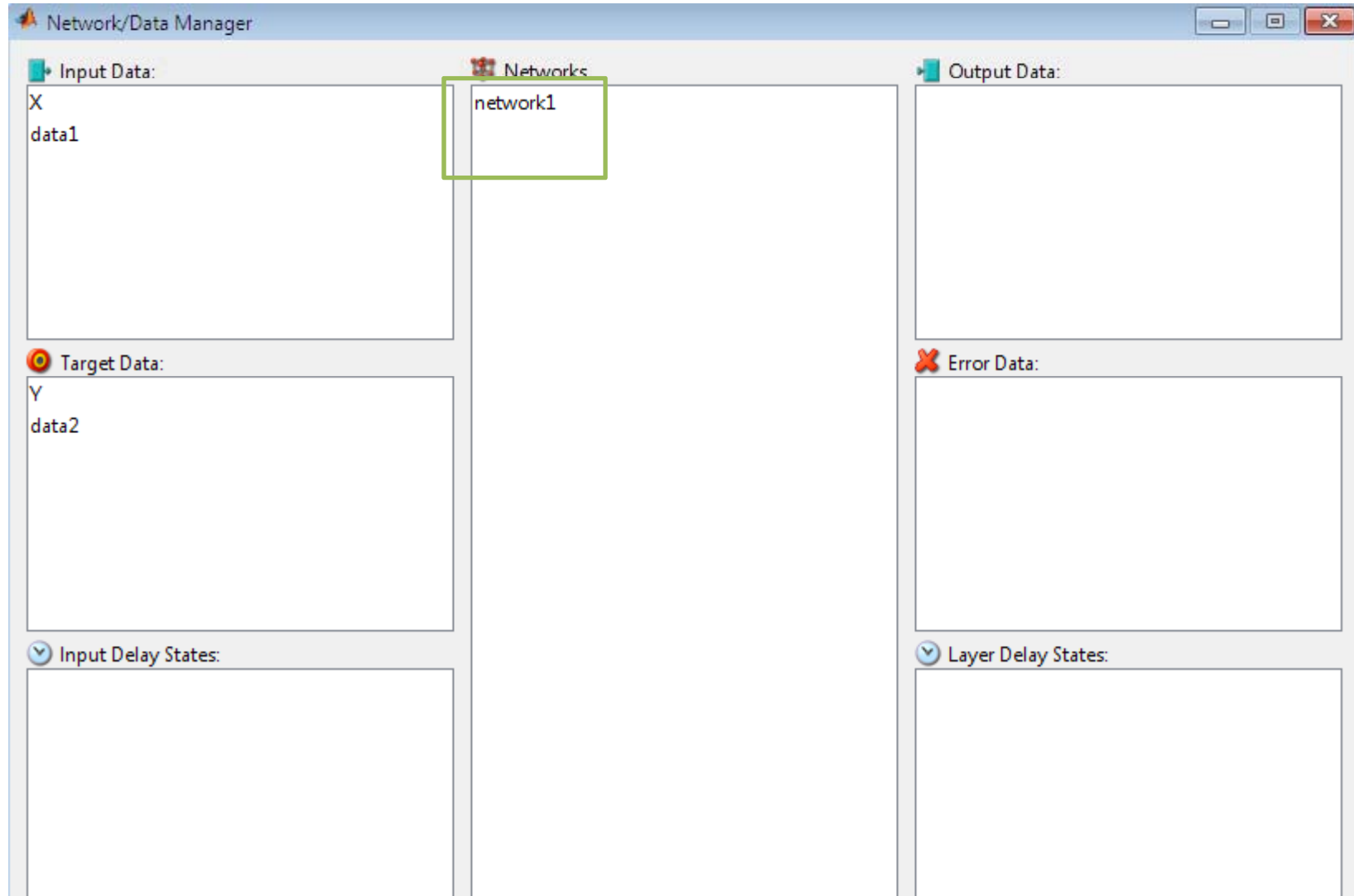
← نوع خطای شبکه

← تعداد لایه ها

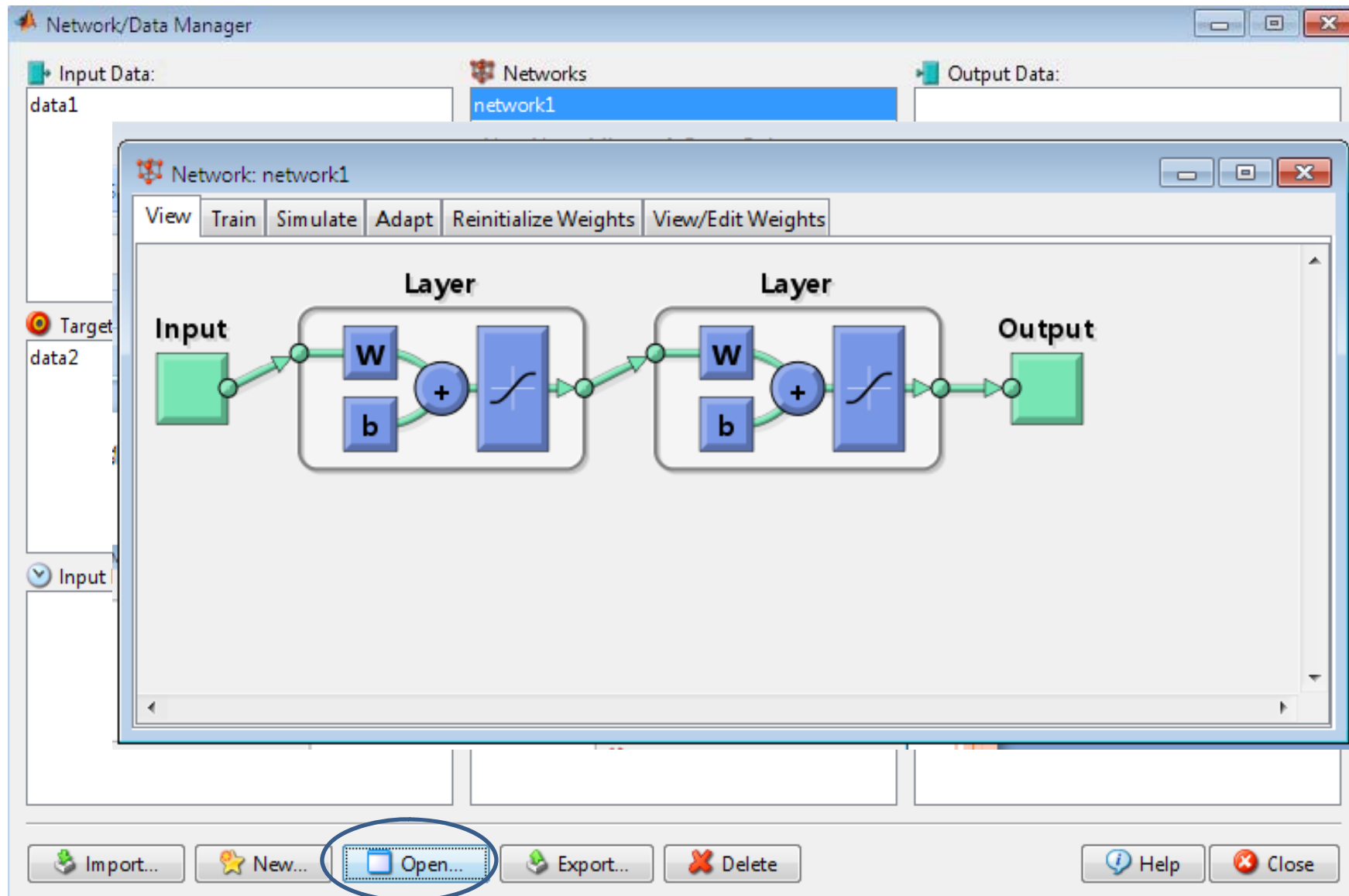
← ویژگی های هر لایه

← ساخت شبکه

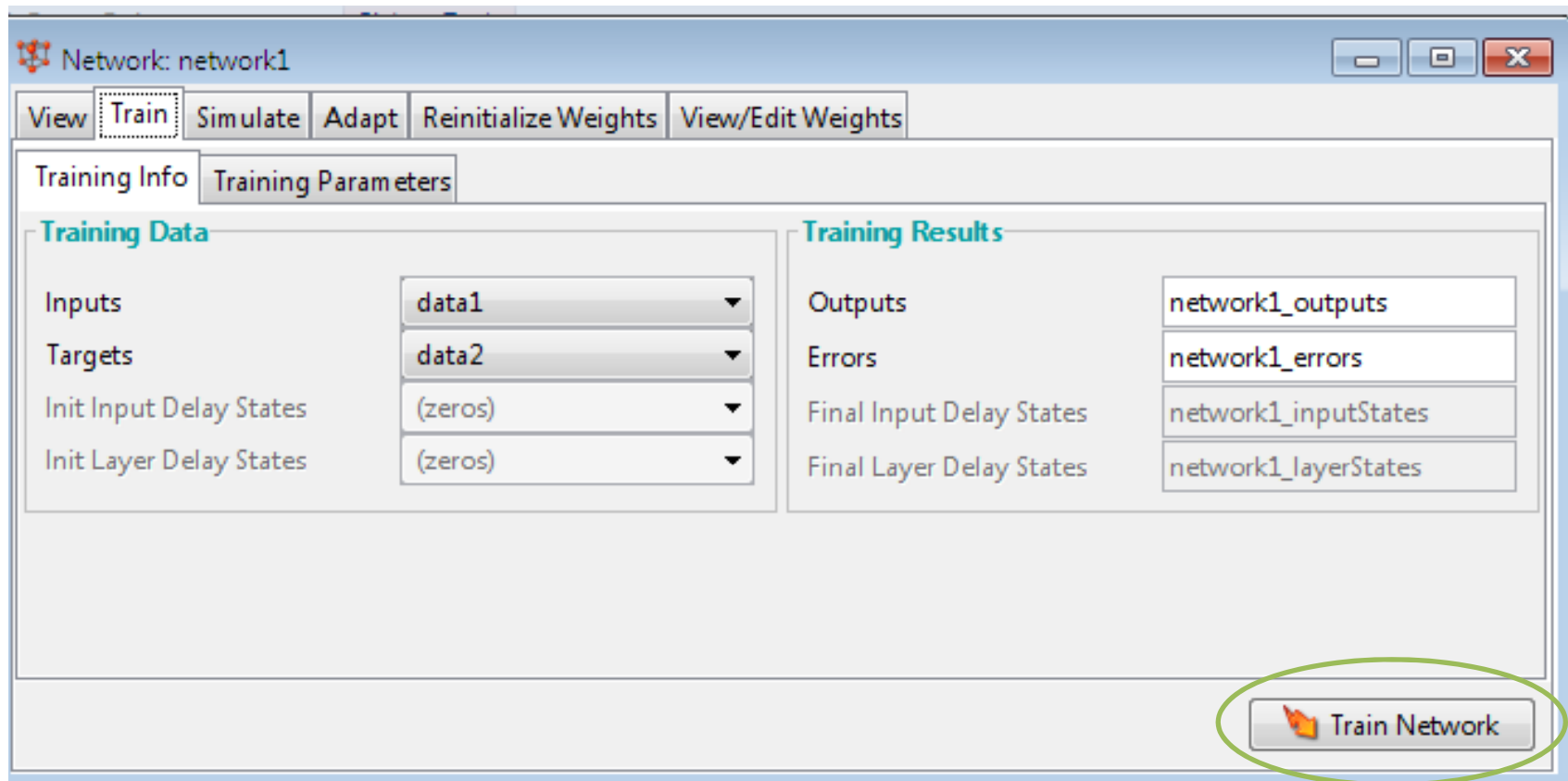
با انجام دستورات فوق شبکه با نام موردنظر در لیست Networks از منوی Network/data manager قرار می گیرد

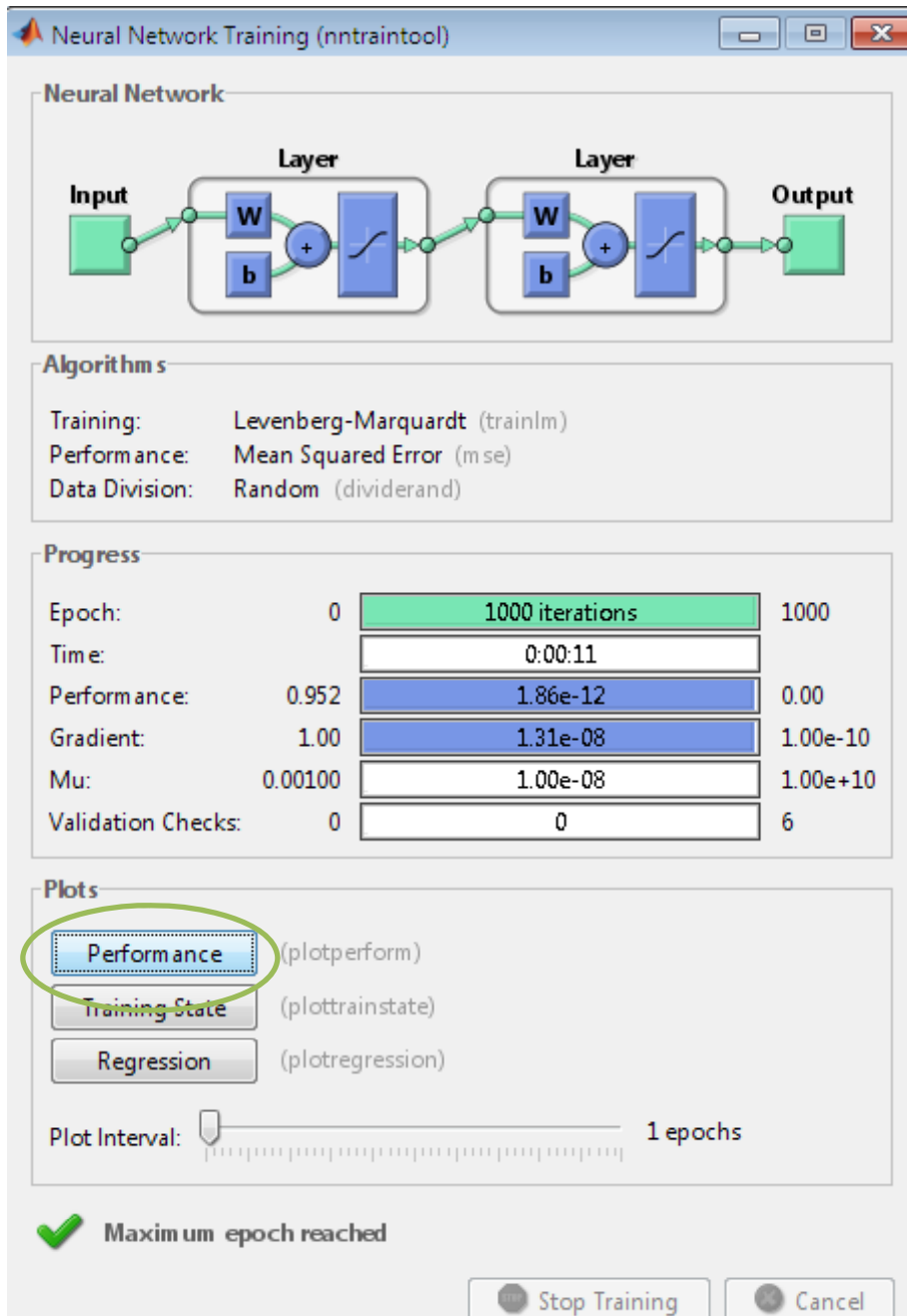


حال برای آموزش شبکه آن را از لیست فوق انتخاب نموده و گزینه open را انتخاب کنید منوی زیر ظاهر می شود

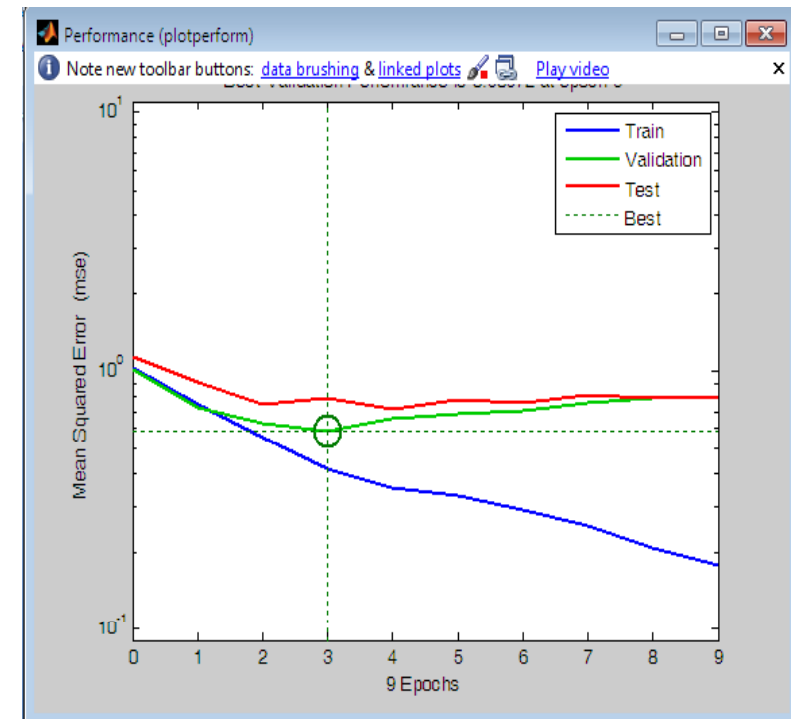


سپس با انتخاب زبانه Train متغیرهای ورودی و خروجی و سایر پارامترهای شبکه را تعیین نموده و گزینه Train network را انتخاب کنید.

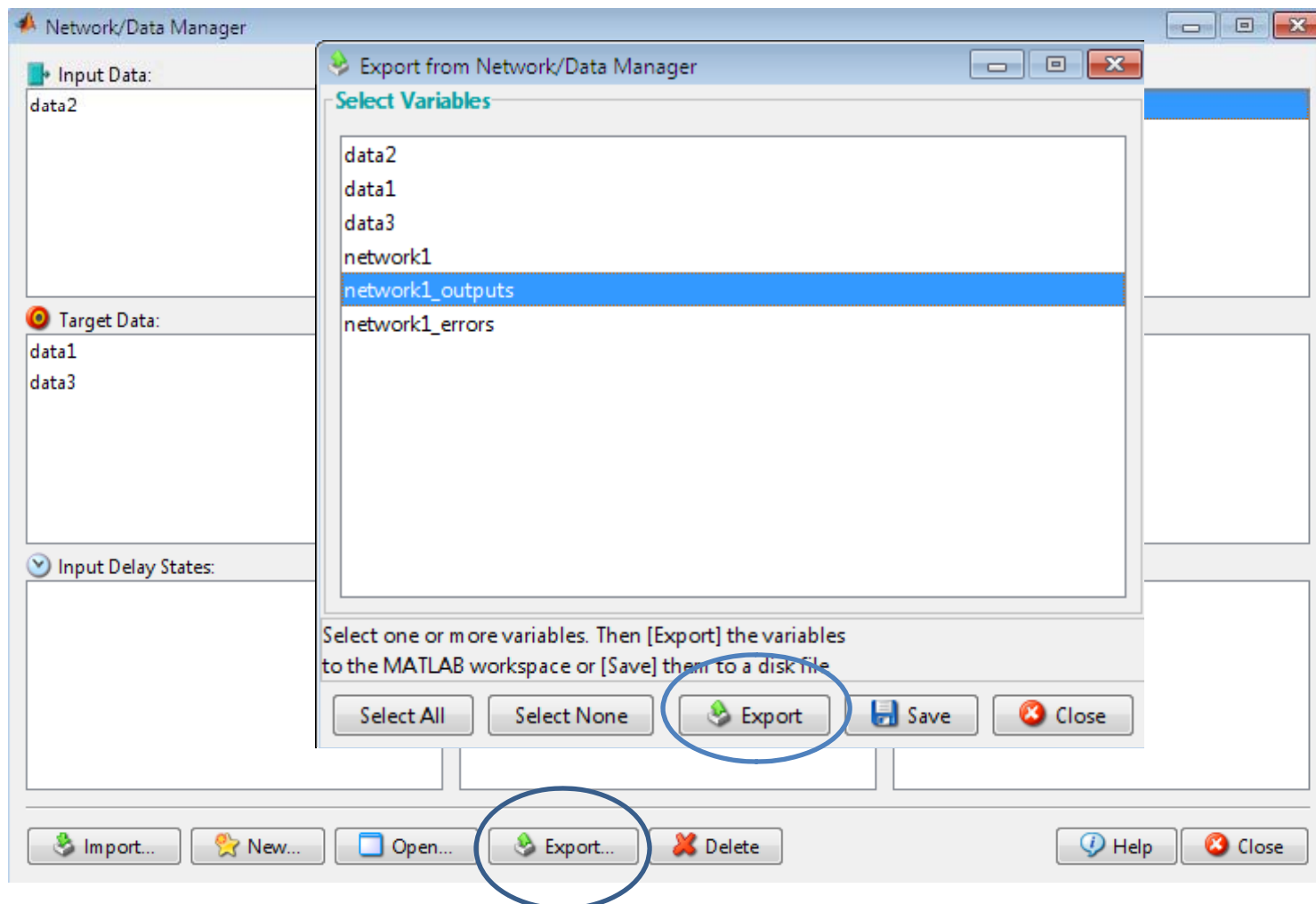




با انجام عملیات فوق شبکه آموزش می یابد و منوی زیر ظاهر می شود. برای دیدن مراحل آموزش شبکه گزینه Performance را انتخاب کنید



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

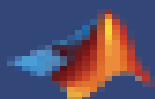
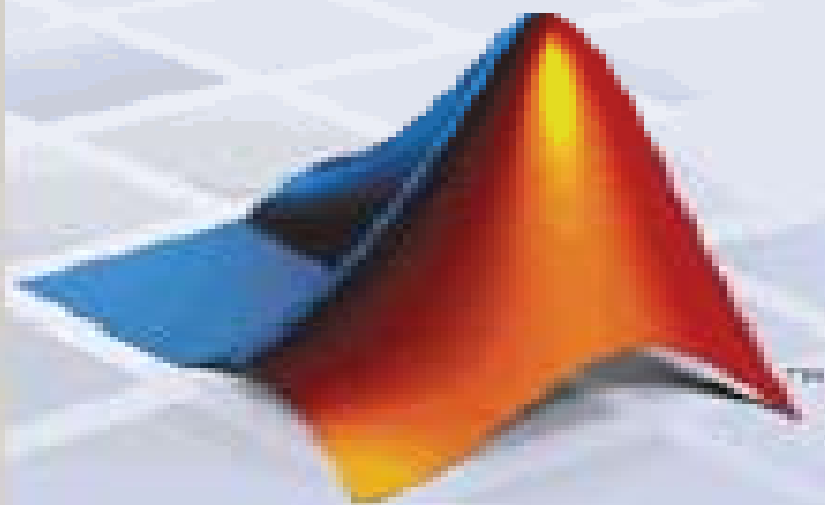


MATLAB
& SIMULINK

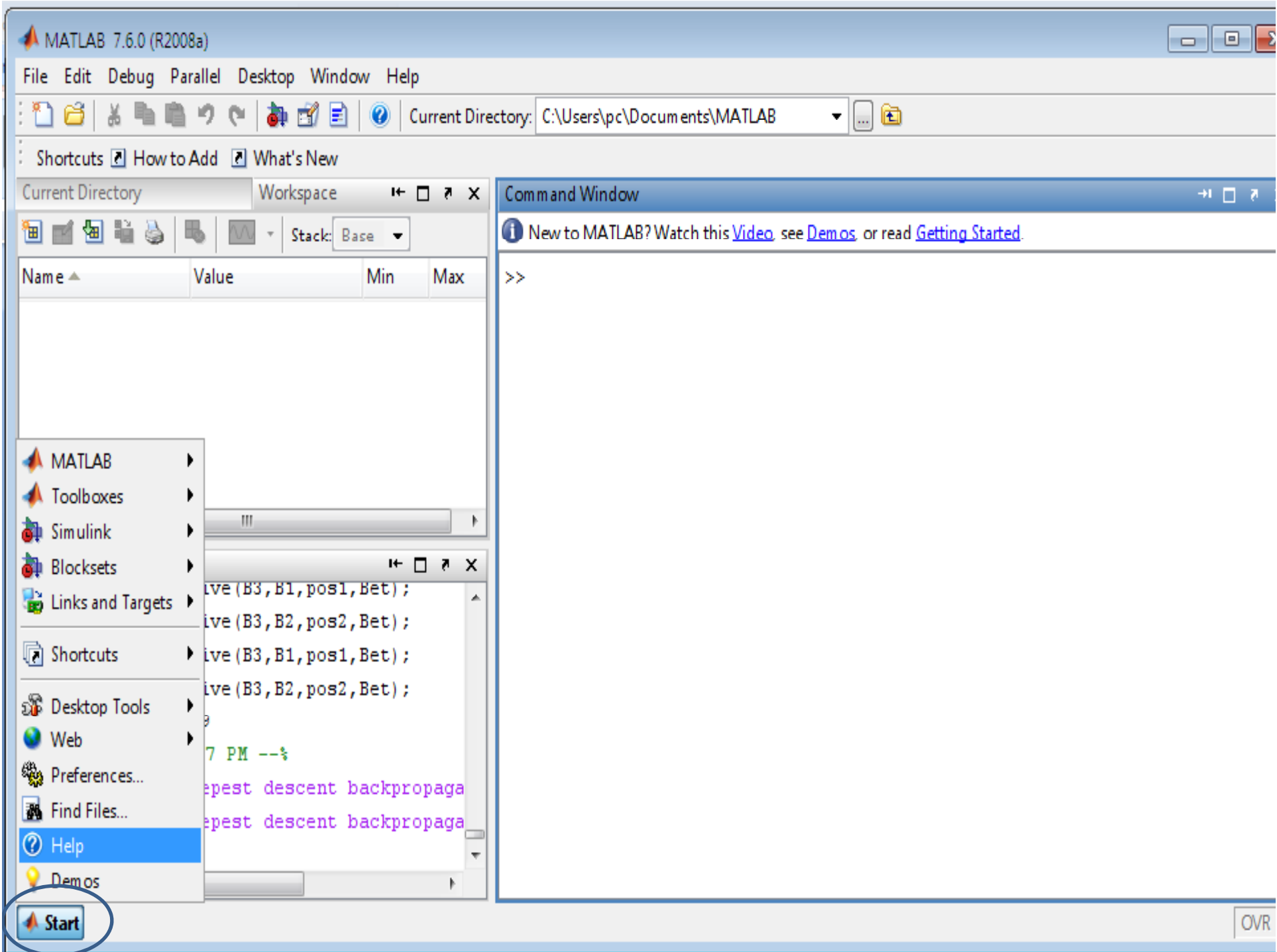
R2008a

استفاده از ToolboX شبکه عصبی در

Help نرم افزار MATLAB



The MathWorks™



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Example: "plot tools" OR plot* tools

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- SystemTest

Title: Neural Network Toolbox

Neural Network Toolbox™

0.0036 0.0036
0.0036 0.0036 0.0036
0.0046 0.0046

Functions:

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- [Alphabetical List](#)

Documentation Set

- [Getting Started](#)
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

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

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

- [Neural Network Toolbox User's Guide](#)

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Title: Neural Network Toolbox

Neural Network Toolbox™

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 - Net Input Functions
 - Network Initialization Function

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

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- [trainbfgc](#)
- [trainbr](#)
- [trainbuwb](#)
- [trainc](#)
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- [traincql](#)
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Batch training with weight and bias learning rules

BFGS quasi-Newton backpropagation

BFGS quasi-Newton backpropagation for use with NN model reference adaptive controller

Bayesian regularization

Batch unsupervised weight/bias training

Cyclical order incremental update

Powell-Beale conjugate gradient backpropagation

Fletcher-Powell conjugate gradient backpropagation

Polak-Ribière conjugate gradient backpropagation

Gradient descent backpropagation

Gradient descent with adaptive learning rule backpropagation

Gradient descent with momentum backpropagation

Gradient descent with momentum and adaptive learning rule backpropagation

Levenberg-Marquardt backpropagation

One step secant backpropagation

Random order incremental training with learning functions

Resilient backpropagation (Rprop)

Sequential order incremental training with learning functions

Scaled conjugate gradient backpropagation

Transfer Functions

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- [hardlim](#)
- [hardlims](#)

Competitive transfer function

Hard limit transfer function

Symmetric hard limit transfer function

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Learning Functions

learncon	Conscience bias learning function
learngd	Gradient descent weight/bias learning function
learnqdm	Gradient descent with momentum weight/bias learning function
learnh	Hebb weight learning function
learnhd	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 shows the MATLAB Help Navigator window. The search bar contains the text "Function Reference (Neural Network Toolbox™)". The left sidebar shows a tree view of the help content, with "Function Reference" selected and circled in blue. The main content area displays the "Transfer Functions" section, listing various functions with their corresponding icons and descriptions. The "ansig" function is also circled in blue.

Search for: Go














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Weight Functions
Transfer Function Graphs

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Transfer Functions

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- [hardlim](#)  Hard limit transfer function
- [hardlims](#)  Symmetric hard limit transfer function
- [logsig](#)  Log-sigmoid transfer function
- [netinv](#)  Inverse transfer function
- [poslin](#)  Positive linear transfer function
- [purelin](#)  Linear transfer function
- [radbas](#)  Radial basis transfer function
- [satlin](#)  Saturating linear transfer function
- [satlins](#)  Symmetric saturating linear transfer function
- [softmax](#)  Softmax transfer function
- [ansig](#)  Hyperbolic tangent sigmoid transfer function
- [tribas](#)  Triangular basis transfer function

Utility Functions