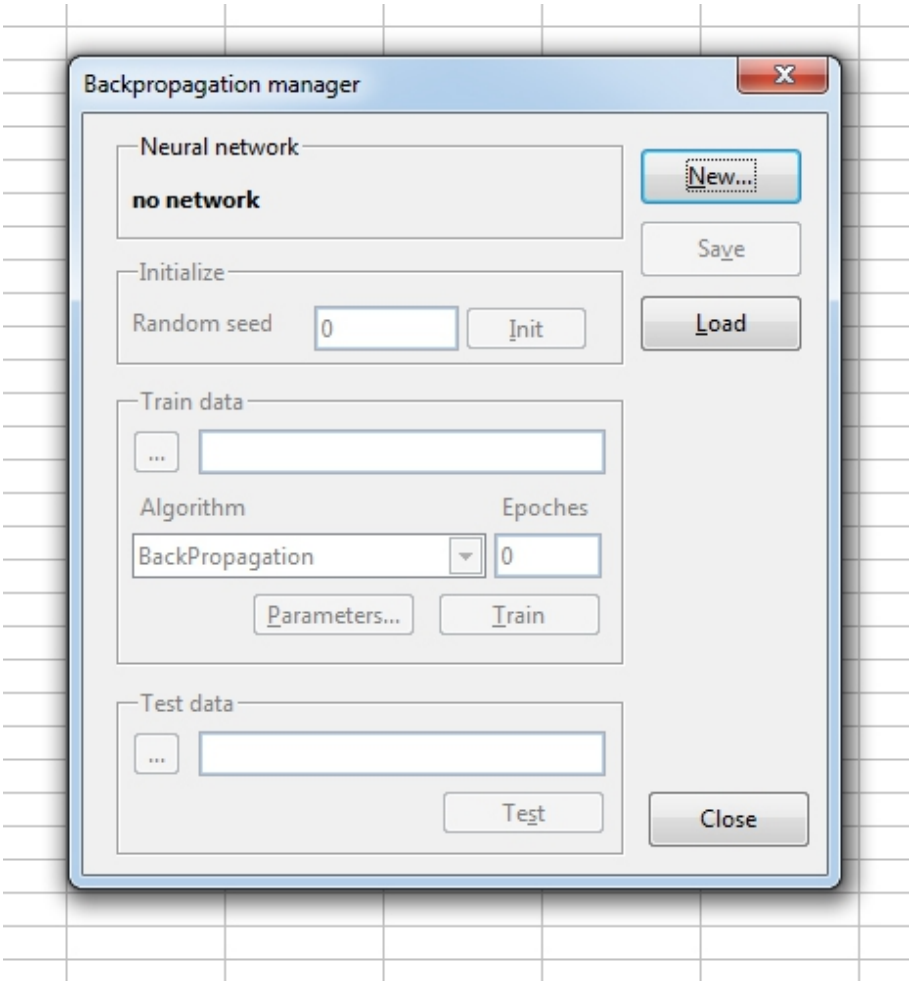
Neural network extension Neuronica realizes three main multilayer perceptron learning algorithms by back propagation method.
1. Classic algorithm Backpropagation
http://en.wikipedia.org/wiki/Backpropagation

2. Fast algorithm Resilient Propagation
http://de.wikipedia.org/wiki/Resilient_Propagation

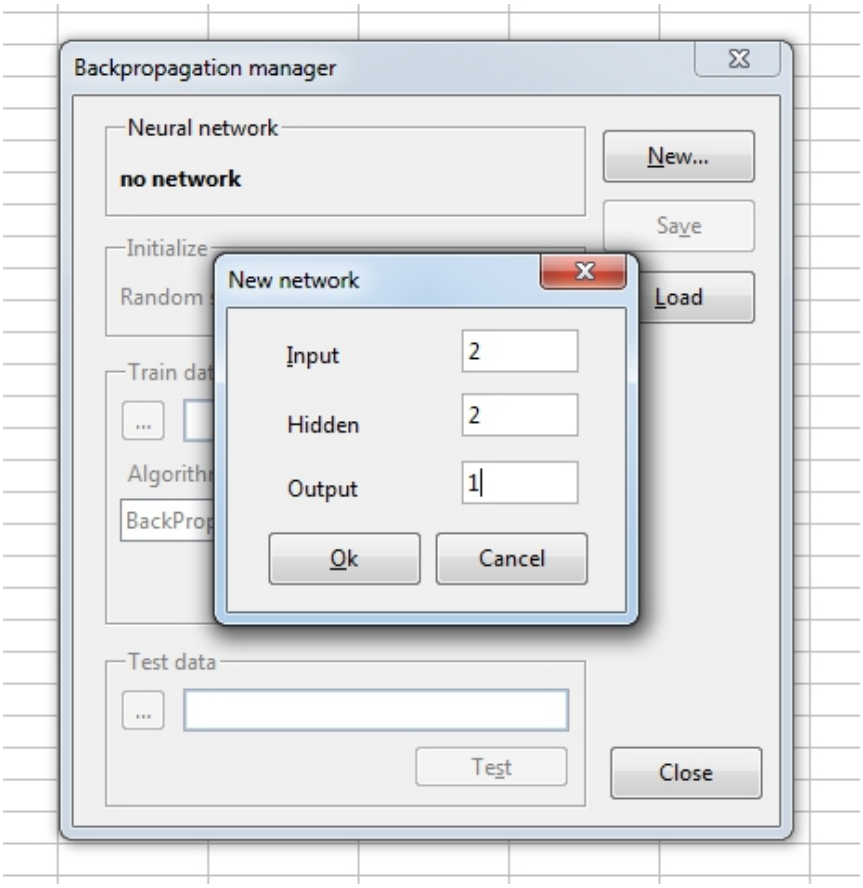
3. Fast algorithm by conjugate gradient method
http://en.wikipedia.org/wiki/Conjugate_gradient_method

More info about neural networks and learning algorithms is here:
http://en.wikipedia.org/wiki/Artificial_neural_network

To work with algorithms you can refer to menu «Neural / Backpropagation network...» which opens a new dialog window of extension.

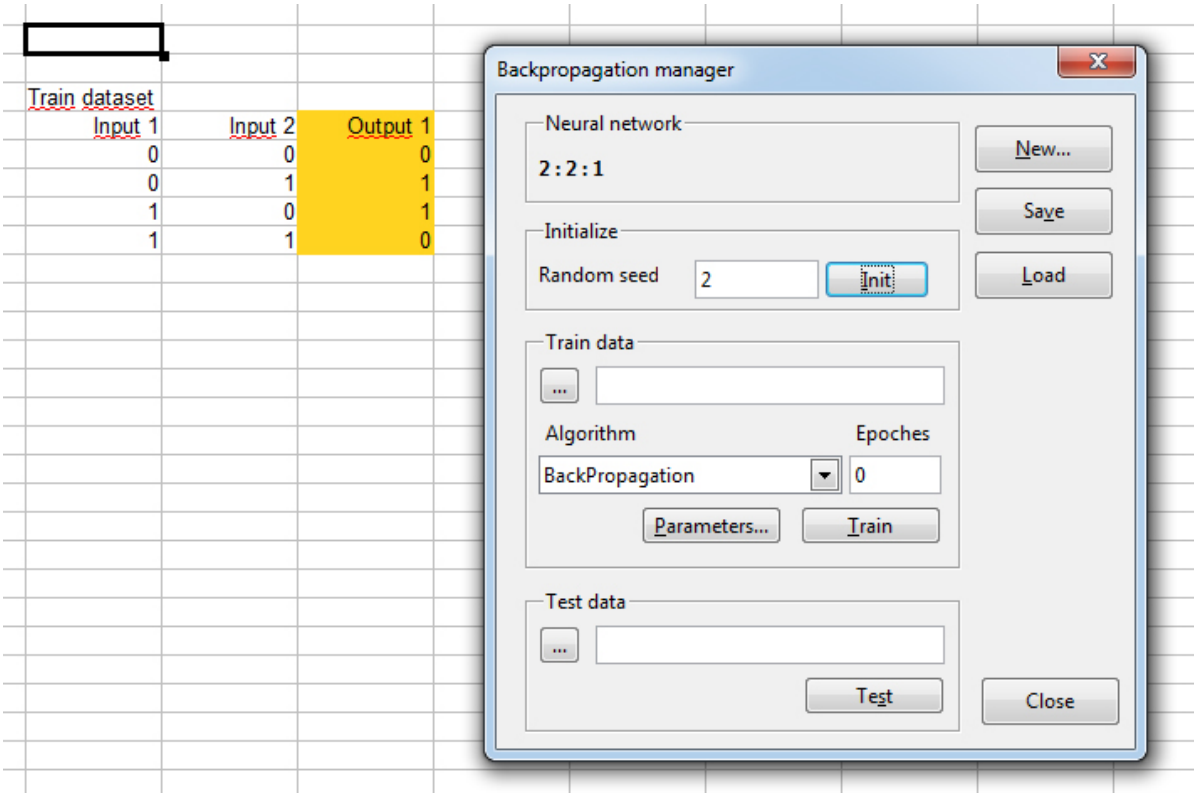


1. To create new neural network press the button «New...». A simple dialog window will be opened, in which it will be necessary to specify number of neurons in input layer, hidden layer and output layer. At the moment the extension works only with three-layer networks. We will examine neural network function by the example of its learning to (of) logical operation XOR.
For this purpose it is necessary to create a network with the number of inputs – 2, outputs – 1 and number or neurons in hidden layer – 2.

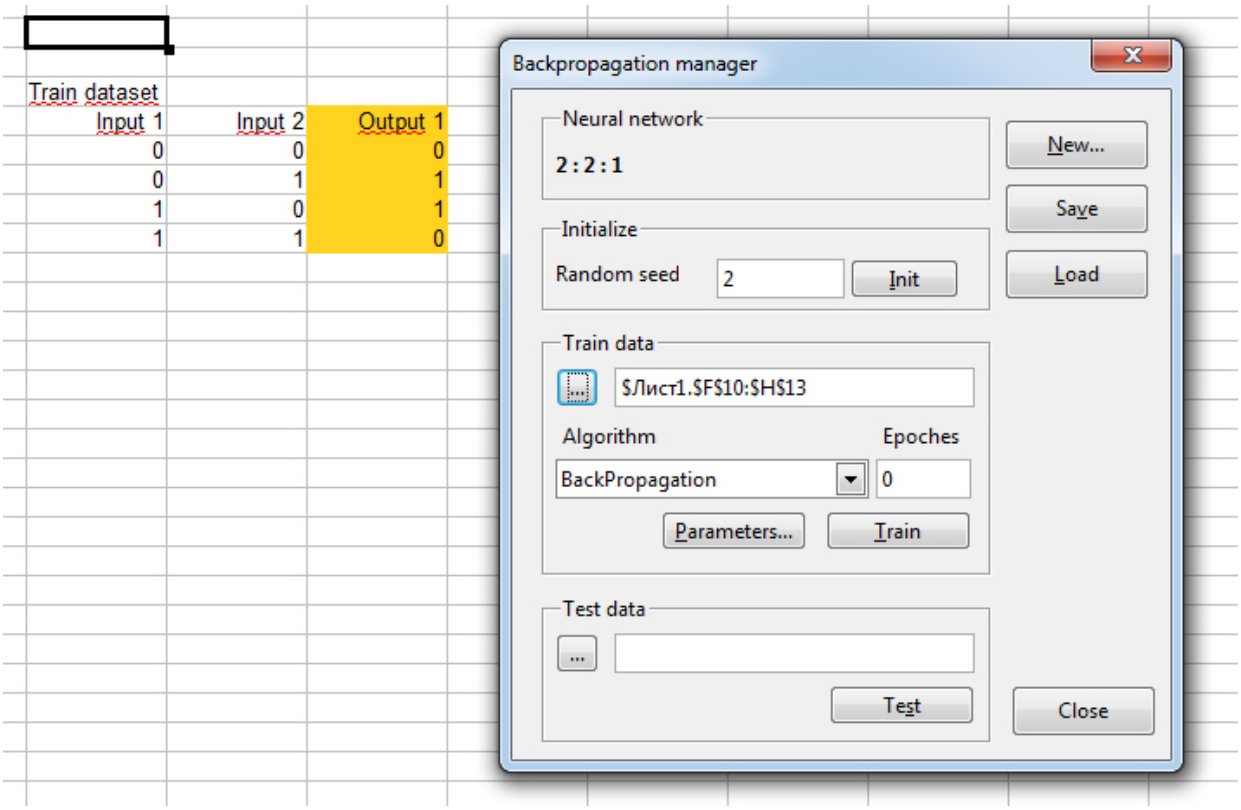


2. Initialize created neural network by random integer value (in our example 2).

3. Produce train data set. For this purpose it is necessary to close dialog window, and to open it again after table handling.

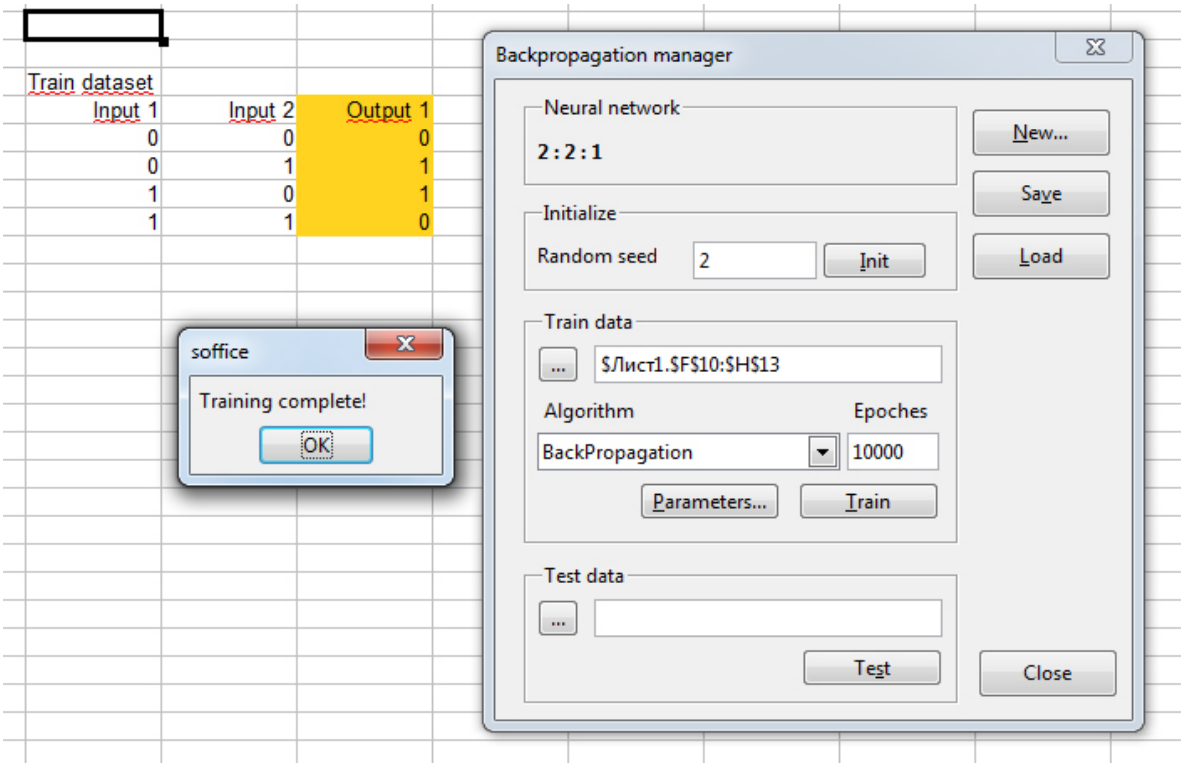


4. Choose the whole train data set, including input and output values. Do not include row with columns (inputs and outputs) titles!

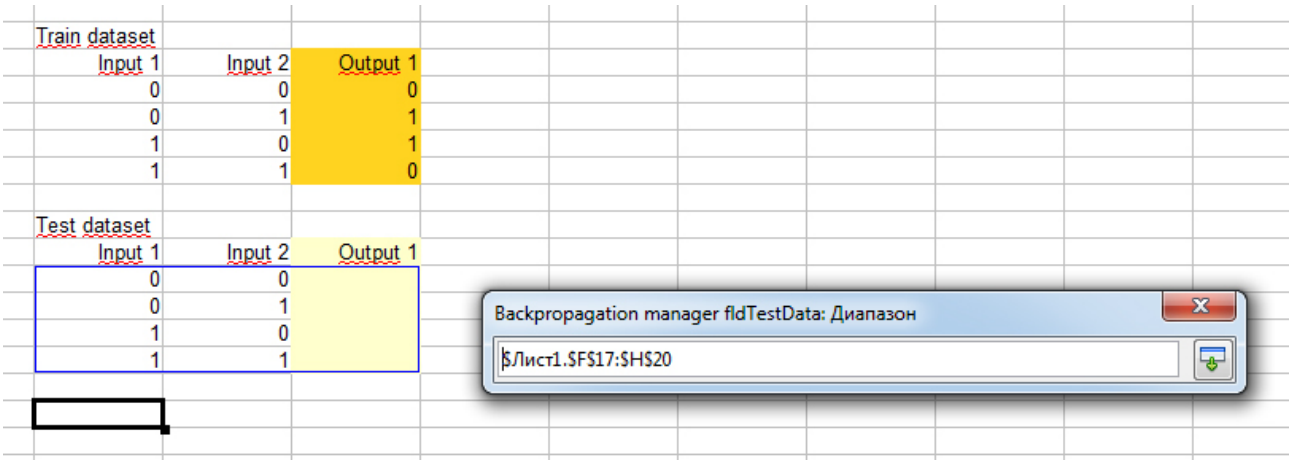


5. Choose needed algorithm and set its parameters. In most cases it is not needed to change algorithm parameter: authors quantity values are set as default.

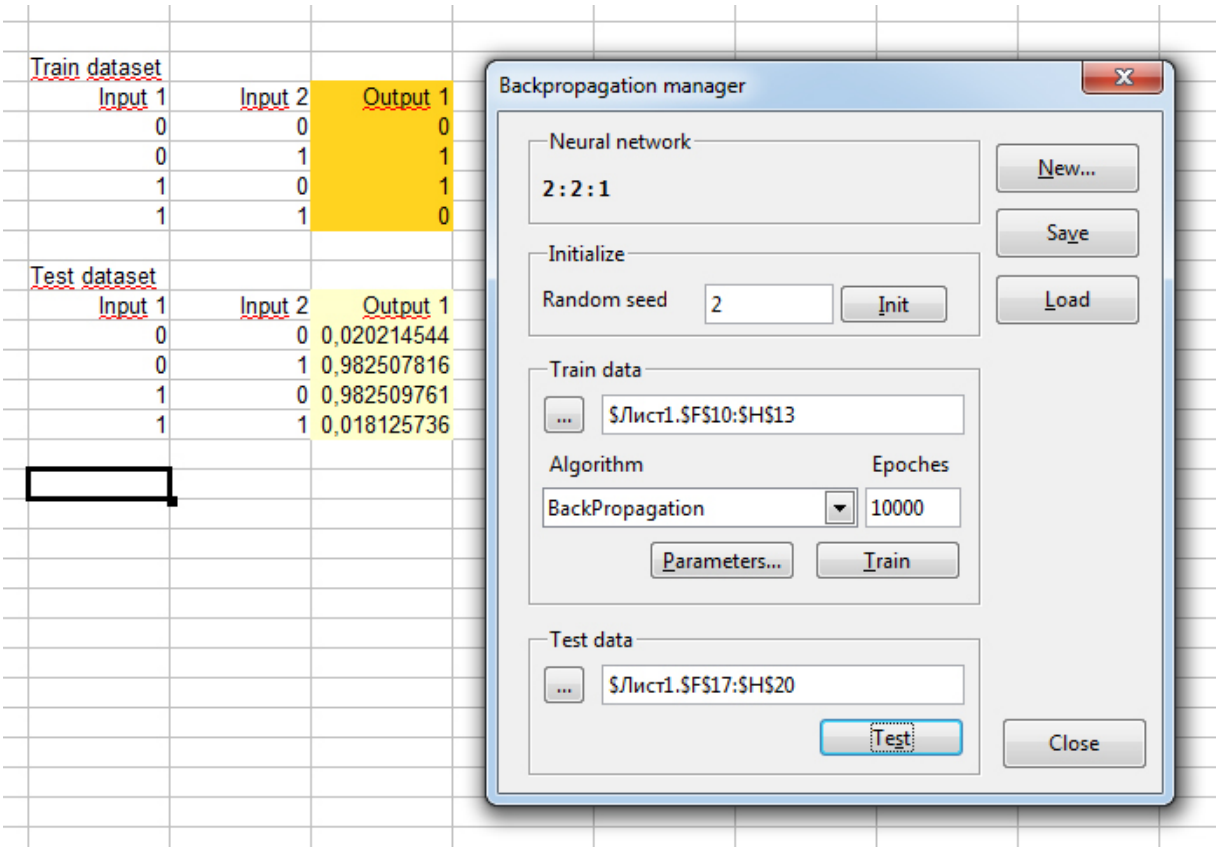
6. Insert needed number of learning epochs and press the button «Train».



7. After the finish of learning, produce test data set and choose it by pressing of the button «...» in «Test data» section. Note, as for learning train data set, it is necessary to choose an area including input and output data, despite the output data are still absent.



8. After the choice of train data set press the button «Test». Output data of learned neural network will be brought to respective empty zone.



9. For saving of structure and data of learned neural network press the button «Save». Neural network data will be brought to a new sheet of current workbook.

	A	B	C
1	Backpropagation Neural Network		
2			
3	STRUCTURE		
4	Layer0	2	
5	Layer1	2	
6	Layer2	1	
7			
8	WEIGHTS DATA		
9	Weight0	-2,838162471	
10	Weight1	6,404164378	
11	Weight2	6,40247638	
12	Weight3	-7,032216366	
13	Weight4	4,582802191	
14	Weight5	4,582377738	
15	Weight6	-4,396973616	
16	Weight7	9,49447629	
17	Weight8	-10,16612652	
18			

In future this already learned neural network can be loaded by «Load» button. While loading, only data concerning neural network are used, so it is allowed to hold other data on this sheet on the right and at the bottom.