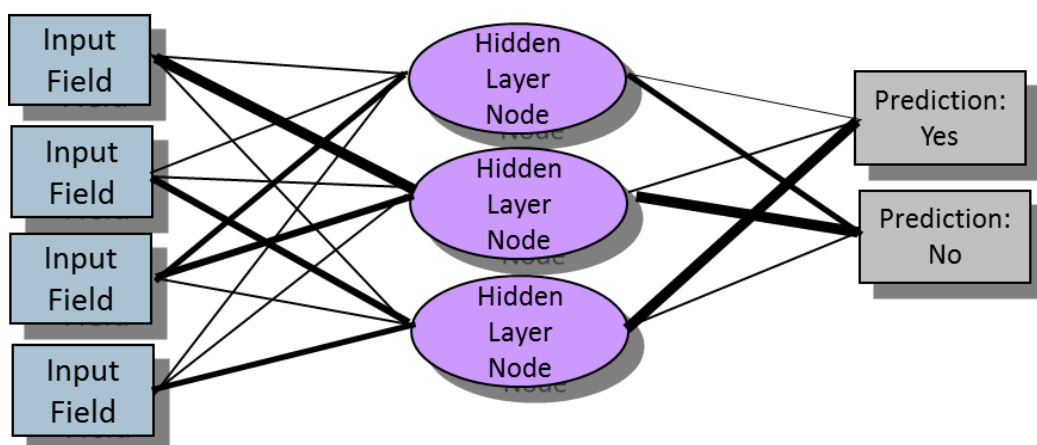
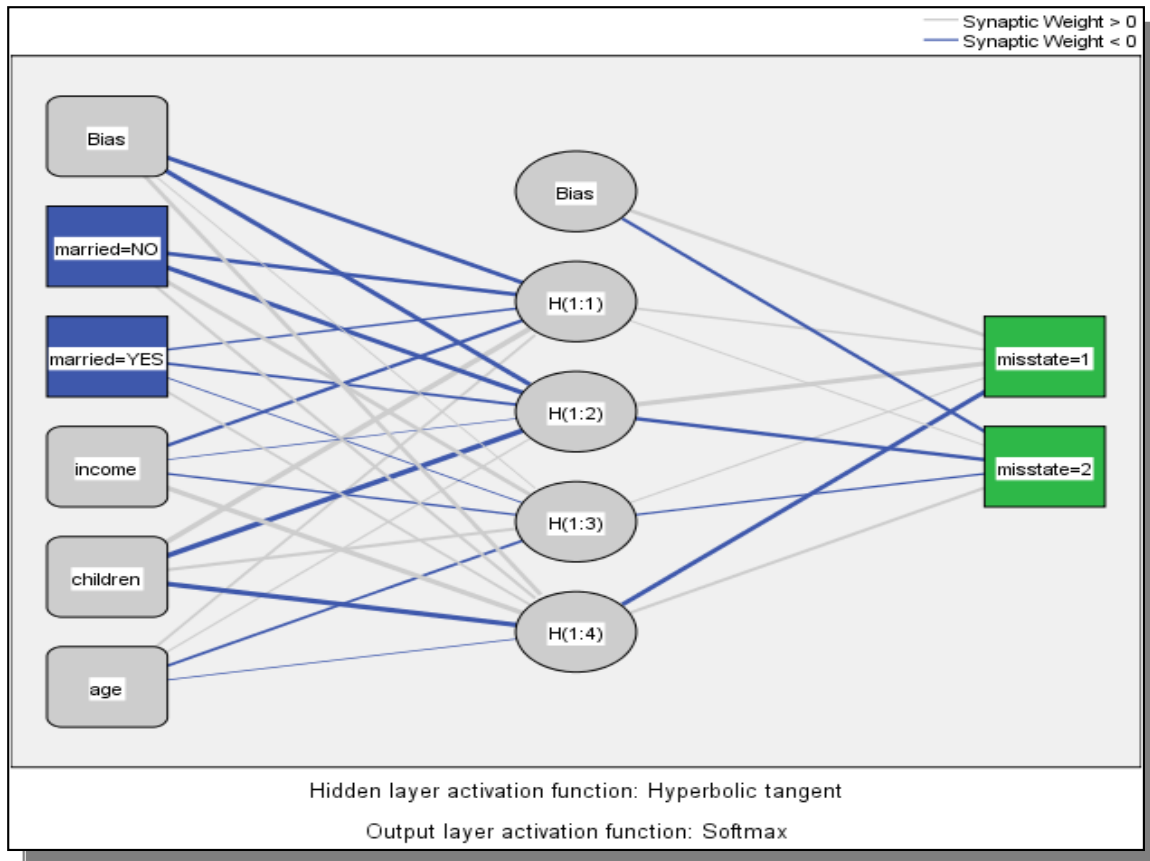


## IBM SPSS Neural Networks

- IBM SPSS Neural Networks provides an alternative predictive capability to approaches such as regression or classification trees. Predictive neural networks are particularly useful in applications where the data from the underlying phenomena is complex such as fraud detection, credit scoring and pattern recognition.
- SPSS offers two neural network algorithms:
  - Multilayer Perceptron (MLP)
  - Radial Basis Function (RBF)
- These algorithms are known as ‘supervised networks’ in the sense that the model-predicted results can be compared against known values of the target variables.
- One of the primary advantages of neural networks when compared to classical statistical techniques is their flexibility and lack of distributional assumptions. For example, Neural Networks can be used to predict both categorical and continuous outcomes. However, the trade-off is that neural networks can often be difficult to interpret as they can produce extremely complex models with multiple layers.
- A neural network works by taking the values of predictor or input fields and feeding them into the algorithm as an input layer.
- The input layer is used to create a hidden layer containing unseen nodes (or units) where each node is some function of the input fields (in fact some networks can create more than one hidden layer).
- The output layer contains the responses or predictions. The network is continually rebuilt or refined so that the synaptic weights in the nodes correctly predict the outcome.



Graphical representation of a neural network model



Actual output from an IBM SPSS Neural Networks model used to predict tax returns where the payer has misstated. The output shows input fields, synaptic weights, hidden layer and output categories representing misstated 'yes' and 'no'.