Neural FCA Homework

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Dataset

German Credit Card Data

1000 objects
9 attributes:

- 1 binary
- 3 numeric
- 5 categorical

Target is unbalanced $\Rightarrow$ F1 Score as metric.

Apply binarization with uniform and quantile-based bins for numeric variables.
This results in 35 binary attributes in total.

Concept Selection

- Full Concept Lattice takes too long to calculate
- Use Sofia algorithm to select only few concepts with high stability
- As few as 10 concepts yields good results

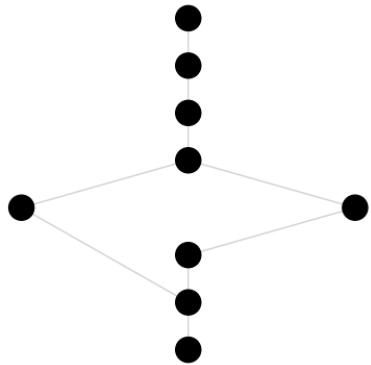

Figure: POSet of best concepts

Neural Network Visualisation

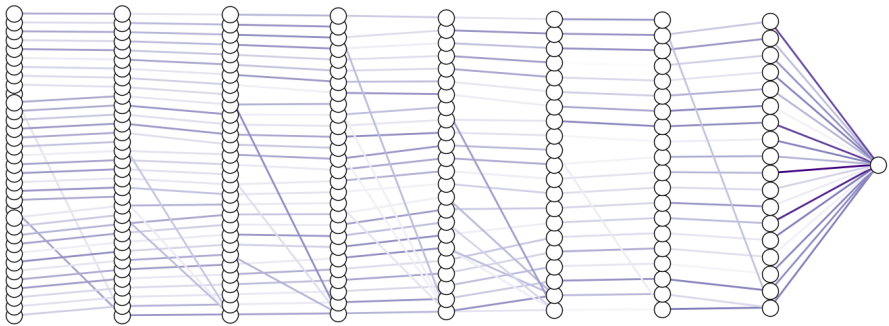

Figure: Weigths of fitted network, absolute values

Experiment Results

Table: F1-Score per nonlinearity

	F1 Score
ReLU	0.8201
Tanh	0.8097
Sigmoid	0.8201

Table: F1-Score on test data

	Binary	Numeric
KNN	**0.8520**	0.8455
Random Forest	0.8333	0.8339
Logistic Regression	0.8143	0.8212
MLP	0.8200	0.7579
Neural FCA	0.8439	-