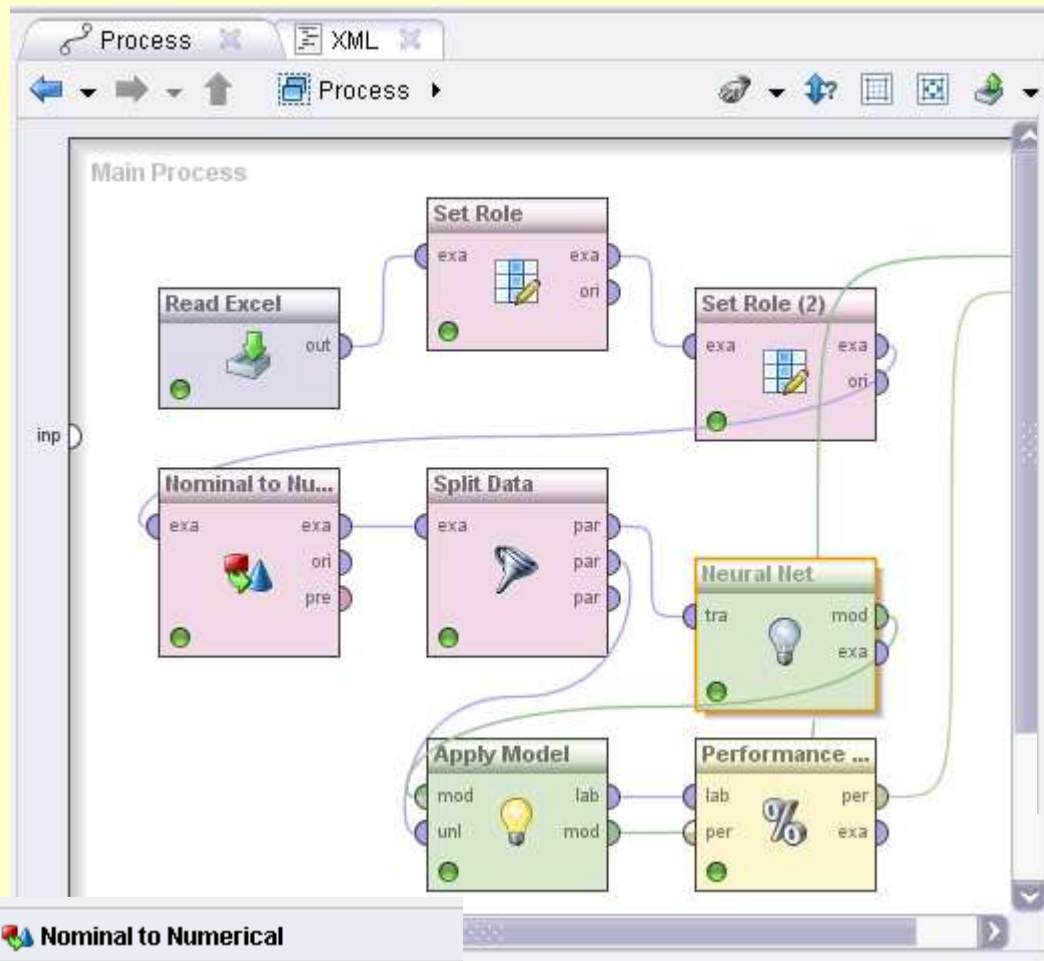


# Week 10

## NN and SVM

- **Dataset:** risk  
week 10 – datasets.xls
- **Algorithms:** NN and SVM



### Neural Net

hidden layers

training cycles

learning rate

momentum

decay

shuffle

normalize

error epsilon

use local random seed

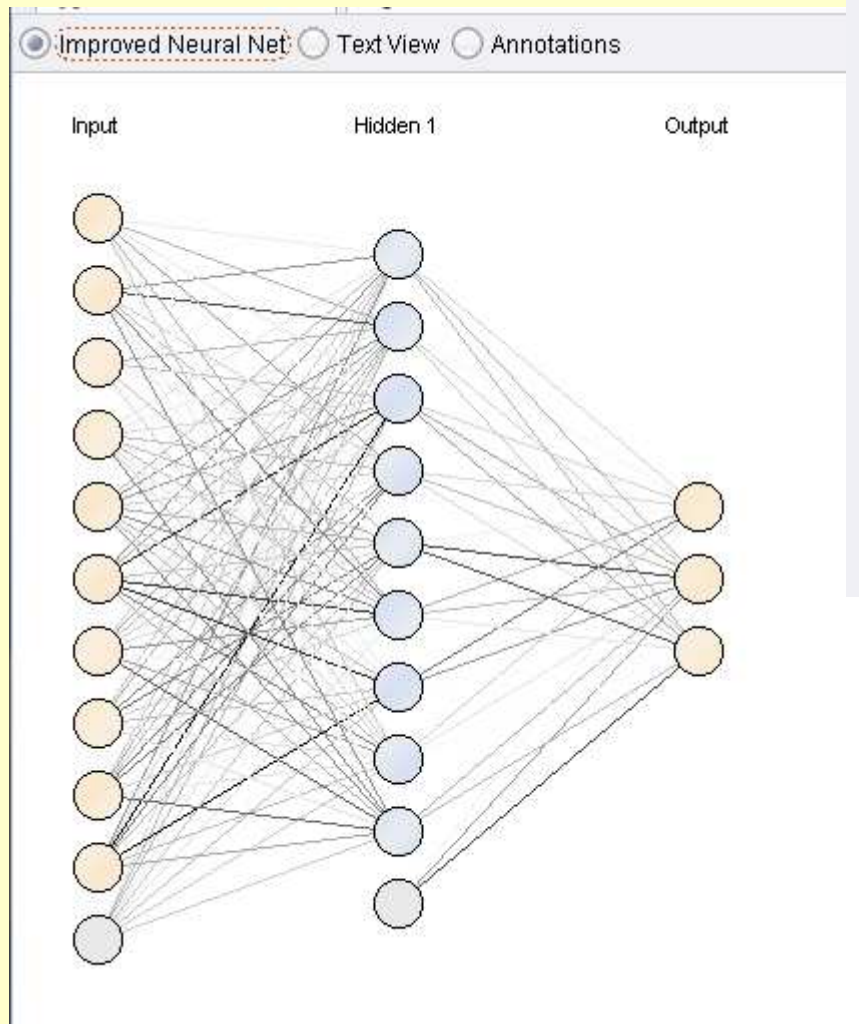
### Nominal to Numerical

create view

attribute filter type

invert selection

include special attributes



```

Hidden 1
=====

Node 1 (Sigmoid)
-----
GENDER: -0.580
MARITAL: 3.570
HOWPAID: -0.061
MORTGAGE: -0.857
AGE: 2.373
INCOME: -4.160
NUMKIDS: -1.620
NUMCARDS: 2.100
STORECAR: 1.715
LOANS: 3.842
Threshold: -1.073
  
```

```

Output
=====

Class 'good risk' (Sigmoid)
-----

Node 1: 1.465
Node 2: 0.350
Node 3: -1.480
Node 4: -1.339
Node 5: 0.341
Node 6: 2.640
Node 7: -4.800
Node 8: 1.705
Node 9: -0.071
Threshold: 0.435
  
```

# Neural Network

Table / Plot View
  Text View
  Annotations

Criterion Selector  
 accuracy  
 classification\_error

Multiclass Classification Performance
  Annotations

Table View
  Plot View

**accuracy: 75.79%**

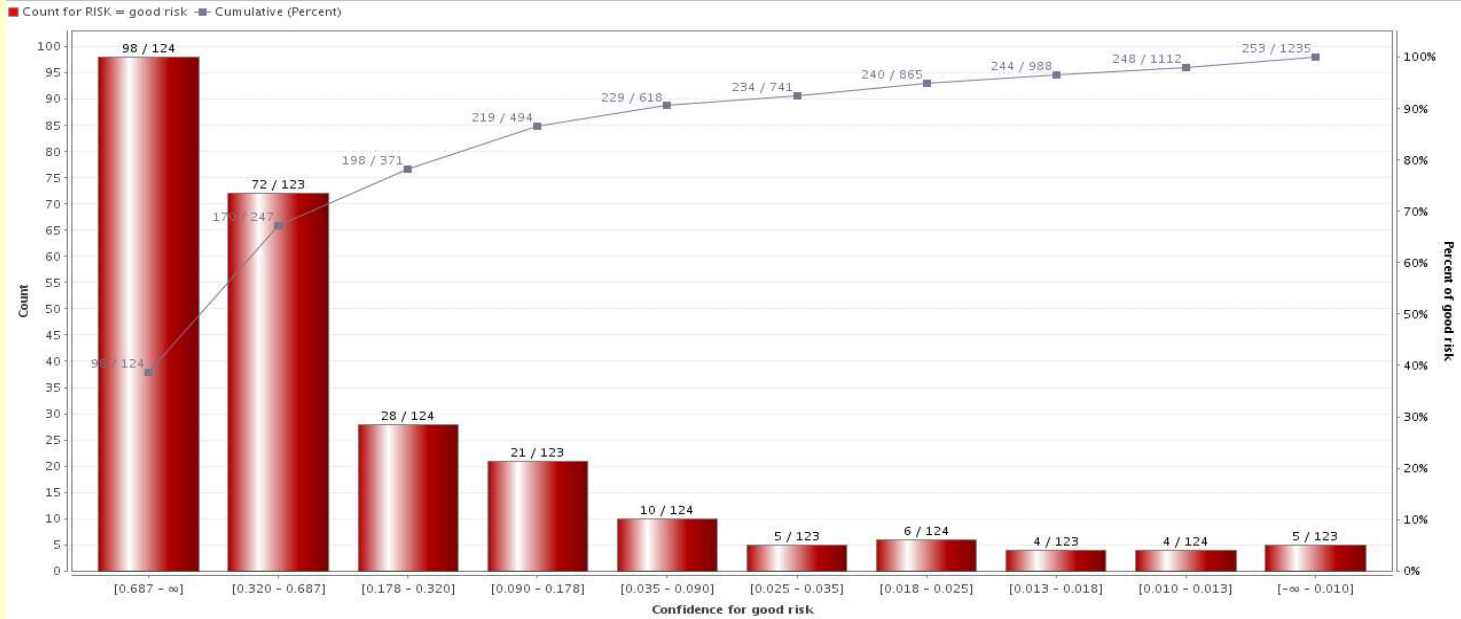
	true good risk	true bad loss	true bad profit	class precision
pred. good risk	170	27	43	70.83%
pred. bad loss	16	117	27	73.12%
pred. bad profit	67	119	649	77.72%
class recall	67.19%	44.49%	90.26%	

# Decision Tree

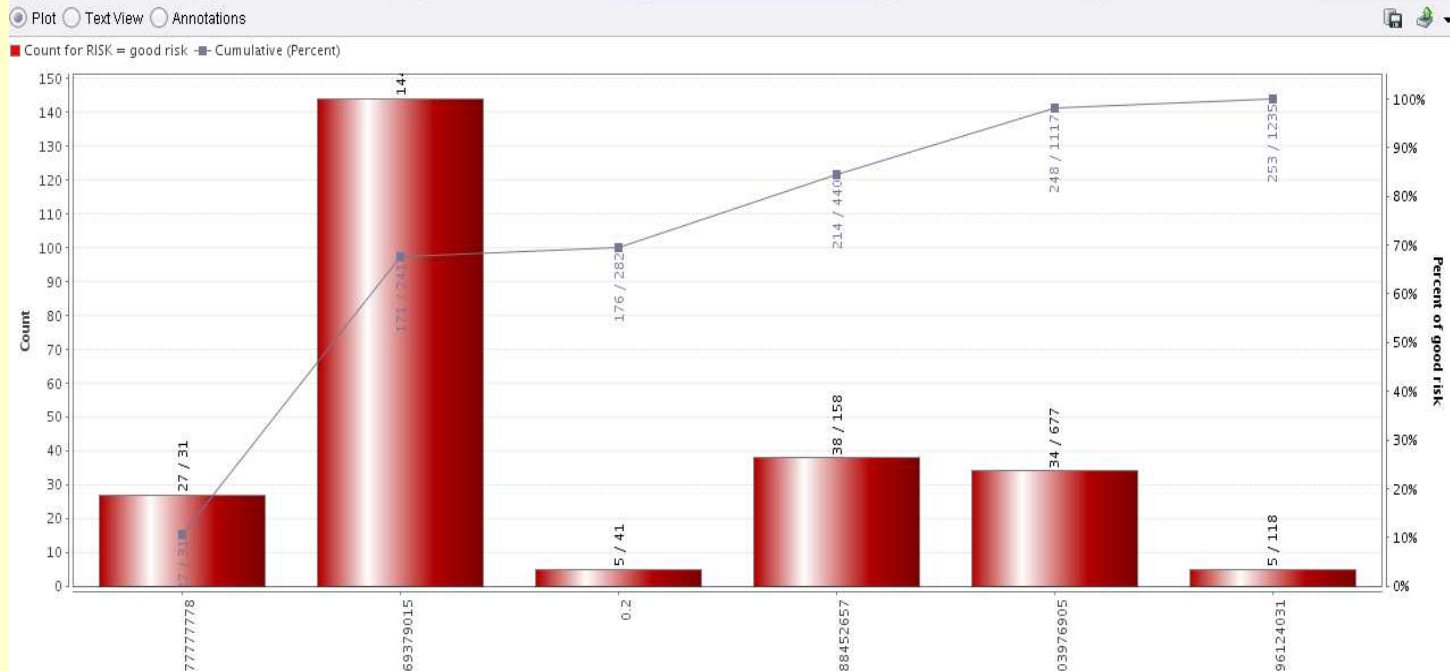
**accuracy: 75.79%**

	true good risk	true bad loss	true bad profit	class precision
pred. good risk	171	27	43	70.95%
pred. bad loss	5	101	12	85.59%
pred. bad profit	77	135	664	75.80%
class recall	67.59%	38.40%	92.35%	

# Neural Network

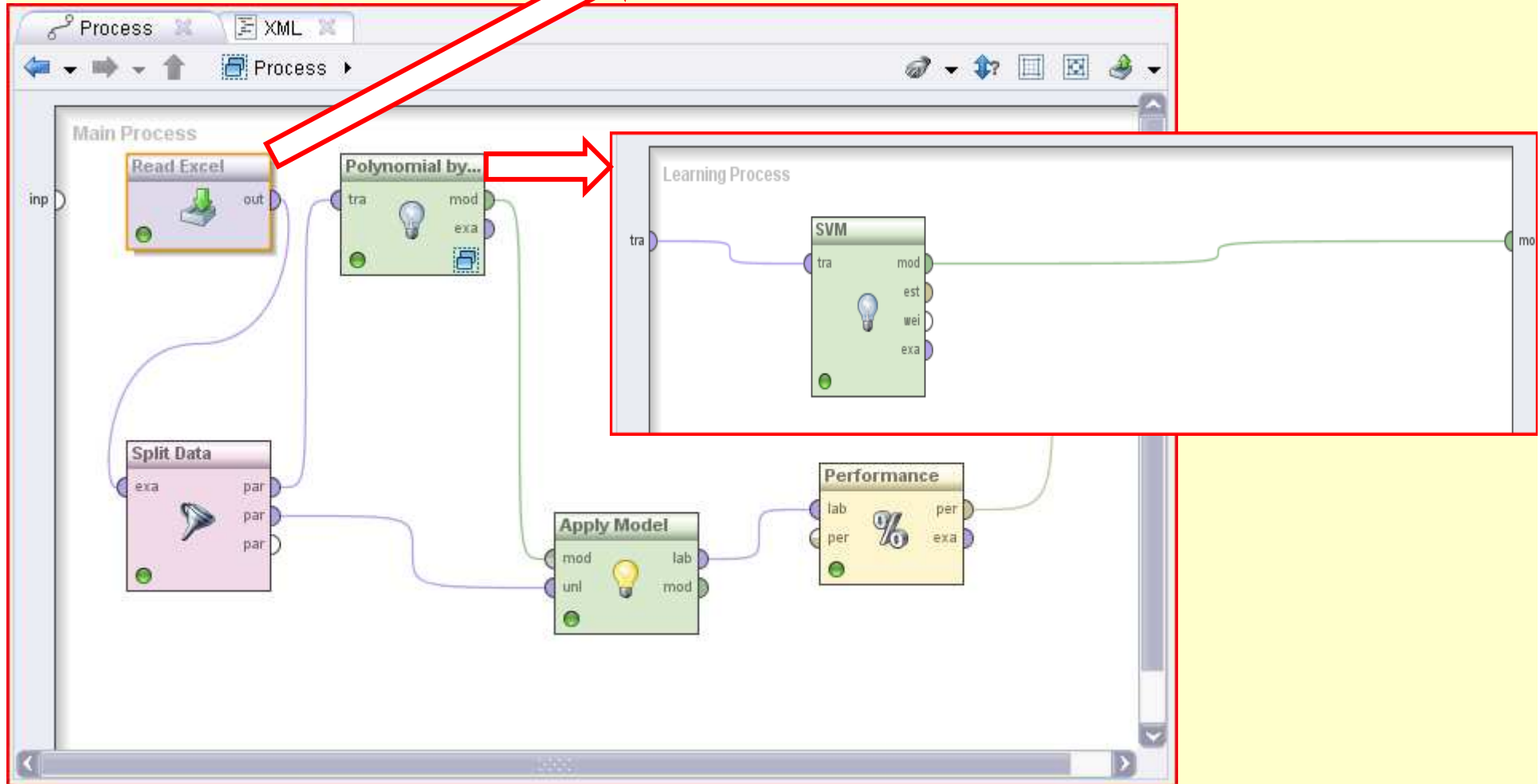


# Decision Tree



Support Vector Machines

Target variable of nominal type;  
Use only the numerical input variables.



Test different methods for polynomial classification using binary classifiers (OAO and OAA)  
Test different kernels (dot, radial and polynomial) and different parameters.

## Support vector machines: linear (dot) kernel

accuracy: 72.79%				
	true good risk	true bad loss	true bad profit	class precision
pred. good risk	147	26	37	70.00%
pred. bad loss	27	132	62	59.73%
pred. bad profit	79	105	620	77.11%
class recall	58.10%	50.19%	86.23%	

## Support vector machines: radial kernel

accuracy: 76.03%				
	true good risk	true bad loss	true bad profit	class precision
pred. good risk	170	27	43	70.83%
pred. bad loss	14	121	28	74.23%
pred. bad profit	69	115	648	77.88%
class recall	67.19%	46.01%	90.13%	

## Support vector machines: polynomial kernel

accuracy: 64.94%				
	true good risk	true bad loss	true bad profit	class precision
pred. good risk	91	19	32	64.08%
pred. bad loss	15	55	31	54.46%
pred. bad profit	147	189	656	66.13%
class recall	35.97%	20.91%	91.24%	