

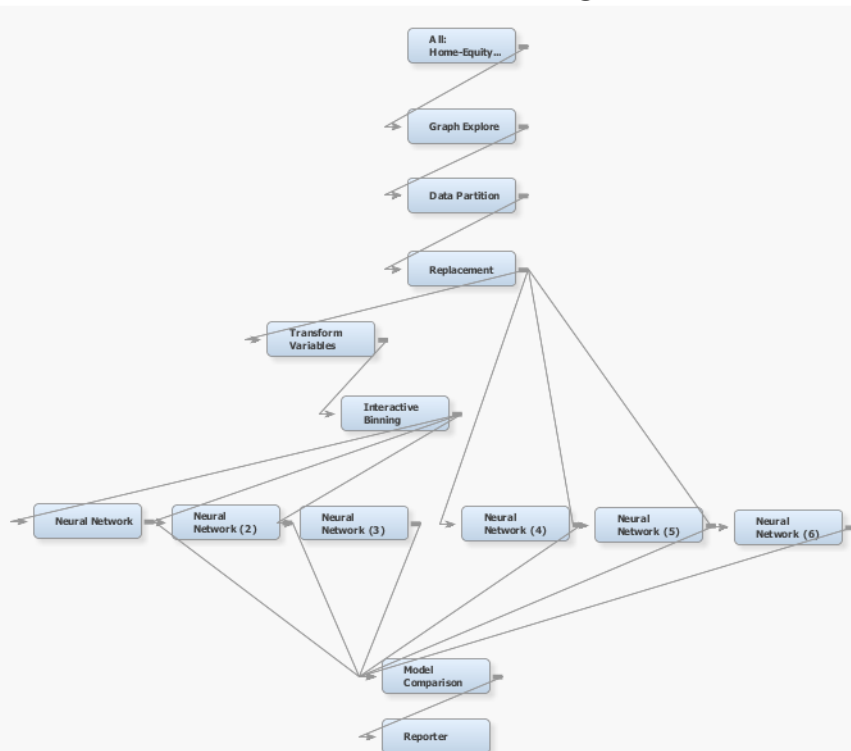
SAS Enterprise Miner Report

User = bteric01
Date = 14:12:55 November 05
Project = Project_3
Diagram = Diagram_3

Start Node = Report
Node label = Reporter
Nodes = PATH
Showall = N

Format = PDF
Style = LISTING

SAS Enterprise Miner Report Process Flow Diagram



SAS Enterprise Miner Report

Node=All: Home-Equity Loan Scoring Data Summary

Node id = Ids
Node label = All: Home-Equity Loan Scoring Data
Meta path = Ids
Notes =

Node=All: Home-Equity Loan Scoring Data Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	DataSource		DsCreatedBy	bteric01		NBytes	656384	.
ApplyIntervalLevelLowerLimit	Y		DsId	allhomeequityloanscoringdata		NCols	13	.
ApplyMaxClassLevels	Y		DsModifiedBy	bteric01		NObs	5960	.
ApplyMaxPercentMissing	Y		DsModifyDate	1762196217		NewTable		
CMeta	WORK.M338XJ75		DsSampleName			NewVariableRole	REJECT	
ComputeStatistics	N		DsSampleSize			OutputType	VIEW	
DBPassThrough	Y		DsSampleSizeType			Role	RAW	TRAIN
Data	SAMPSIO.DMAHMEQ		DsScope	LOCAL		Sample	D	
DataSelection	DATASOURCE		IdentifyEmptyColumns	Y		SampleSizeObs	10000	
DataSource	allhomeequityloanscoringdata		IntervalLowerLimit	20		SampleSizePercent	20	
DataSourceRole	RAW		Library	SAMPSIO		SampleSizeType	PERCENT	
Description	All: Home-Equity Loan Scoring Data		MaxClassLevels	20		Scope	LOCAL	
DropMapVariables	Y		MaxPercentMissing	50		Segment		
DsCreateDate	1762196216.8		MetaAdvisor	BASIC		Table	DMAHMEQ	

Node=All: Home-Equity Loan Scoring Data Data Attributes

Attribute	Value	Attribute	Value	Attribute	Value
Data Name	DMAHMEQ	Date Created	20Jun2013:01:47:04	Data Size	656384
Data Type	DATA	Date Modified	20Jun2013:01:47:04	Role	RAW
Data Label	All: Home-Equity Loan Scoring Data	Number Rows	5960	Segment	
Engine	V9	Number Columns	13	Data Library	SAMPSIO

Node=All: Home-Equity Loan Scoring Data Variables List

Name	Label	Role	Level	Type	Length	Format	Creator
bad	Default or seriously delinquent	TARGET	BINARY	N	8		
clage	Age of oldest trade line in months	INPUT	INTERVAL	N	8		
clno	Number of trade (credit) lines	INPUT	INTERVAL	N	8		
debtinc	Debt to income ratio	INPUT	INTERVAL	N	8		
delinq	Number of delinquent trade lines	INPUT	INTERVAL	N	8		
derog	Number of major derogatory reports	INPUT	INTERVAL	N	8		
job	Prof/exec sales mngr office self other	INPUT	NOMINAL	C	6		
loan	Amount of current loan request	INPUT	INTERVAL	N	8		
mortdue	Amount due on existing mortgage	INPUT	INTERVAL	N	8		
ninq	Number of recent credit inquiries	INPUT	INTERVAL	N	8		
reason	Home improvement or debt consolidation	INPUT	NOMINAL	C	7		
value	Value of current property	INPUT	INTERVAL	N	8		
yoj	Years on current job	INPUT	INTERVAL	N	8		

SAS Enterprise Miner Report

Node=Graph Explore Summary

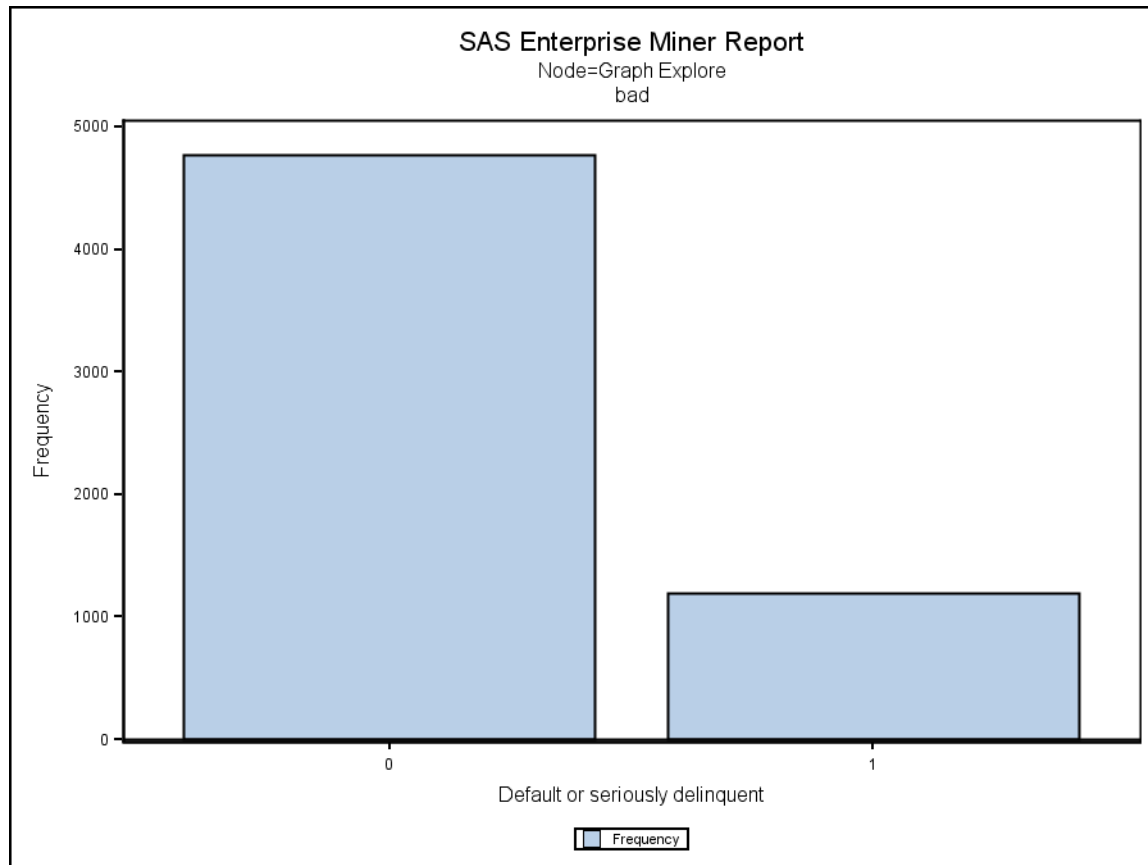
Node id = GrfExpl
Node label = Graph Explore
Meta path = Ids => GrfExpl
Notes =

Node=Graph Explore Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	GraphExplore		EmRandomSeed	12345		EmSampleSize	DEFAULT	
DataSource	SAMPLE		EmSampleMethod	FIRSTN		GroupByTarget	Y	

Node=Graph Explore Variable Summary

Role	Level	Frequency Count	Name
INPUT	INTERVAL	10	clage clno debtinc delinq derog loan mortdue ninq value yoj
INPUT	NOMINAL	2	job reason



SAS Enterprise Miner Report

Node=Data Partition Summary

Node id = Part
Node label = Data Partition
Meta path = Ids => GrfExpl => Part
Notes =

Node=Data Partition Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	Partition		Method	DEFAULT		TestPct	0	30
ClassDistribution	Y		OutputType	DATA		TrainPct	50	40
IntervalDistribution	Y		RandomSeed	12345		ValidatePct	50	30

Node=Data Partition Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	bad
INPUT	INTERVAL	10	clage clno debtinc delinq derog loan mortdue ninq value yoj
INPUT	NOMINAL	2	job reason

SAS Enterprise Miner Report

Node=Replacement
Summary

Node id = Repl
Node label = Replacement
Meta path = Ids => GrfExpl => Part => Repl
Notes =

Node=Replacement
Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	Replace		IntervalMethod	NONE		SpacingsCutoff	9.0	9
CalcMethod	STDDEV		MADSCutoff	9.0	9	StddevCutoff	3.0	3
CountReport	Y		PercentsCutoff	0.5		UnknownLevel	NONE	MODE
HideVariable	N		ReplaceMethod	COMPUTED				

Node=Replacement
Variable Summary

Role	Level	Frequency Count	Name
INPUT	INTERVAL	10	clage clno debtinc delinq derog loan mortdue ninq value yoj
INPUT	NOMINAL	2	job reason

Node=Replacement
Interval Variables

Variable	Replace Variable	Lower limit	Upper Limit	Label	Limits Method	Replacement Method	Lower Replacement Value	Upper Replacement Value
clage	REP_clage	-80.78	443.09	Age of oldest trade line in months	STDDEV	COMPUTED	-80.78	443.09
clno	REP_clno	-9.57	52.13	Number of trade (credit) lines	STDDEV	COMPUTED	-9.57	52.13
debtinc	REP_debtinc	6.77	60.81	Debt to income ratio	STDDEV	COMPUTED	6.77	60.81
delinq	REP_delinq	-3.15	4.08	Number of delinquent trade lines	STDDEV	COMPUTED	-3.15	4.08
derog	REP_derog	-2.20	2.68	Number of major derogatory reports	STDDEV	COMPUTED	-2.20	2.68
loan	REP_loan	-15948.42	53316.59	Amount of current loan request	STDDEV	COMPUTED	-15948.42	53316.59
mortdue	REP_mortdue	-57459.22	204609.03	Amount due on existing mortgage	STDDEV	COMPUTED	-57459.22	204609.03
ninq	REP_ninq	-3.96	6.27	Number of recent credit inquiries	STDDEV	COMPUTED	-3.96	6.27
value	REP_value	-71444.81	276406.04	Value of current property	STDDEV	COMPUTED	-71444.81	276406.04
yoj	REP_yoj	-14.03	31.77	Years on current job	STDDEV	COMPUTED	-14.03	31.77

Node=Replacement
Total Replacement Counts

Variable	Label	Role	Train	Validation
clage	Age of oldest trade line in months	INPUT	15	14
clno	Number of trade (credit) lines	INPUT	19	18
debtinc	Debt to income ratio	INPUT	30	22
delinq	Number of delinquent trade lines	INPUT	52	38
derog	Number of major derogatory reports	INPUT	59	71
loan	Amount of current loan request	INPUT	52	34
mortdue	Amount due on existing mortgage	INPUT	48	46
ninq	Number of recent credit inquiries	INPUT	59	62
value	Value of current property	INPUT	46	43
yoj	Years on current job	INPUT	13	5

SAS Enterprise Miner Report

Node=Transform Variables
Summary

Node id = Trans
Node label = Transform Variables
Meta path = Ids => GrfExpl => Part => Repl => Trans
Notes =

Node=Transform Variables
Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	Transform		EmSampleSize	DEFAULT		MissingValue	USEINSEARCH	
DefaultClassMethod	NONE		GroupCutoff	0.1	0.5	NumberOfBins	VARIABLES	
DefaultClassTargetMethod	NONE		GroupMissing	N		Offset	1	
DefaultMethod	LOG	NONE	HideVariable	Y		RejectVariable	Y	
DefaultTargetMethod	NONE		MaxOptimalBins	4		SummaryStatistics	Y	
EmRandomSeed	12345		MinOffset	Y		SummaryVariables	TRANSFORMED	
EmSampleMethod	FIRSTN		MissingAsLevel	N		UseMetaTransform	Y	

Node=Transform Variables
Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	bad
REJECTED	INTERVAL	10	clage clno debttinc delinq derog loan mortdue ninq value yoj
INPUT	INTERVAL	10	REP_clage REP_clno REP_debttinc REP_delinq REP_derog REP_loan REP_mortdue REP_ninq REP_value REP_yoj
INPUT	NOMINAL	2	job reason

Node=Transform Variables
Transformations Statistics

Source	Method	Variable Name	Formula	Number of Levels	Non Missing	Missing	Minimum	Maximum	Mean	Standard Deviation	Skewness	Kurtosis	Label
Input	Original	REP_clage		.	2820	159	0.00	443.09	180.00	80.83	0.54411	-0.03018	Replacement: Age of oldest trade line in mon
Input	Original	REP_clno		.	2862	117	0.00	52.13	21.24	10.16	0.70065	0.64513	Replacement: Number of trade (credit) lines
Input	Original	REP_debttinc		.	2364	615	6.77	60.81	33.64	7.48	-0.44680	1.26130	Replacement: Debt to income ratio
Input	Original	REP_delinq		.	2687	292	0.00	4.08	0.41	0.95	2.59196	6.15677	Replacement: Number of delinquent trade line
Input	Original	REP_derog		.	2627	352	0.00	2.68	0.20	0.57	3.00163	8.42335	Replacement: Number of major derogatory repo
Input	Original	REP_loan		.	2979	0	1100.00	53316.59	18393.74	10294.06	1.33646	2.07281	Replacement: Amount of current loan request
Input	Original	REP_mortdue		.	2727	252	2063.00	204609.03	72871.46	40796.45	1.07966	1.33476	Replacement: Amount due on existing mortgage
Input	Original	REP_ninq		.	2720	259	0.00	6.27	1.10	1.48	1.69198	2.74841	Replacement: Number of recent credit inquiri

Source	Method	Variable Name	Formula	Number of Levels	Non Missing	Missing	Minimum	Maximum	Mean	Standard Deviation	Skewness	Kurtosis	Label
Input	Original	REP_value		.	2925	54	8000.00	276406.04	101458.77	51161.44	1.27391	1.65500	Replacement: Value of current property
Input	Original	REP_yoj		.	2729	250	0.00	31.77	8.85	7.57	0.97071	0.21108	Replacement: Years on current job
Input	Original	yoj		.	2729	250	0.00	41.00	8.87	7.63	1.02350	0.48019	Years on current job
Output	Computed	LOG_REP_clage	$\log(\text{REP_clage} + 1)$	.	2820	159	0.00	6.10	5.08	0.54	-1.77596	9.66145	Transformed: Replacement: Age of oldest trad
Output	Computed	LOG_REP_clno	$\log(\text{REP_clno} + 1)$	.	2862	117	0.00	3.97	2.97	0.58	-1.83913	6.87153	Transformed: Replacement: Number of trade (c
Output	Computed	LOG_REP_debtinc	$\log(\text{REP_debtinc} + 1)$	.	2364	615	2.05	4.12	3.52	0.26	-1.89051	6.88101	Transformed: Replacement: Debt to income rat
Output	Computed	LOG_REP_delinq	$\log(\text{REP_delinq} + 1)$	.	2687	292	0.00	1.62	0.22	0.44	1.90779	2.43205	Transformed: Replacement: Number of delinque
Output	Computed	LOG_REP_derog	$\log(\text{REP_derog} + 1)$	.	2627	352	0.00	1.30	0.12	0.32	2.53829	5.17594	Transformed: Replacement: Number of major de
Output	Computed	LOG_REP_loan	$\log(\text{REP_loan} + 1)$	.	2979	0	7.00	10.88	9.67	0.57	-0.40557	0.70103	Transformed: Replacement: Amount of current
Output	Computed	LOG_REP_mortdue	$\log(\text{REP_mortdue} + 1)$	.	2727	252	7.63	12.23	11.02	0.64	-0.93102	1.81158	Transformed: Replacement: Amount due on exis
Output	Computed	LOG_REP_ninq	$\log(\text{REP_ninq} + 1)$	.	2720	259	0.00	1.98	0.55	0.60	0.63350	-0.74272	Transformed: Replacement: Number of recent c
Output	Computed	LOG_REP_value	$\log(\text{REP_value} + 1)$	.	2925	54	8.99	12.53	11.41	0.49	-0.15161	0.47295	Transformed: Replacement: Value of current p
Output	Computed	LOG_REP_yoj	$\log(\text{REP_yoj} + 1)$	.	2729	250	0.00	3.49	1.93	0.93	-0.51440	-0.53708	Transformed: Replacement: Years on current j
Output	Computed	LOG_yoj	$\log(\text{yoj} + 1)$	.	2729	250	0.00	3.74	1.93	0.93	-0.50927	-0.53331	Transformed: Years on current job

SAS Enterprise Miner Report

Node=Interactive Binning
Summary

Node id = BINNING
Node label = Interactive Binning
Meta path = Ids => GrfExpl => Part => Repl => Trans => BINNING
Notes =

Node=Interactive Binning
Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	Binning		GiniCutoff	20	20.0	LastRunMessage	Must use one target variable.	
ApplyLevelRule	N		GroupCutoff	0.5		MaxVar	10	
BinMethod	QUANTILE		GroupMissing	N		MissingAsLevel	Y	
ClassGroupRare	Y		GrpMsmnt	ORDINAL		NumBins	4	
CreateGrouping	N		INTTARGETMETHOD	CUTMEAN		Precision	2	
CreateMethod	OVERWRITE		ImportData			RejectIntTarget	N	
Freeze	N		ImportGrouping	N		USERCUTVALUE	0.20	0.2

Node=Interactive Binning
Variable Summary

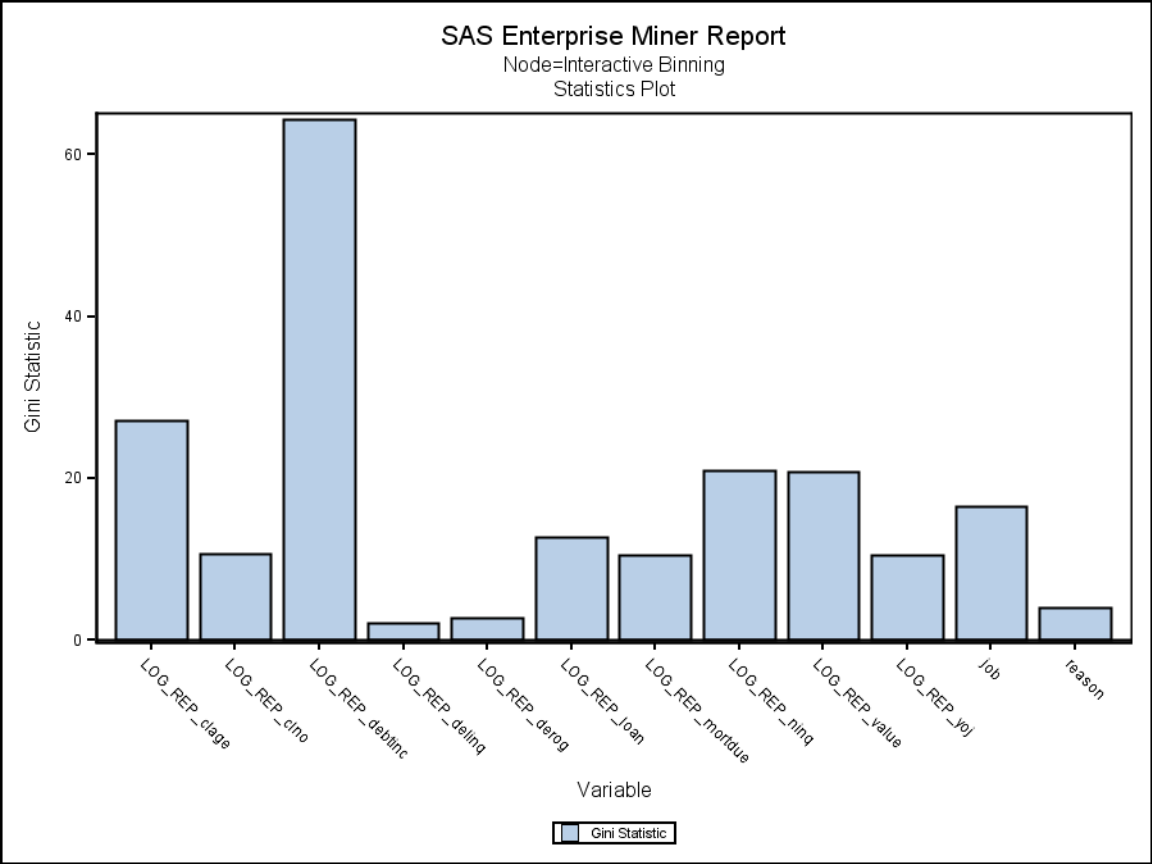
Role	Level	Frequency Count	Name
TARGET	BINARY	1	bad
INPUT	INTERVAL	10	LOG_REP_clage LOG_REP_clno LOG_REP_debtinc LOG_REP_delinq LOG_REP_derog LOG_REP_loan LOG_REP_mortdue LOG_REP_ninq LOG_REP_value LOG_REP_yoj
INPUT	NOMINAL	2	job reason
ID	INTERVAL	1	_dataobs_

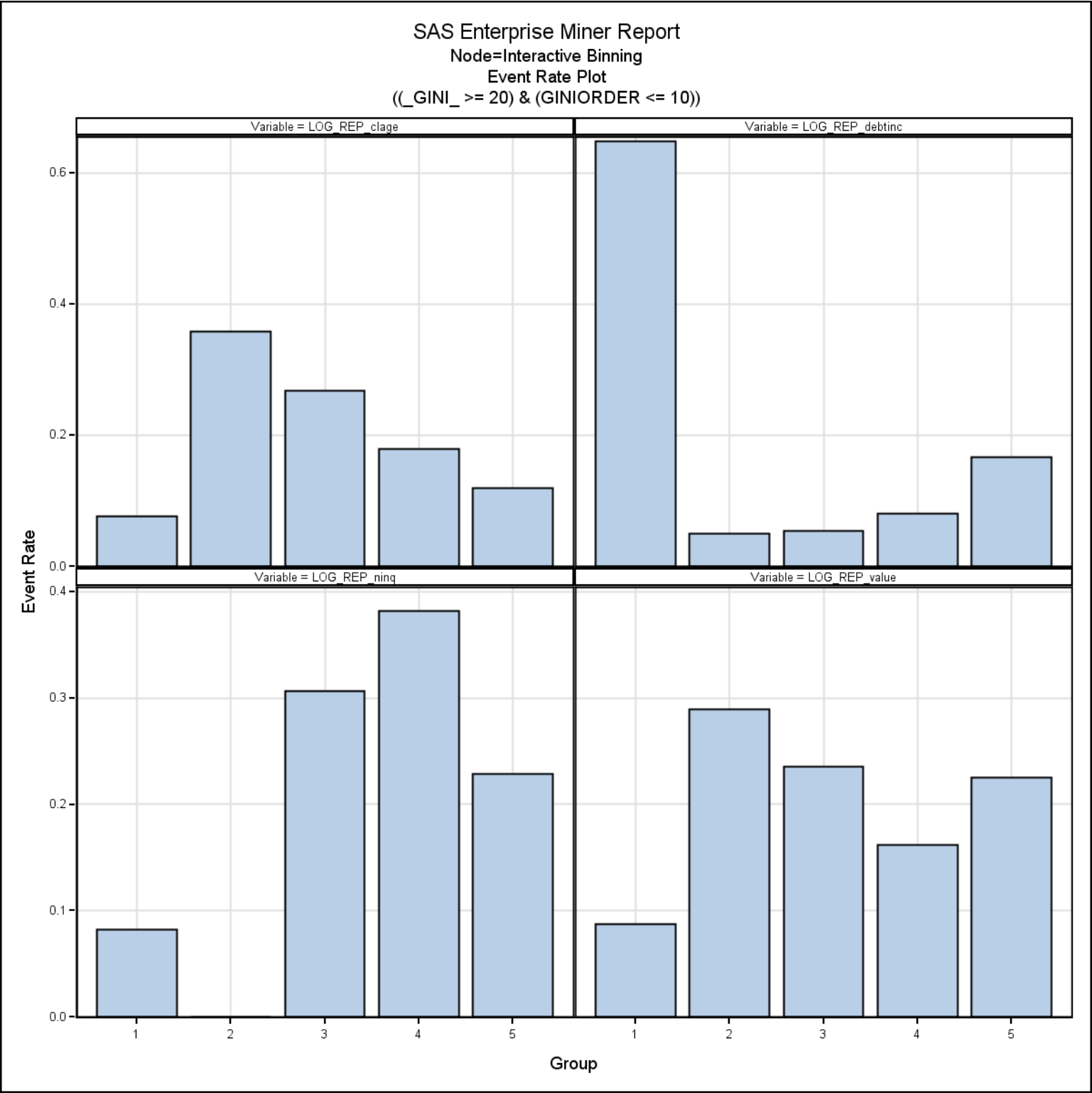
Node=Interactive Binning
Created Variables Summary

Role	Level	Frequency Count	Name
INPUT	ORDINAL	4	GRP_LOG_REP_clage GRP_LOG_REP_debtinc GRP_LOG_REP_ninq GRP_LOG_REP_value

Node=Interactive Binning
Output Variables

Variable	Gini Statistic	Level for Interactive	Calculated Role	New Role	Level	Label	Gini Ordering
LOG_REP_debtinc	64.355	INTERVAL	Input	Default	INTERVAL	Transformed: Replacement: Debt to income ratio	1
LOG_REP_clage	27.143	INTERVAL	Input	Default	INTERVAL	Transformed: Replacement: Age of oldest trade line in months	2
LOG_REP_ninq	20.940	INTERVAL	Input	Default	INTERVAL	Transformed: Replacement: Number of recent credit inquiries	3
LOG_REP_value	20.771	INTERVAL	Input	Default	INTERVAL	Transformed: Replacement: Value of current property	4
job	16.512	NOMINAL	Rejected	Default	NOMINAL	Prof/exec sales mngr office self other	5
LOG_REP_loan	12.733	INTERVAL	Rejected	Default	INTERVAL	Transformed: Replacement: Amount of current loan request	6
LOG_REP_clno	10.711	INTERVAL	Rejected	Default	INTERVAL	Transformed: Replacement: Number of trade (credit) lines	7
LOG_REP_mortdue	10.543	INTERVAL	Rejected	Default	INTERVAL	Transformed: Replacement: Amount due on existing mortgage	8
LOG_REP_yoj	10.510	INTERVAL	Rejected	Default	INTERVAL	Transformed: Replacement: Years on current job	9
reason	3.975	NOMINAL	Rejected	Default	NOMINAL	Home improvement or debt consolidation	10
LOG_REP_derog	2.773	INTERVAL	Rejected	Default	INTERVAL	Transformed: Replacement: Number of major derogatory reports	11
LOG_REP_delinq	2.150	INTERVAL	Rejected	Default	INTERVAL	Transformed: Replacement: Number of delinquent trade lines	12





SAS Enterprise Miner Report
Node=Interactive Binning
Event Rate Plot
((_GINI_ >= 20) & (GINIORDER <= 10))

Variable	Group Values	Group	Role	Event Rate
LOG_REP_clage	Missing	1	Input	0.07576
LOG_REP_clage	LOG_REP_clage< 4.76	2	Input	0.35859
LOG_REP_clage	4.76<= LOG_REP_clage< 5.17	3	Input	0.26768
LOG_REP_clage	5.17<= LOG_REP_clage< 5.45	4	Input	0.17845
LOG_REP_clage	5.45<= LOG_REP_clage	5	Input	0.11953
LOG_REP_debtinc	Missing	1	Input	0.64815
LOG_REP_debtinc	LOG_REP_debtinc< 3.4	2	Input	0.05051
LOG_REP_debtinc	3.4<= LOG_REP_debtinc< 3.58	3	Input	0.05387
LOG_REP_debtinc	3.58<= LOG_REP_debtinc< 3.69	4	Input	0.08081
LOG_REP_debtinc	3.69<= LOG_REP_debtinc	5	Input	0.16667
LOG_REP_ninq	Missing	1	Input	0.08249
LOG_REP_ninq	LOG_REP_ninq< 0	2	Input	0.00000
LOG_REP_ninq	0<= LOG_REP_ninq< 0.69	3	Input	0.30640
LOG_REP_ninq	0.69<= LOG_REP_ninq< 1.1	4	Input	0.38215
LOG_REP_ninq	1.1<= LOG_REP_ninq	5	Input	0.22896
LOG_REP_value	Missing	1	Input	0.08754
LOG_REP_value	LOG_REP_value< 11.1	2	Input	0.28956
LOG_REP_value	11.1<= LOG_REP_value< 11.4	3	Input	0.23569
LOG_REP_value	11.4<= LOG_REP_value< 11.71	4	Input	0.16162
LOG_REP_value	11.71<= LOG_REP_value	5	Input	0.22559

SAS Enterprise Miner Report

Node=Neural Network (6) Summary

Node id = Neural6
Node label = Neural Network (6)
Meta path = Ids => GrfExpl => Part => Repl => Neural6
Notes =

Node=Neural Network (6) Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	NeuralNetwork		Hidden	5	3	Prelim	Y	
AbsConvValue	-1.34078E154	-7.237006E75	HiddenActivation	DEFAULT		PrelimMaxTime	1 HOUR	
AbsFTime	1		HiddenBias	Y		PrelimMaxiter	10	
AbsFValue	0		HiddenCombFunction	DEFAULT		PrelimOutest		
AbsGTime	1		HiddenUnits	N		PreliminaryRuns	5	
AbsGValue	0.00001		InitialIds			RandDist	NORMAL	
AbsXTime	1		InitialSeed	12345		RandLoc	0	
AbsXVValue	1E-8		InputStandardization	STD		RandScale	0.1	
Accelerate	1.2		Learn	0.1		Residuals	Y	
AddHidden	Y		MaxLearn	50		Standardizations	N	
CodefileNoRes			MaxMomentum	1.75		SuppressOutput	N	
CodefileRes			Maxiter	50		TargetActivation	DEFAULT	
ConvDefaults	Y		Maxtime	4 HOURS		TargetBias	Y	
Decelerate	0.5		MinLearn	0.00001		TargetCombFunction	DEFAULT	
DirectConnection	N		ModelSelectionCriterion	PROFIT/LOSS		TargetError	DEFAULT	
FConvTime	1		Momentum	0		Tilt	0	
FConvValue	0		NetworkArchitecture	MLP		TrainCode		
GConvTime	1		Outest			TrainingTechnique	DEFAULT	
GConvValue	1E-6		Outfit			UseEstimates	N	

Node=Neural Network (6) Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	bad
INPUT	INTERVAL	10	REP_clage REP_clno REP_debtinc REP_delinq REP_derog REP_loan REP_mortdue REP_ninq REP_value REP_yoj
INPUT	NOMINAL	2	job reason

Node=Neural Network (6) Model Fit Statistics

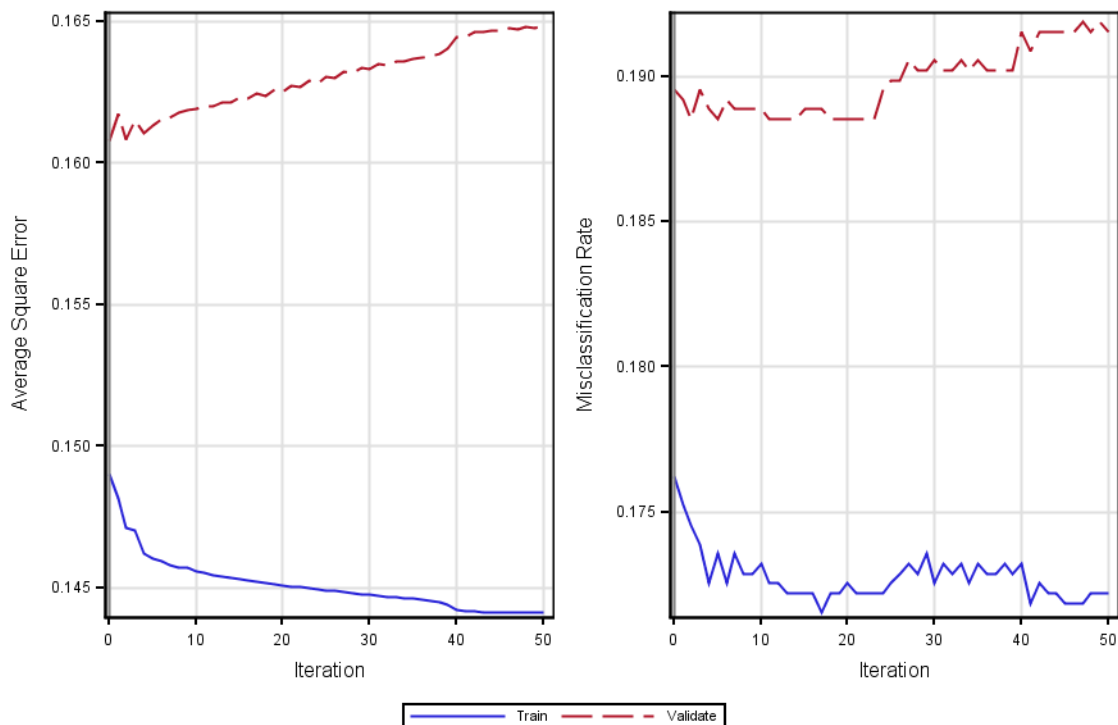
Target=bad Target Label=Default or seriously delinquent

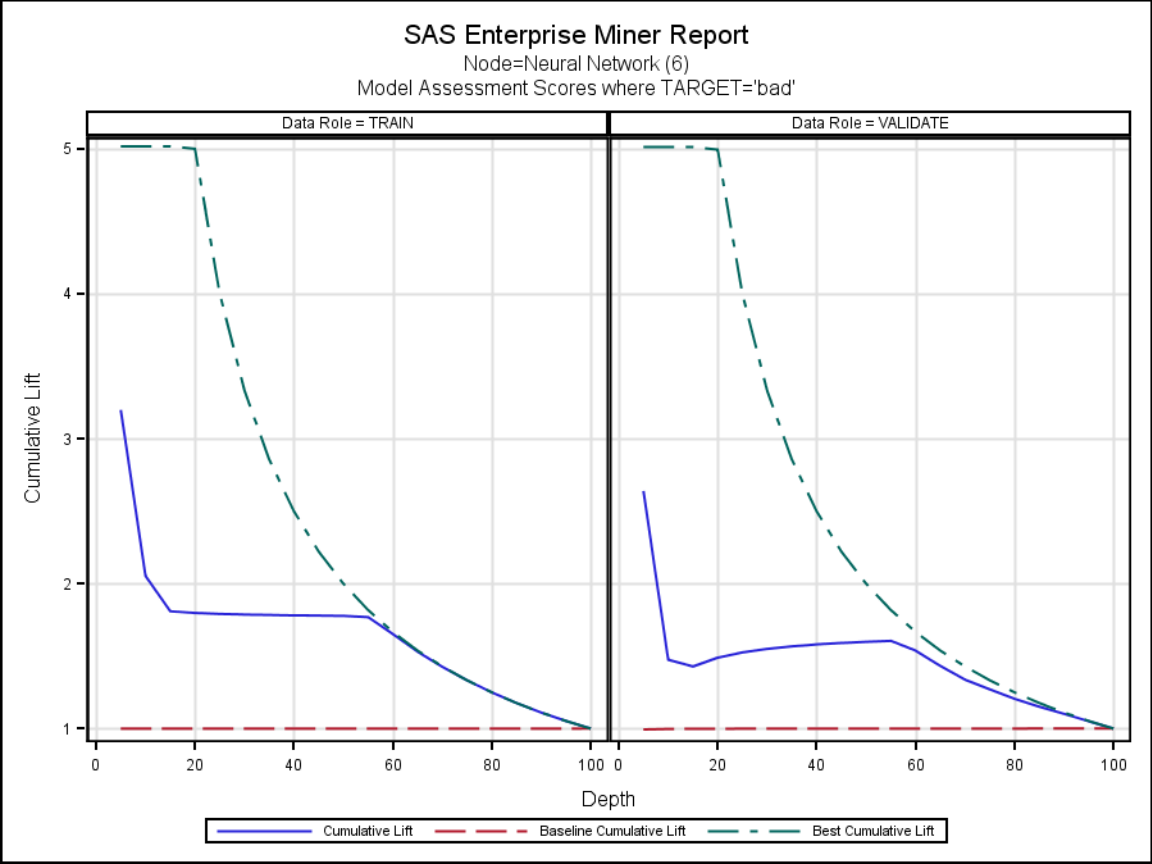
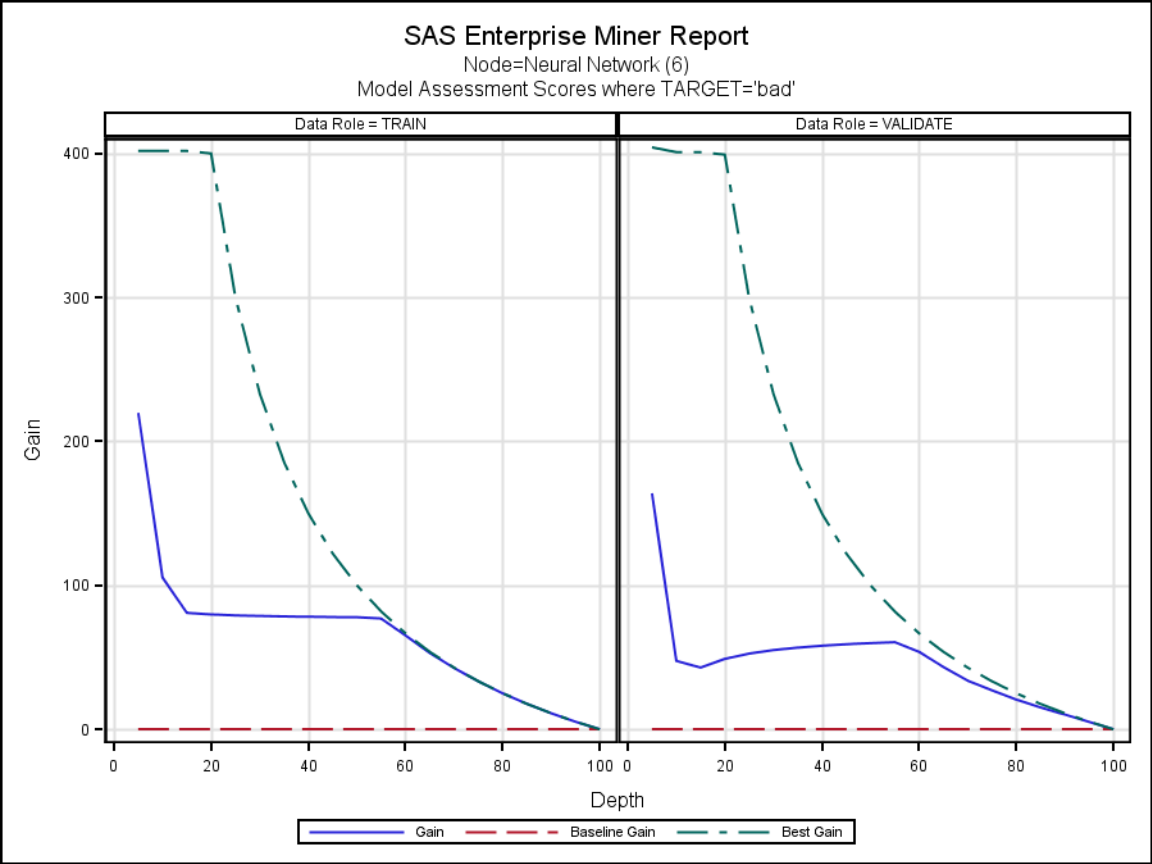
Label of Statistic	Train	Validation	Test
Total Degrees of Freedom	2979.00	.	.
Degrees of Freedom for Error	2888.00	.	.
Model Degrees of Freedom	91.00	.	.
Number of Estimated Weights	91.00	.	.
Akaike's Information Criterion	2976.26	.	.
Schwarz's Bayesian Criterion	3522.20	.	.
Average Squared Error	0.15	0.16	.
Maximum Absolute Error	0.99	1.00	.
Divisor for ASE	5958.00	5962.00	.

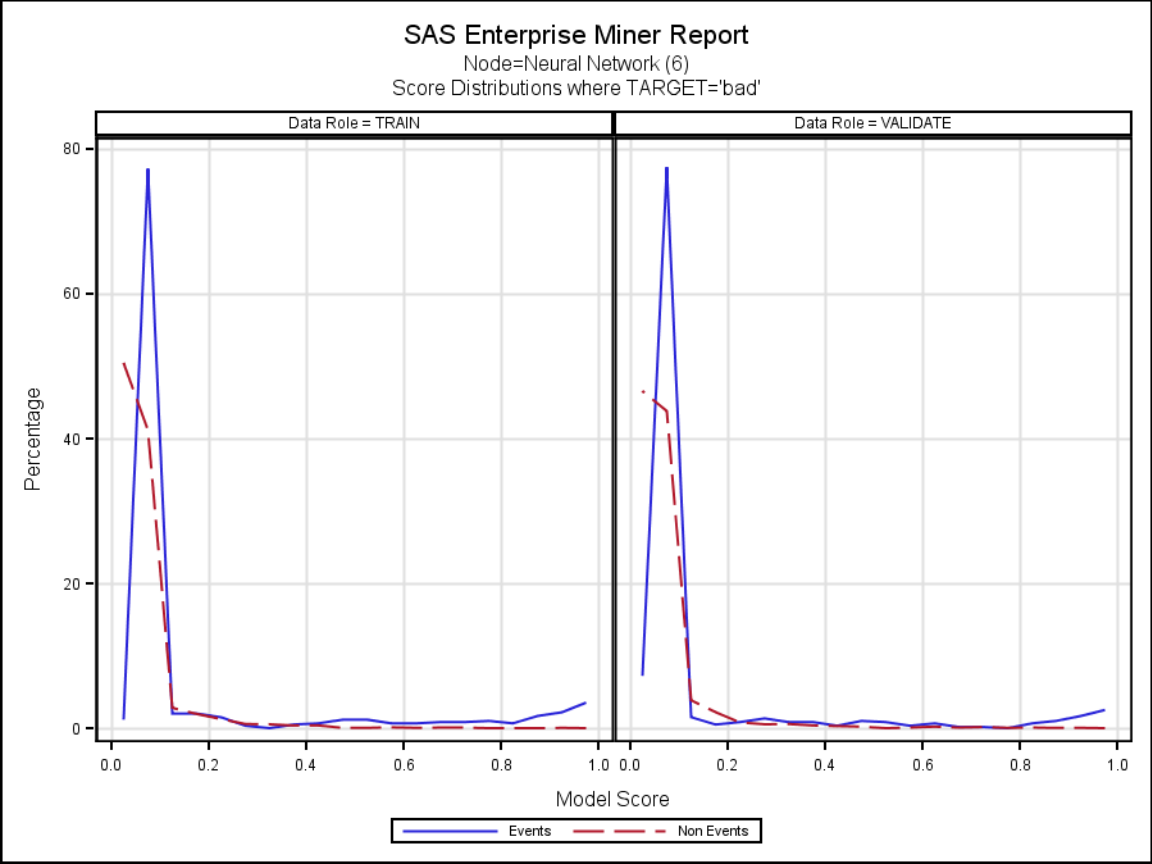
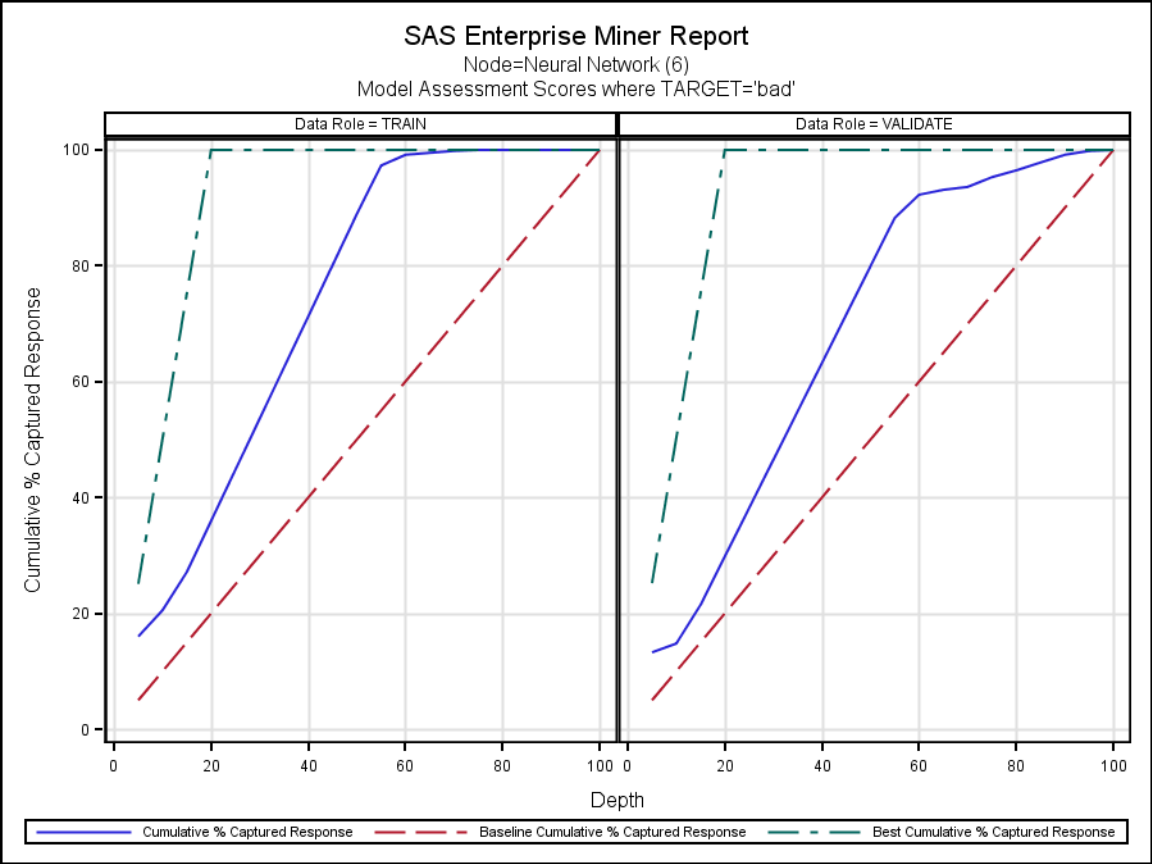
Target=bad Target Label=Default or seriously delinquent

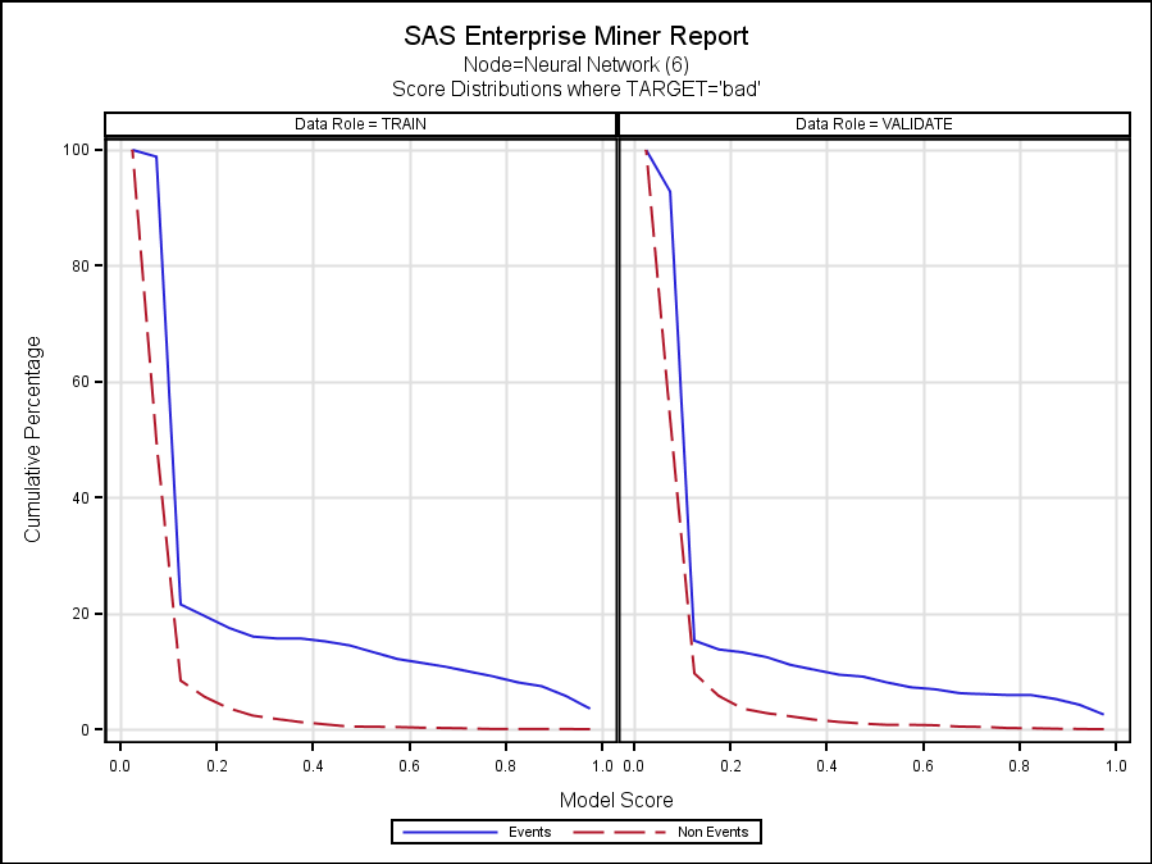
Label of Statistic	Train	Validation	Test
Sum of Frequencies	2979.00	2981.00	.
Root Average Squared Error	0.39	0.40	.
Sum of Squared Errors	887.92	958.67	.
Sum of Case Weights Times Freq	5958.00	5962.00	.
Final Prediction Error	0.16	.	.
Mean Squared Error	0.15	0.16	.
Root Final Prediction Error	0.40	.	.
Root Mean Squared Error	0.39	0.40	.
Average Error Function	0.47	0.53	.
Error Function	2794.26	3186.63	.
Misclassification Rate	0.18	0.19	.
Number of Wrong Classifications	525.00	565.00	.

SAS Enterprise Miner Report
Node=Neural Network (6)
Model Iteration Plots









Node=Neural Network (6)
Score Distributions

Target Variable=bad Data Role=TRAIN

Posterior Probability Range	Number of Events	Percentage of Events	Percentage of Nonevents	Cumulative Percentage of Events	Cumulative Percentage of Nonevents
0.95-1.00	21	3.5354	0.0000	3.535	0.000
0.90-0.95	13	2.1886	0.0419	5.724	0.042
0.85-0.90	10	1.6835	0.0000	7.407	0.042
0.80-0.85	4	0.6734	0.0000	8.081	0.042
0.75-0.80	6	1.0101	0.0000	9.091	0.042
0.70-0.75	5	0.8418	0.0839	9.933	0.126
0.65-0.70	5	0.8418	0.0839	10.774	0.210
0.60-0.65	4	0.6734	0.0419	11.448	0.252
0.55-0.60	4	0.6734	0.1258	12.121	0.377
0.50-0.55	7	1.1785	0.0419	13.300	0.419
0.45-0.50	7	1.1785	0.0419	14.478	0.461
0.40-0.45	4	0.6734	0.3774	15.152	0.839
0.35-0.40	3	0.5051	0.3774	15.657	1.216
0.30-0.35	0	0.0000	0.5451	15.657	1.761
0.25-0.30	2	0.3367	0.5870	15.993	2.348
0.20-0.25	9	1.5152	1.2579	17.508	3.606
0.15-0.20	12	2.0202	1.9706	19.529	5.577
0.10-0.15	12	2.0202	2.8092	21.549	8.386
0.05-0.10	459	77.2727	41.1740	98.822	49.560
0.00-0.05	7	1.1785	50.4403	100.000	100.000

Target Variable=bad Data Role=VALIDATE

Posterior Probability Range	Number of Events	Percentage of Events	Percentage of Nonevents	Cumulative Percentage of Events	Cumulative Percentage of Nonevents
0.95-1.00	15	2.5210	0.0000	2.521	0.000
0.90-0.95	10	1.6807	0.0419	4.202	0.042
0.85-0.90	6	1.0084	0.0419	5.210	0.084
0.80-0.85	4	0.6723	0.0838	5.882	0.168
0.75-0.80	0	0.0000	0.0419	5.882	0.210
0.70-0.75	1	0.1681	0.1676	6.050	0.377
0.65-0.70	1	0.1681	0.0838	6.218	0.461
0.60-0.65	4	0.6723	0.2096	6.891	0.671
0.55-0.60	2	0.3361	0.0838	7.227	0.754
0.50-0.55	5	0.8403	0.0000	8.067	0.754
0.45-0.50	6	1.0084	0.2096	9.076	0.964
0.40-0.45	2	0.3361	0.2934	9.412	1.257
0.35-0.40	5	0.8403	0.3772	10.252	1.635
0.30-0.35	5	0.8403	0.5868	11.092	2.221
0.25-0.30	8	1.3445	0.5448	12.437	2.766
0.20-0.25	5	0.8403	0.7963	13.277	3.562
0.15-0.20	3	0.5042	2.2213	13.782	5.784
0.10-0.15	9	1.5126	3.8558	15.294	9.640
0.05-0.10	461	77.4790	43.7972	92.773	53.437
0.00-0.05	43	7.2269	46.5633	100.000	100.000

SAS Enterprise Miner Report

Node=Neural Network (5) Summary

Node id = Neural5
Node label = Neural Network (5)
Meta path = Ids => GrfExpl => Part => Repl => Neural5
Notes =

Node=Neural Network (5) Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	NeuralNetwork		Hidden	3		Prelim	Y	
AbsConvValue	-1.34078E154	-7.237006E75	HiddenActivation	DEFAULT		PrelimMaxTime	1 HOUR	
AbsFTime	1		HiddenBias	Y		PrelimMaxiter	10	
AbsFValue	0		HiddenCombFunction	DEFAULT		PrelimOutest		
AbsGTime	1		HiddenUnits	N		PreliminaryRuns	5	
AbsGValue	0.00001		InitialDs			RandDist	NORMAL	
AbsXTime	1		InitialSeed	12345		RandLoc	0	
AbsXVValue	1E-8		InputStandardization	STD		RandScale	0.1	
Accelerate	1.2		Learn	0.1		Residuals	Y	
AddHidden	Y		MaxLearn	50		Standardizations	N	
CodefileNoRes			MaxMomentum	1.75		SuppressOutput	N	
CodefileRes			Maxiter	50		TargetActivation	DEFAULT	
ConvDefaults	Y		Maxtime	4 HOURS		TargetBias	Y	
Decelerate	0.5		MinLearn	0.00001		TargetCombFunction	DEFAULT	
DirectConnection	N		ModelSelectionCriterion	PROFIT/LOSS		TargetError	DEFAULT	
FConvTime	1		Momentum	0		Tilt	0	
FConvValue	0		NetworkArchitecture	MLP		TrainCode		
GConvTime	1		Outest			TrainingTechnique	DEFAULT	
GConvValue	1E-6		Outfit			UseEstimates	N	

Node=Neural Network (5) Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	bad
INPUT	INTERVAL	10	REP_clage REP_clno REP_debtinc REP_delinq REP_derog REP_loan REP_mortdue REP_ninq REP_value REP_yoj
INPUT	NOMINAL	2	job reason

Node=Neural Network (5) Model Fit Statistics

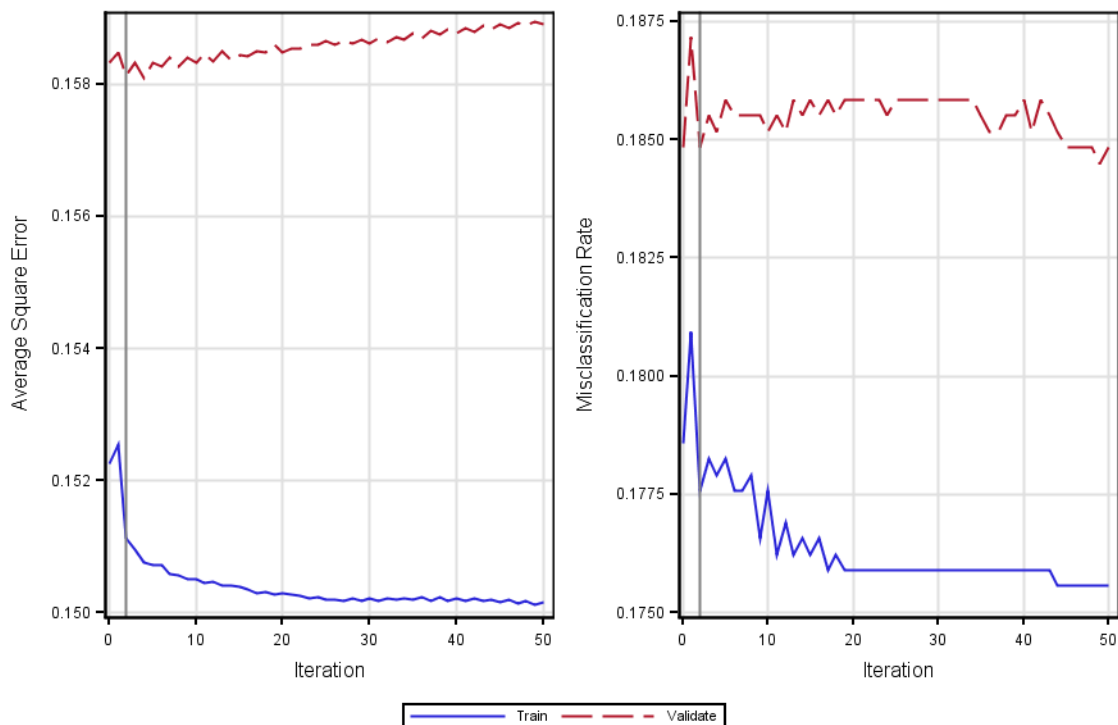
Target=bad Target Label=Default or seriously delinquent

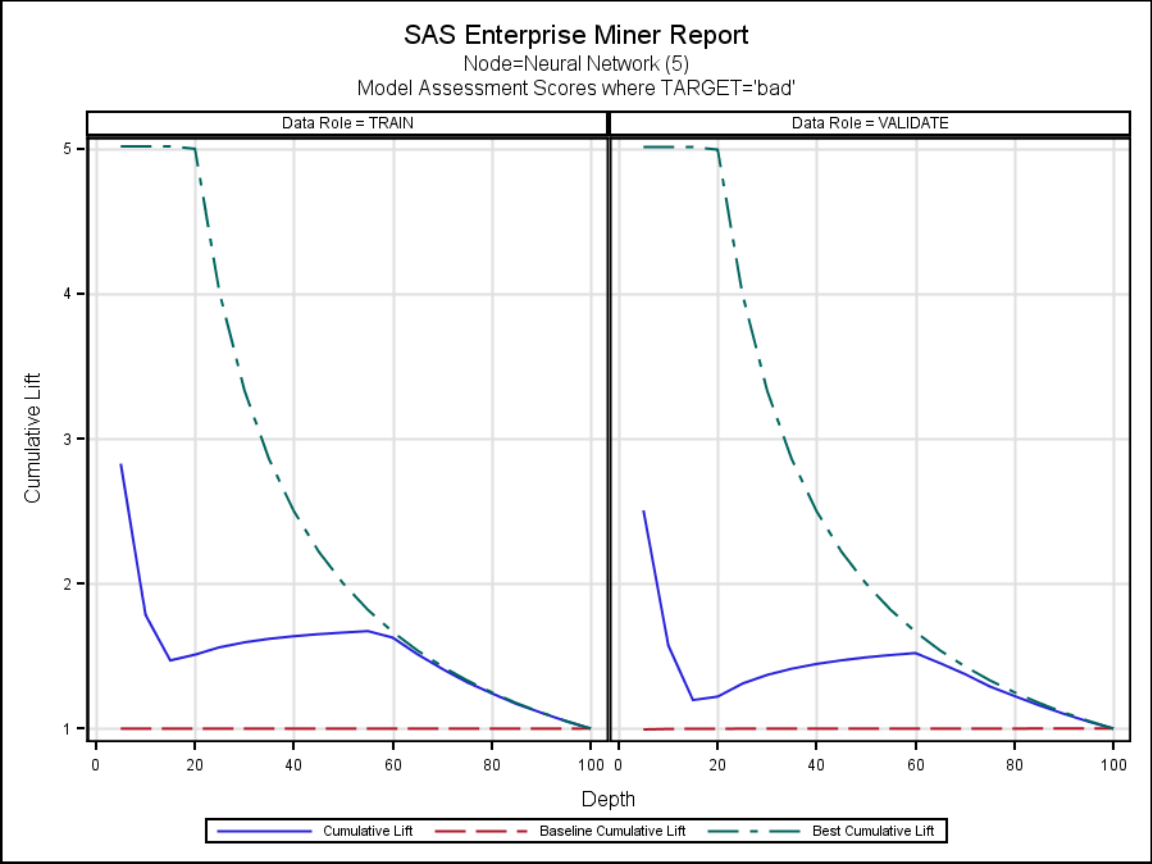
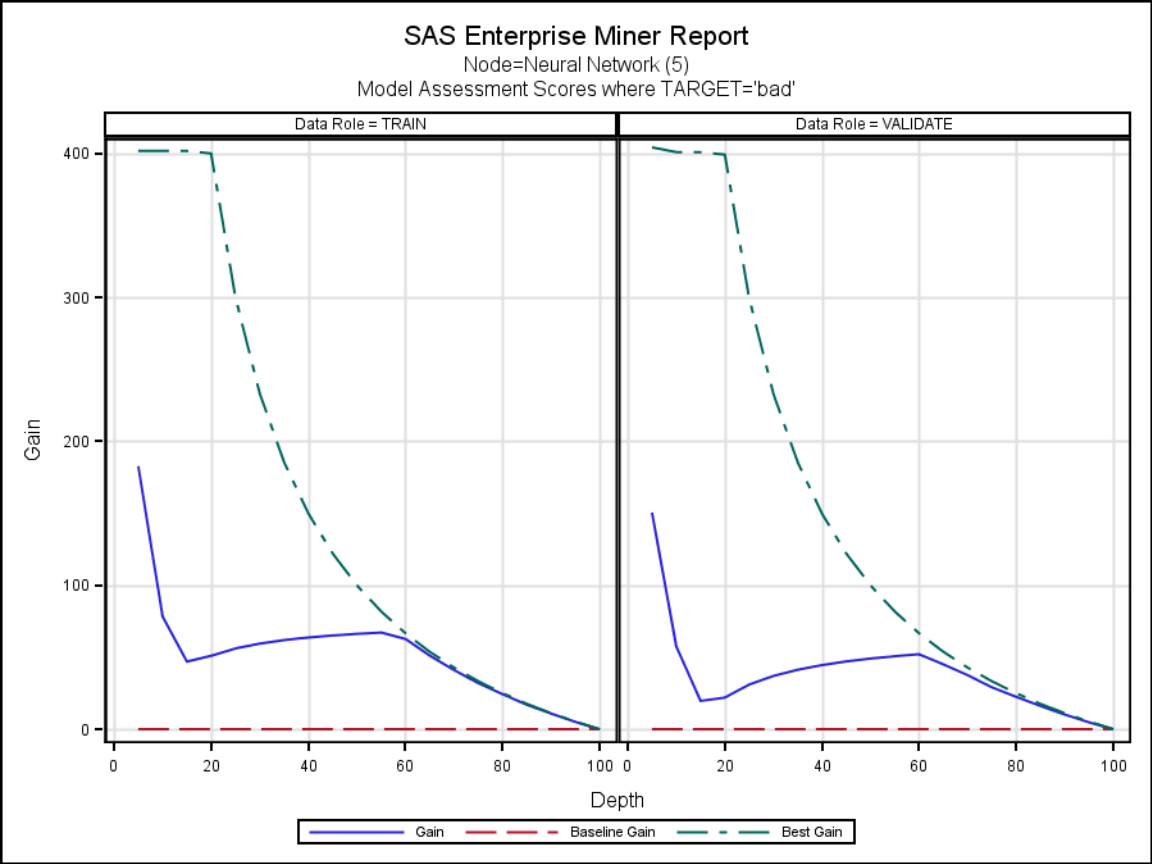
Label of Statistic	Train	Validation	Test
Total Degrees of Freedom	2979.00	.	.
Degrees of Freedom for Error	2924.00	.	.
Model Degrees of Freedom	55.00	.	.
Number of Estimated Weights	55.00	.	.
Akaike's Information Criterion	2975.19	.	.
Schwarz's Bayesian Criterion	3305.15	.	.
Average Squared Error	0.15	0.16	.
Maximum Absolute Error	1.00	1.00	.
Divisor for ASE	5958.00	5962.00	.

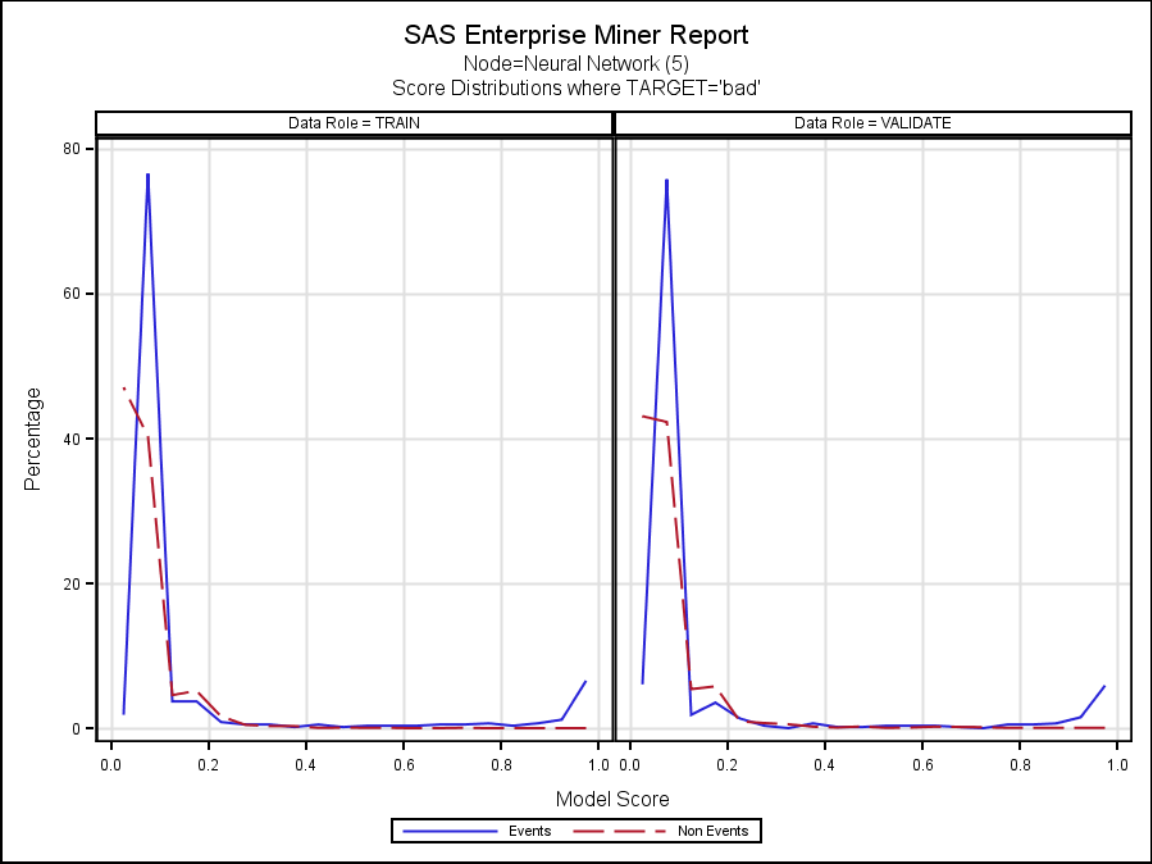
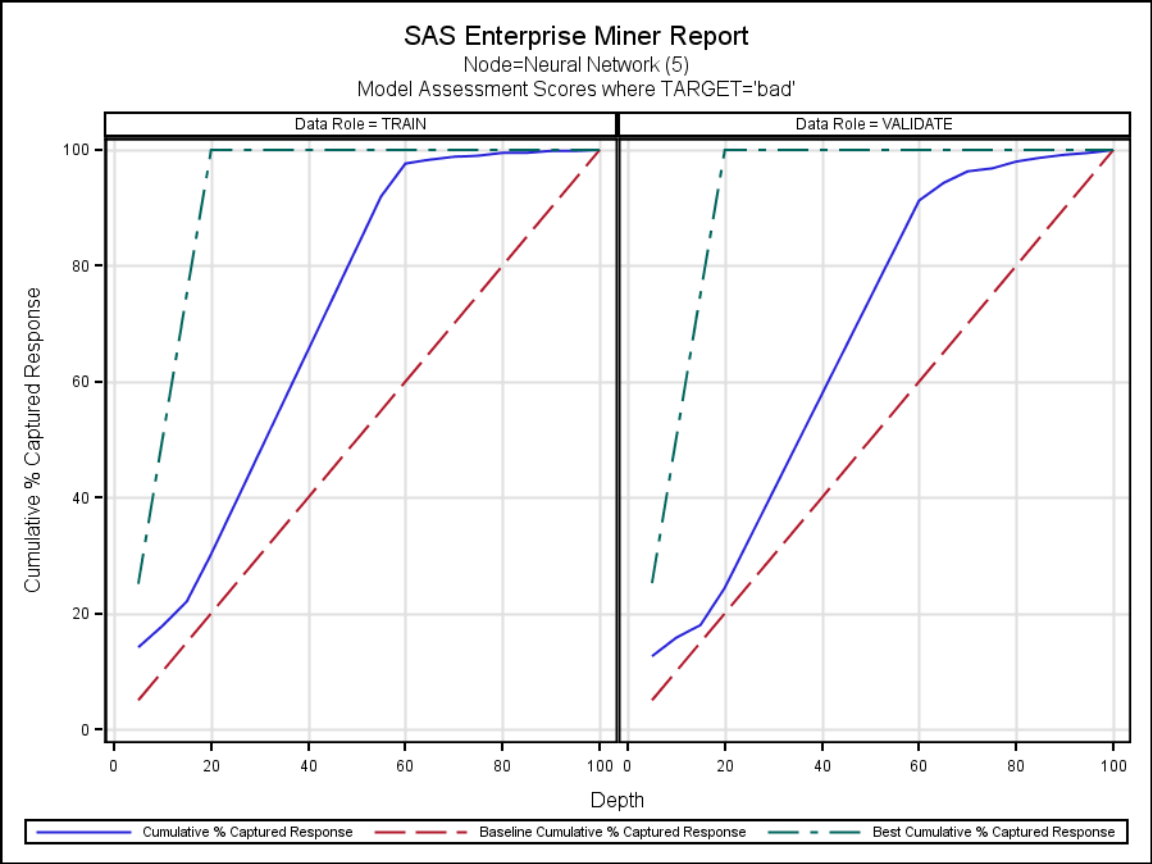
Target=bad Target Label=Default or seriously delinquent

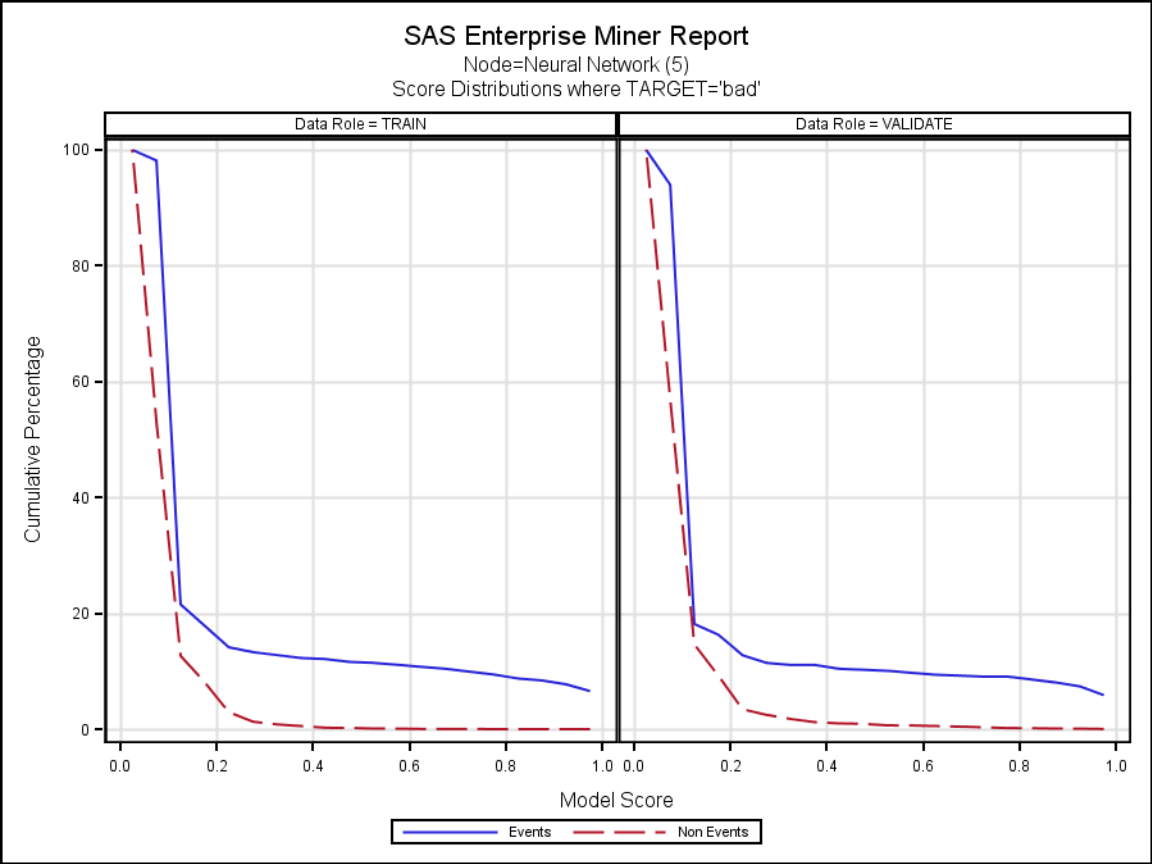
Label of Statistic	Train	Validation	Test
Sum of Frequencies	2979.00	2981.00	.
Root Average Squared Error	0.39	0.40	.
Sum of Squared Errors	900.46	942.82	.
Sum of Case Weights Times Freq	5958.00	5962.00	.
Final Prediction Error	0.16	.	.
Mean Squared Error	0.15	0.16	.
Root Final Prediction Error	0.40	.	.
Root Mean Squared Error	0.39	0.40	.
Average Error Function	0.48	0.52	.
Error Function	2865.19	3078.45	.
Misclassification Rate	0.18	0.18	.
Number of Wrong Classifications	529.00	551.00	.

SAS Enterprise Miner Report
Node=Neural Network (5)
Model Iteration Plots









Node=Neural Network (5)
Score Distributions

Target Variable=bad Data Role=TRAIN

Posterior Probability Range	Number of Events	Percentage of Events	Percentage of Nonevents	Cumulative Percentage of Events	Cumulative Percentage of Nonevents
0.95-1.00	39	6.5657	0.0000	6.566	0.000
0.90-0.95	7	1.1785	0.0000	7.744	0.000
0.85-0.90	4	0.6734	0.0000	8.418	0.000
0.80-0.85	2	0.3367	0.0000	8.754	0.000
0.75-0.80	4	0.6734	0.0000	9.428	0.000
0.70-0.75	3	0.5051	0.0419	9.933	0.042
0.65-0.70	3	0.5051	0.0000	10.438	0.042
0.60-0.65	2	0.3367	0.0000	10.774	0.042
0.55-0.60	2	0.3367	0.0419	11.111	0.084
0.50-0.55	2	0.3367	0.0419	11.448	0.126
0.45-0.50	1	0.1684	0.0839	11.616	0.210
0.40-0.45	3	0.5051	0.0419	12.121	0.252
0.35-0.40	1	0.1684	0.2935	12.290	0.545
0.30-0.35	3	0.5051	0.2935	12.795	0.839
0.25-0.30	3	0.5051	0.4612	13.300	1.300
0.20-0.25	5	0.8418	1.6352	14.141	2.935
0.15-0.20	22	3.7037	5.1572	17.845	8.092
0.10-0.15	22	3.7037	4.5702	21.549	12.662
0.05-0.10	455	76.5993	40.2935	98.148	52.956
0.00-0.05	11	1.8519	47.0440	100.000	100.000

Target Variable=bad Data Role=VALIDATE

Posterior Probability Range	Number of Events	Percentage of Events	Percentage of Nonevents	Cumulative Percentage of Events	Cumulative Percentage of Nonevents
0.95-1.00	35	5.8824	0.0419	5.882	0.042
0.90-0.95	9	1.5126	0.0419	7.395	0.084
0.85-0.90	4	0.6723	0.0419	8.067	0.126
0.80-0.85	3	0.5042	0.0419	8.571	0.168
0.75-0.80	3	0.5042	0.0419	9.076	0.210
0.70-0.75	0	0.0000	0.1257	9.076	0.335
0.60-0.65	2	0.3361	0.2096	9.412	0.545
0.55-0.60	2	0.3361	0.0838	9.748	0.629
0.50-0.55	2	0.3361	0.0419	10.084	0.671
0.45-0.50	1	0.1681	0.2515	10.252	0.922
0.40-0.45	1	0.1681	0.0838	10.420	1.006
0.35-0.40	4	0.6723	0.2096	11.092	1.215
0.30-0.35	0	0.0000	0.5448	11.092	1.760
0.25-0.30	2	0.3361	0.7125	11.429	2.473
0.20-0.25	8	1.3445	0.9640	12.773	3.437
0.15-0.20	21	3.5294	5.7837	16.303	9.220
0.10-0.15	11	1.8487	5.4065	18.151	14.627
0.05-0.10	451	75.7983	42.2883	93.950	56.915
0.00-0.05	36	6.0504	43.0847	100.000	100.000

SAS Enterprise Miner Report

Node=Neural Network (4) Summary

Node id = Neural4
 Node label = Neural Network (4)
 Meta path = Ids => GrfExpl => Part => Repl => Neural4
 Notes =

Node=Neural Network (4) Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	NeuralNetwork		Hidden	1	3	Prelim	Y	
AbsConvValue	-1.34078E154	-7.237006E75	HiddenActivation	DEFAULT		PrelimMaxTime	1 HOUR	
AbsFTime	1		HiddenBias	Y		PrelimMaxiter	10	
AbsFValue	0		HiddenCombFunction	DEFAULT		PrelimOutest		
AbsGTime	1		HiddenUnits	N		PreliminaryRuns	5	
AbsGValue	0.00001		InitialDs			RandDist	NORMAL	
AbsXTime	1		InitialSeed	12345		RandLoc	0	
AbsXVValue	1E-8		InputStandardization	STD		RandScale	0.1	
Accelerate	1.2		Learn	0.1		Residuals	Y	
AddHidden	Y		MaxLearn	50		Standardizations	N	
CodefileNoRes			MaxMomentum	1.75		SuppressOutput	N	
CodefileRes			Maxiter	50		TargetActivation	DEFAULT	
ConvDefaults	Y		Maxtime	4 HOURS		TargetBias	Y	
Decelerate	0.5		MinLearn	0.00001		TargetCombFunction	DEFAULT	
DirectConnection	N		ModelSelectionCriterion	PROFIT/LOSS		TargetError	DEFAULT	
FConvTime	1		Momentum	0		Tilt	0	
FConvValue	0		NetworkArchitecture	MLP		TrainCode		
GConvTime	1		Outest			TrainingTechnique	DEFAULT	
GConvValue	1E-6		Outfit			UseEstimates	N	

Node=Neural Network (4) Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	bad
INPUT	INTERVAL	10	REP_clage REP_clno REP_debtinc REP_delinq REP_derog REP_loan REP_mortdue REP_ninq REP_value REP_yoj
INPUT	NOMINAL	2	job reason

Node=Neural Network (4) Model Fit Statistics

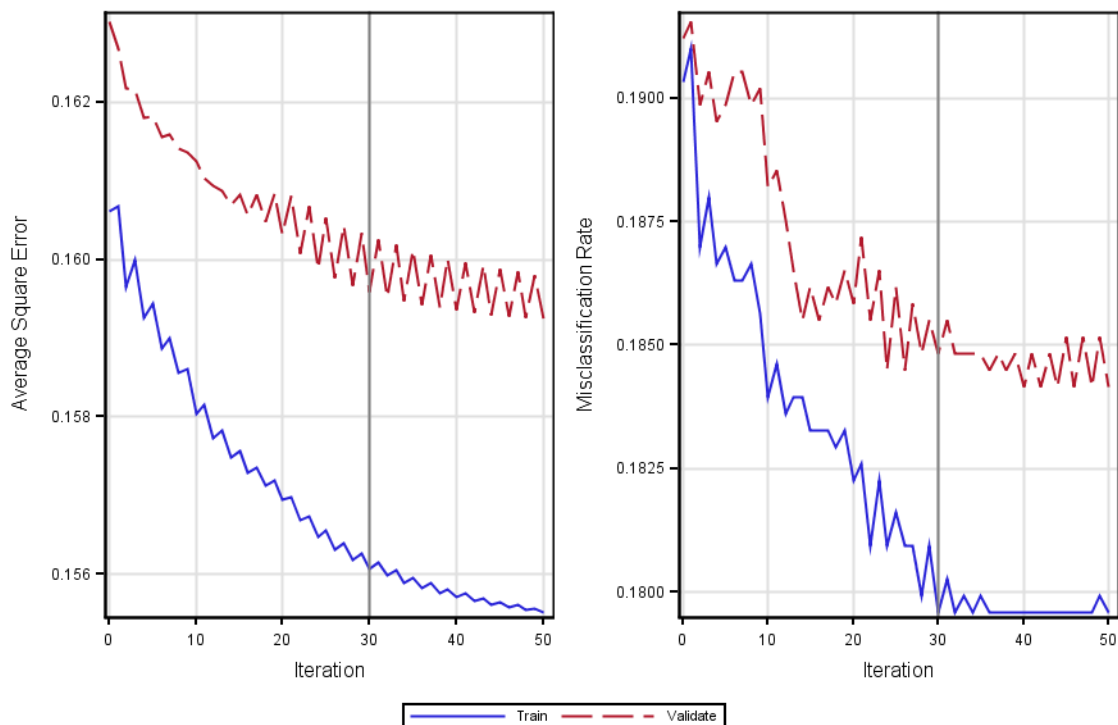
Target=bad Target Label=Default or seriously delinquent

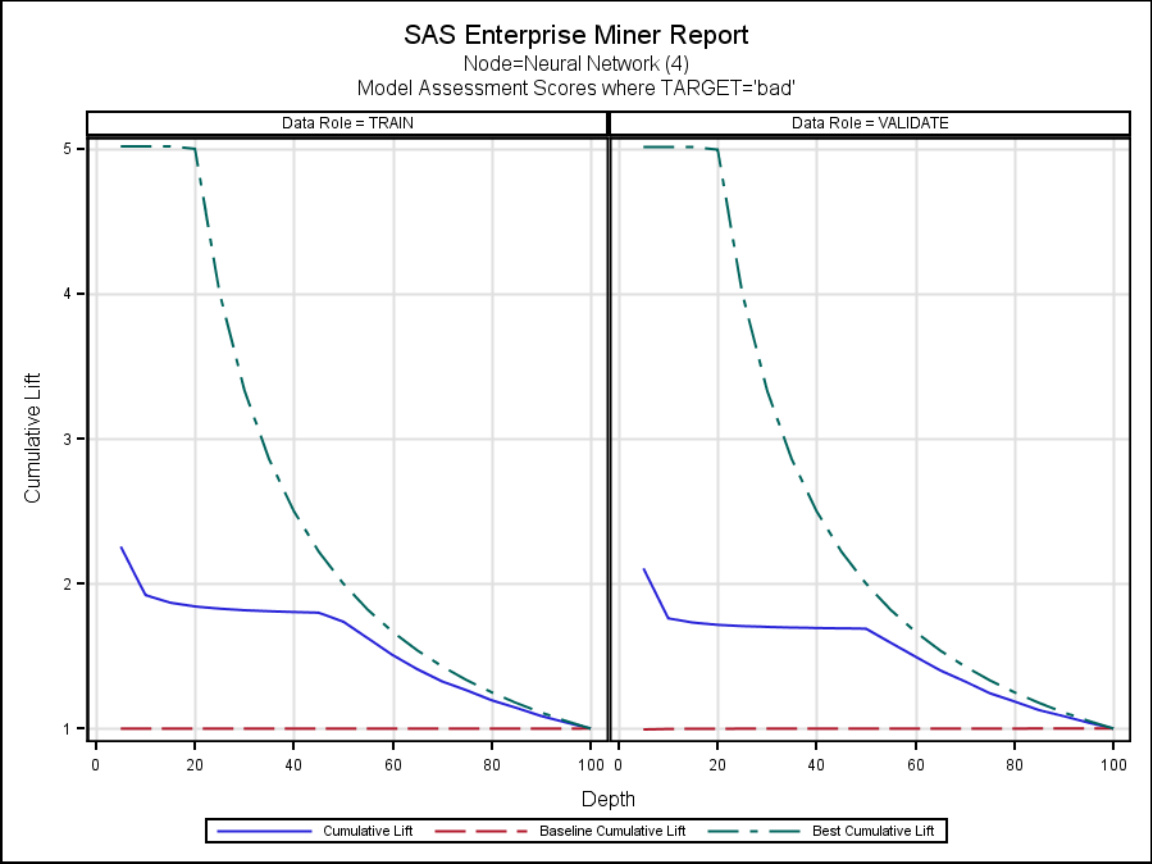
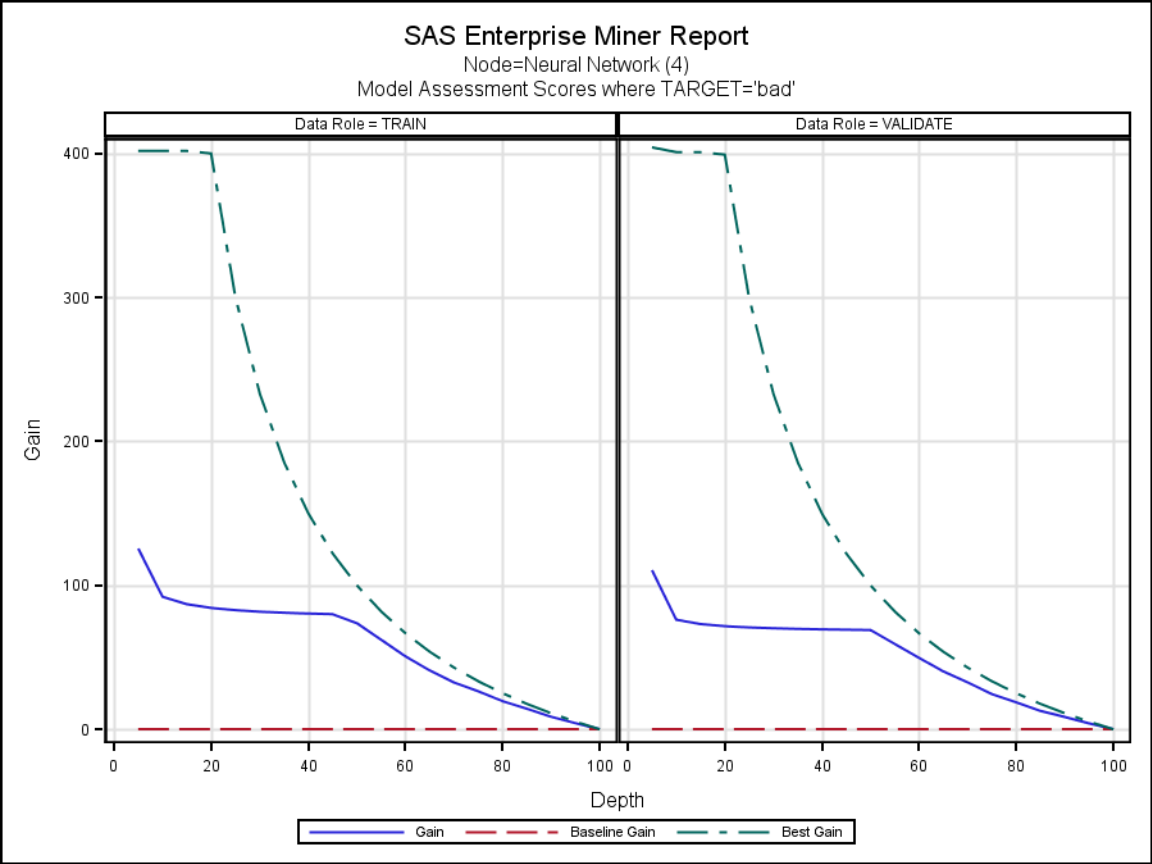
Label of Statistic	Train	Validation	Test
Total Degrees of Freedom	2979.00	.	.
Degrees of Freedom for Error	2960.00	.	.
Model Degrees of Freedom	19.00	.	.
Number of Estimated Weights	19.00	.	.
Akaike's Information Criterion	3076.47	.	.
Schwarz's Bayesian Criterion	3190.46	.	.
Average Squared Error	0.16	0.16	.
Maximum Absolute Error	0.95	0.99	.
Divisor for ASE	5958.00	5962.00	.

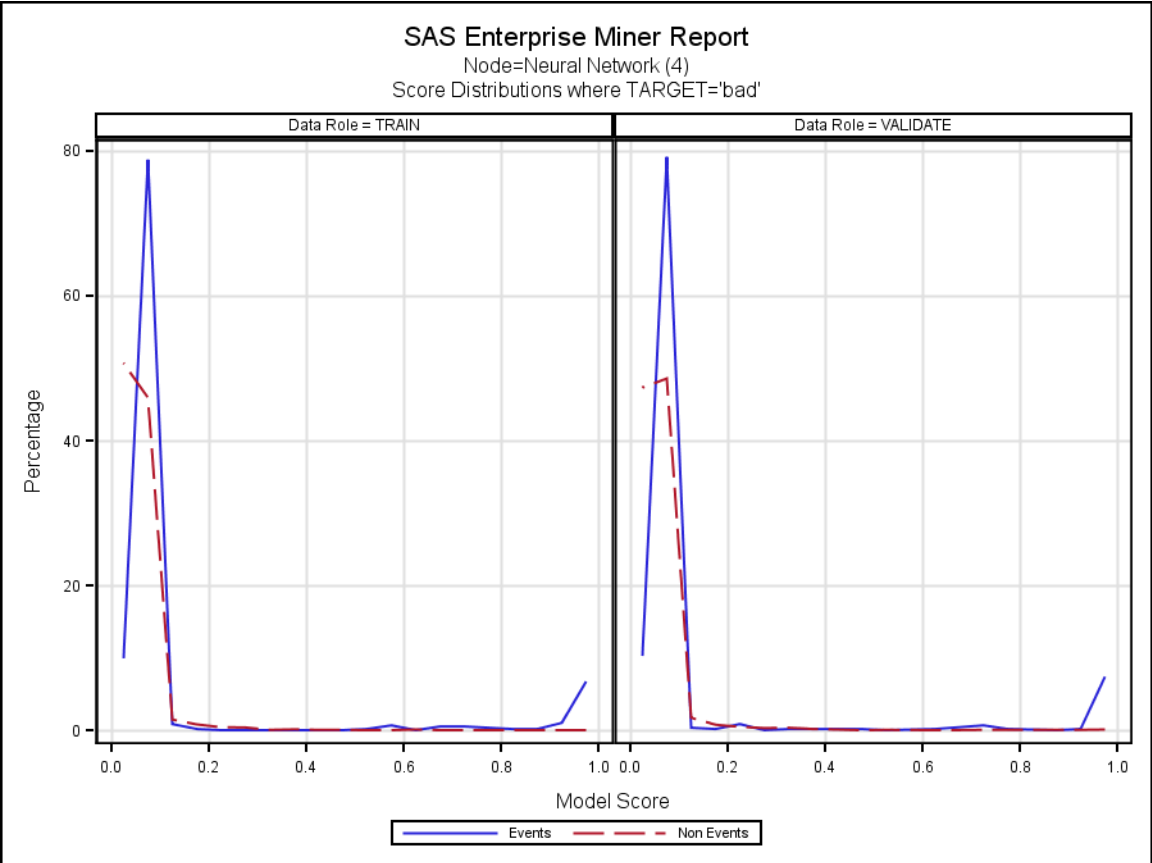
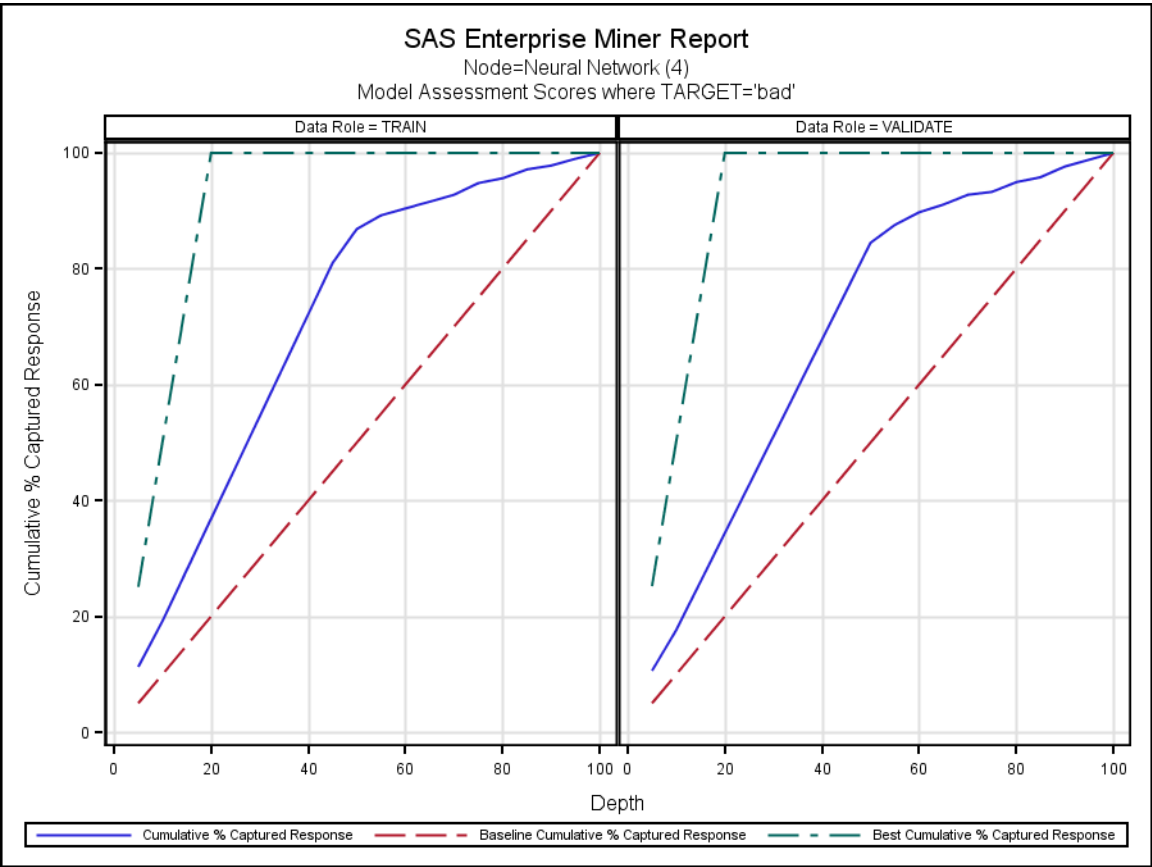
Target=bad Target Label=Default or seriously delinquent

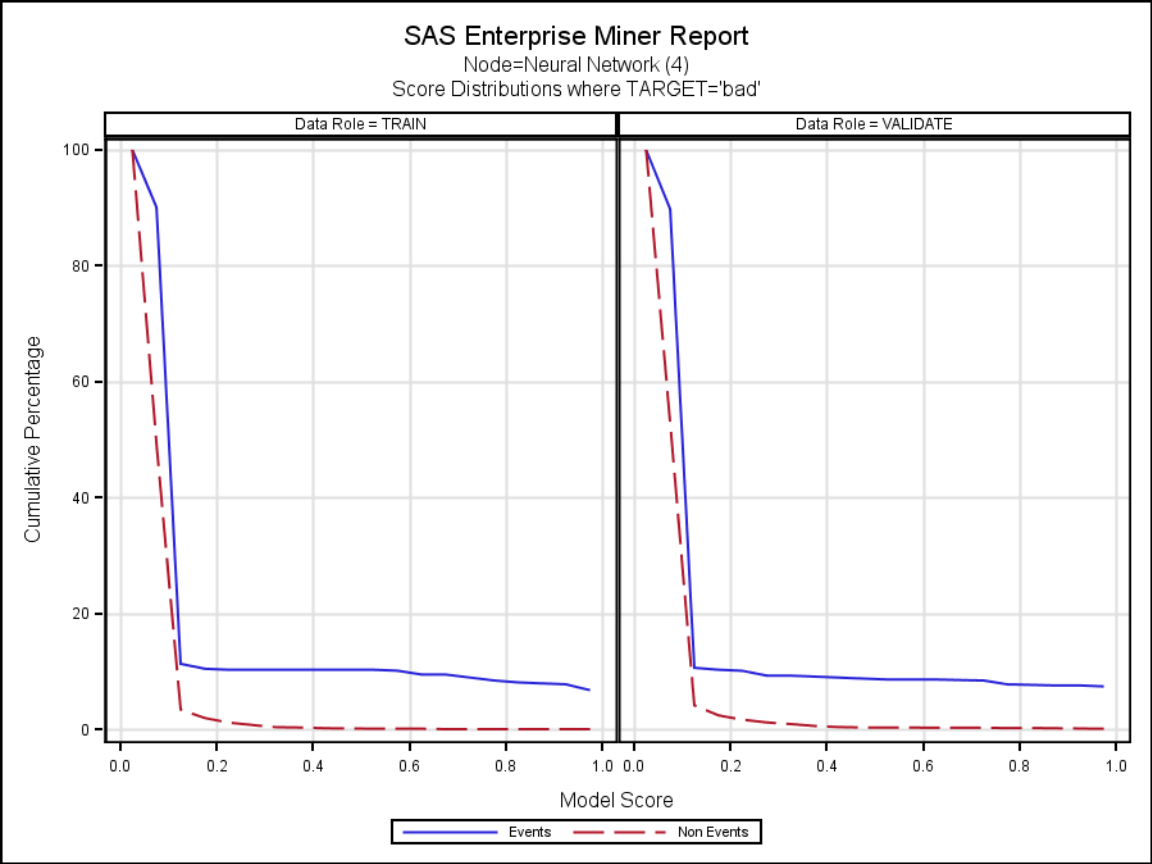
Label of Statistic	Train	Validation	Test
Sum of Frequencies	2979.00	2981.00	.
Root Average Squared Error	0.40	0.40	.
Sum of Squared Errors	929.91	951.49	.
Sum of Case Weights Times Freq	5958.00	5962.00	.
Final Prediction Error	0.16	.	.
Mean Squared Error	0.16	0.16	.
Root Final Prediction Error	0.40	.	.
Root Mean Squared Error	0.40	0.40	.
Average Error Function	0.51	0.52	.
Error Function	3038.47	3108.59	.
Misclassification Rate	0.18	0.18	.
Number of Wrong Classifications	535.00	551.00	.

SAS Enterprise Miner Report
Node=Neural Network (4)
Model Iteration Plots









Node=Neural Network (4)
Score Distributions

Target Variable=bad Data Role=TRAIN

Posterior Probability Range	Number of Events	Percentage of Events	Percentage of Nonevents	Cumulative Percentage of Events	Cumulative Percentage of Nonevents
0.95-1.00	40	6.7340	0.0000	6.734	0.000
0.90-0.95	6	1.0101	0.0000	7.744	0.000
0.85-0.90	1	0.1684	0.0000	7.912	0.000
0.80-0.85	1	0.1684	0.0000	8.081	0.000
0.75-0.80	2	0.3367	0.0000	8.418	0.000
0.70-0.75	3	0.5051	0.0000	8.923	0.000
0.65-0.70	3	0.5051	0.0000	9.428	0.000
0.60-0.65	0	0.0000	0.0839	9.428	0.084
0.55-0.60	4	0.6734	0.0000	10.101	0.084
0.50-0.55	1	0.1684	0.0000	10.269	0.084
0.45-0.50	0	0.0000	0.0419	10.269	0.126
0.40-0.45	0	0.0000	0.0419	10.269	0.168
0.35-0.40	0	0.0000	0.1258	10.269	0.294
0.30-0.35	0	0.0000	0.0419	10.269	0.335
0.25-0.30	0	0.0000	0.3774	10.269	0.713
0.20-0.25	0	0.0000	0.4193	10.269	1.132
0.15-0.20	1	0.1684	0.7966	10.438	1.929
0.10-0.15	5	0.8418	1.4675	11.279	3.396
0.05-0.10	468	78.7879	45.9119	90.067	49.308
0.00-0.05	59	9.9327	50.6918	100.000	100.000

Target Variable=bad Data Role=VALIDATE

Posterior Probability Range	Number of Events	Percentage of Events	Percentage of Nonevents	Cumulative Percentage of Events	Cumulative Percentage of Nonevents
0.95-1.00	44	7.3950	0.0838	7.395	0.084
0.90-0.95	1	0.1681	0.0419	7.563	0.126
0.85-0.90	0	0.0000	0.0419	7.563	0.168
0.75-0.80	1	0.1681	0.0419	7.731	0.210
0.70-0.75	4	0.6723	0.0419	8.403	0.251
0.60-0.65	1	0.1681	0.0000	8.571	0.251
0.50-0.55	0	0.0000	0.0419	8.571	0.293
0.45-0.50	1	0.1681	0.0000	8.739	0.293
0.40-0.45	1	0.1681	0.0838	8.908	0.377
0.35-0.40	1	0.1681	0.1676	9.076	0.545
0.30-0.35	1	0.1681	0.3353	9.244	0.880
0.25-0.30	0	0.0000	0.2934	9.244	1.174
0.20-0.25	5	0.8403	0.4610	10.084	1.635
0.15-0.20	1	0.1681	0.7544	10.252	2.389
0.10-0.15	2	0.3361	1.7184	10.588	4.107
0.05-0.10	471	79.1597	48.5750	89.748	52.682
0.00-0.05	61	10.2521	47.3177	100.000	100.000

SAS Enterprise Miner Report

Node=Neural Network (3) Summary

Node id = Neural3
 Node label = Neural Network (3)
 Meta path = Ids => GrfExpl => Part => Repl => Trans => BINNING => Neural3
 Notes =

Node=Neural Network (3) Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	NeuralNetwork		Hidden	5	3	Prelim	Y	
AbsConvValue	-1.34078E154	-7.237006E75	HiddenActivation	DEFAULT		PrelimMaxTime	1 HOUR	
AbsFTime	1		HiddenBias	Y		PrelimMaxiter	10	
AbsFValue	0		HiddenCombFunction	DEFAULT		PrelimOutest		
AbsGTime	1		HiddenUnits	N		PreliminaryRuns	5	
AbsGValue	0.00001		InitialDs			RandDist	NORMAL	
AbsXTime	1		InitialSeed	12345		RandLoc	0	
AbsXVValue	1E-8		InputStandardization	STD		RandScale	0.1	
Accelerate	1.2		Learn	0.1		Residuals	Y	
AddHidden	Y		MaxLearn	50		Standardizations	N	
CodefileNoRes			MaxMomentum	1.75		SuppressOutput	N	
CodefileRes			Maxiter	50		TargetActivation	DEFAULT	
ConvDefaults	Y		Maxtime	4 HOURS		TargetBias	Y	
Decelerate	0.5		MinLearn	0.00001		TargetCombFunction	DEFAULT	
DirectConnection	N		ModelSelectionCriterion	PROFIT/LOSS		TargetError	DEFAULT	
FConvTime	1		Momentum	0		Tilt	0	
FConvValue	0		NetworkArchitecture	MLP		TrainCode		
GConvTime	1		Outest			TrainingTechnique	DEFAULT	
GConvValue	1E-6		Outfit			UseEstimates	N	

Node=Neural Network (3) Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	bad
INPUT	ORDINAL	4	GRP_LOG_REP_clage GRP_LOG_REP_debtinc GRP_LOG_REP_ninq GRP_LOG_REP_value

Node=Neural Network (3) Model Fit Statistics

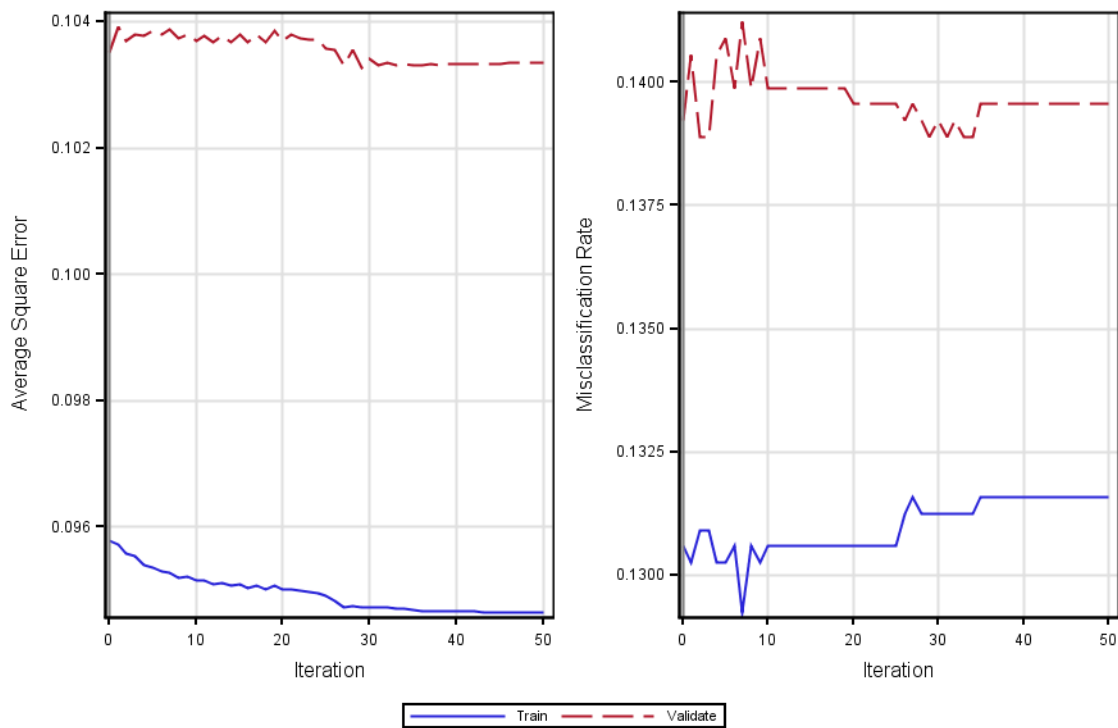
Target=bad Target Label=Default or seriously delinquent

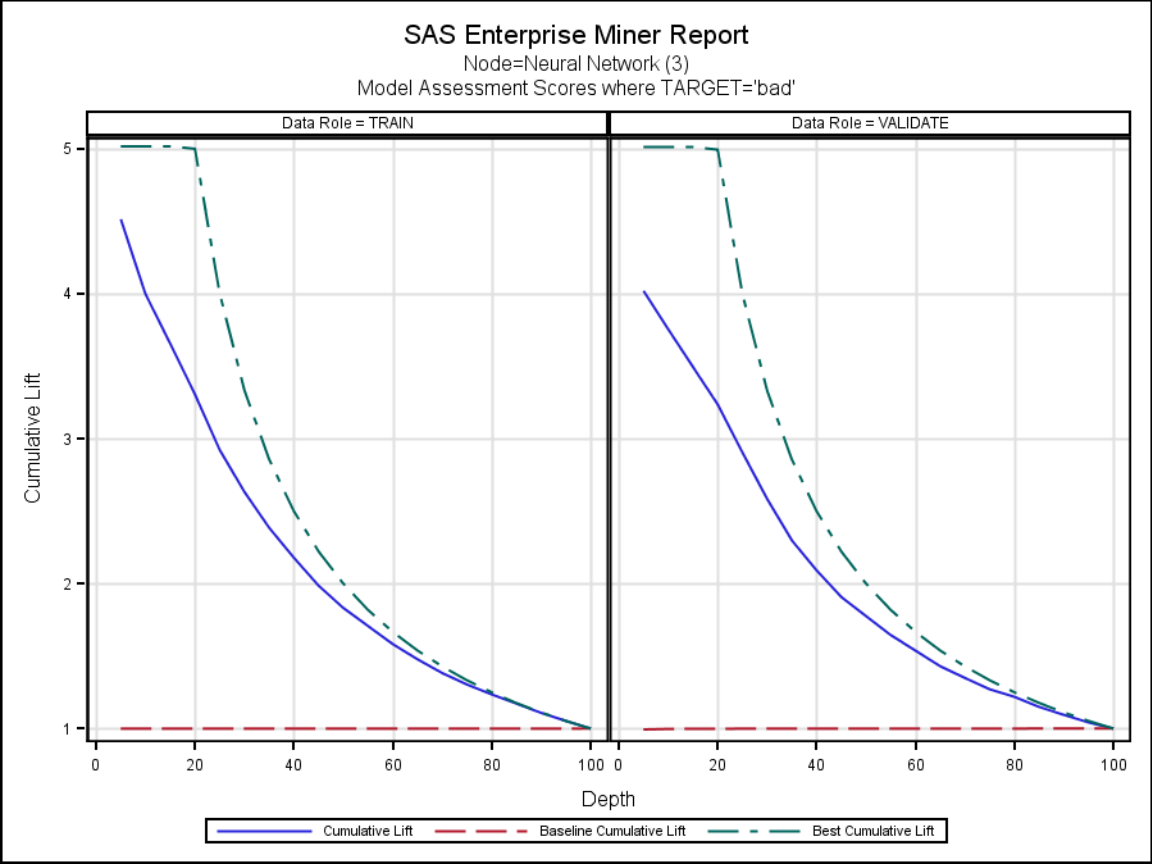
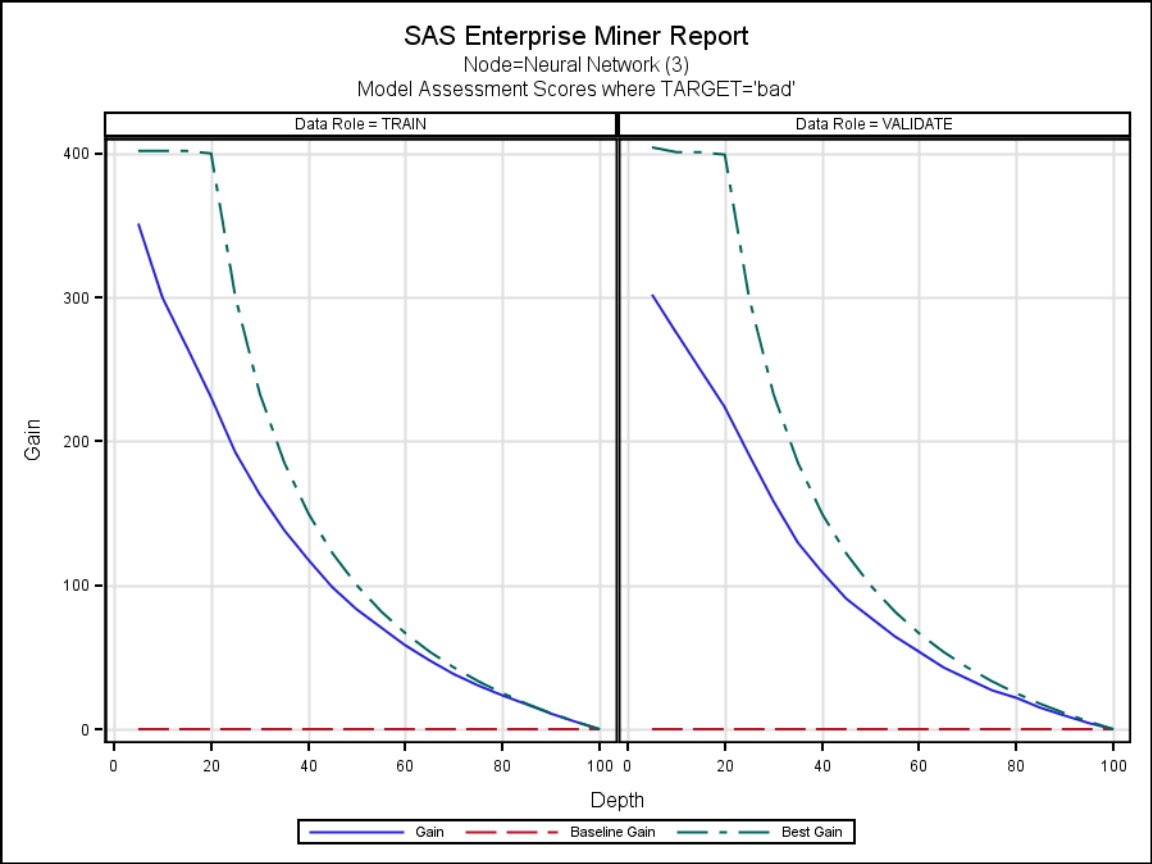
Label of Statistic	Train	Validation	Test
Total Degrees of Freedom	2979.00	.	.
Degrees of Freedom for Error	2893.00	.	.
Model Degrees of Freedom	86.00	.	.
Number of Estimated Weights	86.00	.	.
Akaike's Information Criterion	2036.82	.	.
Schwarz's Bayesian Criterion	2552.77	.	.
Average Squared Error	0.10	0.10	.
Maximum Absolute Error	0.99	0.99	.
Divisor for ASE	5958.00	5962.00	.
Sum of Frequencies	2979.00	2981.00	.

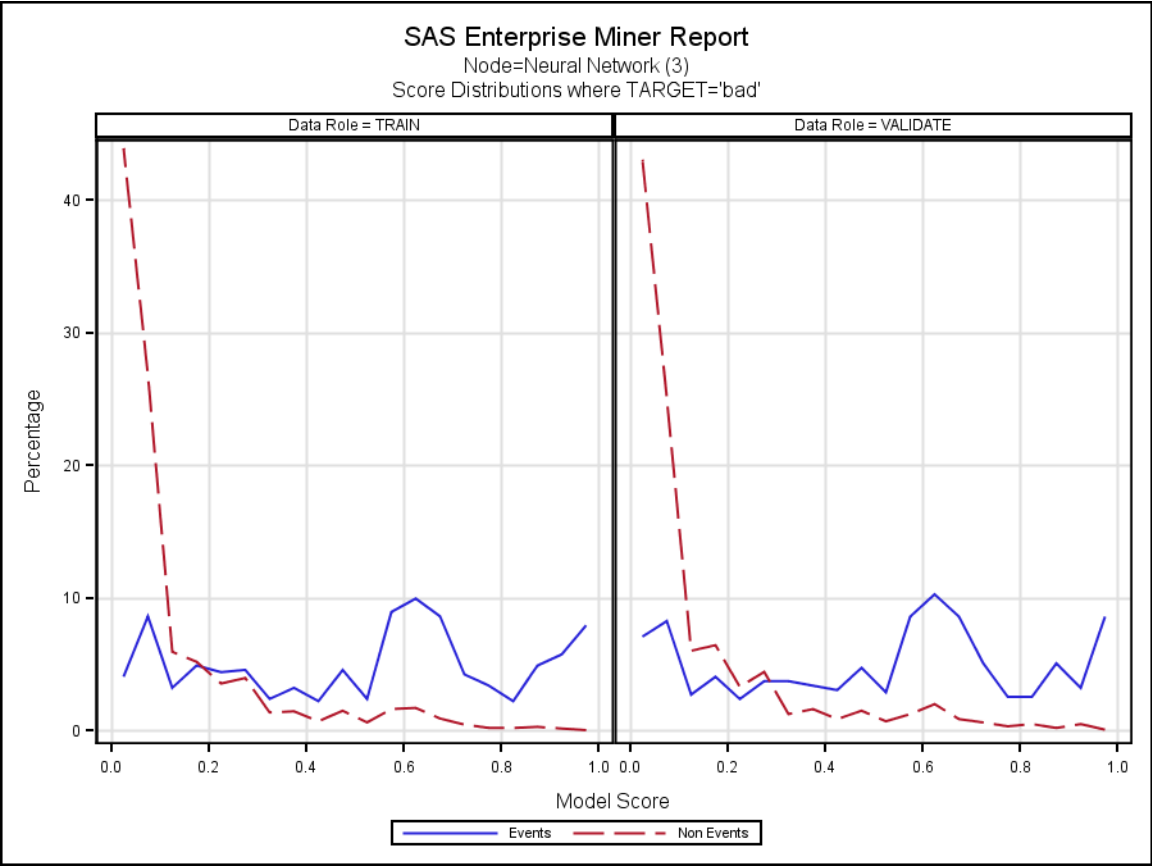
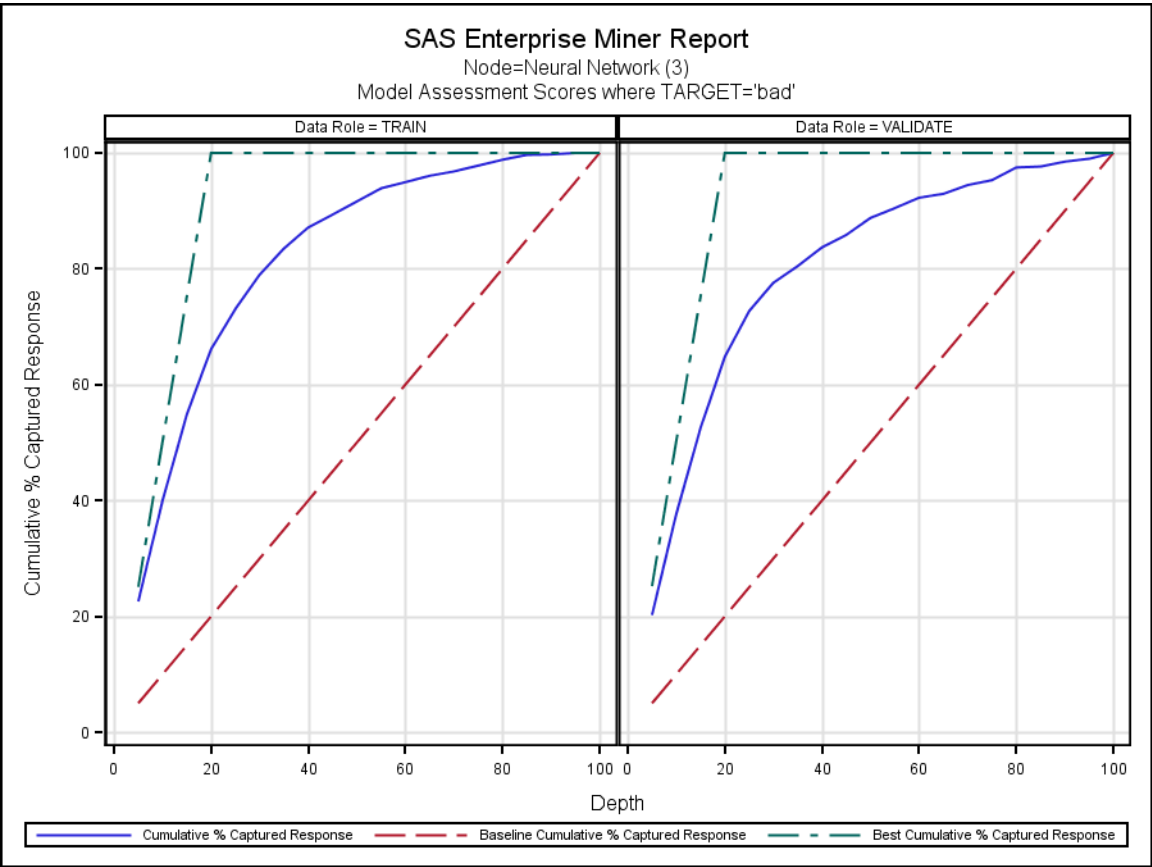
Target=bad Target Label=Default or seriously delinquent

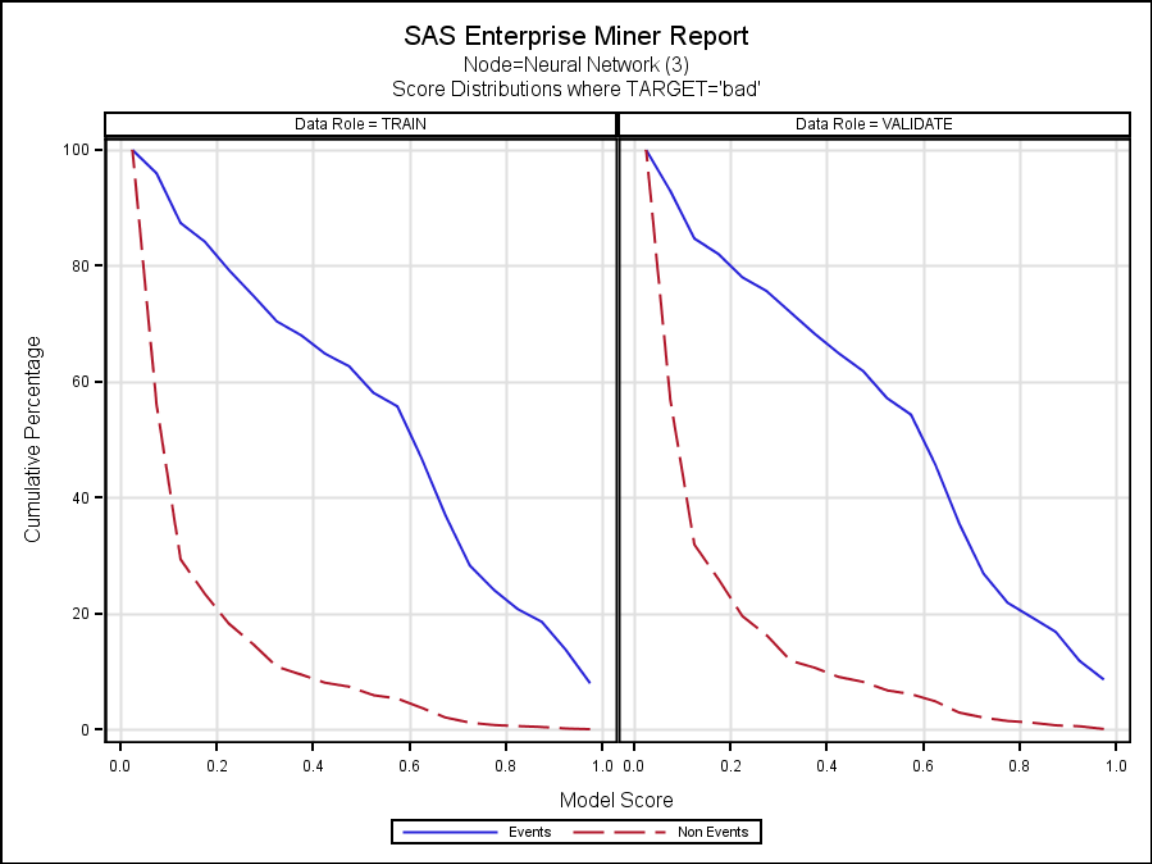
Label of Statistic	Train	Validation	Test
Root Average Squared Error	0.31	0.32	.
Sum of Squared Errors	570.64	617.16	.
Sum of Case Weights Times Freq	5958.00	5962.00	.
Final Prediction Error	0.10	.	.
Mean Squared Error	0.10	0.10	.
Root Final Prediction Error	0.32	.	.
Root Mean Squared Error	0.31	0.32	.
Average Error Function	0.31	0.34	.
Error Function	1864.82	2050.57	.
Misclassification Rate	0.13	0.14	.
Number of Wrong Classifications	389.00	415.00	.

SAS Enterprise Miner Report
Node=Neural Network (3)
Model Iteration Plots









Node=Neural Network (3)
Score Distributions

Target Variable=bad Data Role=TRAIN

Posterior Probability Range	Number of Events	Percentage of Events	Percentage of Nonevents	Cumulative Percentage of Events	Cumulative Percentage of Nonevents
0.95-1.00	47	7.91246	0.0000	7.912	0.000
0.90-0.95	34	5.72391	0.1258	13.636	0.126
0.85-0.90	29	4.88215	0.2516	18.519	0.377
0.80-0.85	13	2.18855	0.1677	20.707	0.545
0.75-0.80	20	3.36700	0.1677	24.074	0.713
0.70-0.75	25	4.20875	0.4193	28.283	1.132
0.65-0.70	51	8.58586	0.8805	36.869	2.013
0.60-0.65	59	9.93266	1.6771	46.801	3.690
0.55-0.60	53	8.92256	1.5933	55.724	5.283
0.50-0.55	14	2.35690	0.5870	58.081	5.870
0.45-0.50	27	4.54545	1.4675	62.626	7.338
0.40-0.45	13	2.18855	0.6709	64.815	8.008
0.35-0.40	19	3.19865	1.4256	68.013	9.434
0.30-0.35	14	2.35690	1.3417	70.370	10.776
0.25-0.30	27	4.54545	3.9413	74.916	14.717
0.20-0.25	26	4.37710	3.5220	79.293	18.239
0.15-0.20	29	4.88215	5.1572	84.175	23.396
0.10-0.15	19	3.19865	5.9119	87.374	29.308
0.05-0.10	51	8.58586	26.7925	95.960	56.101
0.00-0.05	24	4.04040	43.8994	100.000	100.000

Target Variable=bad Data Role=VALIDATE

Posterior Probability Range	Number of Events	Percentage of Events	Percentage of Nonevents	Cumulative Percentage of Events	Cumulative Percentage of Nonevents
0.95-1.00	51	8.5714	0.0419	8.571	0.042
0.90-0.95	19	3.1933	0.4610	11.765	0.503
0.85-0.90	30	5.0420	0.1676	16.807	0.671
0.80-0.85	15	2.5210	0.4610	19.328	1.132
0.75-0.80	15	2.5210	0.2934	21.849	1.425
0.70-0.75	30	5.0420	0.5868	26.891	2.012
0.65-0.70	51	8.5714	0.8382	35.462	2.850
0.60-0.65	61	10.2521	1.9698	45.714	4.820
0.55-0.60	51	8.5714	1.2154	54.286	6.035
0.50-0.55	17	2.8571	0.6706	57.143	6.706
0.45-0.50	28	4.7059	1.4669	61.849	8.173
0.40-0.45	18	3.0252	0.8382	64.874	9.011
0.35-0.40	20	3.3613	1.5926	68.235	10.604
0.30-0.35	22	3.6975	1.2154	71.933	11.819
0.25-0.30	22	3.6975	4.4007	75.630	16.220
0.20-0.25	14	2.3529	3.2691	77.983	19.489
0.15-0.20	24	4.0336	6.4124	82.017	25.901
0.10-0.15	16	2.6891	5.9933	84.706	31.894
0.05-0.10	49	8.2353	25.0629	92.941	56.957
0.00-0.05	42	7.0588	43.0427	100.000	100.000

SAS Enterprise Miner Report

Node=Neural Network (2) Summary

Node id = Neural2
 Node label = Neural Network (2)
 Meta path = Ids => GrfExpl => Part => Repl => Trans => BINNING => Neural2
 Notes =

Node=Neural Network (2) Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	NeuralNetwork		Hidden	3		Prelim	Y	
AbsConvValue	-1.34078E154	-7.237006E75	HiddenActivation	DEFAULT		PrelimMaxTime	1 HOUR	
AbsFTime	1		HiddenBias	Y		PrelimMaxiter	10	
AbsFValue	0		HiddenCombFunction	DEFAULT		PrelimOutest		
AbsGTime	1		HiddenUnits	N		PreliminaryRuns	5	
AbsGValue	0.00001		InitialDs			RandDist	NORMAL	
AbsXTime	1		InitialSeed	12345		RandLoc	0	
AbsXVValue	1E-8		InputStandardization	STD		RandScale	0.1	
Accelerate	1.2		Learn	0.1		Residuals	Y	
AddHidden	Y		MaxLearn	50		Standardizations	N	
CodefileNoRes			MaxMomentum	1.75		SuppressOutput	N	
CodefileRes			Maxiter	50		TargetActivation	DEFAULT	
ConvDefaults	Y		Maxtime	4 HOURS		TargetBias	Y	
Decelerate	0.5		MinLearn	0.00001		TargetCombFunction	DEFAULT	
DirectConnection	N		ModelSelectionCriterion	PROFIT/LOSS		TargetError	DEFAULT	
FConvTime	1		Momentum	0		Tilt	0	
FConvValue	0		NetworkArchitecture	MLP		TrainCode		
GConvTime	1		Outest			TrainingTechnique	DEFAULT	
GConvValue	1E-6		Outfit			UseEstimates	N	

Node=Neural Network (2) Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	bad
INPUT	ORDINAL	4	GRP_LOG_REP_clage GRP_LOG_REP_debtinc GRP_LOG_REP_ninq GRP_LOG_REP_value

Node=Neural Network (2) Model Fit Statistics

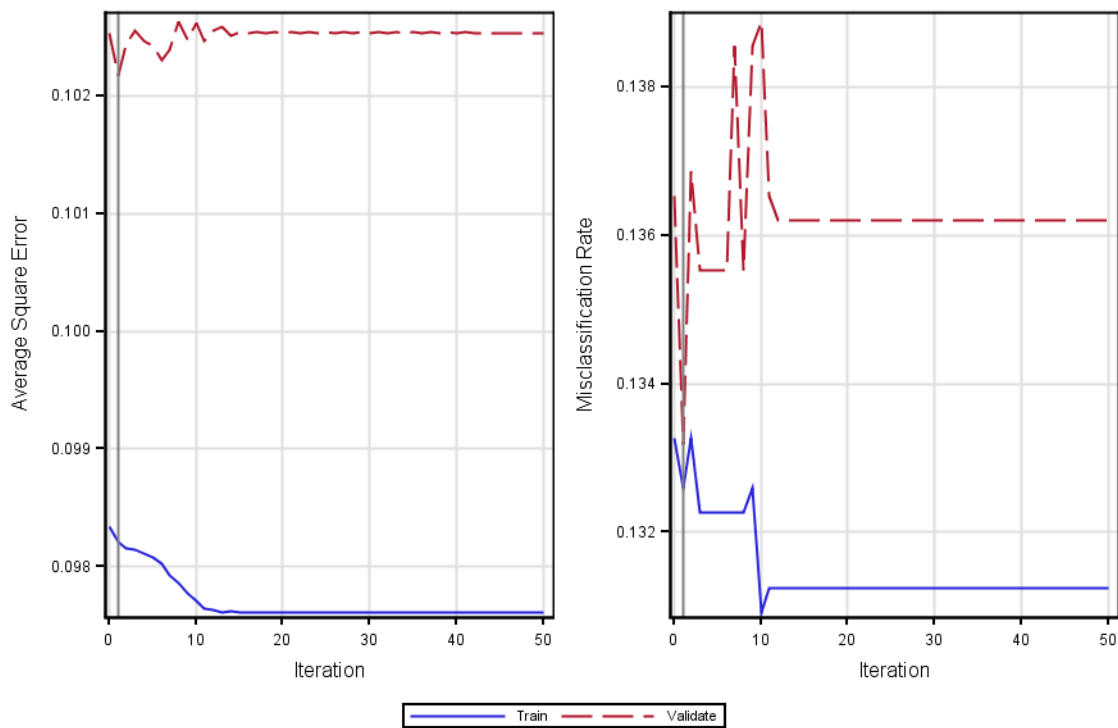
Target=bad Target Label=Default or seriously delinquent

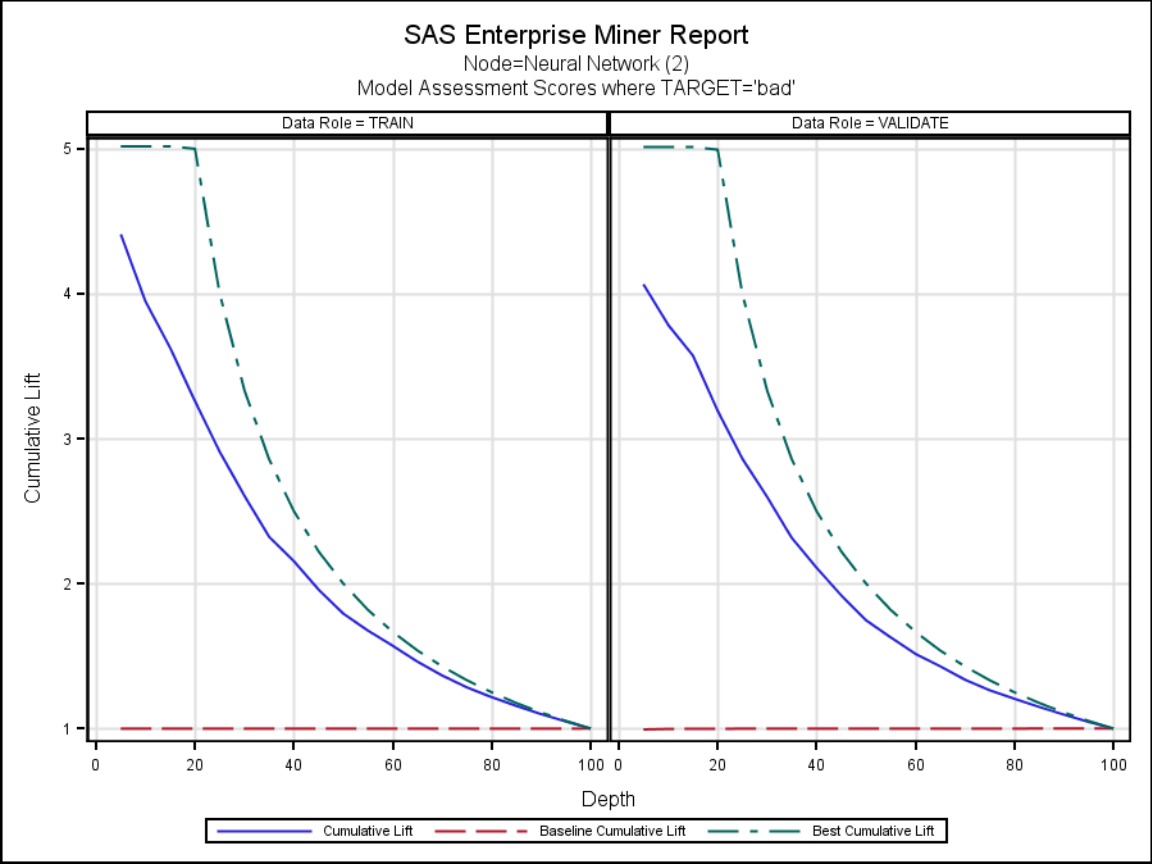
Label of Statistic	Train	Validation	Test
Total Degrees of Freedom	2979.00	.	.
Degrees of Freedom for Error	2927.00	.	.
Model Degrees of Freedom	52.00	.	.
Number of Estimated Weights	52.00	.	.
Akaike's Information Criterion	2034.29	.	.
Schwarz's Bayesian Criterion	2346.25	.	.
Average Squared Error	0.10	0.10	.
Maximum Absolute Error	0.99	0.99	.
Divisor for ASE	5958.00	5962.00	.
Sum of Frequencies	2979.00	2981.00	.

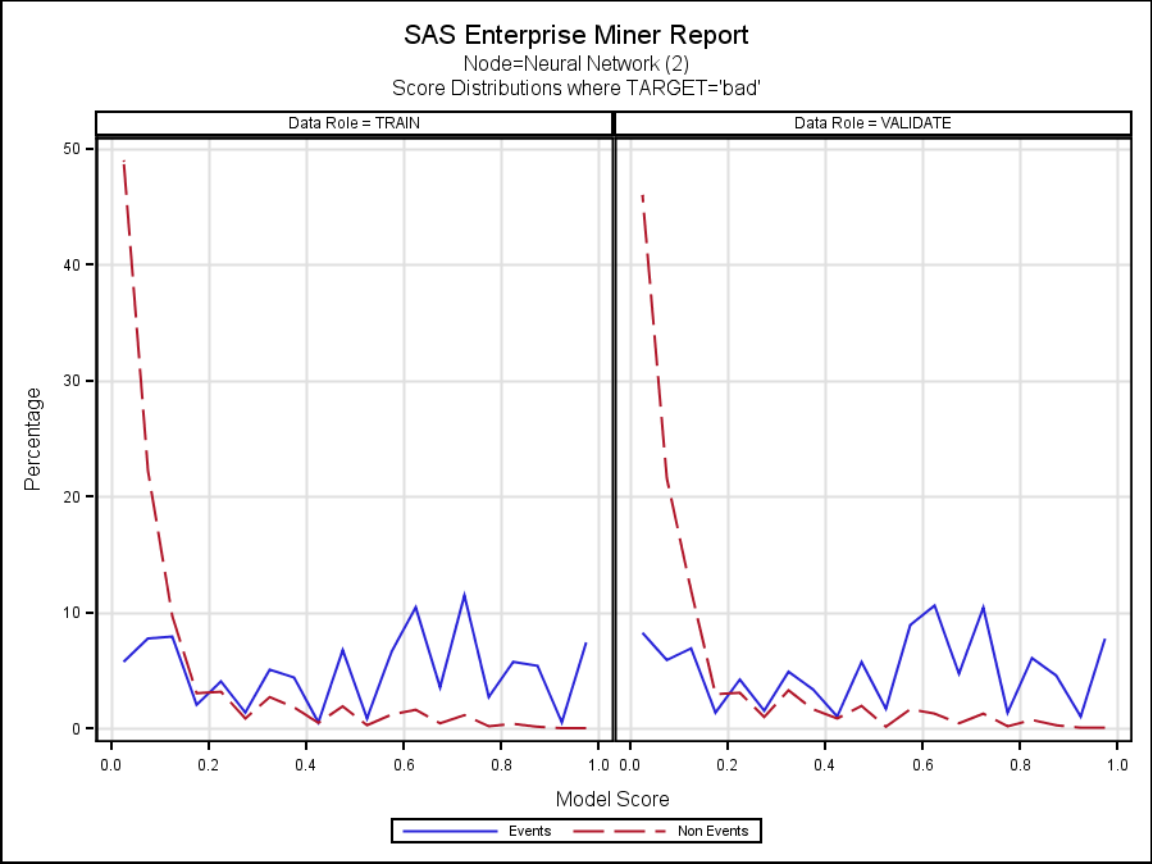
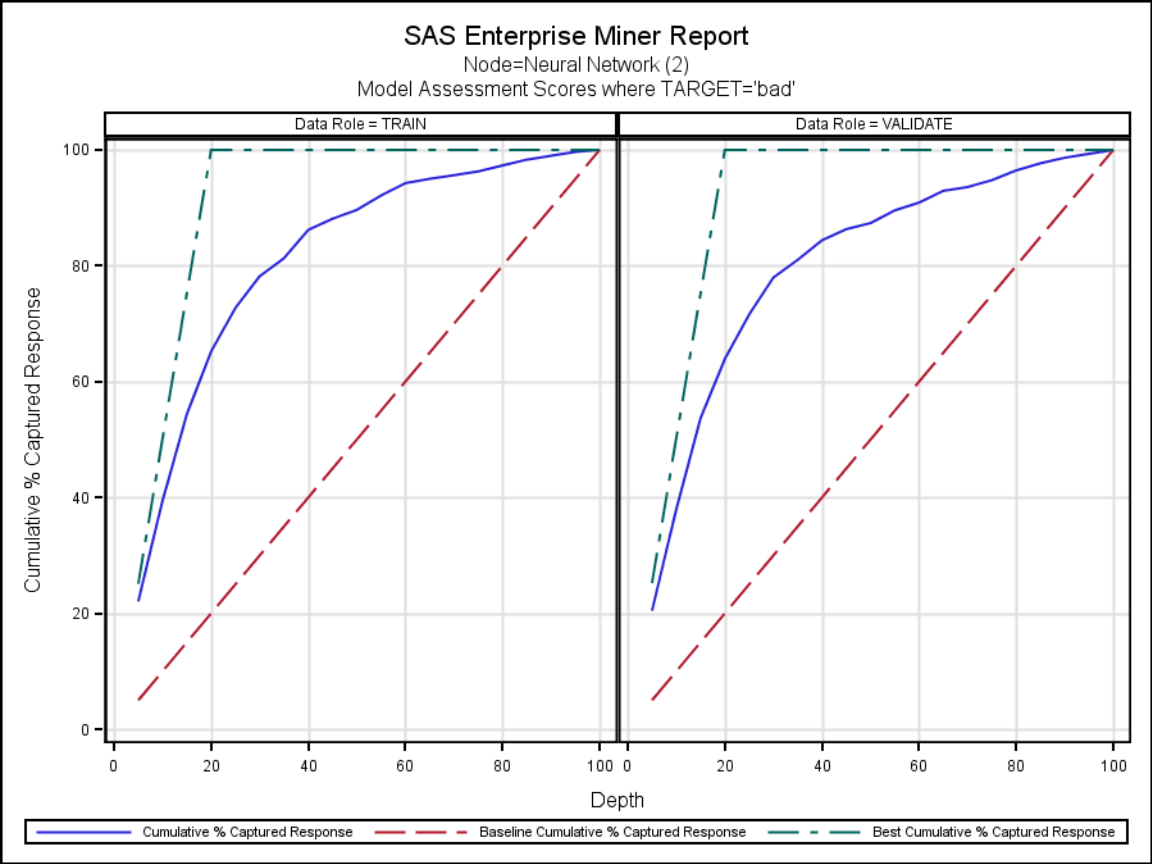
Target=bad Target Label=Default or seriously delinquent

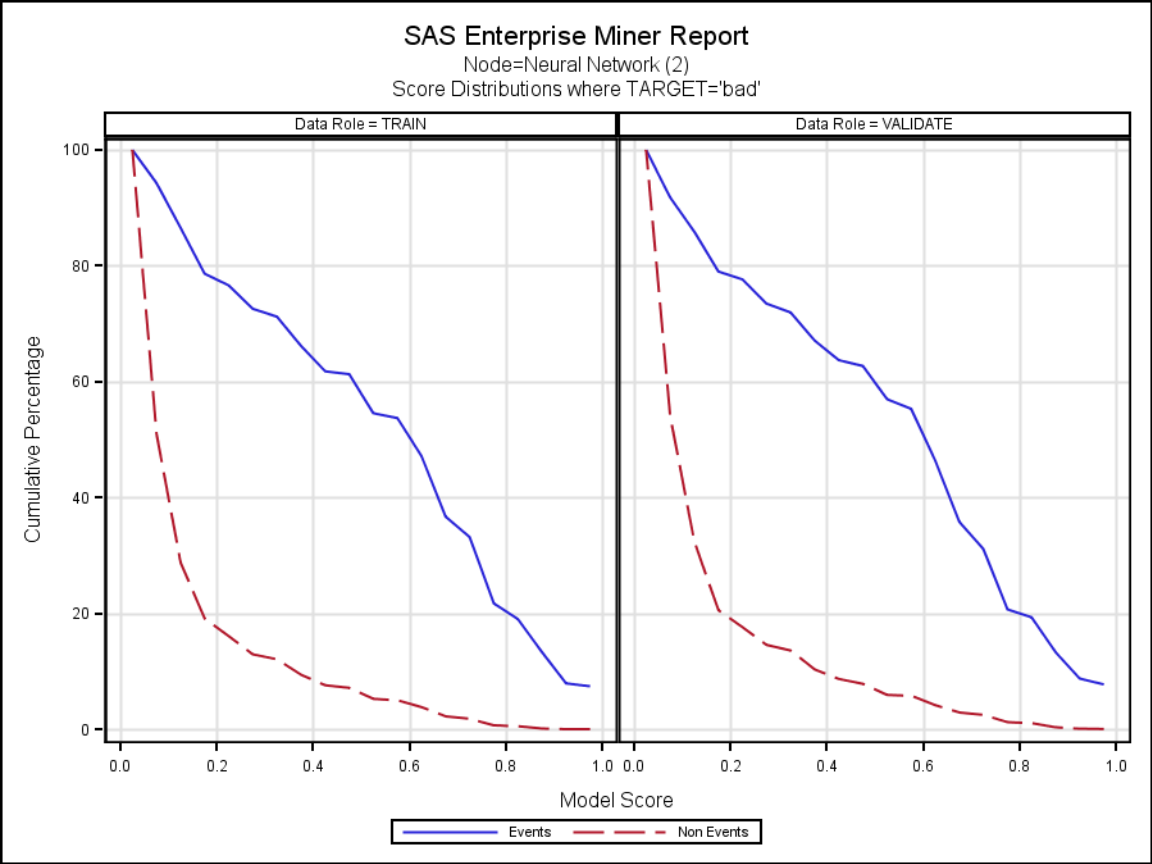
Label of Statistic	Train	Validation	Test
Root Average Squared Error	0.31	0.32	.
Sum of Squared Errors	585.13	609.13	.
Sum of Case Weights Times Freq	5958.00	5962.00	.
Final Prediction Error	0.10	.	.
Mean Squared Error	0.10	0.10	.
Root Final Prediction Error	0.32	.	.
Root Mean Squared Error	0.32	0.32	.
Average Error Function	0.32	0.34	.
Error Function	1930.29	2021.97	.
Misclassification Rate	0.13	0.13	.
Number of Wrong Classifications	395.00	397.00	.

SAS Enterprise Miner Report
Node=Neural Network (2)
Model Iteration Plots









Node=Neural Network (2)
Score Distributions

Target Variable=bad Data Role=TRAIN

Posterior Probability Range	Number of Events	Percentage of Events	Percentage of Nonevents	Cumulative Percentage of Events	Cumulative Percentage of Nonevents
0.95-1.00	44	7.4074	0.0000	7.407	0.000
0.90-0.95	3	0.5051	0.0000	7.912	0.000
0.85-0.90	32	5.3872	0.1258	13.300	0.126
0.80-0.85	34	5.7239	0.3774	19.024	0.503
0.75-0.80	16	2.6936	0.1677	21.717	0.671
0.70-0.75	68	11.4478	1.1321	33.165	1.803
0.65-0.70	21	3.5354	0.4193	36.700	2.222
0.60-0.65	62	10.4377	1.5933	47.138	3.816
0.55-0.60	39	6.5657	1.1740	53.704	4.990
0.50-0.55	5	0.8418	0.2516	54.545	5.241
0.45-0.50	40	6.7340	1.8868	61.279	7.128
0.40-0.45	3	0.5051	0.4612	61.785	7.589
0.35-0.40	26	4.3771	1.8029	66.162	9.392
0.30-0.35	30	5.0505	2.6834	71.212	12.075
0.25-0.30	8	1.3468	0.8386	72.559	12.914
0.20-0.25	24	4.0404	3.1447	76.599	16.059
0.15-0.20	12	2.0202	3.0189	78.620	19.078
0.10-0.15	47	7.9125	9.6855	86.532	28.763
0.05-0.10	46	7.7441	22.2222	94.276	50.985
0.00-0.05	34	5.7239	49.0147	100.000	100.000

Target Variable=bad Data Role=VALIDATE

Posterior Probability Range	Number of Events	Percentage of Events	Percentage of Nonevents	Cumulative Percentage of Events	Cumulative Percentage of Nonevents
0.95-1.00	46	7.7311	0.0419	7.731	0.042
0.90-0.95	6	1.0084	0.0419	8.739	0.084
0.85-0.90	27	4.5378	0.2515	13.277	0.335
0.80-0.85	36	6.0504	0.7125	19.328	1.048
0.75-0.80	8	1.3445	0.1676	20.672	1.215
0.70-0.75	62	10.4202	1.2573	31.092	2.473
0.65-0.70	28	4.7059	0.4191	35.798	2.892
0.60-0.65	63	10.5882	1.2573	46.387	4.149
0.55-0.60	53	8.9076	1.6345	55.294	5.784
0.50-0.55	10	1.6807	0.1257	56.975	5.909
0.45-0.50	34	5.7143	1.9279	62.689	7.837
0.40-0.45	6	1.0084	0.8382	63.697	8.676
0.35-0.40	20	3.3613	1.6345	67.059	10.310
0.30-0.35	29	4.8739	3.2691	71.933	13.579
0.25-0.30	9	1.5126	0.9640	73.445	14.543
0.20-0.25	25	4.2017	3.0595	77.647	17.603
0.15-0.20	8	1.3445	2.9338	78.992	20.536
0.10-0.15	41	6.8908	11.8609	85.882	32.397
0.05-0.10	35	5.8824	21.5842	91.765	53.982
0.00-0.05	49	8.2353	46.0184	100.000	100.000

SAS Enterprise Miner Report

Node=Neural Network Summary

Node id = Neural
Node label = Neural Network
Meta path = Ids => GrfExpl => Part => Repl => Trans => BINNING => Neural
Notes =

Node=Neural Network Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	NeuralNetwork		HiddenActivation	DEFAULT		PrelimMaxTime	1 HOUR	
AbsConvValue	-1.34078E154	-7.237006E75	HiddenBias	Y		PrelimMaxiter	10	
AbsFTime	1		HiddenCombFunction	DEFAULT		PrelimOutest		
AbsFValue	0		HiddenUnits	N		PreliminaryRuns	5	
AbsGTime	1		InitialDs			RandDist	NORMAL	
AbsGValue	0.00001		InitialSeed	12345		RandLoc	0	
AbsXTime	1		InputStandardization	STD		RandScale	0.1	
AbsXVValue	1E-8		LastRunMessage	Run time error was encountered. Please see the log for more details.		Residuals	Y	
Accelerate	1.2		Learn	0.1		Standardizations	N	
AddHidden	Y		MaxLearn	50		SuppressOutput	N	
CodefileNoRes			MaxMomentum	1.75		TargetActivation	DEFAULT	
CodefileRes			Maxiter	50		TargetBias	Y	
ConvDefaults	Y		Maxtime	4 HOURS		TargetCombFunction	DEFAULT	
Decelerate	0.5		MinLearn	0.00001		TargetError	DEFAULT	
DirectConnection	N		ModelSelectionCriterion	PROFIT/LOSS		Tilt	0	
FConvTime	1		Momentum	0		TrainCode		
FConvValue	0		NetworkArchitecture	MLP		TrainingTechnique	DEFAULT	
GConvTime	1		Outest			UseEstimates	N	
GConvValue	1E-6		Outfit			WeightDecay	0	
Hidden	1	3	Prelim	Y				

Node=Neural Network Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	bad
INPUT	ORDINAL	4	GRP_LOG_REP_clage GRP_LOG_REP_debtinc GRP_LOG_REP_ninq GRP_LOG_REP_value

Node=Neural Network Model Fit Statistics

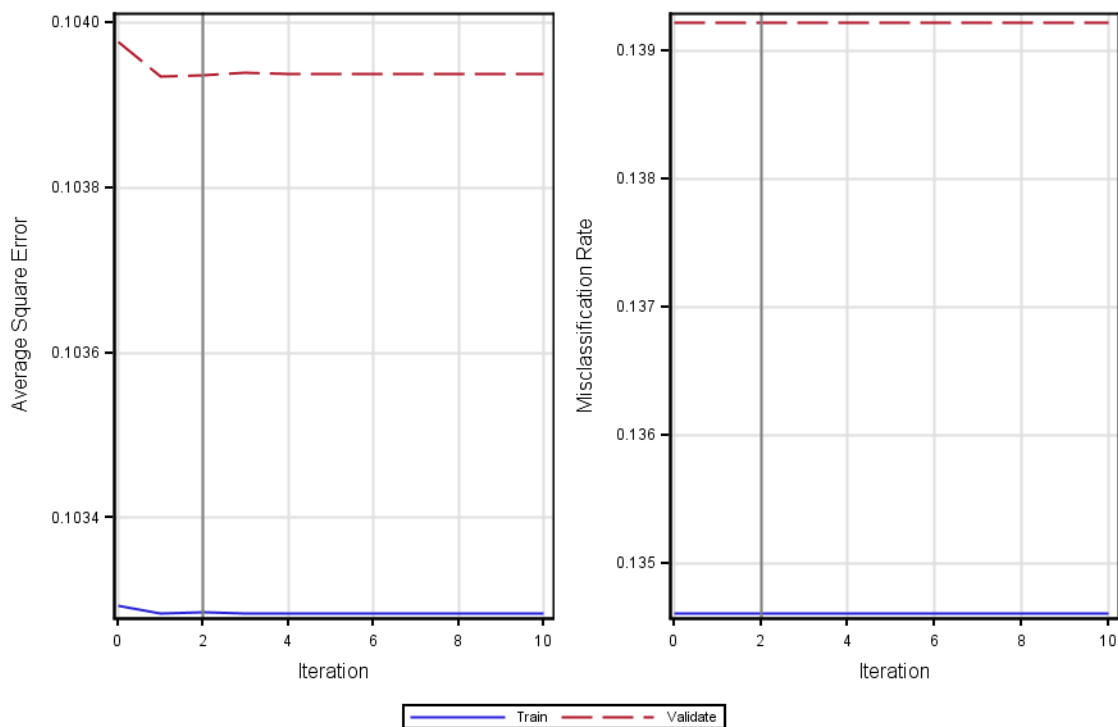
Target=bad Target Label=Default or seriously delinquent

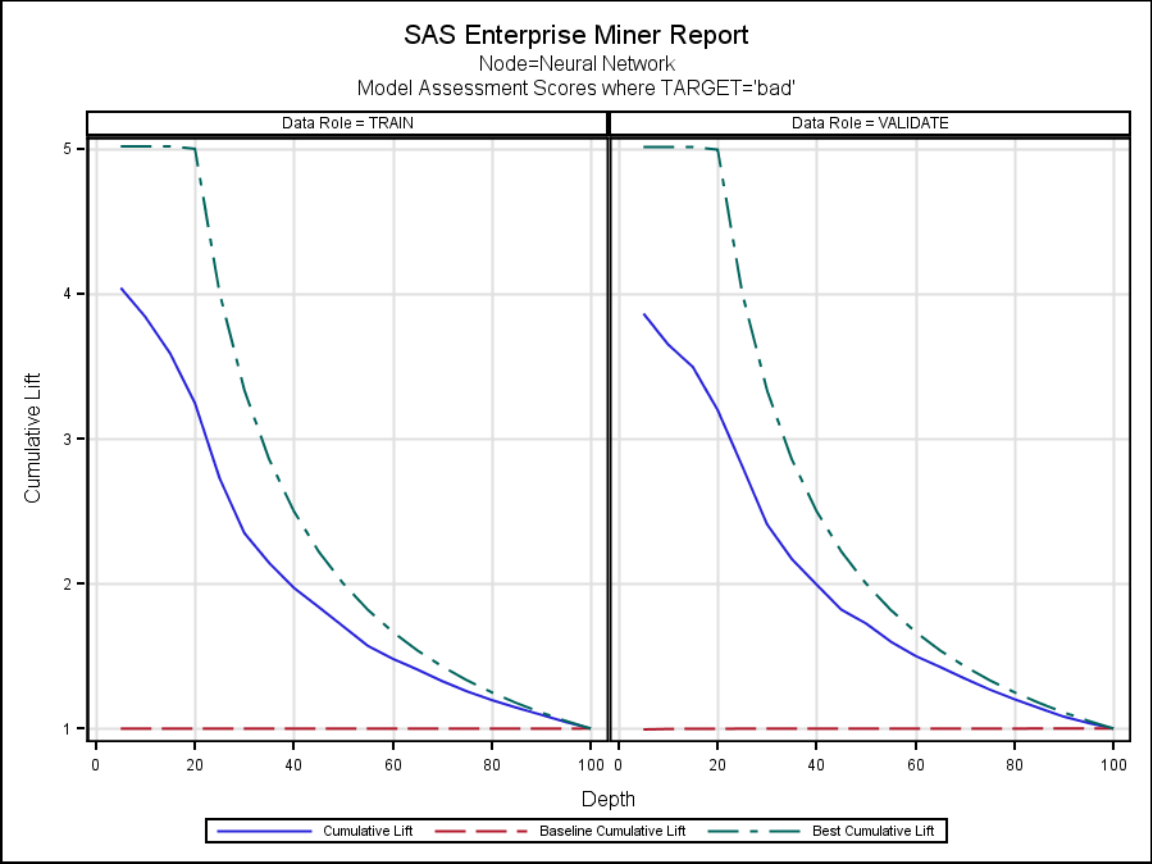
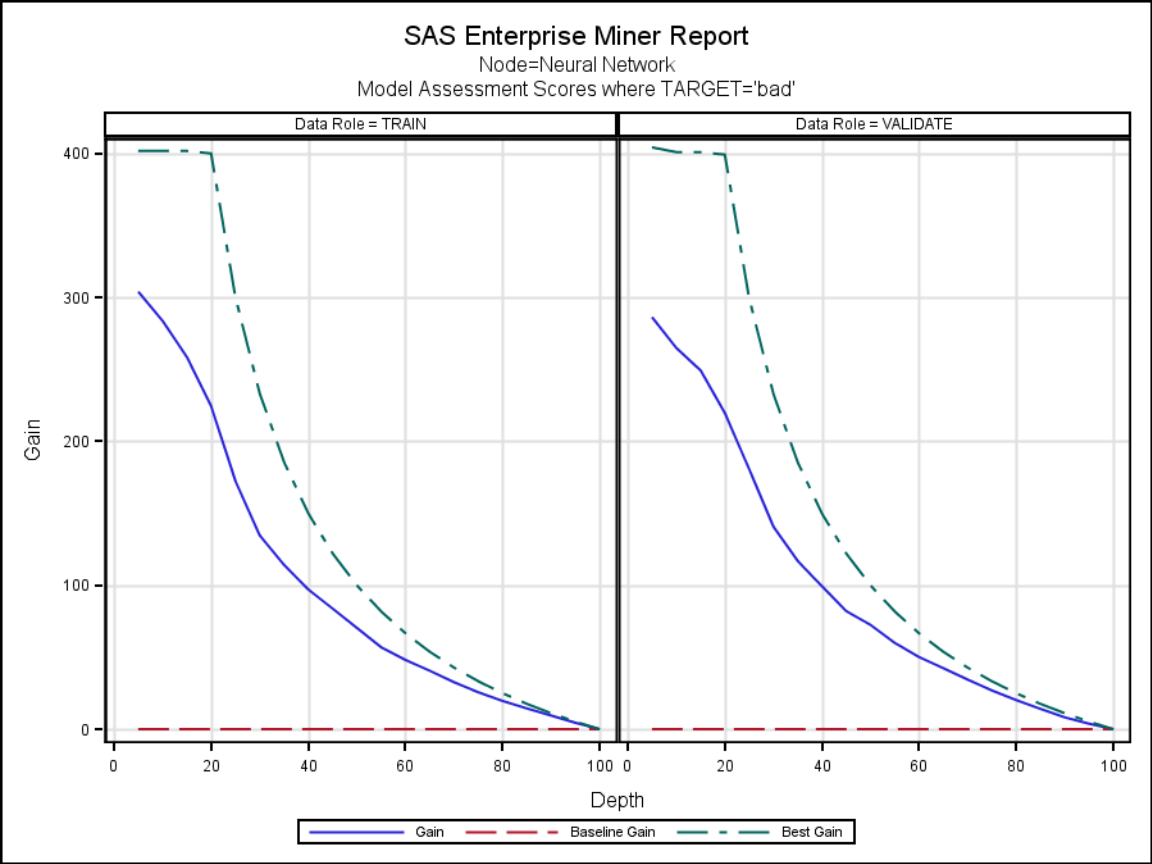
Label of Statistic	Train	Validation	Test
Total Degrees of Freedom	2979.00	.	.
Degrees of Freedom for Error	2961.00	.	.
Model Degrees of Freedom	18.00	.	.
Number of Estimated Weights	18.00	.	.
Akaike's Information Criterion	2101.80	.	.
Schwarz's Bayesian Criterion	2209.79	.	.
Average Squared Error	0.10	0.10	.
Maximum Absolute Error	0.97	0.96	.

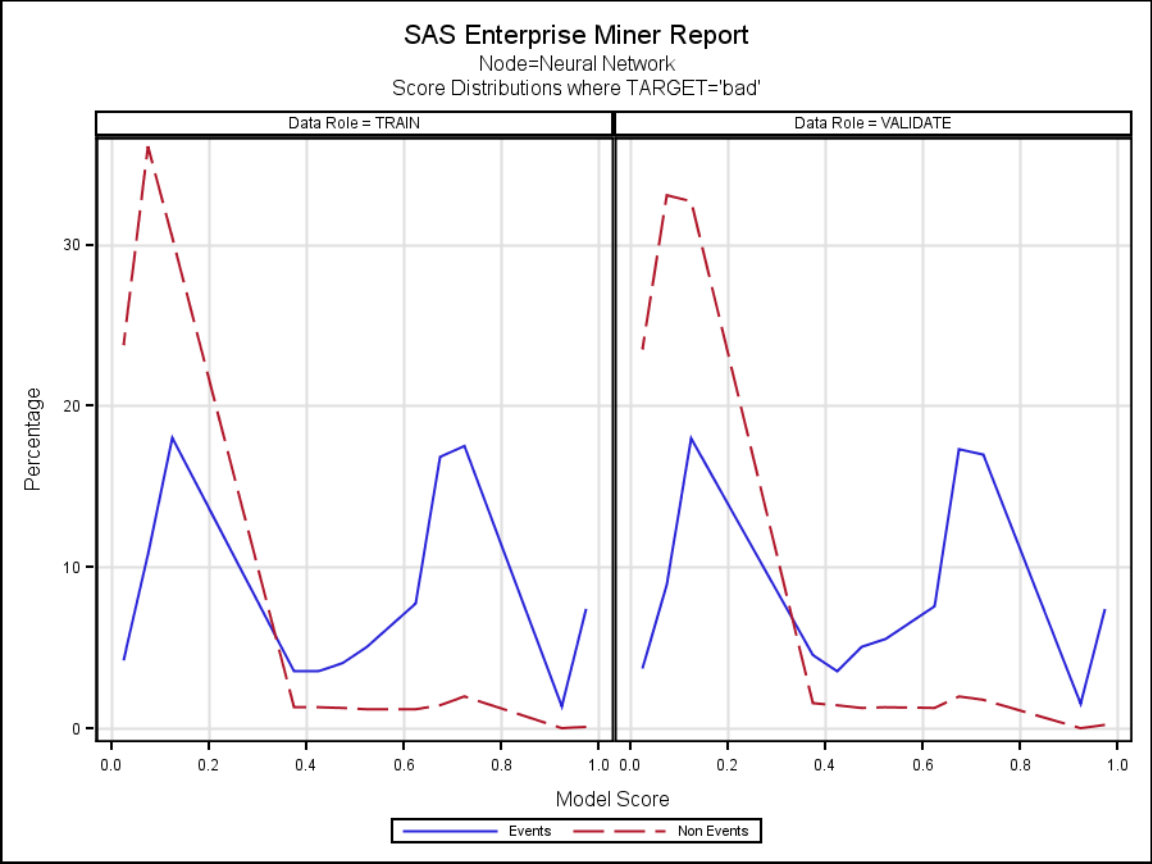
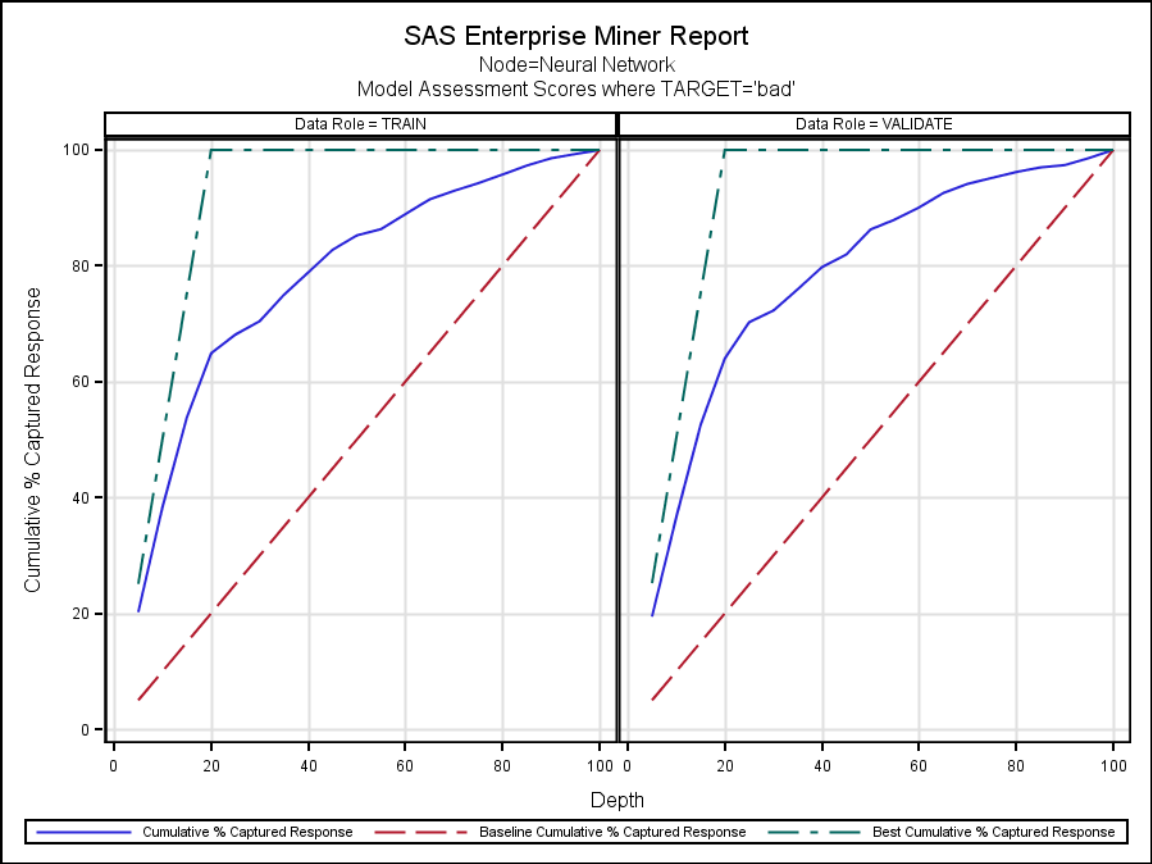
Target=bad Target Label=Default or seriously delinquent

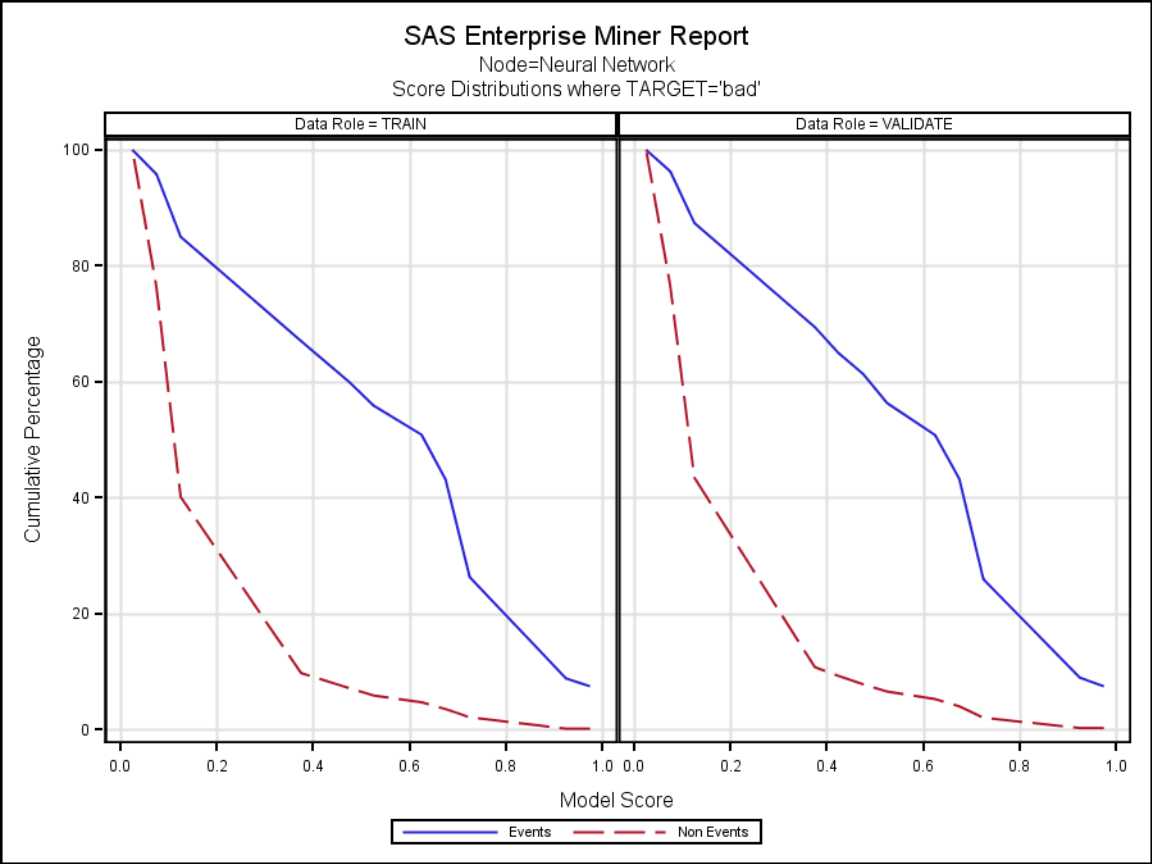
Label of Statistic	Train	Validation	Test
Divisor for ASE	5958.00	5962.00	.
Sum of Frequencies	2979.00	2981.00	.
Root Average Squared Error	0.32	0.32	.
Sum of Squared Errors	615.37	619.66	.
Sum of Case Weights Times Freq	5958.00	5962.00	.
Final Prediction Error	0.10	.	.
Mean Squared Error	0.10	0.10	.
Root Final Prediction Error	0.32	.	.
Root Mean Squared Error	0.32	0.32	.
Average Error Function	0.35	0.35	.
Error Function	2065.80	2067.16	.
Misclassification Rate	0.13	0.14	.
Number of Wrong Classifications	401.00	415.00	.

SAS Enterprise Miner Report
Node=Neural Network
Model Iteration Plots









Node=Neural Network
Score Distributions

Target Variable=bad Data Role=TRAIN

Posterior Probability Range	Number of Events	Percentage of Events	Percentage of Nonevents	Cumulative Percentage of Events	Cumulative Percentage of Nonevents
0.95-1.00	44	7.4074	0.0839	7.407	0.084
0.90-0.95	8	1.3468	0.0000	8.754	0.084
0.70-0.75	104	17.5084	1.9706	26.263	2.055
0.65-0.70	100	16.8350	1.4256	43.098	3.480
0.60-0.65	46	7.7441	1.1740	50.842	4.654
0.50-0.55	30	5.0505	1.1740	55.892	5.828
0.45-0.50	24	4.0404	1.2579	59.933	7.086
0.40-0.45	21	3.5354	1.2998	63.468	8.386
0.35-0.40	21	3.5354	1.2998	67.003	9.686
0.10-0.15	107	18.0135	30.4403	85.017	40.126
0.05-0.10	64	10.7744	36.1006	95.791	76.226
0.00-0.05	25	4.2088	23.7736	100.000	100.000

Target Variable=bad Data Role=VALIDATE

Posterior Probability Range	Number of Events	Percentage of Events	Percentage of Nonevents	Cumulative Percentage of Events	Cumulative Percentage of Nonevents
0.95-1.00	44	7.3950	0.2096	7.395	0.210
0.90-0.95	9	1.5126	0.0000	8.908	0.210
0.70-0.75	101	16.9748	1.7603	25.882	1.970
0.65-0.70	103	17.3109	1.9698	43.193	3.940
0.60-0.65	45	7.5630	1.2573	50.756	5.197
0.50-0.55	33	5.5462	1.2992	56.303	6.496
0.45-0.50	30	5.0420	1.2573	61.345	7.754
0.40-0.45	21	3.5294	1.4250	64.874	9.179
0.35-0.40	27	4.5378	1.5507	69.412	10.729
0.10-0.15	107	17.9832	32.6907	87.395	43.420
0.05-0.10	53	8.9076	33.0679	96.303	76.488
0.00-0.05	22	3.6975	23.5122	100.000	100.000

SAS Enterprise Miner Report

Node=Model Comparison Summary

Node id = MdlComp
 Node label = Model Comparison
 Meta path = Ids => GrfExpl => Part => Repl => Trans => BINNING => Neural2 => MdlComp
 Notes =

Node=Model Comparison Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	ModelCompare		NormalizeReportingVariables	Y		ScoreDistBin	20	
AssessAllTargetLevels	N		NumberOfReportedLevels	1E-6		SelectionCriteria	DEFAULT	
DecileBin	20		NumberOfBins	20		SelectionData	DEFAULT	
HPCriteria	DEFAULT		ProfitEpsilon	1E-6		SelectionDepth	10	
LiftEpsilon	1E-6		RecomputeAssess	N		SelectionTable	TRAIN	TABLE
ModelCriteria	Valid: Misclassification Rate		RocChart	Y		StatisticUsed	_VMISC_	
ModelDescription	Neural Network (2)		RocEpsilon	0.01		TargetLabel	Default or seriously delinquent	
ModelId	Neural2		RoiEpsilon	1E-6		TargetName	bad	

Node=Model Comparison Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	bad

Node=Model Comparison Fit Statistics Table

Selected Model	Predecessor Node	Model Node	Model Description	Target Variable	Target Label	Selection Criterion: Valid: Misclassification Rate	Train: Average Squared Error	Train: Misclassification Rate	Train: Kolmogorov-Smirnov Statistic
Y	Neural2	Neural2	Neural Network (2)	bad	Default or seriously delinquent	0.13318	0.09821	0.13259	0.609
	Neural3	Neural3	Neural Network (3)	bad	Default or seriously delinquent	0.13922	0.09578	0.13058	0.615
	Neural	Neural	Neural Network	bad	Default or seriously delinquent	0.13922	0.10329	0.13461	0.573
	Neural5	Neural5	Neural Network (5)	bad	Default or seriously delinquent	0.18484	0.15114	0.17758	0.486
	Neural4	Neural4	Neural Network (4)	bad	Default or seriously delinquent	0.18484	0.15608	0.17959	0.472
	Neural6	Neural6	Neural Network (6)	bad	Default or seriously delinquent	0.18953	0.14903	0.17623	0.524

Selected Model	Predecessor Node	Model Node	Model Description	Target Variable	Target Label	Selection Criterion: Valid: Misclassification Rate	Valid: Average Squared Error	Valid: Misclassification Rate	Valid: Kolmogorov-Smirnov Statistic
Y	Neural2	Neural2	Neural Network (2)	bad	Default or seriously delinquent	0.13318	0.10217	0.13318	0.602
	Neural3	Neural3	Neural Network (3)	bad	Default or seriously delinquent	0.13922	0.10352	0.13922	0.601
	Neural	Neural	Neural Network	bad	Default or seriously delinquent	0.13922	0.10394	0.13922	0.587
	Neural5	Neural5	Neural Network (5)	bad	Default or seriously delinquent	0.18484	0.15814	0.18484	0.393
	Neural4	Neural4	Neural Network (4)	bad	Default or seriously delinquent	0.18484	0.15959	0.18484	0.430
	Neural6	Neural6	Neural Network (6)	bad	Default or seriously delinquent	0.18953	0.16080	0.18953	0.421

SAS Enterprise Miner Report
Node=Model Comparison
Classification Chart
TARGET='bad' and _TYPE_='PREDICTION'

