

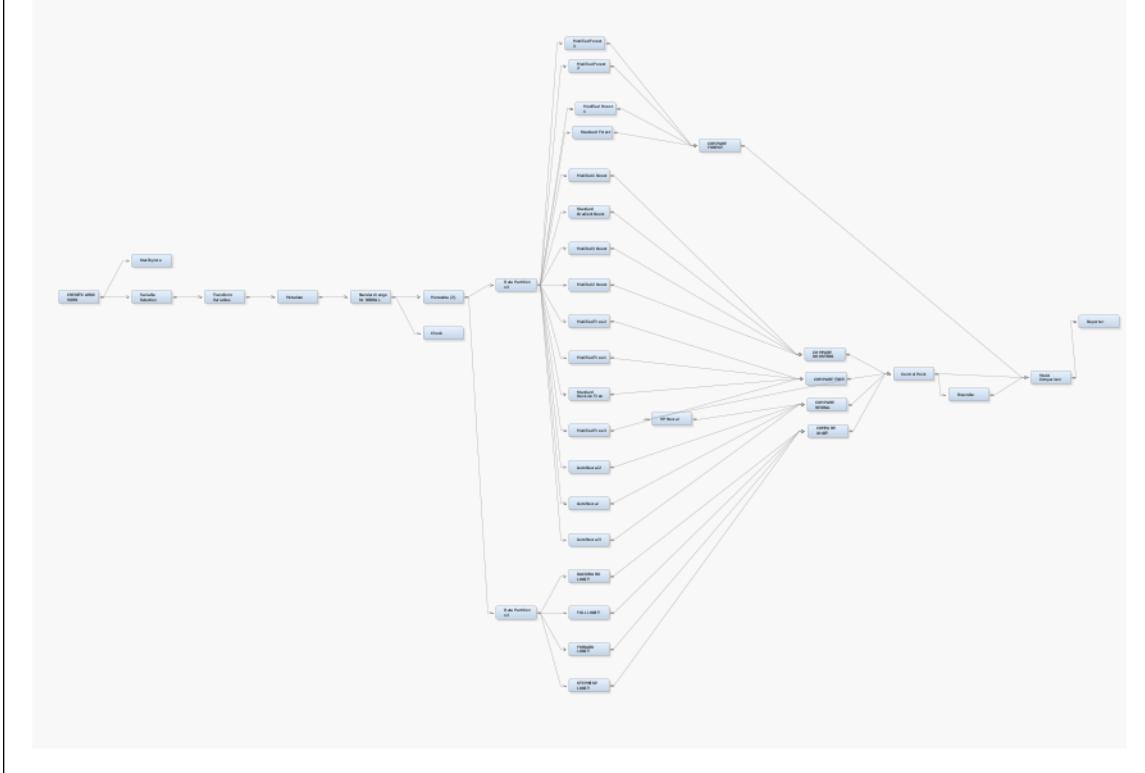
## SAS Enterprise Miner Report

User = Kevin  
 Date = 15:43:52 April 09  
 Project = CreditCard\_ChurnRate  
 Diagram = CreditCard\_ChurnRate

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=CREDITCARDCHURN Summary

Node id = lds  
 Node label = CREDITCARDCHURN  
 Meta path = lds  
 Notes =

### Node=CREDITCARDCHURN Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	DataSource		DsCreatedBy	Kevin		NBytes	1901568	.
ApplyIntervalLevelLowerLimit	Y		DsId	creditcardchurn		NCols	21	.
ApplyMaxClassLevels	Y		DsModifiedBy	Kevin		NObs	10127	.
ApplyMaxPercentMissing	Y		DsModifyDate	1963923747.1		NewTable		
CMeta	WORK.M3FPSSMZ		DsSampleName			NewVariableRole	REJECT	
ComputeStatistics	Y	N	DsSampleSize			OutputType	VIEW	
DBPassThrough	Y		DsSampleSizeType			Role	RAW	TRAIN
Data	CHURN478.CREDITCARDCHURN		DsScope	LOCAL		Sample	D	
DataSelection	DATASOURCE		IdentifyEmptyColumns	Y		SampleSizeObs	10000	
DataSource	creditcardchurn		IntervalLowerLimit	20		SampleSizePercent	20	
DataSourceRole	RAW		Library	CHURN478		SampleSizeType	PERCENT	
Description			MaxClassLevels	20		Scope	LOCAL	
DropMapVariables	Y		MaxPercentMissing	50		Segment		
DsCreateDate	1963923747		MetaAdvisor	BASIC		Table	CREDITCARDCHURN	

### Node=CREDITCARDCHURN

#### Data Attributes

Attribute	Value	Attribute	Value	Attribute	Value
Data Name	CREDITCARDCHURN	Date Created	26Mar2022:14:21:21	Data Size	1901568
Data Type	DATA	Date Modified	26Mar2022:14:21:21	Role	RAW
Data Label		Number Rows	10127	Segment	
Engine	V9	Number Columns	21	Data Library	CHURN478

### Node=CREDITCARDCHURN

#### Variables List

Name	Label	Role	Level	Type	Length	Format	Creator
Attrition_Flag		TARGET	BINARY	C	17	\$CHAR17.	
Avg_Open_To_Buy		INPUT	INTERVAL	N	8	BEST6.0	
Avg_Utilization_Ratio		INPUT	INTERVAL	N	8	BEST5.0	
CLIENTNUM		ID	NOMINAL	N	8	BEST9.0	
Card_Category		INPUT	NOMINAL	C	8	\$CHAR8.	
Contacts_Count_12_mon		INPUT	NOMINAL	N	8	BEST1.0	
Credit_Limit		INPUT	INTERVAL	N	8	BEST6.0	
Customer_Age		INPUT	NOMINAL	N	8	BEST2.0	
Dependent_count		INPUT	NOMINAL	N	8	BEST1.0	
Education_Level		INPUT	NOMINAL	C	13	\$CHAR13.	
Gender		INPUT	BINARY	C	1	\$CHAR1.	

Name	Label	Role	Level	Type	Length	Format	Creator
Income_Category		INPUT	NOMINAL	C	14	\$CHAR14.	
Marital_Status		INPUT	NOMINAL	C	8	\$CHAR8.	
Months_Inactive_12_mon		INPUT	NOMINAL	N	8	BEST1.0	
Months_on_book		INPUT	NOMINAL	N	8	BEST2.0	
Total_Amt_Chng_Q4_Q1		INPUT	INTERVAL	N	8	BEST5.0	
Total_Ct_Chng_Q4_Q1		INPUT	INTERVAL	N	8	BEST5.0	
Total_Relationship_Count		INPUT	NOMINAL	N	8	BEST1.0	
Total_Revolving_Bal		INPUT	INTERVAL	N	8	BEST4.0	
Total_Trans_Amt		INPUT	INTERVAL	N	8	BEST5.0	
Total_Trans_Ct		INPUT	NOMINAL	N	8	BEST3.0	

## Node=CREDITCARDCHURN

### Interval Variables

Name	Label	Role	Level	Type	Length	Format	Creator	Percent Missing	Minimum	Maximum	Mean	Standard Deviation	Skewness	Kurtosis
Avg_Open_To_Buy		INPUT	INTERVAL	N	8	BEST6.0		0	3	34516	7469.14	9090.685	1.661697	1.798617
Avg_Utilization_Ratio		INPUT	INTERVAL	N	8	BEST5.0		0	0	0.999	0.274894	0.275691	0.718008	-0.79497
Credit_Limit		INPUT	INTERVAL	N	8	BEST6.0		0	1438.3	34516	8631.954	9088.777	1.666726	1.808989
Total_Amt_Chng_Q4_Q1		INPUT	INTERVAL	N	8	BEST5.0		0	0	3.397	0.759941	0.219207	1.732063	9.993501
Total_Ct_Chng_Q4_Q1		INPUT	INTERVAL	N	8	BEST5.0		0	0	3.714	0.712222	0.238086	2.064031	15.68929
Total_Revolving_Bal		INPUT	INTERVAL	N	8	BEST4.0		0	0	2517	1162.814	814.9873	-0.14884	-1.14599
Total_Trans_Amt		INPUT	INTERVAL	N	8	BEST5.0		0	510	18484	4404.086	3397.129	2.041003	3.894023

## Node=CREDITCARDCHURN

### Class Variables

Name	Label	Role	Level	Type	Length	Format	Creator	Number of Levels	Percent Missing
Attrition_Flag		TARGET	BINARY	C	17	\$CHAR17.		2	0
Card_Category		INPUT	NOMINAL	C	8	\$CHAR8.		4	0
Contacts_Count_12_mon		INPUT	NOMINAL	N	8	BEST1.0		7	0
Customer_Age		INPUT	NOMINAL	N	8	BEST2.0		45	0
Dependent_count		INPUT	NOMINAL	N	8	BEST1.0		6	0
Education_Level		INPUT	NOMINAL	C	13	\$CHAR13.		7	0
Gender		INPUT	BINARY	C	1	\$CHAR1.		2	0
Income_Category		INPUT	NOMINAL	C	14	\$CHAR14.		6	0
Marital_Status		INPUT	NOMINAL	C	8	\$CHAR8.		4	0
Months_Inactive_12_mon		INPUT	NOMINAL	N	8	BEST1.0		7	0
Months_on_book		INPUT	NOMINAL	N	8	BEST2.0		44	0
Total_Relationship_Count		INPUT	NOMINAL	N	8	BEST1.0		6	0
Total_Trans_Ct		INPUT	NOMINAL	N	8	BEST3.0		126	0
CLIENTNUM		ID	NOMINAL	N	8	BEST9.0		.	.

## SAS Enterprise Miner Report

### Node=Variable Selection Summary

Node id = Varsel  
 Node label = Variable Selection  
 Meta path = Ids => Varsel  
 Notes =

### Node=Variable Selection Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	VariableSelection		MaxLevel	150	100	RoleUnusedVars	DEFAULT	
Bins	50		MaxMissingPercent	50		SASSPDS	Y	
ByPassVars	NONE		MaxRows	3000		StopR2	0.0005	
ByPassVarsRole	INPUT		MinR2	0.005		TargetModel	DEFAULT	
ChiSquare	3.84		Passes	6		UseAov16	N	
HideRejectedVars	Y		PrintOption	DEFAULT		UseGroups	Y	
HideUnusedInputVars	Y		RejectUnusedInputVars	Y		UseInteractions	N	

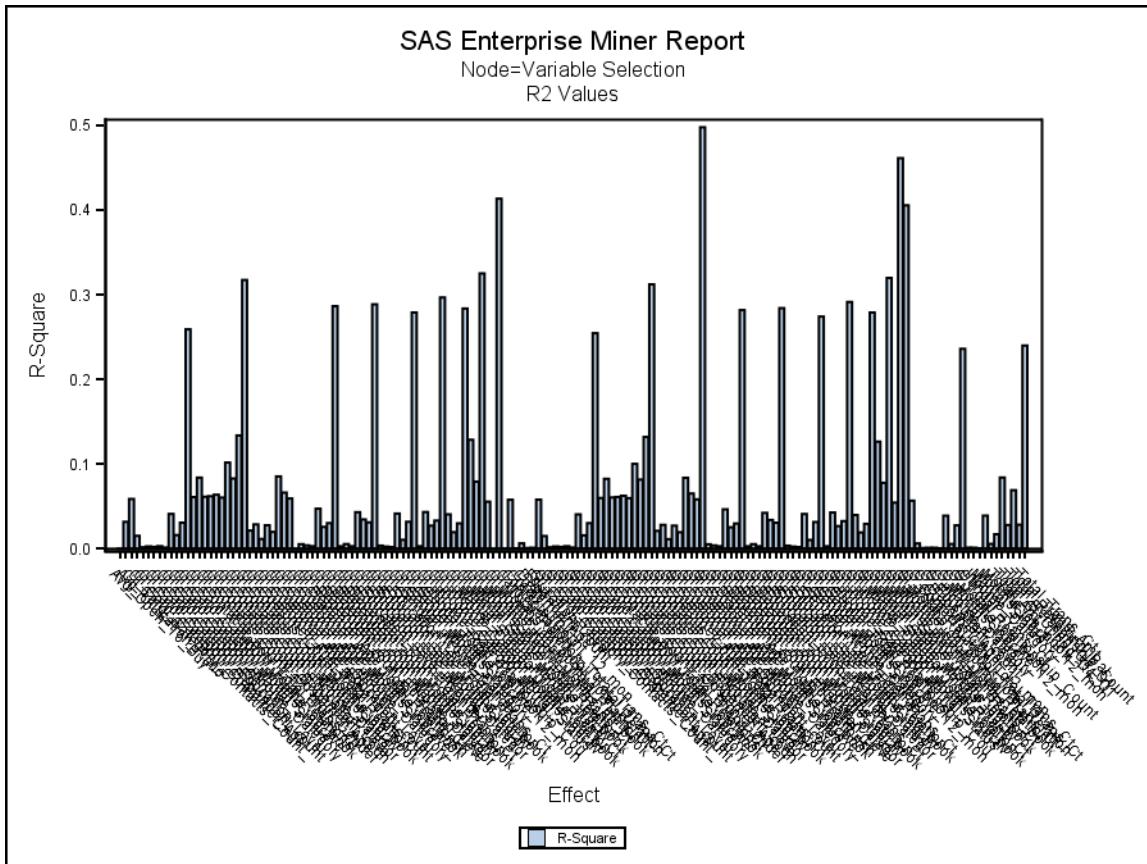
### Node=Variable Selection Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag
INPUT	BINARY	1	Gender
INPUT	INTERVAL	7	Avg_Open_To_Buy Avg_Utilization_Ratio Credit_Limit Total_Amt_Chng_Q4_Q1 Total_Ct_Chng_Q4_Q1 Total_Revolving_Bal Total_Trans_Amt
INPUT	NOMINAL	11	Card_Category Contacts_Count_12_mon Customer_Age Dependent_count Education_Level Income_Category Marital_Status Months_Inactive_12_mon Months_on_book Total_Relationship_Count Total_Trans_Ct

### Node=Variable Selection Variable Selection

Variable Name	Role	Measurement Level	Type	Label	Reasons for Rejection
Avg_Open_To_Buy	REJECTED	INTERVAL	N		Varsel:Small R-square value
Avg_Utilization_Ratio	INPUT	INTERVAL	N		
Card_Category	REJECTED	NOMINAL	C		Varsel:Small R-square value
Contacts_Count_12_mon	REJECTED	NOMINAL	N		Varsel:Small R-square value, Group variable preferred
Credit_Limit	REJECTED	INTERVAL	N		Varsel:Small R-square value
Customer_Age	REJECTED	NOMINAL	N		Varsel:Small R-square value, Group variable preferred
Dependent_count	REJECTED	NOMINAL	N		Varsel:Small R-square value
Education_Level	REJECTED	NOMINAL	C		Varsel:Small R-square value
G_Contacts_Count_12_mon	INPUT	NOMINAL	N	Grouped Levels for Contacts_Count_12_mon	
G_Customer_Age	INPUT	NOMINAL	N	Grouped Levels for Customer_Age	
G_Months_Inactive_12_mon	INPUT	NOMINAL	N	Grouped Levels for Months_Inactive_12_mon	
G_Months_on_book	INPUT	NOMINAL	N	Grouped Levels for Months_on_book	
G_Total_Relationship_Count	INPUT	NOMINAL	N	Grouped Levels for Total_Relationship_Count	
G_Total_Trans_Ct	INPUT	NOMINAL	N	Grouped Levels for Total_Trans_Ct	
Gender	REJECTED	BINARY	C		Varsel:Small R-square value
Income_Category	REJECTED	NOMINAL	C		Varsel:Small R-square value

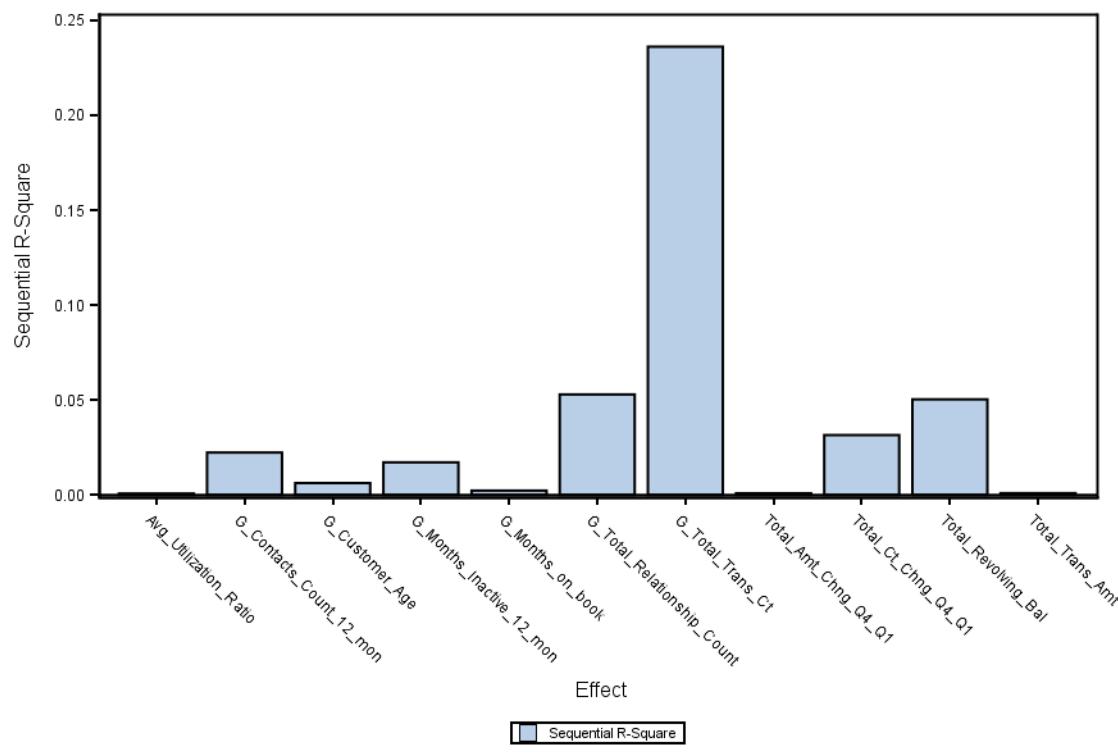
Variable Name	Role	Measurement Level	Type	Label	Reasons for Rejection
Marital_Status	REJECTED	NOMINAL	C		Varsel:Small R-square value
Months_Inactive_12_mon	REJECTED	NOMINAL	N		Varsel:Small R-square value, Group variable preferred
Months_on_book	REJECTED	NOMINAL	N		Varsel:Small R-square value, Group variable preferred
Total_Amt_Chng_Q4_Q1	INPUT	INTERVAL	N		
Total_Ct_Chng_Q4_Q1	INPUT	INTERVAL	N		
Total_Relationship_Count	REJECTED	NOMINAL	N		Varsel:Small R-square value, Group variable preferred
Total_Revolving_Bal	INPUT	INTERVAL	N		
Total_Trans_Amt	INPUT	INTERVAL	N		
Total_Trans_Ct	REJECTED	NOMINAL	N		Varsel:Small R-square value, Group variable preferred



**SAS Enterprise Miner Report****Node=Variable Selection****Effects in the Model****SAS Enterprise Miner Report**

Node=Variable Selection

Effects in the Model



## SAS Enterprise Miner Report

### Node=Transform Variables Summary

Node id = Trans  
 Node label = Transform Variables  
 Meta path = Ids => Varsel => 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		NumberofBins	VARIABLES	
DefaultClassTargetMethod	NONE		GroupMissing	N		Offset	1	
DefaultMethod	MAX_NORM	NONE	HideVariable	Y		RejectVariable	Y	
DefaultTargetMethod	NONE		MaxOptimalBins	4		SummaryStatistics	Y	
EmRandomSeed	12345		MinOffset	Y		SummaryVariables	TRANSFORMED	
EmSampleMethod	RANDOM	FIRSTN	MissingAsLevel	N		UseMetaTransform	Y	

### Node=Transform Variables Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag
INPUT	INTERVAL	5	Avg_Utilization_Ratio Total_Amt_Chng_Q4_Q1 Total_Ct_Chng_Q4_Q1 Total_Revolving_Bal Total_Trans_Amt
INPUT	NOMINAL	6	G_Contacts_Count_12_mon G_Customer_Age G_Months_Inactive_12_mon G_Months_on_book G_Total_Relationship_Count G_Total_Trans_Ct

### Node=Transform Variables Transformations Statistics

Source	Method	Variable Name	Formula	Number of Levels	Non Missing
Input	Original	Avg_Utilization_Ratio		.	10127
Input	Original	Total_Amt_Chng_Q4_Q1		.	10127
Input	Original	Total_Ct_Chng_Q4_Q1		.	10127
Input	Original	Total_Trans_Amt		.	10127
Output	Computed	LOG_Total_Trans_Amt	log(max(Total_Trans_Amt-510, 0.0)/17974 + 1)	.	10127
Output	Computed	SQRT_Avg_Utilization_Ratio	sqrt(max(Avg_Utilization_Ratio-0, 0.0)/0.999)	.	10127
Output	Computed	SQRT_Total_Amt_Chng_Q4_Q1	sqrt(max(Total_Amt_Chng_Q4_Q1-0, 0.0)/3.397)	.	10127
Output	Computed	SQRT_Total_Ct_Chng_Q4_Q1	sqrt(max(Total_Ct_Chng_Q4_Q1-0, 0.0)/3.714)	.	10127

Missing	Minimum	Maximum	Mean	Standard Deviation	Skewness	Kurtosis	Label
0	0	1.00	0.27	0.28	0.71801	-0.7950	
0	0	3.40	0.76	0.22	1.73206	9.9935	
0	0	3.71	0.71	0.24	2.06403	15.6893	
0	510	18484.00	4404.09	3397.13	2.04100	3.8940	
0	0	0.69	0.19	0.14	1.67166	2.6292	Transformed Total_Trans_Amt
0	0	1.00	0.42	0.31	0.00329	-1.3113	Transformed Avg_Utilization_Ratio
0	0	1.00	0.47	0.07	0.38929	4.7970	Transformed Total_Amt_Chng_Q4_Q1
0	0	1.00	0.43	0.07	0.22469	5.0186	Transformed Total_Ct_Chng_Q4_Q1

## SAS Enterprise Miner Report

### Node=Metadata Summary

Node id = Meta  
 Node label = Metadata  
 Meta path = Ids => Varsel => Trans => Meta  
 Notes =

### Node=Metadata Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	Metadata		CombineRule	NONE		HideRejected	N	
AdvancedAdvisor	N		ComputeStatistics	N				

### Node=Metadata Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag
REJECTED	INTERVAL	13	Avg_Open_To_Buy Avg_Utilization_Ratio Contacts_Count_12_mon Credit_Limit Customer_Age Dependent_count Months_Inactive_12_mon Months_on_book Total_Amt_Chng_Q4_Q1 Total_Ct_Chng_Q4_Q1 ...
REJECTED	NOMINAL	5	Card_Category Education_Level Gender Income_Category Marital_Status
INPUT	INTERVAL	5	LOG_Total_Trans_Amt SQRT_Avg_Utilization_Ratio SQRT_Total_Amt_Chng_Q4_Q1 SQRT_Total_Ct_Chng_Q4_Q1 Total_Revolving_Bal
INPUT	NOMINAL	6	G_Contacts_Count_12_mon G_Customer_Age G_Months_Inactive_12_mon G_Months_on_book G_Total_Relationship_Count G_Total_Trans_Ct
ASSESS	NOMINAL	1	_WARN_

## SAS Enterprise Miner Report

### Node=Standard range for NEURAL Summary

Node id = Trans2  
 Node label = Standard range for NEURAL  
 Meta path = Ids => Varsel => Trans => Meta => Trans2  
 Notes =

### Node=Standard range for NEURAL Properties

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

### Node=Standard range for NEURAL Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag
INPUT	INTERVAL	5	LOG_Total_Trans_Amt SQRT_Avg_Utilization_Ratio SQRT_Total_Amt_Chng_Q4_Q1 SQRT_Total_Ct_Chng_Q4_Q1 Total_Revolving_Bal
INPUT	NOMINAL	6	G_Contacts_Count_12_mon G_Customer_Age G_Months_Inactive_12_mon G_Months_on_book G_Total_Relationship_Count G_Total_Trans_Ct

### Node=Standard range for NEURAL Transformations Statistics

Source	Method	Variable Name	Formula	Number of Levels
Input	Original	LOG_Total_Trans_Amt		.
Input	Original	SQRT_Avg_Utilization_Ratio		.
Input	Original	SQRT_Total_Amt_Chng_Q4_Q1		.
Input	Original	SQRT_Total_Ct_Chng_Q4_Q1		.
Input	Original	Total_Revolving_Bal		.
Output	Computed	RANGE_LOG_Total_Trans_Amt	(LOG_Total_Trans_Amt - 0) / (0.6931471806-0)	.
Output	Computed	RANGE_SQRT_Avg_Utilization_Ratio	(SQRT_Avg_Utilization_Ratio - 0) / (1-0)	.
Output	Computed	RANGE_SQRT_Total_Amt_Chng_Q4_Q1	(SQRT_Total_Amt_Chng_Q4_Q1 - 0) / (1-0)	.
Output	Computed	RANGE_SQRT_Total_Ct_Chng_Q4_Q1	(SQRT_Total_Ct_Chng_Q4_Q1 - 0) / (1-0)	.
Output	Computed	RANGE_Total_Revolving_Bal	(Total_Revolving_Bal - 0) / (2517-0)	.

Non Missing	Missing	Minimum	Maximum	Mean	Standard Deviation	Skewness	Kurtosis	Label
10127	0	0	0.69	0.19	0.138	1.67166	2.62919	Transformed Total_Trans_Amt
10127	0	0	1.00	0.42	0.313	0.00329	-1.31133	Transformed Avg_Utilization_Ratio
10127	0	0	1.00	0.47	0.066	0.38929	4.79700	Transformed Total_Amt_Chng_Q4_Q1
10127	0	0	1.00	0.43	0.071	0.22469	5.01865	Transformed Total_Ct_Chng_Q4_Q1
10127	0	0	2517.00	1162.81	814.987	-0.14884	-1.14599	
10127	0	0	1.00	0.27	0.199	1.67166	2.62919	Transformed: Transformed Total_Trans_Amt
10127	0	0	1.00	0.42	0.313	0.00329	-1.31133	Transformed: Transformed Avg_Utilization_Rat
10127	0	0	1.00	0.47	0.066	0.38929	4.79700	Transformed: Transformed Total_Amt_Chng_Q4_Q
10127	0	0	1.00	0.43	0.071	0.22469	5.01865	Transformed: Transformed Total_Ct_Chng_Q4_Q1
10127	0	0	1.00	0.46	0.324	-0.14884	-1.14599	Transformed Total_Revolving_Bal

## SAS Enterprise Miner Report

### Node=Metadata (2) Summary

Node id = Meta2  
 Node label = Metadata (2)  
 Meta path = Ids => Varsel => Trans => Meta => Trans2 => Meta2  
 Notes =

### Node=Metadata (2) Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	Metadata		CombineRule	NONE		HideRejected	N	
AdvancedAdvisor	N		ComputeStatistics	N				

### Node=Metadata (2) Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag
REJECTED	INTERVAL	18	Avg_Open_To_Buy Avg_Utilization_Ratio Contacts_Count_12_mon Credit_Limit Customer_Age Dependent_count LOG_Total_Trans_Amt Months_Inactive_12_mon Months_on_book SQRT_Avg_Utilization_Ratio ...
REJECTED	NOMINAL	5	Card_Category Education_Level Gender Income_Category Marital_Status
INPUT	INTERVAL	5	RANGE_LOG_Total_Trans_Amt RANGE_SQRT_Avg_Utilization_Ratio RANGE_SQRT_Total_Amt_Chng_Q4_Q1 RANGE_SQRT_Total_Ct_Chng_Q4_Q1 RANGE_Total_Revolving_Bal
INPUT	NOMINAL	6	G_Contacts_Count_12_mon G_Customer_Age G_Months_Inactive_12_mon G_Months_on_book G_Total_Relationship_Count G_Total_Trans_Ct
ASSESS	NOMINAL	1	_WARN_

## SAS Enterprise Miner Report

### Node=Data Partition x3 Summary

Node id = Part2  
 Node label = Data Partition x3  
 Meta path = Ids => Varsel => Trans => Meta => Trans2 => Meta2 => Part2  
 Notes =

### Node=Data Partition x3 Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	Partition		Method	DEFAULT		TestPct	10	30
ClassDistribution	Y		OutputType	DATA		TrainPct	70	40
IntervalDistribution	Y		RandomSeed	78354	12345	ValidatePct	20	30

### Node=Data Partition x3 Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag
INPUT	INTERVAL	5	RANGE_LOG_Total_Trans_Amt RANGE_SQRT_Avg_Utilization_Ratio RANGE_SQRT_Total_Amt_Chng_Q4_Q1 RANGE_SQRT_Total_Ct_Chng_Q4_Q1 RANGE_Total_Revolving_Bal
INPUT	NOMINAL	6	G_Contacts_Count_12_mon G_Customer_Age G_Months_Inactive_12_mon G_Months_on_book G_Total_Relationship_Count G_Total_Trans_Ct
ASSESS	NOMINAL	1	_WARN_

## SAS Enterprise Miner Report

### Node=Modified Forest 3 Summary

Node id = HPDMForest2  
 Node label = Modified Forest 3  
 Meta path = Ids => Varsel => Trans => Meta => Trans2 => Meta2 => Part2 => HPDMForest2  
 Notes =

### Node=Modified Forest 3 Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	HPDMForest		MAXTREES	65	100	SPLITSIZE	.	
ALPHA	0.05		MINCATSIZE	5		TRAINFRACTION	0.6	
CATBINS	30		MINUSEINSEARCH	1		TRAINN	.	
EXHAUSTIVE	5000		MISSING	USEINSEARCH		ToolType	MODEL	
LEAFFRACTION	0.00001		NUMOBSMETHOD	PERCENTAGE		VARSELECT	Y	
LEAFSIZE	1		RBACUT	0.01		VARS_TO_TRY	.	
LEAFSIZEMETHOD	PERCENTAGE	DEFAULT	RBATOPNUM	25		VIMETHOD	LOSSREDUCTION	
MAXDEPTH	50		SEED	78354	12345			

### Node=Modified Forest 3 Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag
INPUT	INTERVAL	5	RANGE_LOG_Total_Trans_Amt RANGE_SQRT_Avg_Utilization_Ratio RANGE_SQRT_Total_Amt_Chng_Q4_Q1 RANGE_SQRT_Total_Ct_Chng_Q4_Q1 RANGE_Total_Revolving_Bal
INPUT	NOMINAL	6	G_Contacts_Count_12_mon G_Customer_Age G_Months_Inactive_12_mon G_Months_on_book G_Total_Relationship_Count G_Total_Trans_Ct
ID	INTERVAL	1	_dataobs_

### Node=Modified Forest 3 Model Fit Statistics

Target=Attrition\_Flag Target Label=''

Label of Statistic	Train	Validation	Test
Average Squared Error	0.04	0.05	0.05
Divisor for ASE	14176.00	4050.00	2028.00
Maximum Absolute Error	0.99	0.98	0.95
Sum of Frequencies	7088.00	2025.00	1014.00
Root Average Squared Error	0.20	0.22	0.21
Sum of Squared Errors	550.00	187.26	91.54
Frequency of Classified Cases	7088.00	2025.00	1014.00
Misclassification Rate	0.05	0.06	0.06
Number of Wrong Classifications	352.00	128.00	61.00

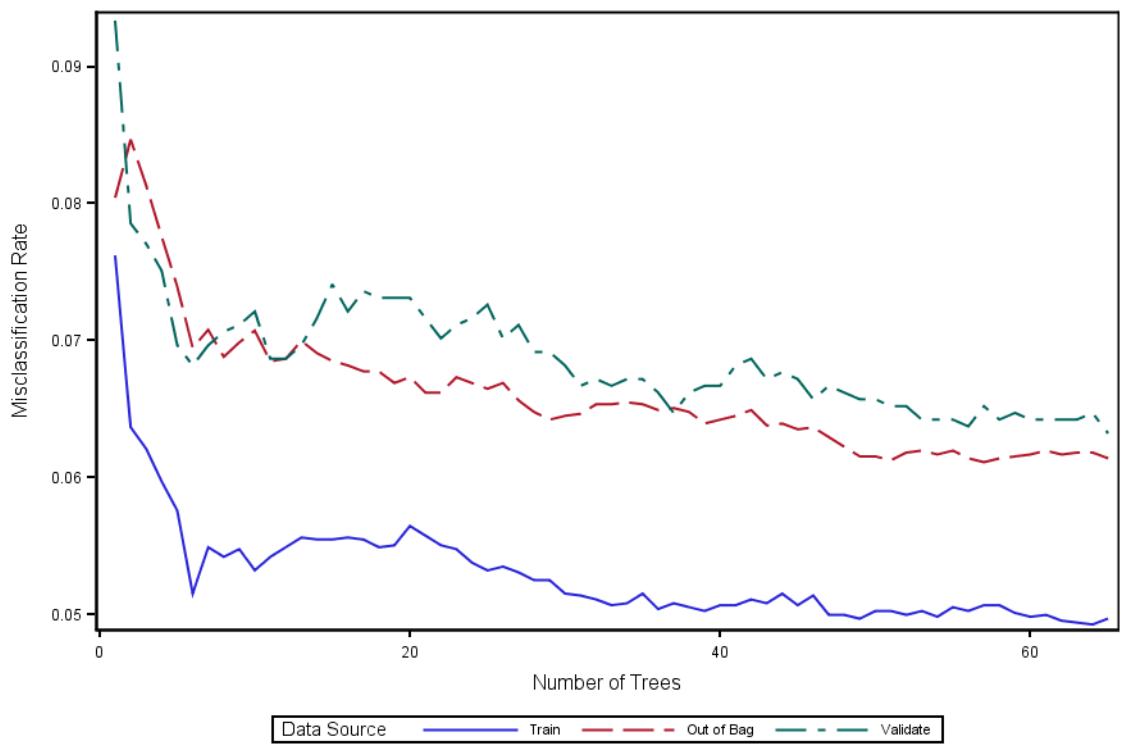
### Node=Modified Forest 3 Iteration History

Number of Trees	Number of Leaves	Average Square Error (Train)	Average Square Error (Out of Bag)	Average Square Error (Validate)	Misclassification Rate (Train)	Misclassification Rate (Out of Bag)	Misclassification Rate (Validate)	Log Loss (Train)	Log Loss (Out of Bag)	Log Loss (Validate)
1	51	0.0578	0.0629	0.0682	0.0762	0.0804	0.0933	0.213	0.255	0.240
2	117	0.0498	0.0653	0.0587	0.0636	0.0846	0.0785	0.177	0.328	0.202
3	172	0.0471	0.0627	0.0557	0.0621	0.0813	0.0770	0.167	0.286	0.189
4	214	0.0448	0.0587	0.0529	0.0597	0.0776	0.0751	0.160	0.244	0.181
5	265	0.0420	0.0559	0.0501	0.0576	0.0739	0.0696	0.150	0.220	0.171
6	325	0.0400	0.0538	0.0492	0.0515	0.0694	0.0681	0.145	0.204	0.169
7	373	0.0408	0.0539	0.0496	0.0549	0.0708	0.0696	0.147	0.200	0.170
8	437	0.0405	0.0530	0.0493	0.0542	0.0688	0.0706	0.146	0.193	0.169
9	484	0.0413	0.0533	0.0496	0.0547	0.0698	0.0711	0.149	0.194	0.170
10	547	0.0412	0.0536	0.0493	0.0532	0.0707	0.0721	0.150	0.190	0.170
11	615	0.0407	0.0526	0.0486	0.0542	0.0685	0.0686	0.149	0.185	0.169
12	661	0.0412	0.0526	0.0489	0.0549	0.0686	0.0686	0.150	0.185	0.169
13	724	0.0418	0.0532	0.0497	0.0556	0.0699	0.0696	0.152	0.186	0.172
14	778	0.0415	0.0524	0.0497	0.0554	0.0691	0.0716	0.151	0.183	0.172
15	838	0.0416	0.0521	0.0499	0.0554	0.0685	0.0741	0.151	0.182	0.173
16	899	0.0414	0.0517	0.0497	0.0556	0.0682	0.0721	0.151	0.181	0.172
17	948	0.0412	0.0514	0.0492	0.0554	0.0677	0.0736	0.150	0.180	0.171
18	1007	0.0410	0.0512	0.0495	0.0549	0.0677	0.0731	0.150	0.179	0.172
19	1051	0.0414	0.0514	0.0495	0.0550	0.0669	0.0731	0.152	0.181	0.172
20	1103	0.0415	0.0514	0.0493	0.0564	0.0673	0.0731	0.152	0.180	0.172
21	1141	0.0416	0.0512	0.0491	0.0557	0.0662	0.0716	0.152	0.180	0.171
22	1212	0.0413	0.0508	0.0489	0.0550	0.0662	0.0701	0.151	0.179	0.171
23	1269	0.0413	0.0508	0.0490	0.0547	0.0673	0.0711	0.151	0.178	0.171
24	1338	0.0409	0.0504	0.0488	0.0538	0.0669	0.0716	0.150	0.177	0.171
25	1391	0.0406	0.0501	0.0486	0.0532	0.0665	0.0726	0.149	0.176	0.170
26	1440	0.0406	0.0501	0.0485	0.0535	0.0669	0.0701	0.149	0.176	0.169
27	1494	0.0403	0.0497	0.0482	0.0530	0.0656	0.0711	0.148	0.174	0.169
28	1563	0.0401	0.0494	0.0481	0.0525	0.0648	0.0691	0.148	0.173	0.168
29	1628	0.0398	0.0490	0.0475	0.0525	0.0642	0.0691	0.147	0.172	0.167
30	1689	0.0399	0.0491	0.0473	0.0515	0.0645	0.0681	0.148	0.173	0.167
31	1761	0.0397	0.0489	0.0471	0.0514	0.0646	0.0667	0.147	0.172	0.166
32	1808	0.0399	0.0491	0.0471	0.0511	0.0653	0.0672	0.148	0.173	0.167
33	1881	0.0398	0.0488	0.0470	0.0506	0.0653	0.0667	0.148	0.172	0.166
34	1931	0.0399	0.0490	0.0471	0.0508	0.0655	0.0672	0.149	0.173	0.167
35	1980	0.0398	0.0487	0.0470	0.0515	0.0653	0.0672	0.148	0.173	0.167
36	2047	0.0398	0.0486	0.0471	0.0504	0.0649	0.0662	0.148	0.172	0.167
37	2096	0.0396	0.0484	0.0469	0.0508	0.0650	0.0647	0.147	0.171	0.167
38	2143	0.0397	0.0485	0.0472	0.0505	0.0648	0.0662	0.148	0.172	0.167
39	2198	0.0397	0.0485	0.0472	0.0502	0.0639	0.0667	0.148	0.172	0.167
40	2264	0.0396	0.0484	0.0472	0.0506	0.0642	0.0667	0.148	0.171	0.167
41	2327	0.0396	0.0484	0.0474	0.0506	0.0645	0.0681	0.148	0.171	0.168
42	2380	0.0397	0.0484	0.0475	0.0511	0.0649	0.0686	0.148	0.172	0.168
43	2430	0.0396	0.0482	0.0475	0.0508	0.0638	0.0672	0.148	0.171	0.168
44	2490	0.0396	0.0482	0.0474	0.0515	0.0639	0.0677	0.148	0.171	0.168
45	2546	0.0394	0.0479	0.0472	0.0506	0.0635	0.0672	0.147	0.170	0.167
46	2603	0.0393	0.0478	0.0471	0.0514	0.0636	0.0657	0.147	0.170	0.167
47	2658	0.0391	0.0476	0.0469	0.0499	0.0629	0.0667	0.146	0.169	0.167
48	2716	0.0390	0.0474	0.0468	0.0499	0.0622	0.0662	0.146	0.169	0.166
49	2758	0.0389	0.0473	0.0467	0.0497	0.0615	0.0657	0.146	0.169	0.166

Number of Trees	Number of Leaves	Average Square Error (Train)	Average Square Error (Out of Bag)	Average Square Error (Validate)	Misclassification Rate (Train)	Misclassification Rate (Out of Bag)	Misclassification Rate (Validate)	Log Loss (Train)	Log Loss (Out of Bag)	Log Loss (Validate)
50	2806	0.0389	0.0472	0.0467	0.0502	0.0615	0.0657	0.146	0.168	0.166
51	2874	0.0389	0.0472	0.0467	0.0502	0.0612	0.0652	0.146	0.169	0.166
52	2926	0.0390	0.0474	0.0468	0.0499	0.0618	0.0652	0.146	0.169	0.166
53	2978	0.0390	0.0474	0.0467	0.0502	0.0619	0.0642	0.146	0.169	0.166
54	3039	0.0390	0.0473	0.0465	0.0498	0.0617	0.0642	0.146	0.169	0.166
55	3096	0.0391	0.0474	0.0466	0.0505	0.0619	0.0642	0.146	0.169	0.166
56	3157	0.0390	0.0473	0.0466	0.0502	0.0614	0.0637	0.146	0.169	0.166
57	3212	0.0390	0.0474	0.0467	0.0506	0.0611	0.0652	0.146	0.169	0.166
58	3278	0.0389	0.0472	0.0465	0.0506	0.0614	0.0642	0.146	0.169	0.165
59	3327	0.0390	0.0473	0.0466	0.0501	0.0615	0.0647	0.146	0.169	0.165
60	3379	0.0388	0.0471	0.0464	0.0498	0.0617	0.0642	0.145	0.168	0.165
61	3445	0.0388	0.0471	0.0464	0.0499	0.0619	0.0642	0.145	0.168	0.165
62	3495	0.0388	0.0470	0.0463	0.0495	0.0617	0.0642	0.145	0.168	0.165
63	3549	0.0388	0.0470	0.0463	0.0494	0.0618	0.0642	0.145	0.168	0.165
64	3605	0.0388	0.0470	0.0463	0.0492	0.0618	0.0647	0.145	0.168	0.165
65	3655	0.0388	0.0469	0.0462	0.0497	0.0614	0.0632	0.145	0.168	0.164

### SAS Enterprise Miner Report

Node=Modified Forest 3  
Iteration Plot

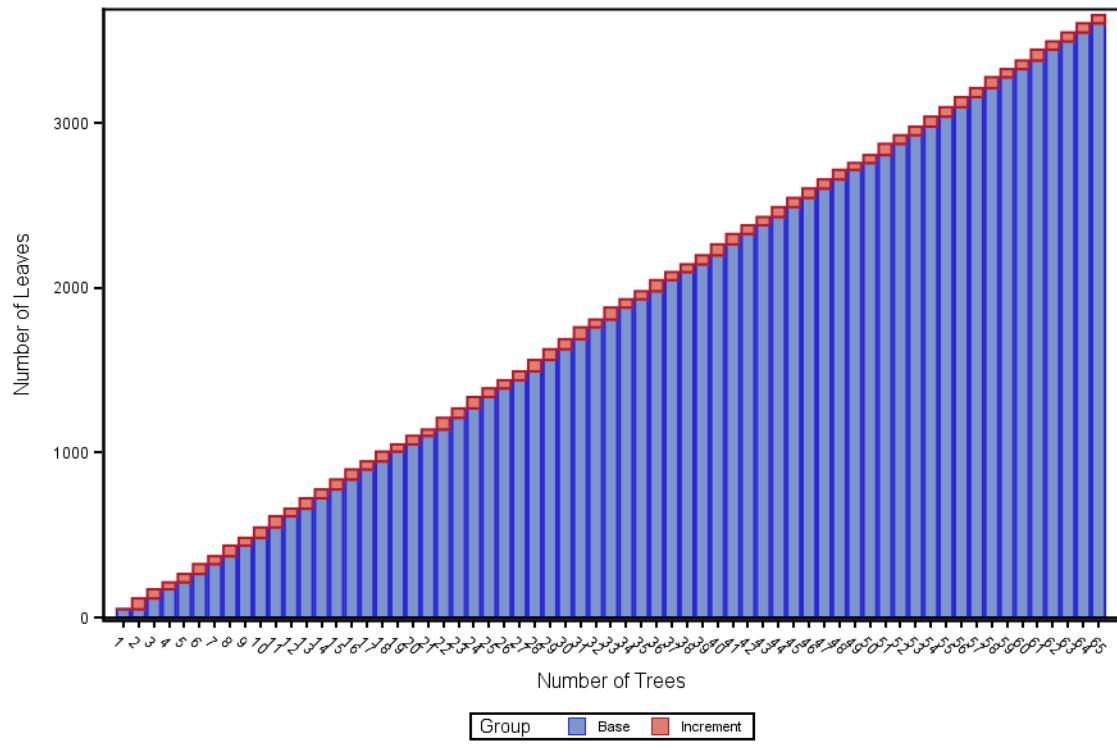


**SAS Enterprise Miner Report**  
**Node=Modified Forest 3**  
**Leaf Plot**

17

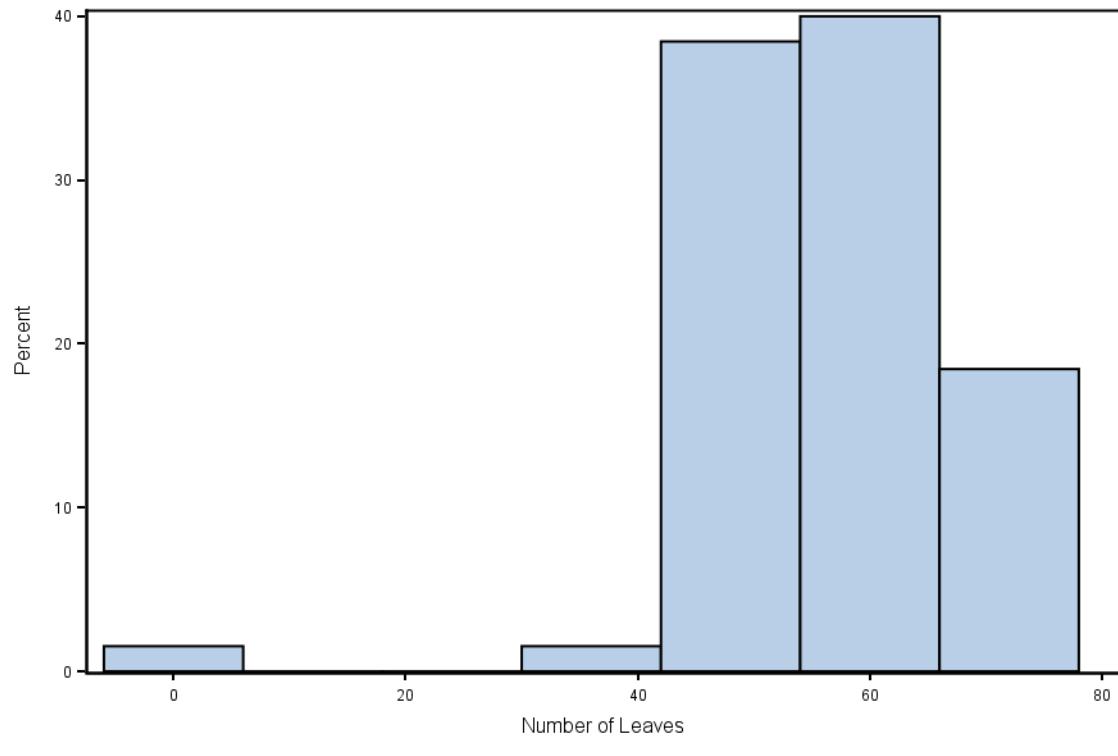
**SAS Enterprise Miner Report**

Node=Modified Forest 3  
Leaf Plot



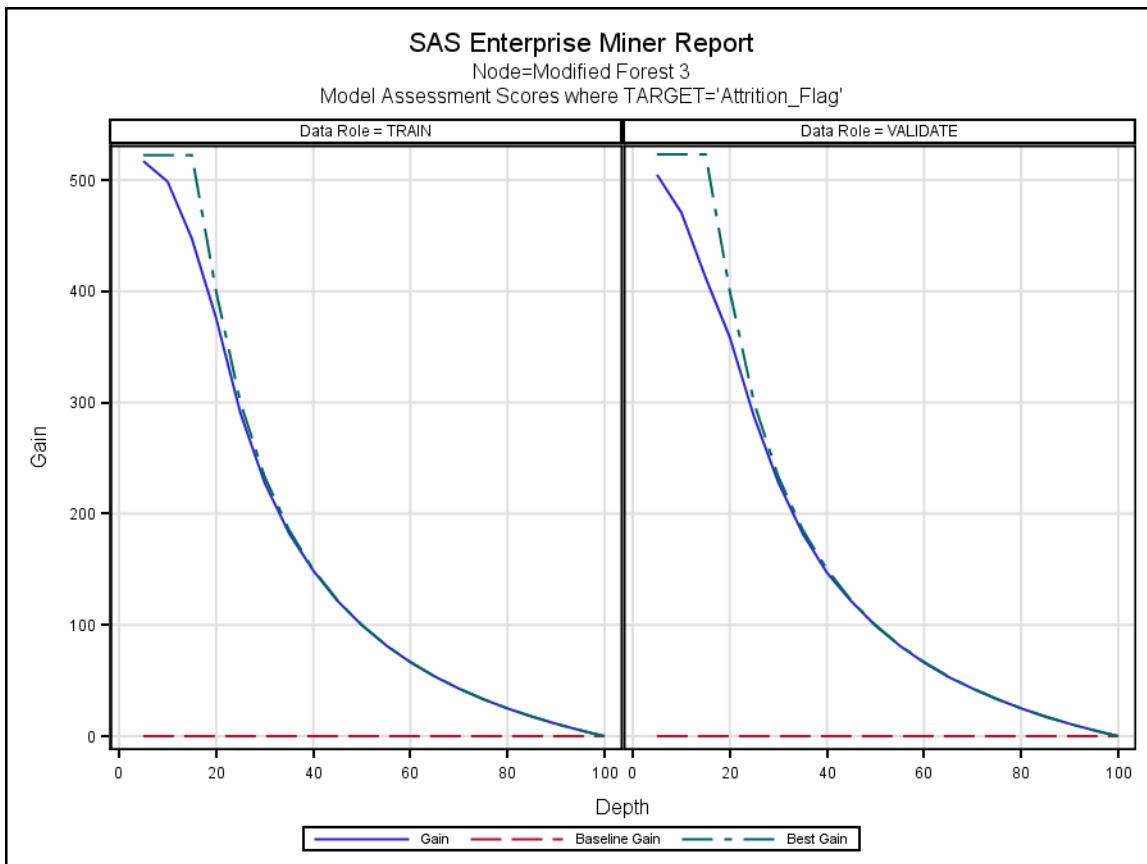
**SAS Enterprise Miner Report**

Node=Modified Forest 3  
Leaf Statistics



**Node=Modified Forest 3**  
**Variable Importance**

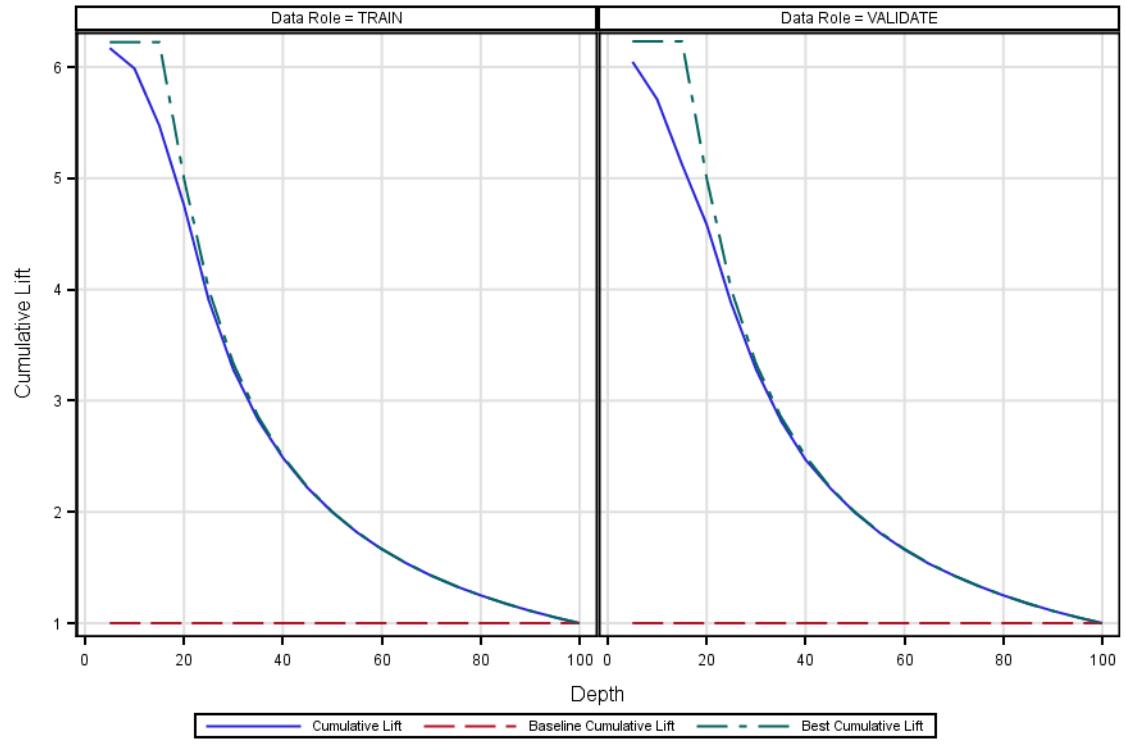
Variable Name	Number of Splitting Rules	Train: Gini Reduction	Train: Margin Reduction	OOB: Gini Reduction	OOB: Margin Reduction	Valid: Gini Reduction	Valid: Margin Reduction	Label
RANGE_LOG_Total_Trans_Amt	762	0.032650	0.065300	0.02483	0.056113	0.02603	0.057969	Transformed: Transformed Total_Trans_Amt
G_Total_Trans_Ct	532	0.042040	0.084080	0.03842	0.082640	0.03340	0.075422	Grouped Levels for Total_Trans_Ct
RANGE_SQRT_Total_Ct_Chng_Q4_Q1	377	0.021530	0.043060	0.01593	0.036991	0.01691	0.039525	Transformed: Transformed Total_Ct_Chng_Q4_Q1
G_Total_Relationship_Count	368	0.012914	0.025828	0.01051	0.023028	0.01365	0.025939	Grouped Levels for Total_Relationship_Count
RANGE_Total_Revolving_Bal	341	0.024885	0.049770	0.02091	0.045858	0.02165	0.046614	Transformed Total_Revolving_Bal
G_Contacts_Count_12_mon	271	0.004710	0.009419	0.00350	0.009038	0.00307	0.008910	Grouped Levels for Contacts_Count_12_mon
G_Months_Inactive_12_mon	255	0.003753	0.007507	0.00209	0.006022	0.00318	0.006259	Grouped Levels for Months_Inactive_12_mon
RANGE_SQRT_Total_Amt_Chng_Q4_Q1	250	0.005292	0.010584	0.00159	0.006585	0.00219	0.006945	Transformed: Transformed Total_Amt_Chng_Q4_Q1
RANGE_SQRT_Avg_Utilization_Ratio	182	0.016629	0.033258	0.01452	0.031115	0.01212	0.029195	Transformed: Transformed Avg_Utilization_Ratio
G_Customer_Age	138	0.001857	0.003715	0.00051	0.002814	0.00015	0.002373	Grouped Levels for Customer_Age
G_Months_on_book	114	0.000757	0.001514	-0.00024	0.000966	-0.00040	0.000740	Grouped Levels for Months_on_book



## SAS Enterprise Miner Report

Node=Modified Forest 3

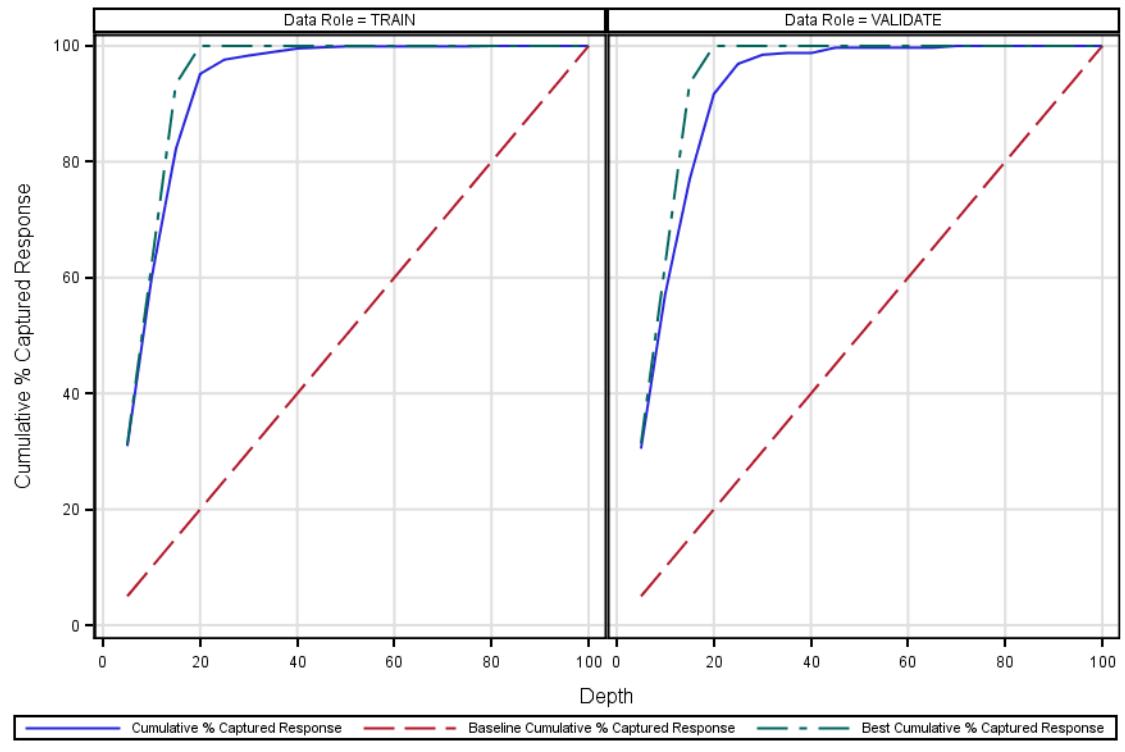
Model Assessment Scores where TARGET='Attrition\_Flag'

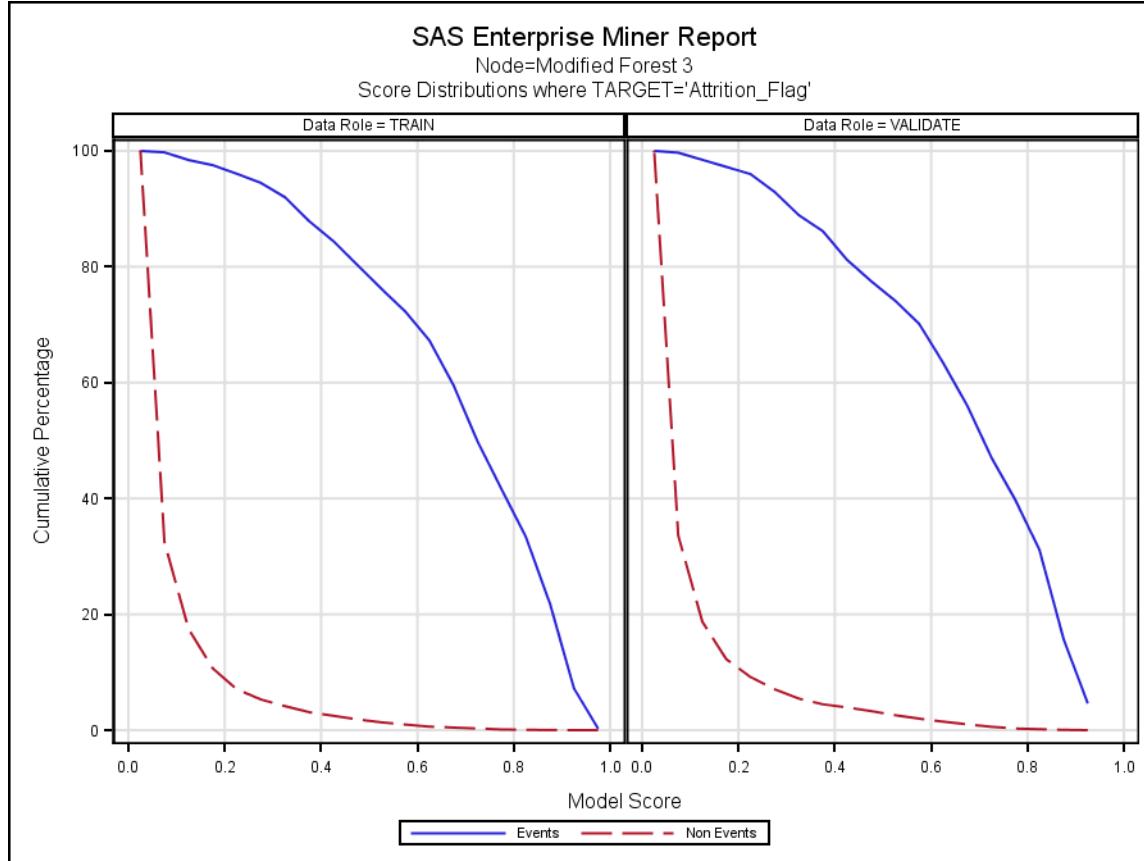
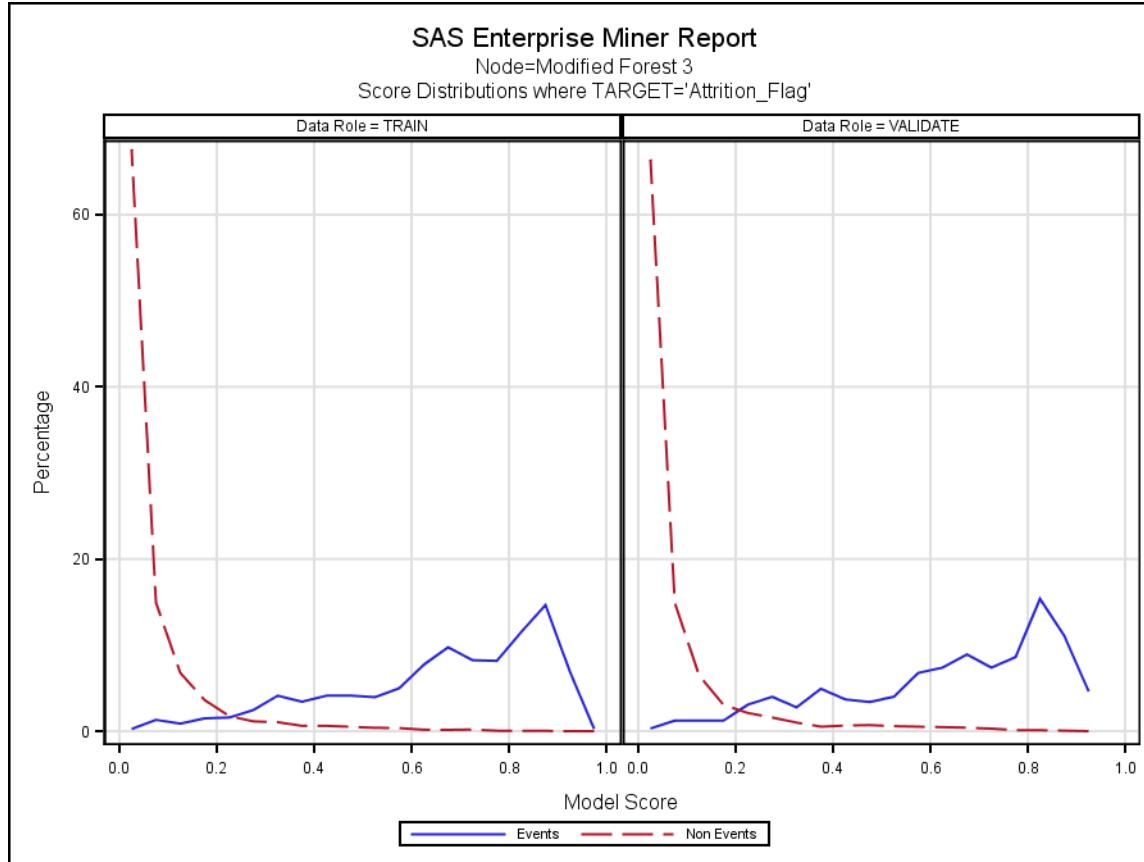


## SAS Enterprise Miner Report

Node=Modified Forest 3

Model Assessment Scores where TARGET='Attrition\_Flag'





**Node=Modified Forest 3**  
**Score Distributions**

Target Variable=Attrition\_Flag 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	3	0.2634	0.0000	0.263	0.000
0.90-0.95	79	6.9359	0.0000	7.199	0.000
0.85-0.90	167	14.6620	0.0336	21.861	0.034
0.80-0.85	131	11.5013	0.0336	33.363	0.067
0.75-0.80	93	8.1651	0.0504	41.528	0.118
0.70-0.75	94	8.2529	0.1849	49.781	0.303
0.65-0.70	111	9.7454	0.1513	59.526	0.454
0.60-0.65	88	7.7261	0.1681	67.252	0.622
0.55-0.60	57	5.0044	0.3530	72.256	0.975
0.50-0.55	45	3.9508	0.3866	76.207	1.362
0.45-0.50	47	4.1264	0.5043	80.334	1.866
0.40-0.45	47	4.1264	0.6220	84.460	2.488
0.35-0.40	39	3.4241	0.6220	87.884	3.110
0.30-0.35	47	4.1264	1.0422	92.011	4.152
0.25-0.30	28	2.4583	1.1430	94.469	5.295
0.20-0.25	18	1.5803	1.7650	96.049	7.060
0.15-0.20	17	1.4925	3.6141	97.542	10.674
0.10-0.15	10	0.8780	6.7742	98.420	17.448
0.05-0.10	15	1.3169	14.9605	99.737	32.409
0.00-0.05	3	0.2634	67.5912	100.000	100.000

Target Variable=Attrition\_Flag Data Role=VALIDATE

Posterior Probability Range	Number of Events	Percentage of Events	Percentage of Nonevents	Cumulative Percentage of Events	Cumulative Percentage of Nonevents
0.90-0.95	15	4.6154	0.0000	4.615	0.000
0.85-0.90	36	11.0769	0.0588	15.692	0.059
0.80-0.85	50	15.3846	0.1176	31.077	0.176
0.75-0.80	28	8.6154	0.1176	39.692	0.294
0.70-0.75	24	7.3846	0.2941	47.077	0.588
0.65-0.70	29	8.9231	0.4118	56.000	1.000
0.60-0.65	24	7.3846	0.4706	63.385	1.471
0.55-0.60	22	6.7692	0.5294	70.154	2.000
0.50-0.55	13	4.0000	0.5882	74.154	2.588
0.45-0.50	11	3.3846	0.7059	77.538	3.294
0.40-0.45	12	3.6923	0.6471	81.231	3.941
0.35-0.40	16	4.9231	0.5294	86.154	4.471
0.30-0.35	9	2.7692	1.0000	88.923	5.471
0.25-0.30	13	4.0000	1.5882	92.923	7.059
0.20-0.25	10	3.0769	2.1176	96.000	9.176
0.15-0.20	4	1.2308	3.0588	97.231	12.235
0.10-0.15	4	1.2308	6.4706	98.462	18.706
0.05-0.10	4	1.2308	14.8824	99.692	33.588
0.00-0.05	1	0.3077	66.4118	100.000	100.000

## SAS Enterprise Miner Report

### Node=Modified Forest 2 Summary

Node id = HPDMForest4  
 Node label = Modified Forest 2  
 Meta path = Ids => Varsel => Trans => Meta => Trans2 => Meta2 => Part2 => HPDMForest4  
 Notes =

### Node=Modified Forest 2 Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	HPDMForest		MAXTREES	75	100	SPLITSIZE	.	
ALPHA	0.05		MINCATSIZE	5		TRAINFRACTION	0.6	
CATBINS	30		MINUSEINSEARCH	1		TRAINN	.	
EXHAUSTIVE	5000		MISSING	USEINSEARCH		ToolType	MODEL	
LEAFFRACTION	0.00001		NUMOBSMETHOD	PERCENTAGE		VARSELECT	Y	
LEAFSIZE	1		RBACUT	0.01		VARS_TO_TRY	.	
LEAFSIZEMETHOD	PERCENTAGE	DEFAULT	RBATOPNUM	25		VIMETHOD	LOSSREDUCTION	
MAXDEPTH	50		SEED	78354	12345			

### Node=Modified Forest 2 Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag
INPUT	INTERVAL	5	RANGE_LOG_Total_Trans_Amt RANGE_SQRT_Avg_Utilization_Ratio RANGE_SQRT_Total_Amt_Chng_Q4_Q1 RANGE_SQRT_Total_Ct_Chng_Q4_Q1 RANGE_Total_Revolving_Bal
INPUT	NOMINAL	6	G_Contacts_Count_12_mon G_Customer_Age G_Months_Inactive_12_mon G_Months_on_book G_Total_Relationship_Count G_Total_Trans_Ct
ID	INTERVAL	1	_dataobs_

### Node=Modified Forest 2 Model Fit Statistics

Target=Attrition\_Flag Target Label=''

Label of Statistic	Train	Validation	Test
Average Squared Error	0.04	0.05	0.05
Divisor for ASE	14176.00	4050.00	2028.00
Maximum Absolute Error	0.99	0.98	0.95
Sum of Frequencies	7088.00	2025.00	1014.00
Root Average Squared Error	0.20	0.21	0.21
Sum of Squared Errors	551.14	187.18	91.76
Frequency of Classified Cases	7088.00	2025.00	1014.00
Misclassification Rate	0.05	0.06	0.06
Number of Wrong Classifications	355.00	131.00	61.00

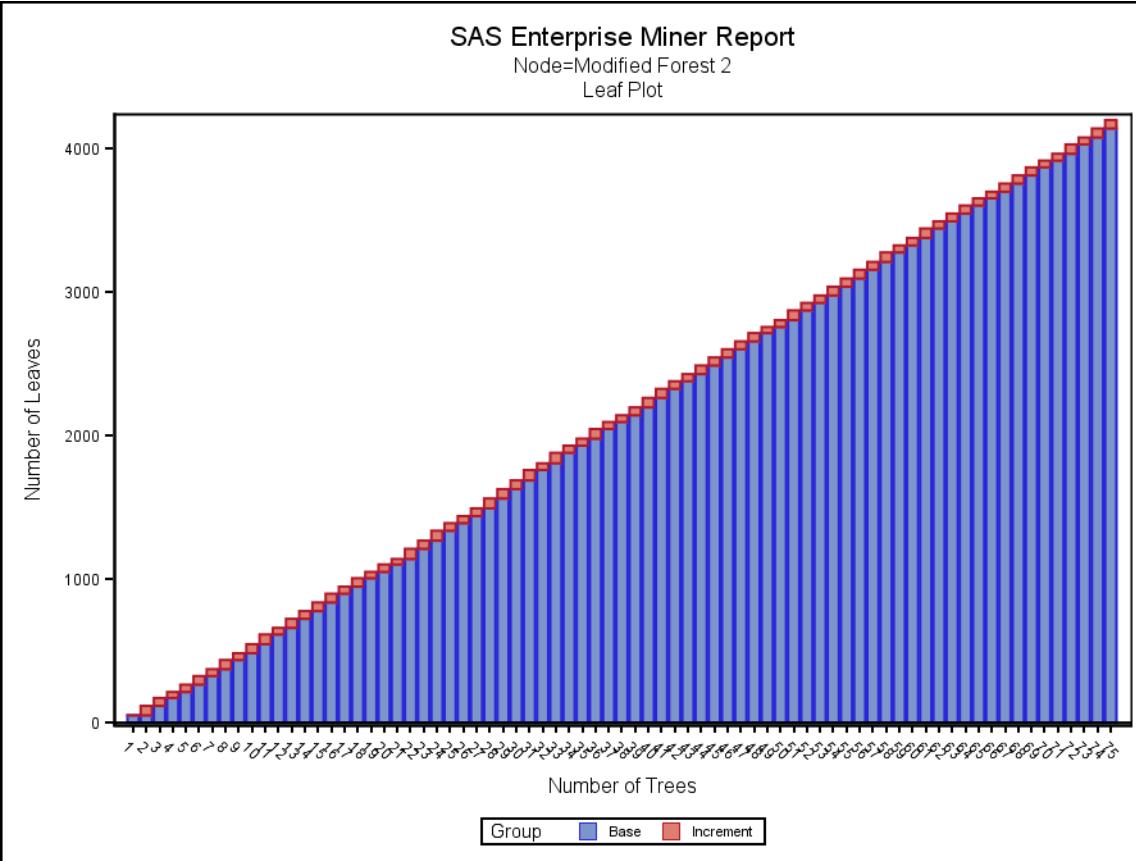
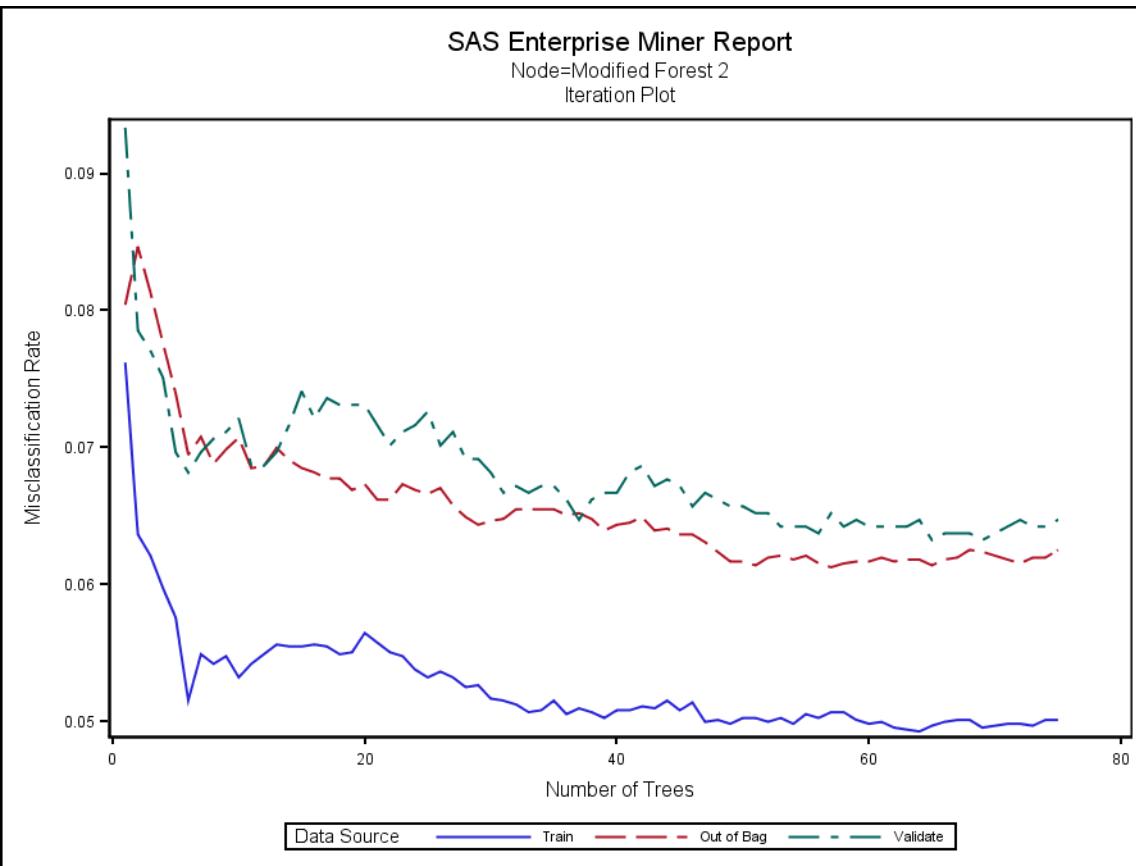
### Node=Modified Forest 2 Iteration History

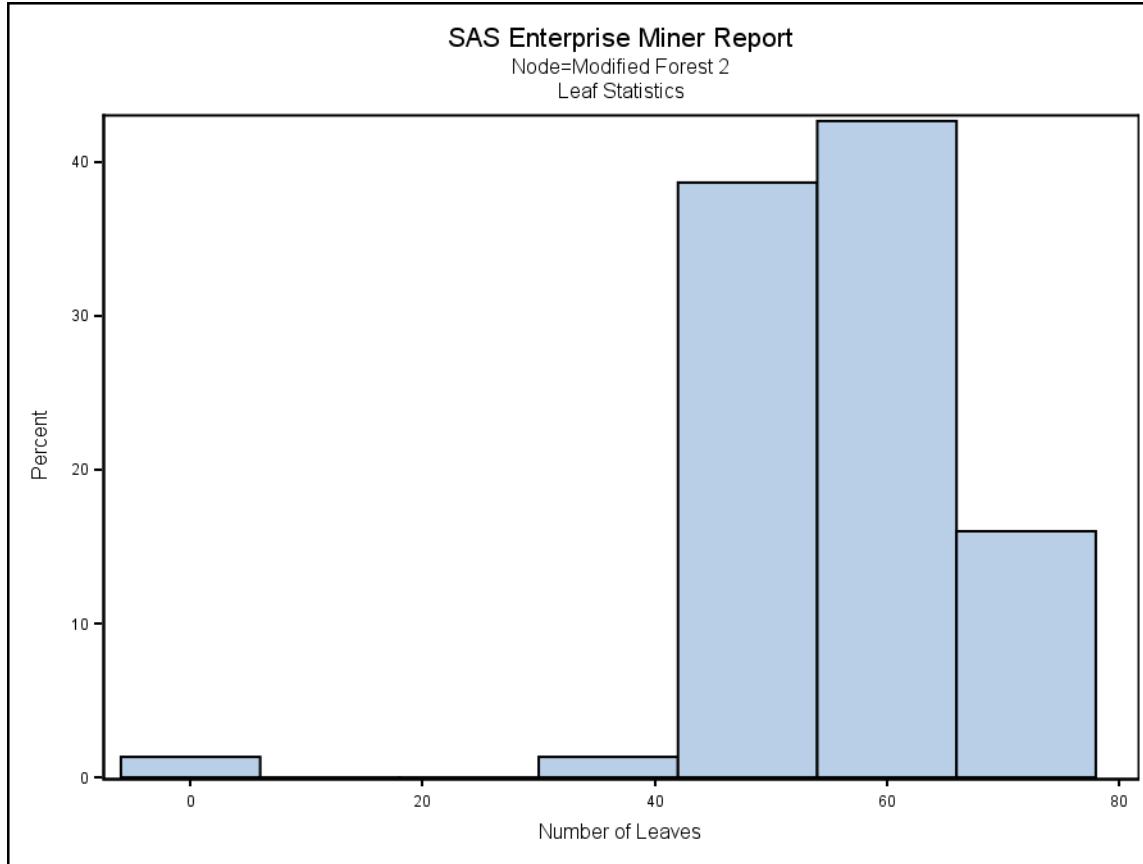
Number of Trees	Number of Leaves	Average Square Error (Train)	Average Square Error (Out of Bag)	Average Square Error (Validate)	Misclassification Rate (Train)	Misclassification Rate (Out of Bag)	Misclassification Rate (Validate)	Log Loss (Train)	Log Loss (Out of Bag)	Log Loss (Validate)
1	51	0.0578	0.0629	0.0682	0.0762	0.0804	0.0933	0.213	0.255	0.240
2	117	0.0498	0.0653	0.0587	0.0636	0.0846	0.0785	0.177	0.328	0.202
3	172	0.0471	0.0627	0.0557	0.0621	0.0813	0.0770	0.167	0.286	0.189
4	214	0.0448	0.0587	0.0529	0.0597	0.0776	0.0751	0.160	0.244	0.181
5	265	0.0420	0.0559	0.0501	0.0576	0.0739	0.0696	0.150	0.220	0.171
6	325	0.0400	0.0538	0.0492	0.0515	0.0694	0.0681	0.145	0.204	0.169
7	373	0.0408	0.0539	0.0496	0.0549	0.0708	0.0696	0.147	0.200	0.170
8	437	0.0405	0.0530	0.0493	0.0542	0.0688	0.0706	0.146	0.193	0.169
9	484	0.0413	0.0533	0.0496	0.0547	0.0698	0.0711	0.149	0.194	0.170
10	547	0.0412	0.0536	0.0493	0.0532	0.0707	0.0721	0.150	0.190	0.170
11	615	0.0407	0.0526	0.0486	0.0542	0.0685	0.0686	0.149	0.185	0.169
12	661	0.0412	0.0526	0.0489	0.0549	0.0686	0.0686	0.150	0.185	0.169
13	724	0.0418	0.0532	0.0497	0.0556	0.0699	0.0696	0.152	0.186	0.172
14	778	0.0415	0.0524	0.0497	0.0554	0.0691	0.0716	0.151	0.183	0.172
15	838	0.0416	0.0521	0.0499	0.0554	0.0685	0.0741	0.151	0.182	0.173
16	899	0.0414	0.0517	0.0497	0.0556	0.0682	0.0721	0.151	0.181	0.172
17	948	0.0412	0.0514	0.0492	0.0554	0.0677	0.0736	0.150	0.180	0.171
18	1007	0.0410	0.0512	0.0495	0.0549	0.0677	0.0731	0.150	0.179	0.172
19	1051	0.0414	0.0514	0.0495	0.0550	0.0669	0.0731	0.152	0.181	0.172
20	1103	0.0415	0.0514	0.0493	0.0564	0.0673	0.0731	0.152	0.180	0.172
21	1141	0.0416	0.0512	0.0491	0.0557	0.0662	0.0716	0.152	0.180	0.171
22	1212	0.0413	0.0508	0.0489	0.0550	0.0662	0.0701	0.151	0.179	0.171
23	1269	0.0413	0.0508	0.0490	0.0547	0.0673	0.0711	0.151	0.178	0.171
24	1338	0.0409	0.0504	0.0488	0.0538	0.0669	0.0716	0.150	0.177	0.171
25	1391	0.0406	0.0501	0.0486	0.0532	0.0666	0.0726	0.149	0.176	0.170
26	1440	0.0406	0.0501	0.0484	0.0536	0.0670	0.0701	0.149	0.176	0.169
27	1494	0.0404	0.0497	0.0482	0.0532	0.0657	0.0711	0.148	0.174	0.168
28	1563	0.0401	0.0494	0.0480	0.0525	0.0649	0.0691	0.148	0.173	0.168
29	1628	0.0399	0.0490	0.0475	0.0526	0.0643	0.0691	0.147	0.172	0.167
30	1689	0.0399	0.0491	0.0473	0.0516	0.0646	0.0681	0.148	0.173	0.167
31	1761	0.0397	0.0489	0.0471	0.0515	0.0648	0.0667	0.147	0.172	0.166
32	1808	0.0399	0.0491	0.0471	0.0512	0.0655	0.0672	0.148	0.173	0.167
33	1881	0.0398	0.0488	0.0469	0.0506	0.0655	0.0667	0.148	0.172	0.166
34	1931	0.0399	0.0490	0.0471	0.0508	0.0655	0.0672	0.149	0.173	0.167
35	1980	0.0398	0.0487	0.0470	0.0515	0.0655	0.0672	0.148	0.173	0.167
36	2047	0.0398	0.0487	0.0471	0.0505	0.0650	0.0662	0.148	0.172	0.167
37	2096	0.0396	0.0484	0.0469	0.0509	0.0652	0.0647	0.147	0.171	0.166
38	2143	0.0397	0.0485	0.0471	0.0506	0.0648	0.0662	0.148	0.172	0.167
39	2198	0.0397	0.0485	0.0472	0.0502	0.0639	0.0667	0.148	0.172	0.167
40	2264	0.0396	0.0484	0.0472	0.0508	0.0643	0.0667	0.148	0.171	0.167
41	2327	0.0396	0.0484	0.0474	0.0508	0.0645	0.0681	0.148	0.171	0.168
42	2380	0.0397	0.0485	0.0475	0.0511	0.0649	0.0686	0.148	0.172	0.168
43	2430	0.0396	0.0483	0.0475	0.0509	0.0639	0.0672	0.148	0.171	0.168
44	2490	0.0396	0.0482	0.0473	0.0515	0.0641	0.0677	0.148	0.171	0.168
45	2546	0.0394	0.0479	0.0472	0.0508	0.0636	0.0672	0.147	0.171	0.167
46	2603	0.0393	0.0478	0.0471	0.0514	0.0636	0.0657	0.147	0.170	0.167
47	2658	0.0391	0.0476	0.0469	0.0499	0.0631	0.0667	0.146	0.169	0.167
48	2716	0.0390	0.0474	0.0468	0.0501	0.0624	0.0662	0.146	0.169	0.166
49	2758	0.0389	0.0473	0.0467	0.0498	0.0617	0.0657	0.146	0.169	0.166

Number of Trees	Number of Leaves	Average Square Error (Train)	Average Square Error (Out of Bag)	Average Square Error (Validate)	Misclassification Rate (Train)	Misclassification Rate (Out of Bag)	Misclassification Rate (Validate)	Log Loss (Train)	Log Loss (Out of Bag)	Log Loss (Validate)
50	2806	0.0389	0.0472	0.0467	0.0502	0.0617	0.0657	0.146	0.168	0.166
51	2874	0.0389	0.0472	0.0467	0.0502	0.0614	0.0652	0.146	0.169	0.166
52	2926	0.0390	0.0474	0.0468	0.0499	0.0619	0.0652	0.146	0.169	0.166
53	2978	0.0390	0.0474	0.0467	0.0502	0.0621	0.0642	0.146	0.169	0.166
54	3039	0.0390	0.0473	0.0465	0.0498	0.0618	0.0642	0.146	0.169	0.166
55	3096	0.0391	0.0474	0.0466	0.0505	0.0621	0.0642	0.146	0.169	0.166
56	3157	0.0390	0.0473	0.0465	0.0502	0.0615	0.0637	0.146	0.169	0.165
57	3212	0.0391	0.0474	0.0466	0.0506	0.0612	0.0652	0.146	0.169	0.166
58	3278	0.0389	0.0473	0.0465	0.0506	0.0615	0.0642	0.146	0.169	0.165
59	3327	0.0390	0.0473	0.0466	0.0501	0.0617	0.0647	0.146	0.169	0.165
60	3379	0.0388	0.0471	0.0464	0.0498	0.0617	0.0642	0.145	0.168	0.165
61	3445	0.0388	0.0471	0.0464	0.0499	0.0619	0.0642	0.145	0.168	0.165
62	3495	0.0388	0.0470	0.0463	0.0495	0.0617	0.0642	0.145	0.168	0.165
63	3549	0.0388	0.0470	0.0463	0.0494	0.0618	0.0642	0.145	0.168	0.165
64	3605	0.0388	0.0470	0.0463	0.0492	0.0618	0.0647	0.145	0.168	0.165
65	3655	0.0388	0.0469	0.0462	0.0497	0.0614	0.0632	0.145	0.168	0.164
66	3701	0.0388	0.0470	0.0461	0.0499	0.0618	0.0637	0.145	0.168	0.164
67	3758	0.0389	0.0470	0.0462	0.0501	0.0619	0.0637	0.146	0.168	0.164
68	3815	0.0389	0.0471	0.0463	0.0501	0.0625	0.0637	0.146	0.168	0.165
69	3871	0.0389	0.0470	0.0462	0.0495	0.0624	0.0632	0.145	0.168	0.164
70	3918	0.0390	0.0471	0.0463	0.0497	0.0621	0.0637	0.146	0.168	0.165
71	3966	0.0389	0.0470	0.0462	0.0498	0.0618	0.0642	0.145	0.168	0.164
72	4031	0.0388	0.0470	0.0462	0.0498	0.0615	0.0647	0.145	0.168	0.164
73	4079	0.0389	0.0470	0.0462	0.0497	0.0619	0.0642	0.145	0.168	0.164
74	4142	0.0389	0.0471	0.0462	0.0501	0.0619	0.0642	0.145	0.168	0.164
75	4201	0.0389	0.0470	0.0462	0.0501	0.0625	0.0647	0.145	0.168	0.164

**SAS Enterprise Miner Report**  
**Node=Modified Forest 2**  
**Iteration Plot**

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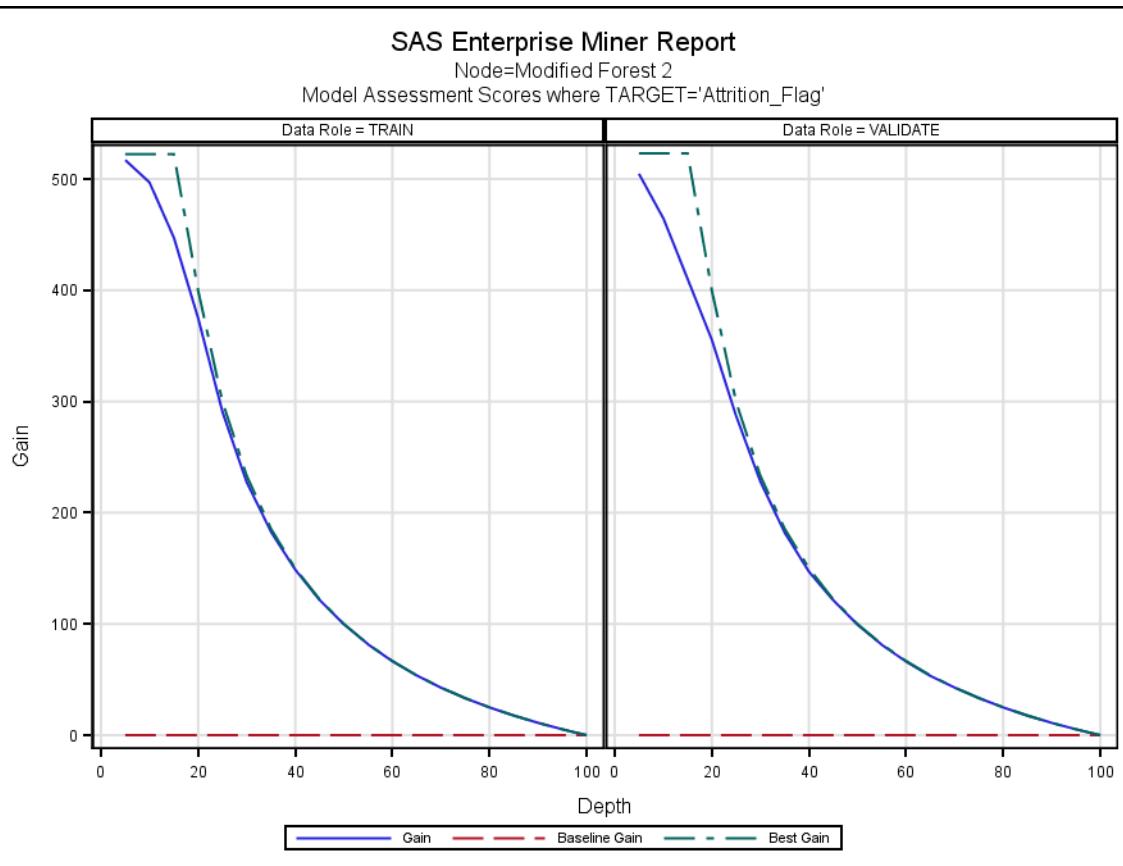
**Node=Modified Forest 2****Variable Importance**

Variable Name	Number of Splitting Rules	Train: Gini Reduction	Train: Margin Reduction	OOB: Gini Reduction	OOB: Margin Reduction	Valid: Gini Reduction	Valid: Margin Reduction	Label
RANGE_LOG_Total_Trans_Amt	884	0.031919	0.063837	0.02379	0.054508	0.02531	0.056575	Transformed: Transformed Total_Trans_Amt
G_Total_Trans_Ct	609	0.041941	0.083881	0.03860	0.082528	0.03358	0.075296	Grouped Levels for Total_Trans_Ct
RANGE_SQRT_Total_Ct_Chng_Q4_Q1	430	0.021656	0.043312	0.01605	0.037274	0.01707	0.039852	Transformed: Transformed Total_Ct_Chng_Q4_Q1
G_Total_Relationship_Count	419	0.012993	0.025985	0.01067	0.023217	0.01388	0.026237	Grouped Levels for Total_Relationship_Count
RANGE_Total_Revolving_Bal	393	0.025222	0.050443	0.02123	0.046485	0.02180	0.047107	Transformed Total_Revolving_Bal
G_Contacts_Count_12_mon	306	0.004690	0.009381	0.00343	0.008914	0.00307	0.008814	Grouped Levels for Contacts_Count_12_mon
G_Months_Inactive_12_mon	295	0.003801	0.007601	0.00208	0.006083	0.00327	0.006421	Grouped Levels for Months_Inactive_12_mon
RANGE_SQRT_Total_Amt_Chng_Q4_Q1	294	0.005456	0.010912	0.00173	0.006907	0.00219	0.007197	Transformed: Transformed Total_Amt_Chng_Q4_Q1
RANGE_SQRT_Avg_Utilization_Ratio	209	0.016787	0.033573	0.01446	0.031207	0.01216	0.029354	Transformed: Transformed Avg_Utilization_Ratio
G_Customer_Age	156	0.001756	0.003512	0.00045	0.002712	0.00010	0.002220	Grouped Levels for Customer_Age
G_Months_on_book	131	0.000767	0.001535	-0.00032	0.000890	-0.00044	0.000718	Grouped Levels for Months_on_book

## SAS Enterprise Miner Report

Node=Modified Forest 2

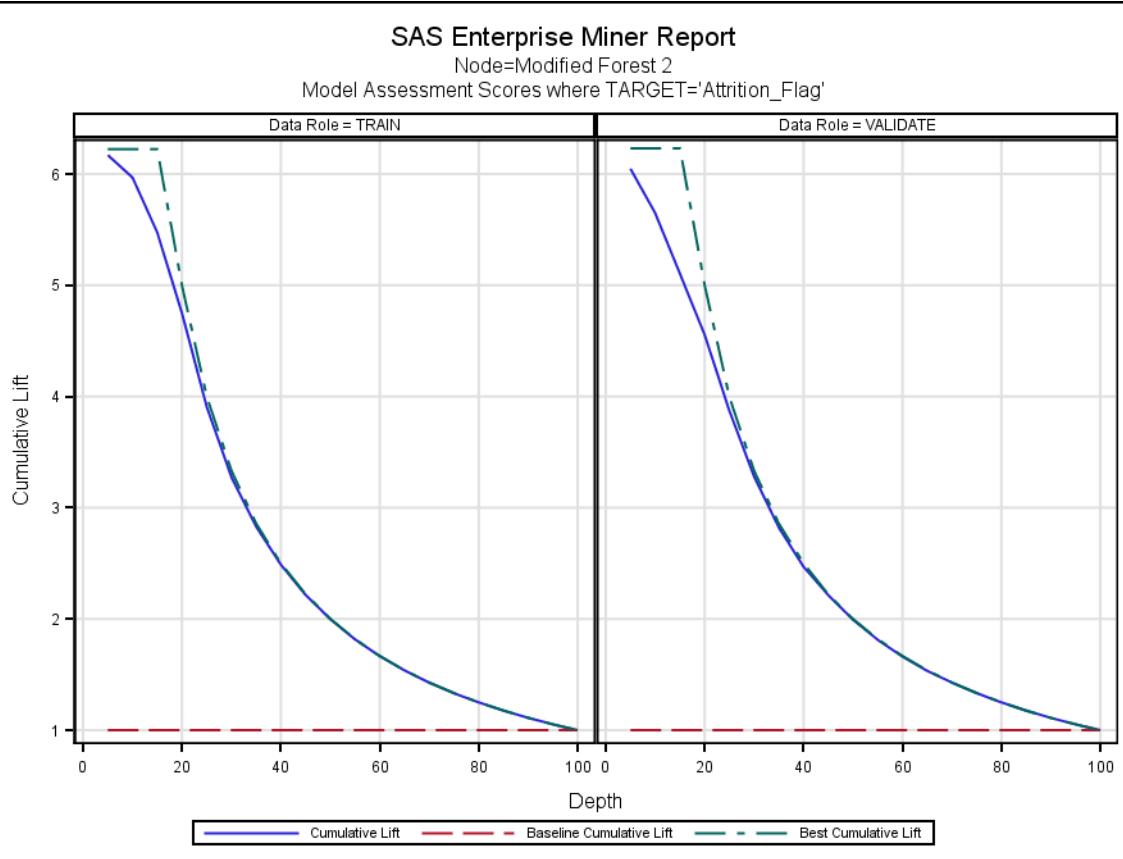
Model Assessment Scores where TARGET='Attrition\_Flag'

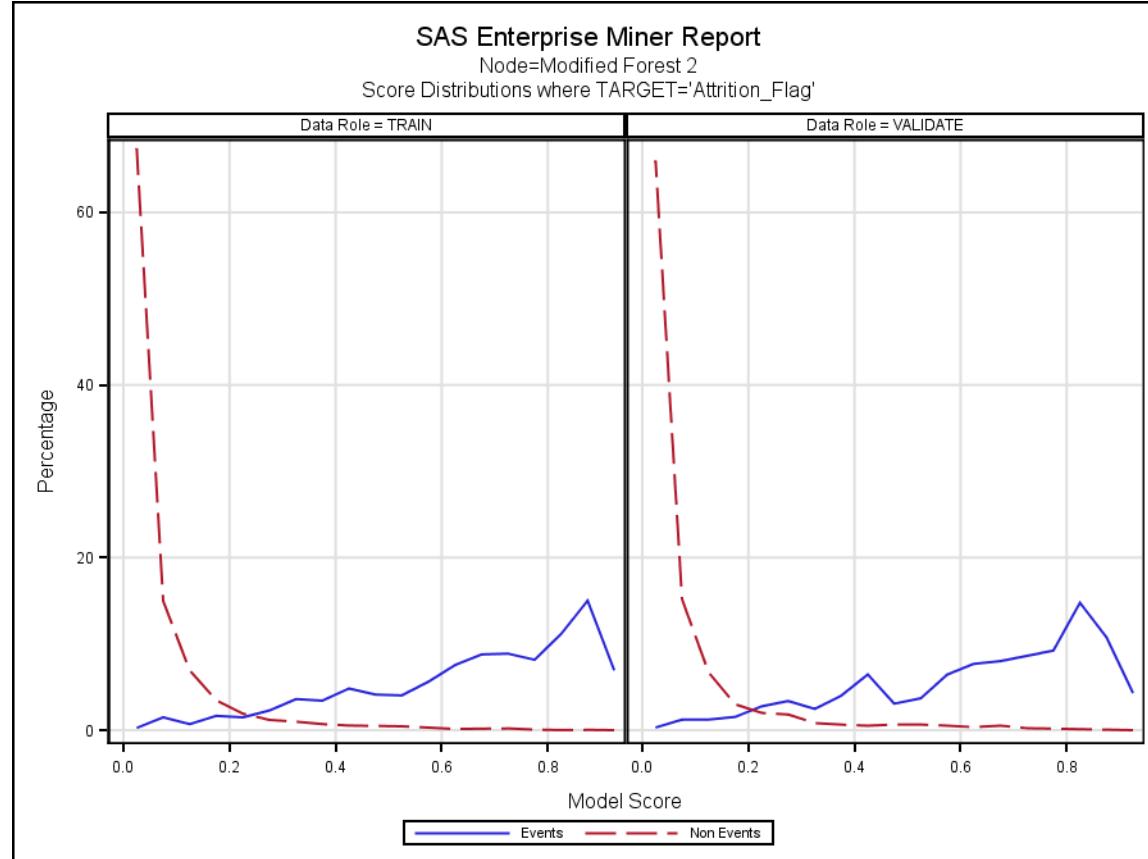
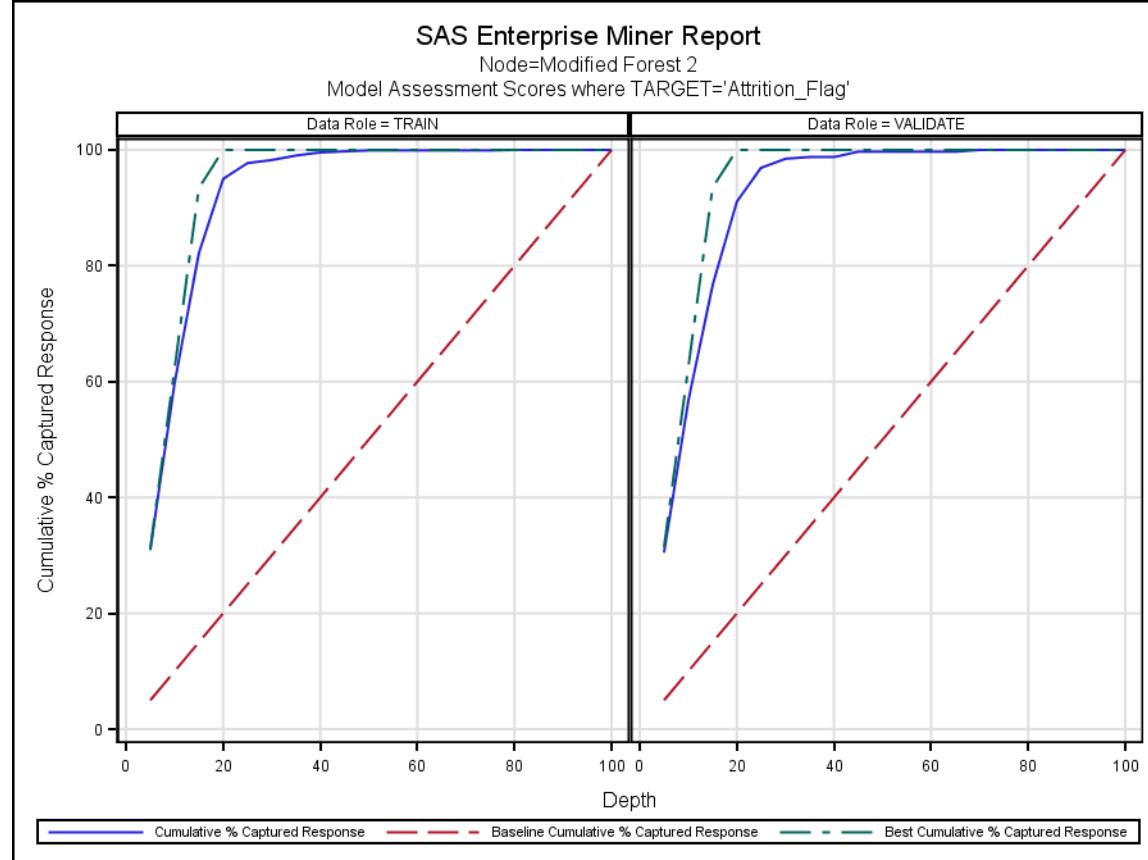


## SAS Enterprise Miner Report

Node=Modified Forest 2

Model Assessment Scores where TARGET='Attrition\_Flag'

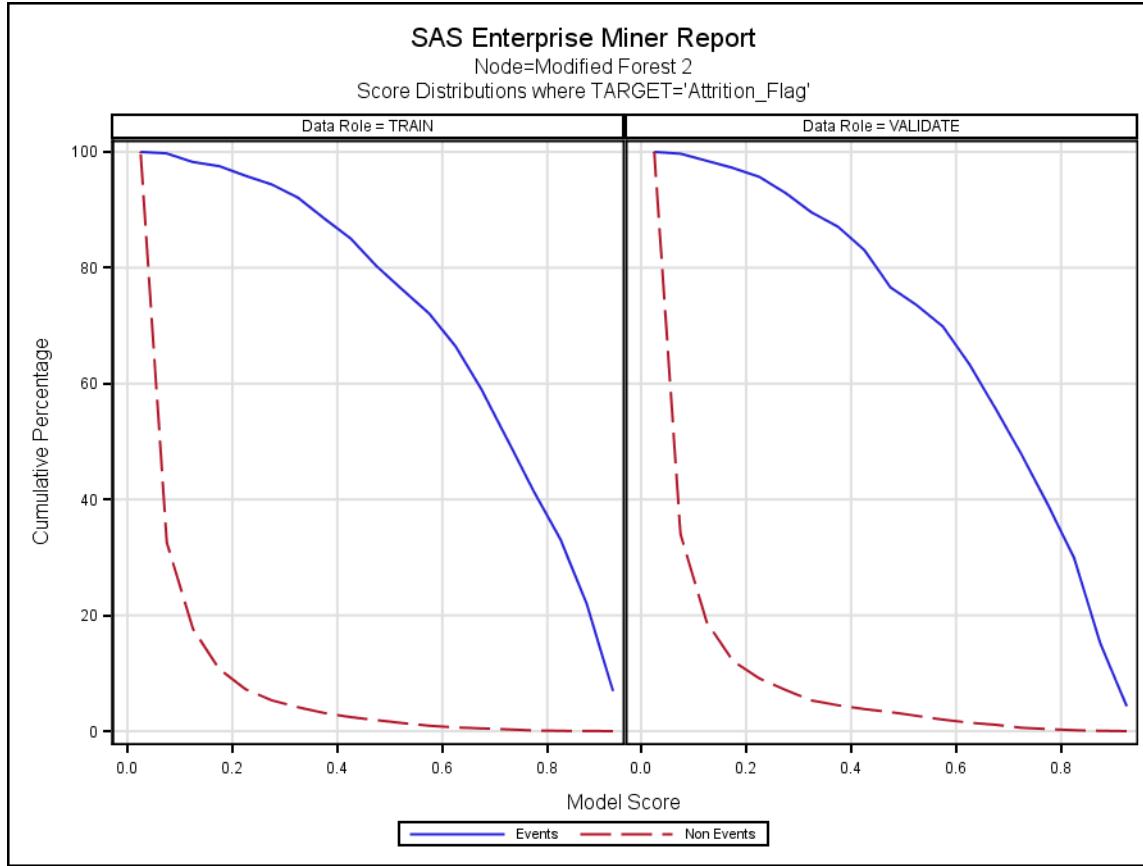




# SAS Enterprise Miner Report

Node=Modified Forest 2

Score Distributions where TARGET='Attrition\_Flag'



Node=Modified Forest 2

Score Distributions

Target Variable=Attrition\_Flag Data Role=TRAIN

Posterior Probability Range	Number of Events	Percentage of Events	Percentage of Nonevents	Cumulative Percentage of Events	Cumulative Percentage of Nonevents
0.90-0.95	79	6.9359	0.0000	6.936	0.000
0.85-0.90	171	15.0132	0.0336	21.949	0.034
0.80-0.85	127	11.1501	0.0168	33.099	0.050
0.75-0.80	93	8.1651	0.0672	41.264	0.118
0.70-0.75	101	8.8674	0.2017	50.132	0.319
0.65-0.70	100	8.7796	0.1681	58.911	0.487
0.60-0.65	86	7.5505	0.1513	66.462	0.639
0.55-0.60	64	5.6190	0.3026	72.081	0.941
0.50-0.55	46	4.0386	0.4539	76.119	1.395
0.45-0.50	47	4.1264	0.5043	80.246	1.899
0.40-0.45	55	4.8288	0.5379	85.075	2.437
0.35-0.40	39	3.4241	0.7060	88.499	3.143
0.30-0.35	41	3.5996	0.9918	92.098	4.135
0.25-0.30	26	2.2827	1.1935	94.381	5.329
0.20-0.25	17	1.4925	1.9163	95.874	7.245
0.15-0.20	19	1.6681	3.4628	97.542	10.708
0.10-0.15	8	0.7024	6.9255	98.244	17.633
0.05-0.10	17	1.4925	14.9437	99.737	32.577
0.00-0.05	3	0.2634	67.4231	100.000	100.000

Target Variable=Attrition\_Flag Data Role=VALIDATE

Posterior Probability Range	Number of Events	Percentage of Events	Percentage of Nonevents	Cumulative Percentage of Events	Cumulative Percentage of Nonevents
0.90-0.95	14	4.3077	0.0000	4.308	0.000
0.85-0.90	35	10.7692	0.0588	15.077	0.059
0.80-0.85	48	14.7692	0.1176	29.846	0.176
0.75-0.80	30	9.2308	0.1765	39.077	0.353
0.70-0.75	28	8.6154	0.2353	47.692	0.588
0.65-0.70	26	8.0000	0.5294	55.692	1.118
0.60-0.65	25	7.6923	0.3529	63.385	1.471
0.55-0.60	21	6.4615	0.5294	69.846	2.000
0.50-0.55	12	3.6923	0.6471	73.538	2.647
0.45-0.50	10	3.0769	0.6471	76.615	3.294
0.40-0.45	21	6.4615	0.5294	83.077	3.824
0.35-0.40	13	4.0000	0.6471	87.077	4.471
0.30-0.35	8	2.4615	0.8235	89.538	5.294
0.25-0.30	11	3.3846	1.8235	92.923	7.118
0.20-0.25	9	2.7692	2.0000	95.692	9.118
0.15-0.20	5	1.5385	3.0000	97.231	12.118
0.10-0.15	4	1.2308	6.7059	98.462	18.824
0.05-0.10	4	1.2308	15.1765	99.692	34.000
0.00-0.05	1	0.3077	66.0000	100.000	100.000

## SAS Enterprise Miner Report

### Node=Modified Forest 1 Summary

Node id = HPDMForest3  
 Node label = Modified Forest 1  
 Meta path = Ids => Varsel => Trans => Meta => Trans2 => Meta2 => Part2 => HPDMForest3  
 Notes =

### Node=Modified Forest 1 Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	HPDMForest		MAXTREES	50	100	SPLITSIZE	.	
ALPHA	0.05		MINCATSIZE	5		TRAINFRACTION	0.6	
CATBINS	30		MINUSEINSEARCH	1		TRAINN	.	
EXHAUSTIVE	5000		MISSING	USEINSEARCH		ToolType	MODEL	
LEAFFRACTION	0.00001		NUMOBSMETHOD	PERCENTAGE		VARSELECT	Y	
LEAFSIZE	1		RBACUT	0.01		VARS_TO_TRY	.	
LEAFSIZEMETHOD	DEFAULT		RBATOPNUM	25		VIMETHOD	LOSSREDUCTION	
MAXDEPTH	50		SEED	78354	12345			

### Node=Modified Forest 1 Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag
INPUT	INTERVAL	5	RANGE_LOG_Total_Trans_Amt RANGE_SQRT_Avg_Utilization_Ratio RANGE_SQRT_Total_Amt_Chng_Q4_Q1 RANGE_SQRT_Total_Ct_Chng_Q4_Q1 RANGE_Total_Revolving_Bal
INPUT	NOMINAL	6	G_Contacts_Count_12_mon G_Customer_Age G_Months_Inactive_12_mon G_Months_on_book G_Total_Relationship_Count G_Total_Trans_Ct
ID	INTERVAL	1	_dataobs_

### Node=Modified Forest 1 Model Fit Statistics

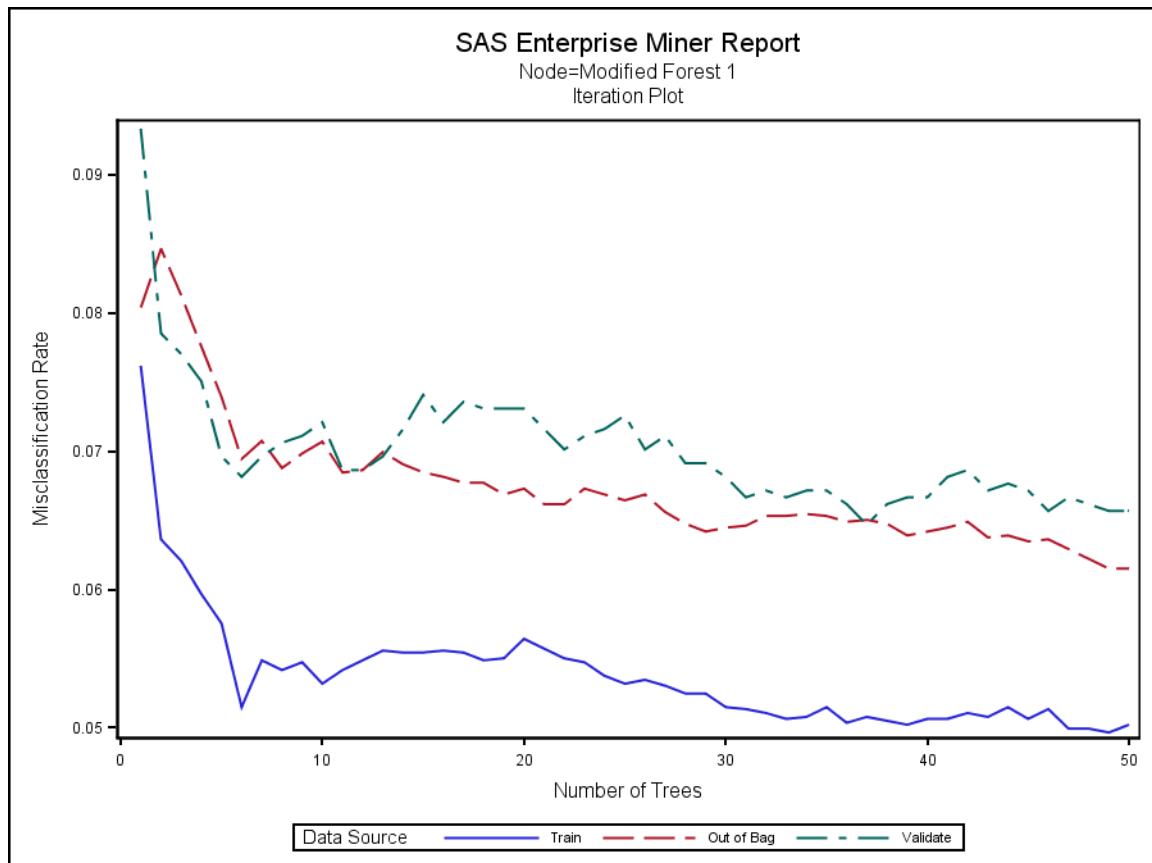
Target=Attrition\_Flag Target Label=''

Label of Statistic	Train	Validation	Test
Average Squared Error	0.04	0.05	0.05
Divisor for ASE	14176.00	4050.00	2028.00
Maximum Absolute Error	0.99	0.98	0.94
Sum of Frequencies	7088.00	2025.00	1014.00
Root Average Squared Error	0.20	0.22	0.21
Sum of Squared Errors	551.56	189.25	92.35
Frequency of Classified Cases	7088.00	2025.00	1014.00
Misclassification Rate	0.05	0.07	0.06
Number of Wrong Classifications	356.00	133.00	59.00

### Node=Modified Forest 1 Iteration History

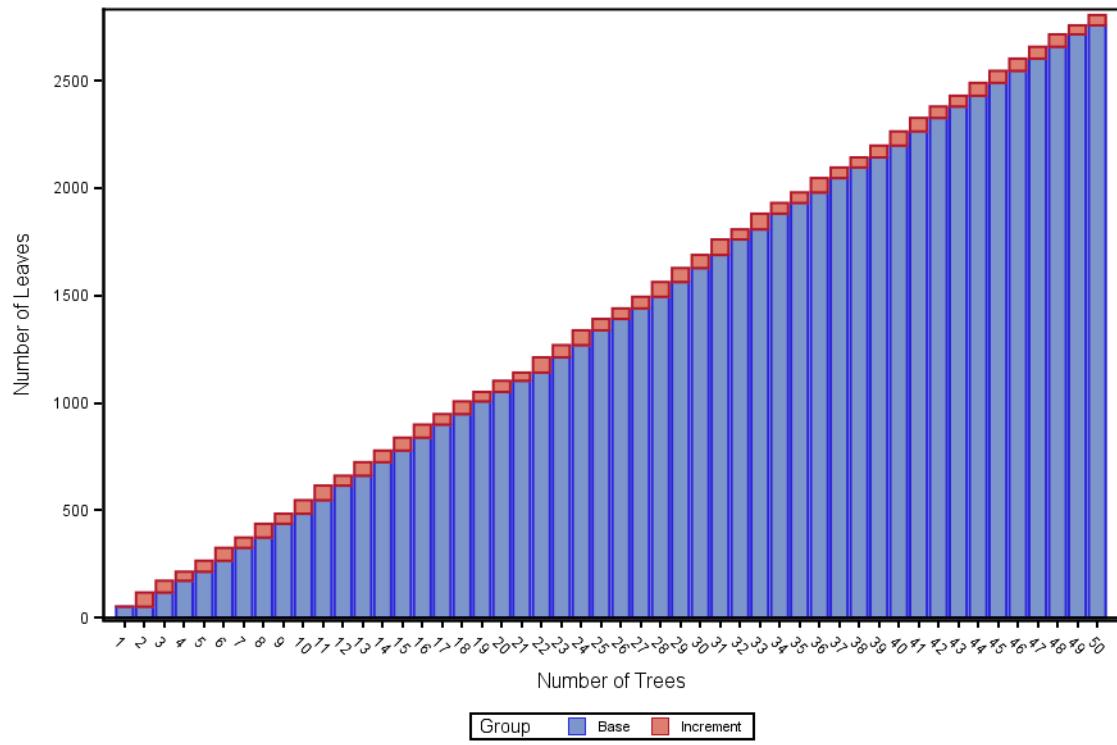
Number of Trees	Number of Leaves	Average Square Error (Train)	Average Square Error (Out of Bag)	Average Square Error (Validate)	Misclassification Rate (Train)	Misclassification Rate (Out of Bag)	Misclassification Rate (Validate)	Log Loss (Train)	Log Loss (Out of Bag)	Log Loss (Validate)
1	51	0.0578	0.0629	0.0682	0.0762	0.0804	0.0933	0.213	0.255	0.240
2	117	0.0498	0.0653	0.0587	0.0636	0.0846	0.0785	0.177	0.328	0.202
3	172	0.0471	0.0627	0.0557	0.0621	0.0813	0.0770	0.167	0.286	0.189
4	214	0.0448	0.0587	0.0529	0.0597	0.0776	0.0751	0.160	0.244	0.181
5	265	0.0420	0.0559	0.0501	0.0576	0.0739	0.0696	0.150	0.220	0.171
6	325	0.0400	0.0538	0.0492	0.0515	0.0694	0.0681	0.145	0.204	0.169
7	373	0.0408	0.0539	0.0496	0.0549	0.0708	0.0696	0.147	0.200	0.170
8	437	0.0405	0.0530	0.0493	0.0542	0.0688	0.0706	0.146	0.193	0.169
9	484	0.0413	0.0533	0.0496	0.0547	0.0698	0.0711	0.149	0.194	0.170
10	547	0.0412	0.0536	0.0493	0.0532	0.0707	0.0721	0.150	0.190	0.170
11	615	0.0407	0.0526	0.0486	0.0542	0.0685	0.0686	0.149	0.185	0.169
12	661	0.0412	0.0526	0.0489	0.0549	0.0686	0.0686	0.150	0.185	0.169
13	724	0.0418	0.0532	0.0497	0.0556	0.0699	0.0696	0.152	0.186	0.172
14	778	0.0415	0.0524	0.0497	0.0554	0.0691	0.0716	0.151	0.183	0.172
15	838	0.0416	0.0521	0.0499	0.0554	0.0685	0.0741	0.151	0.182	0.173
16	899	0.0414	0.0517	0.0497	0.0556	0.0682	0.0721	0.151	0.181	0.172
17	948	0.0412	0.0514	0.0492	0.0554	0.0677	0.0736	0.150	0.180	0.171
18	1007	0.0410	0.0512	0.0495	0.0549	0.0677	0.0731	0.150	0.179	0.172
19	1051	0.0414	0.0514	0.0495	0.0550	0.0669	0.0731	0.152	0.181	0.172
20	1103	0.0415	0.0514	0.0493	0.0564	0.0673	0.0731	0.152	0.180	0.172
21	1141	0.0416	0.0512	0.0491	0.0557	0.0662	0.0716	0.152	0.180	0.171
22	1212	0.0413	0.0508	0.0489	0.0550	0.0662	0.0701	0.151	0.179	0.171
23	1269	0.0413	0.0508	0.0490	0.0547	0.0673	0.0711	0.151	0.178	0.171
24	1338	0.0409	0.0504	0.0488	0.0538	0.0669	0.0716	0.150	0.177	0.171
25	1391	0.0406	0.0501	0.0486	0.0532	0.0665	0.0726	0.149	0.176	0.170
26	1440	0.0406	0.0501	0.0485	0.0535	0.0669	0.0701	0.149	0.176	0.169
27	1494	0.0403	0.0497	0.0482	0.0530	0.0656	0.0711	0.148	0.174	0.169
28	1563	0.0401	0.0494	0.0481	0.0525	0.0648	0.0691	0.148	0.173	0.168
29	1628	0.0398	0.0490	0.0475	0.0525	0.0642	0.0691	0.147	0.172	0.167
30	1689	0.0399	0.0491	0.0473	0.0515	0.0645	0.0681	0.148	0.173	0.167
31	1761	0.0397	0.0489	0.0471	0.0514	0.0646	0.0667	0.147	0.172	0.166
32	1808	0.0399	0.0491	0.0471	0.0511	0.0653	0.0672	0.148	0.173	0.167
33	1881	0.0398	0.0488	0.0470	0.0506	0.0653	0.0667	0.148	0.172	0.166
34	1931	0.0399	0.0490	0.0471	0.0508	0.0655	0.0672	0.149	0.173	0.167
35	1980	0.0398	0.0487	0.0470	0.0515	0.0653	0.0672	0.148	0.173	0.167
36	2047	0.0398	0.0486	0.0471	0.0504	0.0649	0.0662	0.148	0.172	0.167
37	2096	0.0396	0.0484	0.0469	0.0508	0.0650	0.0647	0.147	0.171	0.167
38	2143	0.0397	0.0485	0.0472	0.0505	0.0648	0.0662	0.148	0.172	0.167
39	2198	0.0397	0.0485	0.0472	0.0502	0.0639	0.0667	0.148	0.172	0.167
40	2264	0.0396	0.0484	0.0472	0.0506	0.0642	0.0667	0.148	0.171	0.167
41	2327	0.0396	0.0484	0.0474	0.0506	0.0645	0.0681	0.148	0.171	0.168
42	2380	0.0397	0.0484	0.0475	0.0511	0.0649	0.0686	0.148	0.172	0.168
43	2430	0.0396	0.0482	0.0475	0.0508	0.0638	0.0672	0.148	0.171	0.168
44	2490	0.0396	0.0482	0.0474	0.0515	0.0639	0.0677	0.148	0.171	0.168
45	2546	0.0394	0.0479	0.0472	0.0506	0.0635	0.0672	0.147	0.170	0.167
46	2603	0.0393	0.0478	0.0471	0.0514	0.0636	0.0657	0.147	0.170	0.167
47	2658	0.0391	0.0476	0.0469	0.0499	0.0629	0.0667	0.146	0.169	0.167
48	2716	0.0390	0.0474	0.0468	0.0499	0.0622	0.0662	0.146	0.169	0.166

Number of Trees	Number of Leaves	Average Square Error (Train)	Average Square Error (Out of Bag)	Average Square Error (Validate)	Misclassification Rate (Train)	Misclassification Rate (Out of Bag)	Misclassification Rate (Validate)	Log Loss (Train)	Log Loss (Out of Bag)	Log Loss (Validate)
49	2758	0.0389	0.0473	0.0467	0.0497	0.0615	0.0657	0.146	0.169	0.166
50	2806	0.0389	0.0472	0.0467	0.0502	0.0615	0.0657	0.146	0.168	0.166



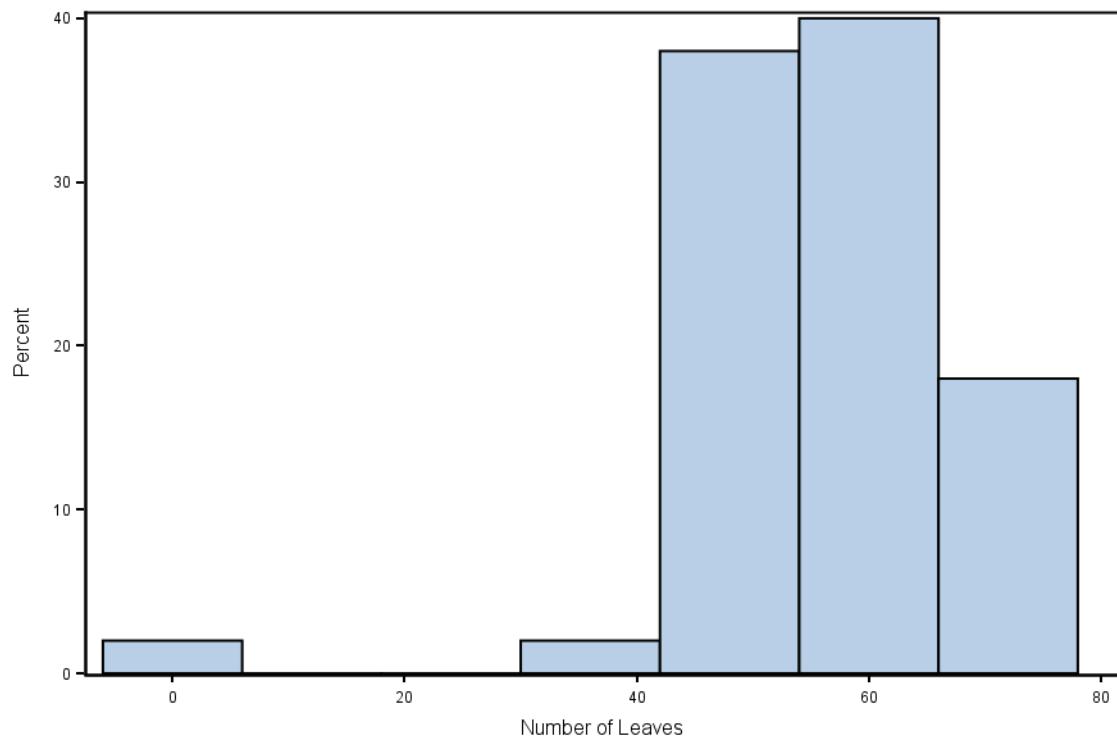
SAS Enterprise Miner Report

Node=Modified Forest 1  
Leaf Plot



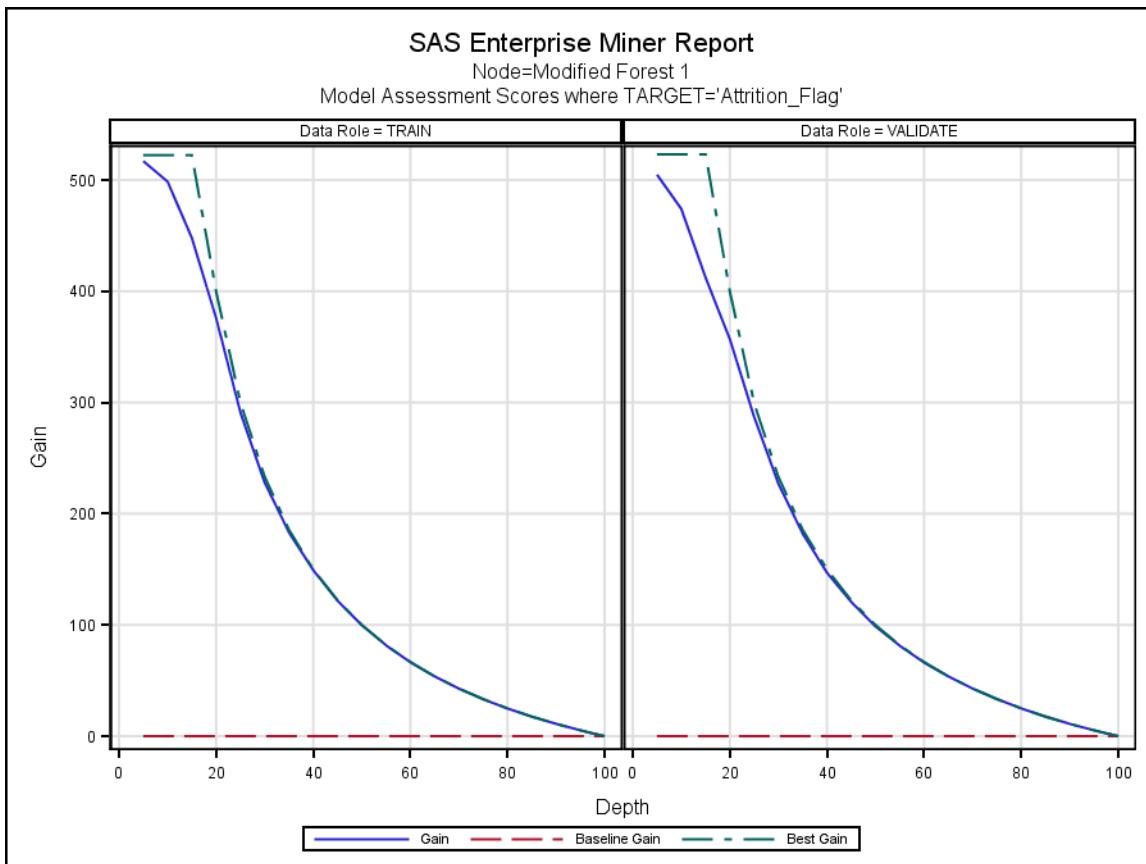
SAS Enterprise Miner Report

Node=Modified Forest 1  
Leaf Statistics



Node=Modified Forest 1  
Variable Importance

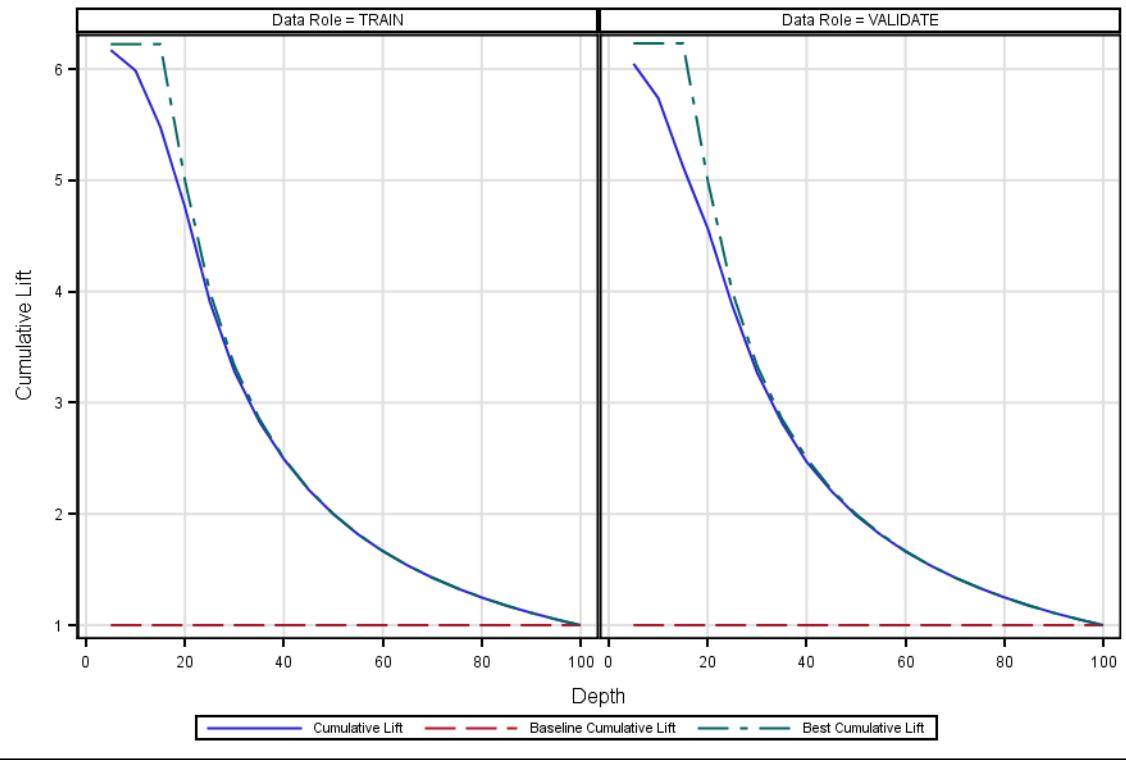
Variable Name	Number of Splitting Rules	Train: Gini Reduction	Train: Margin Reduction	OOB: Gini Reduction	OOB: Margin Reduction	Valid: Gini Reduction	Valid: Margin Reduction	Label
RANGE_LOG_Total_Trans_Amt	599	0.033763	0.067525	0.02647	0.058468	0.02646	0.059180	Transformed: Transformed Total_Trans_Amt
G_Total_Trans_Ct	406	0.040646	0.081291	0.03652	0.079675	0.03225	0.073223	Grouped Levels for Total_Trans_Ct
G_Total_Relationship_Count	283	0.012618	0.025236	0.00983	0.022174	0.01323	0.025179	Grouped Levels for Total_Relationship_Count
RANGE_SQRT_Total_Ct_Chng_Q4_Q1	281	0.021601	0.043203	0.01571	0.036845	0.01705	0.039765	Transformed: Transformed Total_Ct_Chng_Q4_Q1
RANGE_Total_Revolving_Bal	262	0.024412	0.048823	0.01983	0.044119	0.02053	0.044957	Transformed Total_Revolving_Bal
G_Contacts_Count_12_mon	205	0.004352	0.008705	0.00324	0.008461	0.00299	0.008454	Grouped Levels for Contacts_Count_12_mon
G_Months_Inactive_12_mon	192	0.003686	0.007372	0.00204	0.006080	0.00296	0.006002	Grouped Levels for Months_Inactive_12_mon
RANGE_SQRT_Total_Amt_Chng_Q4_Q1	190	0.005306	0.010613	0.00169	0.006653	0.00204	0.006859	Transformed: Transformed Total_Amt_Chng_Q4_Q1
RANGE_SQRT_Avg_Utilization_Ratio	144	0.017495	0.034990	0.01562	0.033161	0.01290	0.030954	Transformed: Transformed Avg_Utilization_Ratio
G_Customer_Age	108	0.002013	0.004026	0.00055	0.002977	0.00021	0.002550	Grouped Levels for Customer_Age
G_Months_on_book	86	0.000680	0.001359	-0.00031	0.000800	-0.00040	0.000712	Grouped Levels for Months_on_book



## SAS Enterprise Miner Report

Node=Modified Forest 1

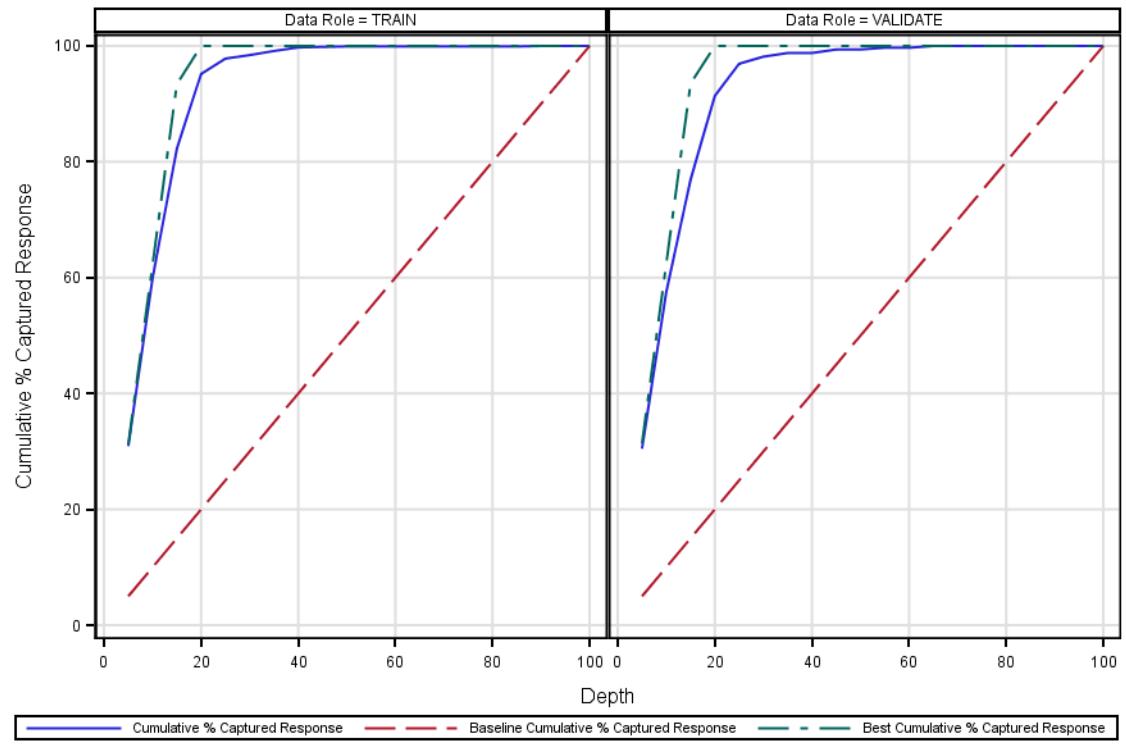
Model Assessment Scores where TARGET='Attrition\_Flag'

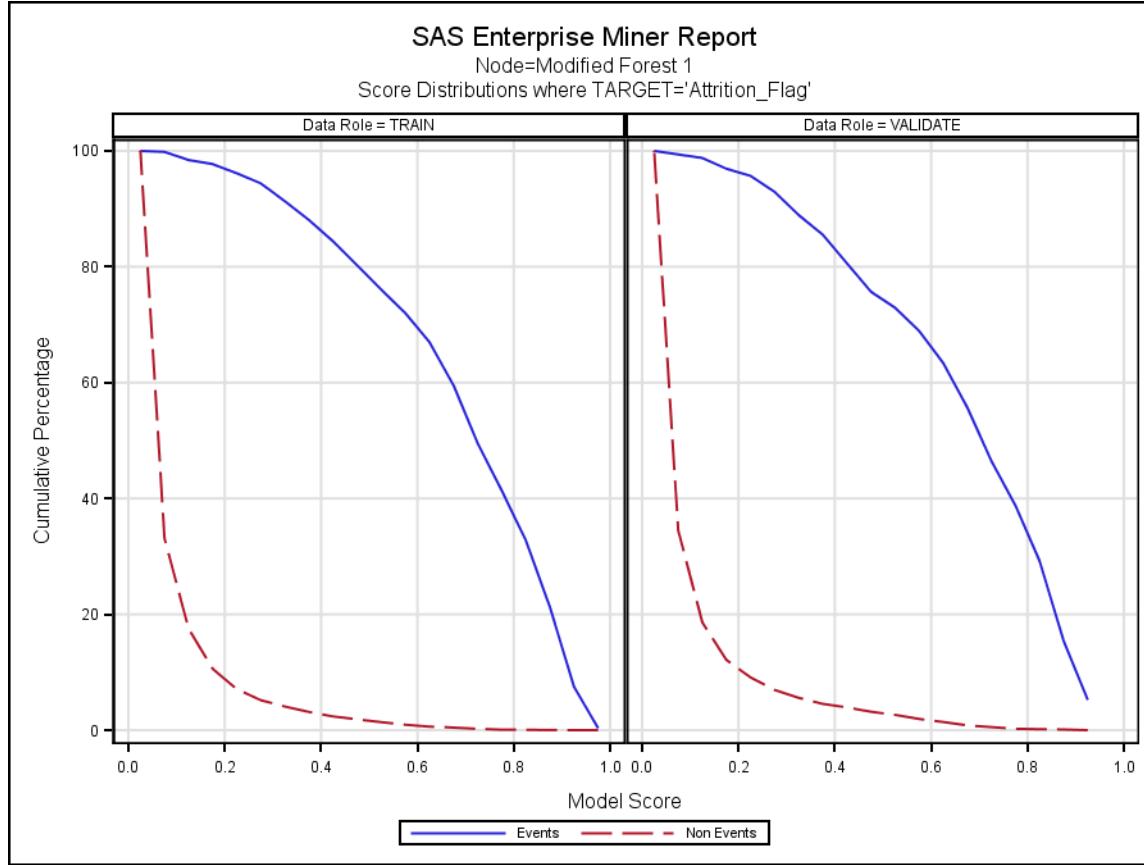
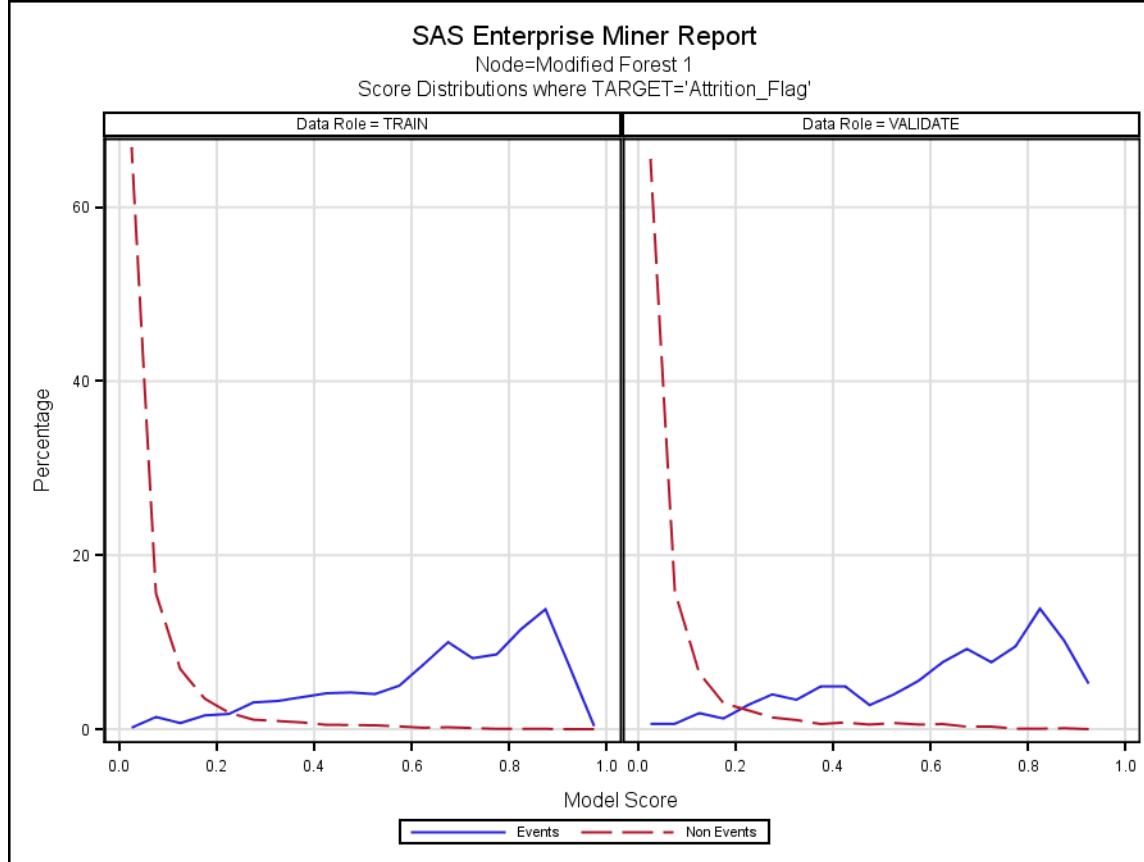


## SAS Enterprise Miner Report

Node=Modified Forest 1

Model Assessment Scores where TARGET='Attrition\_Flag'





**Node=Modified Forest 1**  
**Score Distributions**

Target Variable=Attrition\_Flag 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	4	0.3512	0.0000	0.351	0.000
0.90-0.95	81	7.1115	0.0000	7.463	0.000
0.85-0.90	157	13.7840	0.0336	21.247	0.034
0.80-0.85	131	11.5013	0.0336	32.748	0.067
0.75-0.80	98	8.6040	0.0336	41.352	0.101
0.70-0.75	93	8.1651	0.1345	49.517	0.235
0.65-0.70	114	10.0088	0.2185	59.526	0.454
0.60-0.65	85	7.4627	0.1681	66.989	0.622
0.55-0.60	57	5.0044	0.3194	71.993	0.941
0.50-0.55	46	4.0386	0.4539	76.032	1.395
0.45-0.50	48	4.2142	0.4707	80.246	1.866
0.40-0.45	47	4.1264	0.5043	84.372	2.370
0.35-0.40	42	3.6874	0.7732	88.060	3.143
0.30-0.35	37	3.2485	0.9413	91.308	4.085
0.25-0.30	35	3.0729	1.0926	94.381	5.177
0.20-0.25	20	1.7559	1.8995	96.137	7.077
0.15-0.20	18	1.5803	3.5132	97.717	10.590
0.10-0.15	8	0.7024	6.9087	98.420	17.499
0.05-0.10	16	1.4047	15.6161	99.824	33.115
0.00-0.05	2	0.1756	66.8852	100.000	100.000

Target Variable=Attrition\_Flag Data Role=VALIDATE

Posterior Probability Range	Number of Events	Percentage of Events	Percentage of Nonevents	Cumulative Percentage of Events	Cumulative Percentage of Nonevents
0.90-0.95	17	5.2308	0.0000	5.231	0.000
0.85-0.90	33	10.1538	0.1176	15.385	0.118
0.80-0.85	45	13.8462	0.0588	29.231	0.176
0.75-0.80	31	9.5385	0.0588	38.769	0.235
0.70-0.75	25	7.6923	0.2941	46.462	0.529
0.65-0.70	30	9.2308	0.2941	55.692	0.824
0.60-0.65	25	7.6923	0.5882	63.385	1.412
0.55-0.60	18	5.5385	0.5294	68.923	1.941
0.50-0.55	13	4.0000	0.7059	72.923	2.647
0.45-0.50	9	2.7692	0.5294	75.692	3.176
0.40-0.45	16	4.9231	0.7647	80.615	3.941
0.35-0.40	16	4.9231	0.5882	85.538	4.529
0.30-0.35	11	3.3846	1.0588	88.923	5.588
0.25-0.30	13	4.0000	1.3529	92.923	6.941
0.20-0.25	9	2.7692	2.1765	95.692	9.118
0.15-0.20	4	1.2308	3.0000	96.923	12.118
0.10-0.15	6	1.8462	6.4706	98.769	18.588
0.05-0.10	2	0.6154	15.8824	99.385	34.471
0.00-0.05	2	0.6154	65.5294	100.000	100.000

## SAS Enterprise Miner Report

### Node=Standard Forest Summary

Node id = HPDMForest  
 Node label = Standard Forest  
 Meta path = Ids => Varsel => Trans => Meta => Trans2 => Meta2 => Part2 => HPDMForest  
 Notes =

### Node=Standard Forest Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	HPDMForest		MAXTREES	100		SPLITSIZE	.	
ALPHA	0.05		MINCATSIZE	5		TRAINFRACTION	0.6	
CATBINS	30		MINUSEINSEARCH	1		TRAINN	.	
EXHAUSTIVE	5000		MISSING	USEINSEARCH		ToolType	MODEL	
LEAFFRACTION	0.00001		NUMOBSMETHOD	PERCENTAGE		VARSELECT	Y	
LEAFSIZE	1		RBACUT	0.01		VARS_TO_TRY	.	
LEAFSIZEMETHOD	DEFAULT		RBATOPNUM	25		VIMETHOD	LOSSREDUCTION	
MAXDEPTH	50		SEED	78354	12345			

### Node=Standard Forest Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag
INPUT	INTERVAL	5	RANGE_LOG_Total_Trans_Amt RANGE_SQRT_Avg_Utilization_Ratio RANGE_SQRT_Total_Amt_Chng_Q4_Q1 RANGE_SQRT_Total_Ct_Chng_Q4_Q1 RANGE_Total_Revolving_Bal
INPUT	NOMINAL	6	G_Contacts_Count_12_mon G_Customer_Age G_Months_Inactive_12_mon G_Months_on_book G_Total_Relationship_Count G_Total_Trans_Ct
ID	INTERVAL	1	_dataobs_

### Node=Standard Forest Model Fit Statistics

Target=Attrition\_Flag Target Label=''

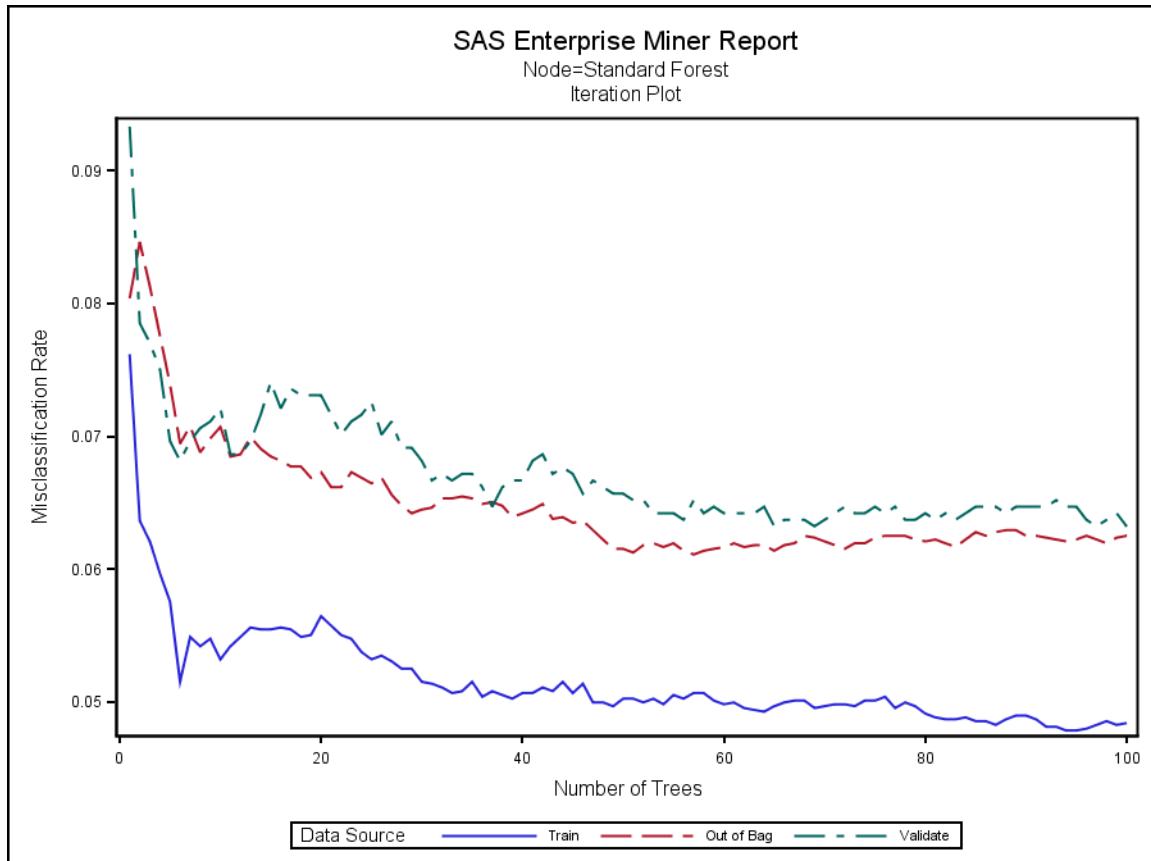
Label of Statistic	Train	Validation	Test
Average Squared Error	0.04	0.05	0.04
Divisor for ASE	14176.00	4050.00	2028.00
Maximum Absolute Error	0.98	0.98	0.93
Sum of Frequencies	7088.00	2025.00	1014.00
Root Average Squared Error	0.20	0.21	0.21
Sum of Squared Errors	547.12	184.96	91.13
Frequency of Classified Cases	7088.00	2025.00	1014.00
Misclassification Rate	0.05	0.06	0.06
Number of Wrong Classifications	343.00	128.00	61.00

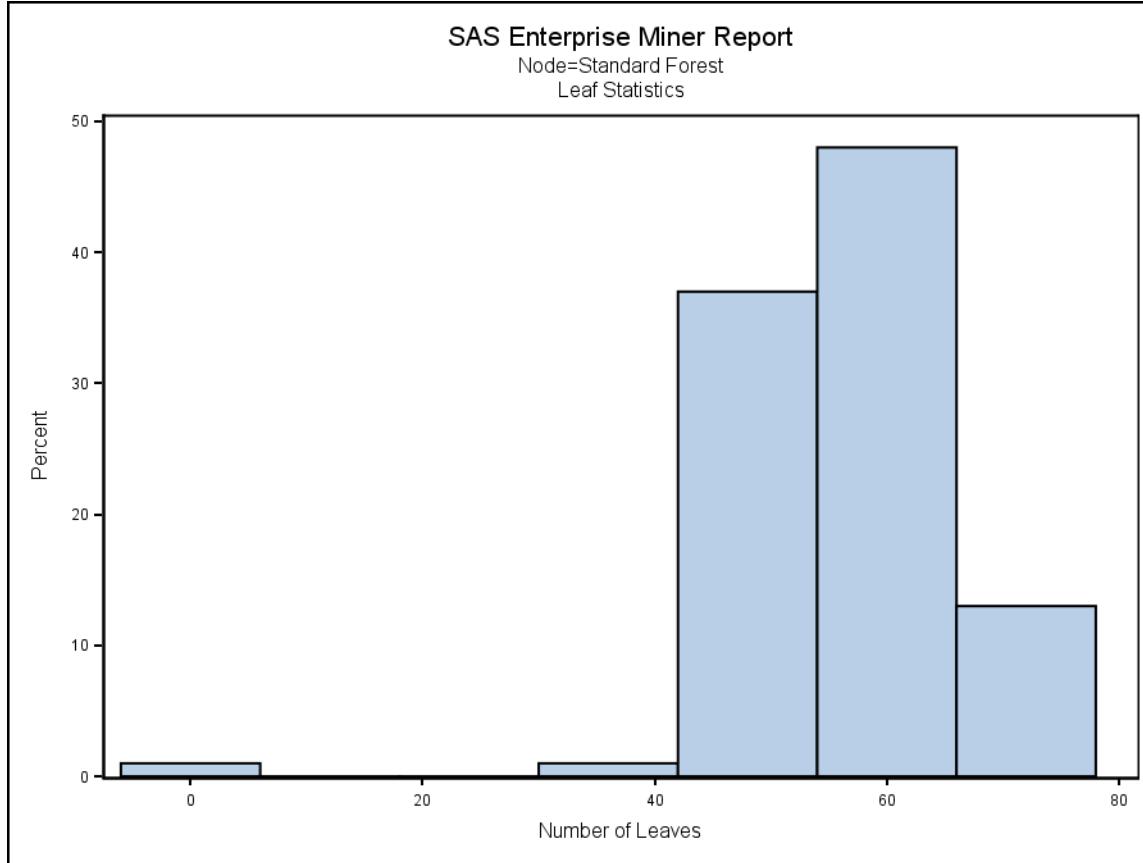
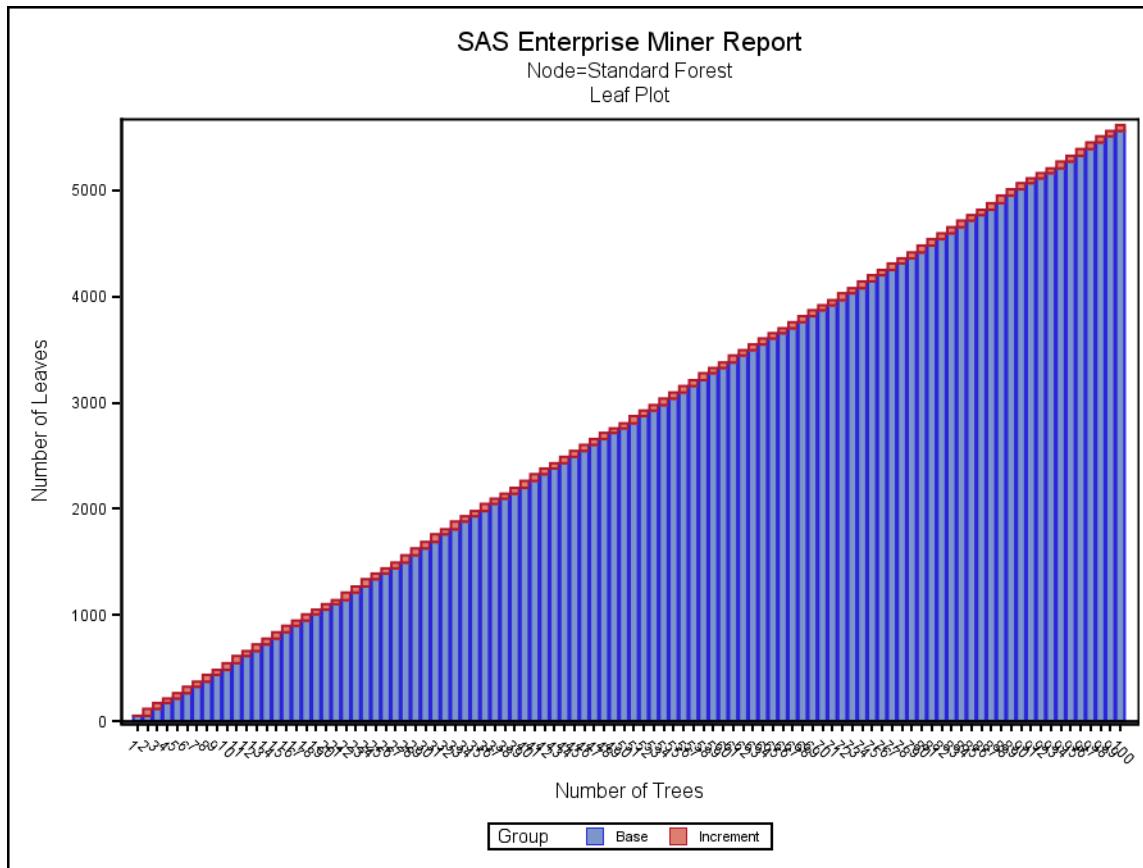
### Node=Standard Forest Iteration History

Number of Trees	Number of Leaves	Average Square Error (Train)	Average Square Error (Out of Bag)	Average Square Error (Validate)	Misclassification Rate (Train)	Misclassification Rate (Out of Bag)	Misclassification Rate (Validate)	Log Loss (Train)	Log Loss (Out of Bag)	Log Loss (Validate)
1	51	0.0578	0.0629	0.0682	0.0762	0.0804	0.0933	0.213	0.255	0.240
2	117	0.0498	0.0653	0.0587	0.0636	0.0846	0.0785	0.177	0.328	0.202
3	172	0.0471	0.0627	0.0557	0.0621	0.0813	0.0770	0.167	0.286	0.189
4	214	0.0448	0.0587	0.0529	0.0597	0.0776	0.0751	0.160	0.244	0.181
5	265	0.0420	0.0559	0.0501	0.0576	0.0739	0.0696	0.150	0.220	0.171
6	325	0.0400	0.0538	0.0492	0.0515	0.0694	0.0681	0.145	0.204	0.169
7	373	0.0408	0.0539	0.0496	0.0549	0.0708	0.0696	0.147	0.200	0.170
8	437	0.0405	0.0530	0.0493	0.0542	0.0688	0.0706	0.146	0.193	0.169
9	484	0.0413	0.0533	0.0496	0.0547	0.0698	0.0711	0.149	0.194	0.170
10	547	0.0412	0.0536	0.0493	0.0532	0.0707	0.0721	0.150	0.190	0.170
11	615	0.0407	0.0526	0.0486	0.0542	0.0685	0.0686	0.149	0.185	0.169
12	661	0.0412	0.0526	0.0489	0.0549	0.0686	0.0686	0.150	0.185	0.169
13	724	0.0418	0.0532	0.0497	0.0556	0.0699	0.0696	0.152	0.186	0.172
14	778	0.0415	0.0524	0.0497	0.0554	0.0691	0.0716	0.151	0.183	0.172
15	838	0.0416	0.0521	0.0499	0.0554	0.0685	0.0741	0.151	0.182	0.173
16	899	0.0414	0.0517	0.0497	0.0556	0.0682	0.0721	0.151	0.181	0.172
17	948	0.0412	0.0514	0.0492	0.0554	0.0677	0.0736	0.150	0.180	0.171
18	1007	0.0410	0.0512	0.0495	0.0549	0.0677	0.0731	0.150	0.179	0.172
19	1051	0.0414	0.0514	0.0495	0.0550	0.0669	0.0731	0.152	0.181	0.172
20	1103	0.0415	0.0514	0.0493	0.0564	0.0673	0.0731	0.152	0.180	0.172
21	1141	0.0416	0.0512	0.0491	0.0557	0.0662	0.0716	0.152	0.180	0.171
22	1212	0.0413	0.0508	0.0489	0.0550	0.0662	0.0701	0.151	0.179	0.171
23	1269	0.0413	0.0508	0.0490	0.0547	0.0673	0.0711	0.151	0.178	0.171
24	1338	0.0409	0.0504	0.0488	0.0538	0.0669	0.0716	0.150	0.177	0.171
25	1391	0.0406	0.0501	0.0486	0.0532	0.0665	0.0726	0.149	0.176	0.170
26	1440	0.0406	0.0501	0.0485	0.0535	0.0669	0.0701	0.149	0.176	0.169
27	1494	0.0403	0.0497	0.0482	0.0530	0.0656	0.0711	0.148	0.174	0.169
28	1563	0.0401	0.0494	0.0481	0.0525	0.0648	0.0691	0.148	0.173	0.168
29	1628	0.0398	0.0490	0.0475	0.0525	0.0642	0.0691	0.147	0.172	0.167
30	1689	0.0399	0.0491	0.0473	0.0515	0.0645	0.0681	0.148	0.173	0.167
31	1761	0.0397	0.0489	0.0471	0.0514	0.0646	0.0667	0.147	0.172	0.166
32	1808	0.0399	0.0491	0.0471	0.0511	0.0653	0.0672	0.148	0.173	0.167
33	1881	0.0398	0.0488	0.0470	0.0506	0.0653	0.0667	0.148	0.172	0.166
34	1931	0.0399	0.0490	0.0471	0.0508	0.0655	0.0672	0.149	0.173	0.167
35	1980	0.0398	0.0487	0.0470	0.0515	0.0653	0.0672	0.148	0.173	0.167
36	2047	0.0398	0.0486	0.0471	0.0504	0.0649	0.0662	0.148	0.172	0.167
37	2096	0.0396	0.0484	0.0469	0.0508	0.0650	0.0647	0.147	0.171	0.167
38	2143	0.0397	0.0485	0.0472	0.0505	0.0648	0.0662	0.148	0.172	0.167
39	2198	0.0397	0.0485	0.0472	0.0502	0.0639	0.0667	0.148	0.172	0.167
40	2264	0.0396	0.0484	0.0472	0.0506	0.0642	0.0667	0.148	0.171	0.167
41	2327	0.0396	0.0484	0.0474	0.0506	0.0645	0.0681	0.148	0.171	0.168
42	2380	0.0397	0.0484	0.0475	0.0511	0.0649	0.0686	0.148	0.172	0.168
43	2430	0.0396	0.0482	0.0475	0.0508	0.0638	0.0672	0.148	0.171	0.168
44	2490	0.0396	0.0482	0.0474	0.0515	0.0639	0.0677	0.148	0.171	0.168
45	2546	0.0394	0.0479	0.0472	0.0506	0.0635	0.0672	0.147	0.170	0.167
46	2603	0.0393	0.0478	0.0471	0.0514	0.0636	0.0657	0.147	0.170	0.167
47	2658	0.0391	0.0476	0.0469	0.0499	0.0629	0.0667	0.146	0.169	0.167
48	2716	0.0390	0.0474	0.0468	0.0499	0.0622	0.0662	0.146	0.169	0.166
49	2758	0.0389	0.0473	0.0467	0.0497	0.0615	0.0657	0.146	0.169	0.166

Number of Trees	Number of Leaves	Average Square Error (Train)	Average Square Error (Out of Bag)	Average Square Error (Validate)	Misclassification Rate (Train)	Misclassification Rate (Out of Bag)	Misclassification Rate (Validate)	Log Loss (Train)	Log Loss (Out of Bag)	Log Loss (Validate)
50	2806	0.0389	0.0472	0.0467	0.0502	0.0615	0.0657	0.146	0.168	0.166
51	2874	0.0389	0.0472	0.0467	0.0502	0.0612	0.0652	0.146	0.169	0.166
52	2926	0.0390	0.0474	0.0468	0.0499	0.0618	0.0652	0.146	0.169	0.166
53	2978	0.0390	0.0474	0.0467	0.0502	0.0619	0.0642	0.146	0.169	0.166
54	3039	0.0390	0.0473	0.0465	0.0498	0.0617	0.0642	0.146	0.169	0.166
55	3096	0.0391	0.0474	0.0466	0.0505	0.0619	0.0642	0.146	0.169	0.166
56	3157	0.0390	0.0473	0.0466	0.0502	0.0614	0.0637	0.146	0.169	0.166
57	3212	0.0390	0.0474	0.0467	0.0506	0.0611	0.0652	0.146	0.169	0.166
58	3278	0.0389	0.0472	0.0465	0.0506	0.0614	0.0642	0.146	0.169	0.165
59	3327	0.0390	0.0473	0.0466	0.0501	0.0615	0.0647	0.146	0.169	0.165
60	3379	0.0388	0.0471	0.0464	0.0498	0.0617	0.0642	0.145	0.168	0.165
61	3445	0.0388	0.0471	0.0464	0.0499	0.0619	0.0642	0.145	0.168	0.165
62	3495	0.0388	0.0470	0.0463	0.0495	0.0617	0.0642	0.145	0.168	0.165
63	3549	0.0388	0.0470	0.0463	0.0494	0.0618	0.0642	0.145	0.168	0.165
64	3605	0.0388	0.0470	0.0463	0.0492	0.0618	0.0647	0.145	0.168	0.165
65	3655	0.0388	0.0469	0.0462	0.0497	0.0614	0.0632	0.145	0.168	0.164
66	3701	0.0388	0.0470	0.0462	0.0499	0.0618	0.0637	0.145	0.168	0.164
67	3758	0.0389	0.0470	0.0463	0.0501	0.0619	0.0637	0.146	0.168	0.164
68	3815	0.0389	0.0471	0.0463	0.0501	0.0625	0.0637	0.146	0.168	0.165
69	3871	0.0389	0.0470	0.0462	0.0495	0.0624	0.0632	0.145	0.168	0.164
70	3918	0.0390	0.0471	0.0463	0.0497	0.0621	0.0637	0.146	0.168	0.165
71	3966	0.0389	0.0470	0.0462	0.0498	0.0618	0.0642	0.145	0.168	0.164
72	4031	0.0388	0.0470	0.0462	0.0498	0.0615	0.0647	0.145	0.168	0.164
73	4079	0.0389	0.0470	0.0462	0.0497	0.0619	0.0642	0.145	0.168	0.164
74	4142	0.0389	0.0471	0.0462	0.0501	0.0619	0.0642	0.145	0.168	0.164
75	4201	0.0389	0.0470	0.0462	0.0501	0.0624	0.0647	0.145	0.168	0.164
76	4250	0.0390	0.0472	0.0463	0.0504	0.0625	0.0642	0.146	0.168	0.165
77	4311	0.0389	0.0471	0.0463	0.0495	0.0625	0.0647	0.146	0.168	0.165
78	4360	0.0389	0.0470	0.0462	0.0499	0.0625	0.0637	0.146	0.168	0.164
79	4415	0.0389	0.0469	0.0462	0.0497	0.0622	0.0637	0.145	0.168	0.164
80	4480	0.0387	0.0468	0.0461	0.0491	0.0621	0.0642	0.145	0.167	0.164
81	4541	0.0386	0.0467	0.0461	0.0488	0.0622	0.0637	0.145	0.167	0.164
82	4595	0.0385	0.0466	0.0460	0.0487	0.0619	0.0642	0.144	0.167	0.164
83	4653	0.0385	0.0466	0.0459	0.0487	0.0617	0.0637	0.145	0.167	0.164
84	4715	0.0386	0.0467	0.0459	0.0488	0.0622	0.0642	0.145	0.167	0.164
85	4767	0.0386	0.0467	0.0459	0.0485	0.0628	0.0647	0.145	0.167	0.164
86	4817	0.0386	0.0467	0.0459	0.0485	0.0625	0.0647	0.145	0.167	0.164
87	4879	0.0386	0.0467	0.0459	0.0483	0.0628	0.0647	0.145	0.167	0.164
88	4951	0.0386	0.0467	0.0458	0.0487	0.0629	0.0642	0.145	0.167	0.164
89	5010	0.0386	0.0468	0.0459	0.0490	0.0629	0.0647	0.145	0.167	0.164
90	5068	0.0386	0.0467	0.0458	0.0490	0.0625	0.0647	0.145	0.167	0.164
91	5113	0.0386	0.0467	0.0458	0.0487	0.0625	0.0647	0.145	0.167	0.164
92	5162	0.0386	0.0467	0.0458	0.0481	0.0624	0.0647	0.145	0.167	0.163
93	5207	0.0386	0.0467	0.0457	0.0481	0.0622	0.0652	0.145	0.167	0.163
94	5271	0.0386	0.0467	0.0457	0.0478	0.0621	0.0647	0.145	0.167	0.163
95	5325	0.0386	0.0468	0.0457	0.0478	0.0622	0.0647	0.145	0.167	0.163
96	5389	0.0386	0.0468	0.0457	0.0480	0.0625	0.0637	0.145	0.167	0.163
97	5451	0.0387	0.0468	0.0457	0.0483	0.0622	0.0632	0.145	0.167	0.163
98	5509	0.0387	0.0467	0.0457	0.0485	0.0619	0.0637	0.145	0.167	0.163

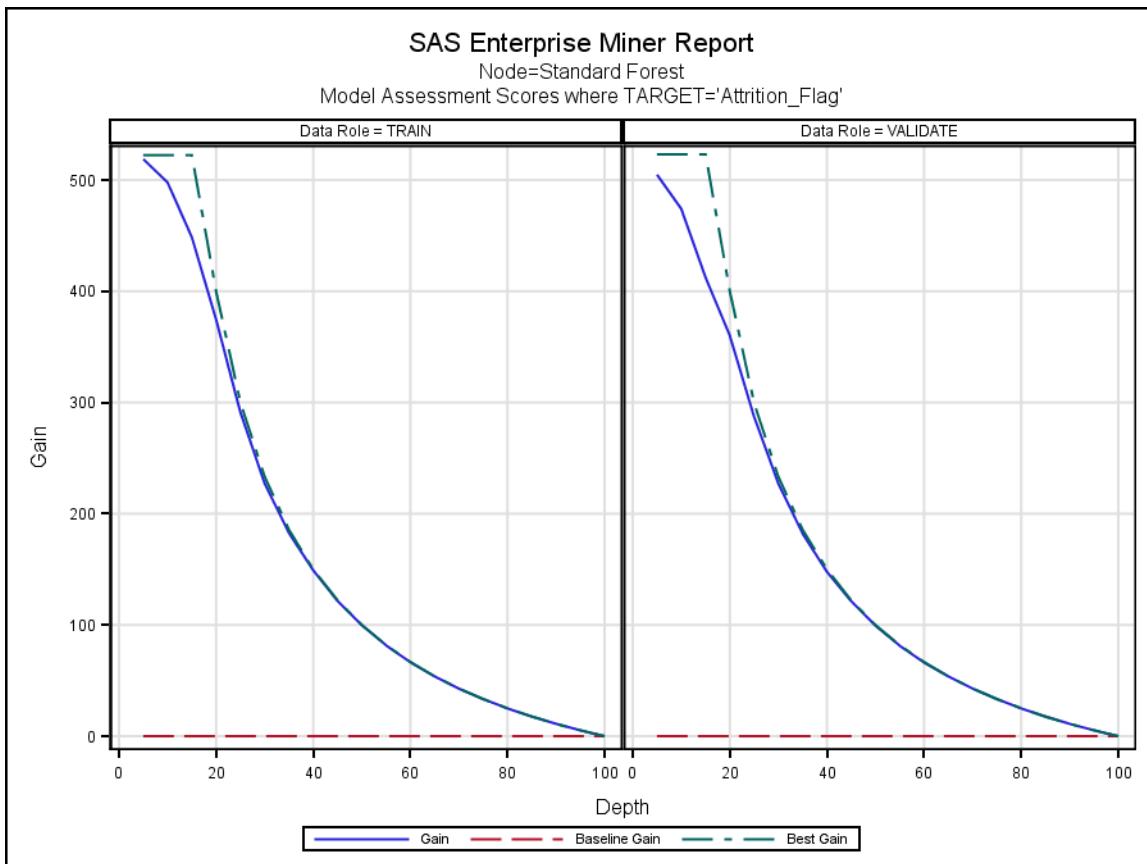
Number of Trees	Number of Leaves	Average Square Error (Train)	Average Square Error (Out of Bag)	Average Square Error (Validate)	Misclassification Rate (Train)	Misclassification Rate (Out of Bag)	Misclassification Rate (Validate)	Log Loss (Train)	Log Loss (Out of Bag)	Log Loss (Validate)
99	5559	0.0386	0.0467	0.0457	0.0483	0.0624	0.0642	0.145	0.167	0.163
100	5615	0.0386	0.0467	0.0457	0.0484	0.0625	0.0632	0.145	0.167	0.163





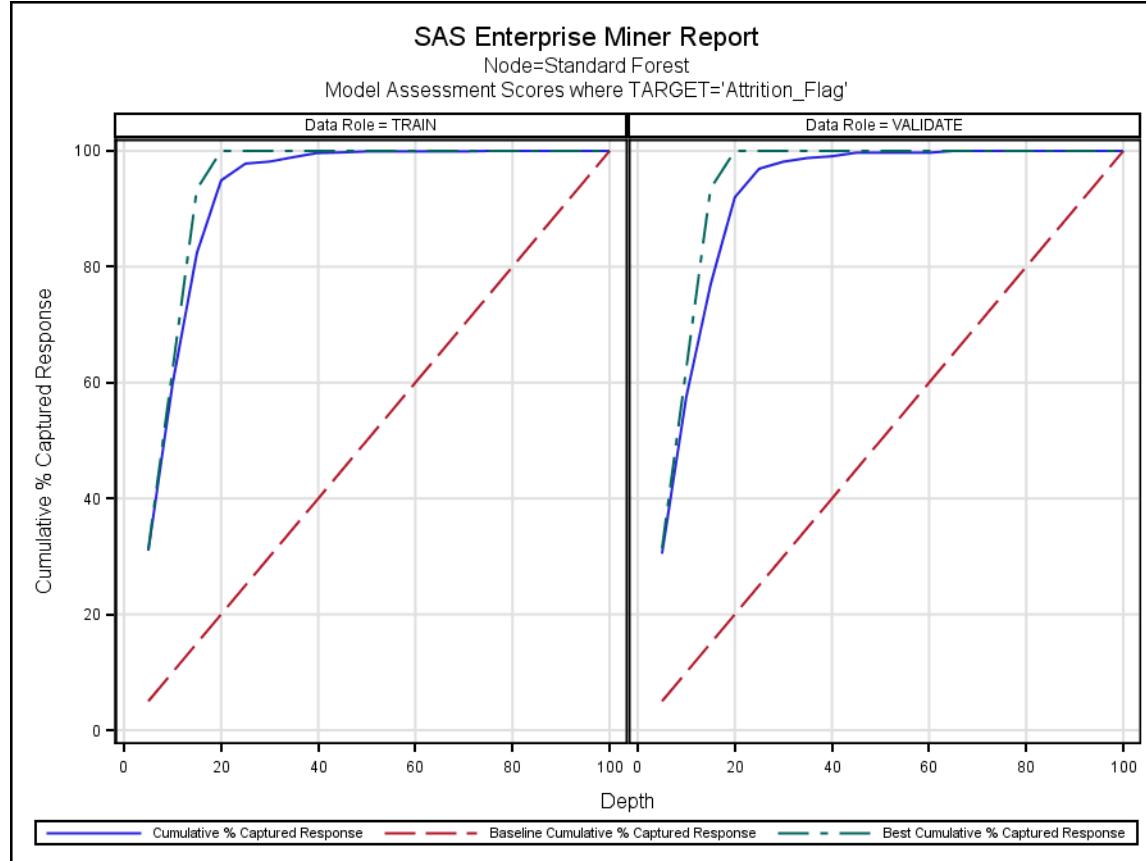
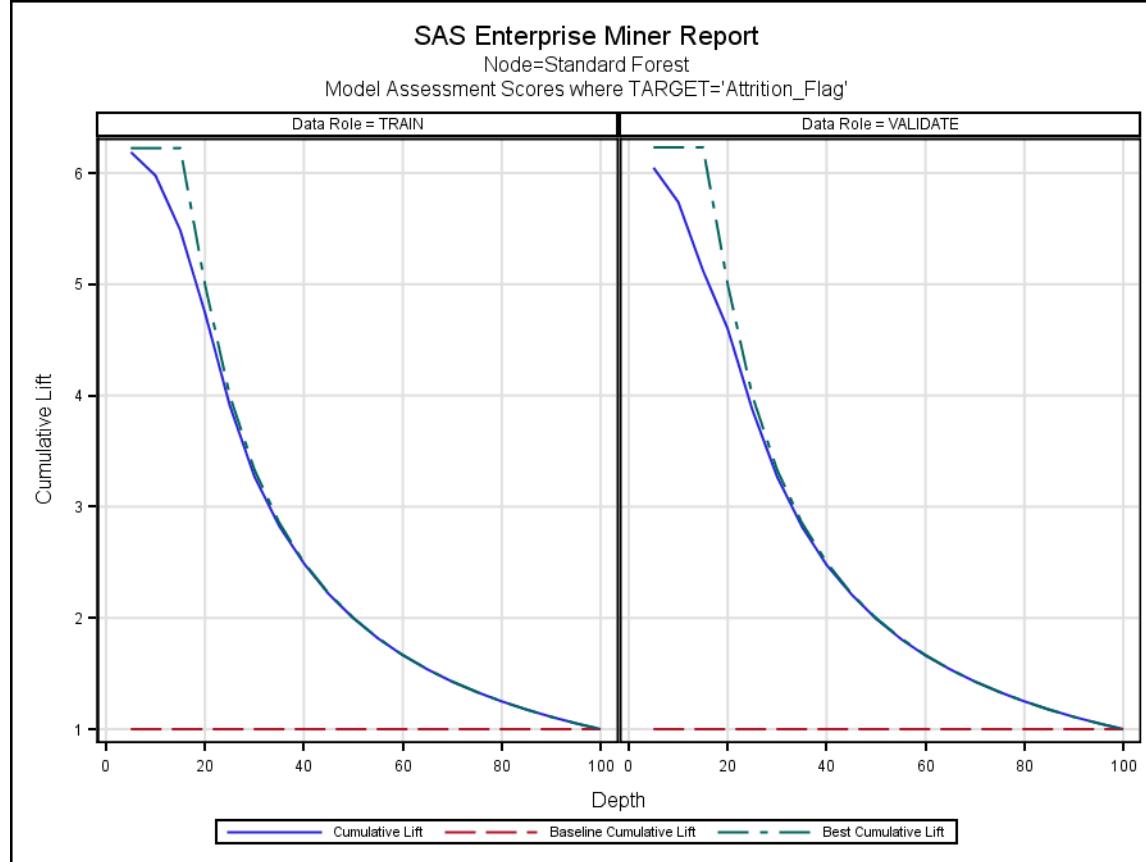
Node=Standard Forest  
Variable Importance

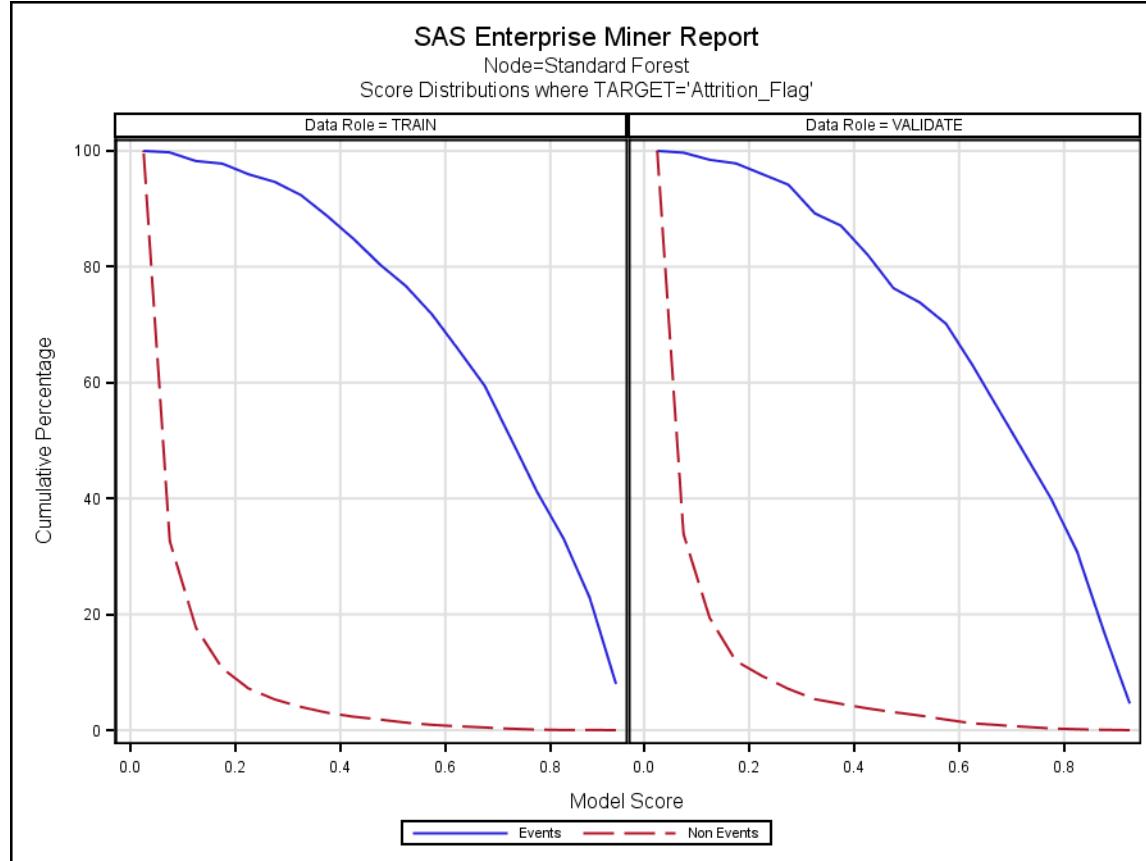
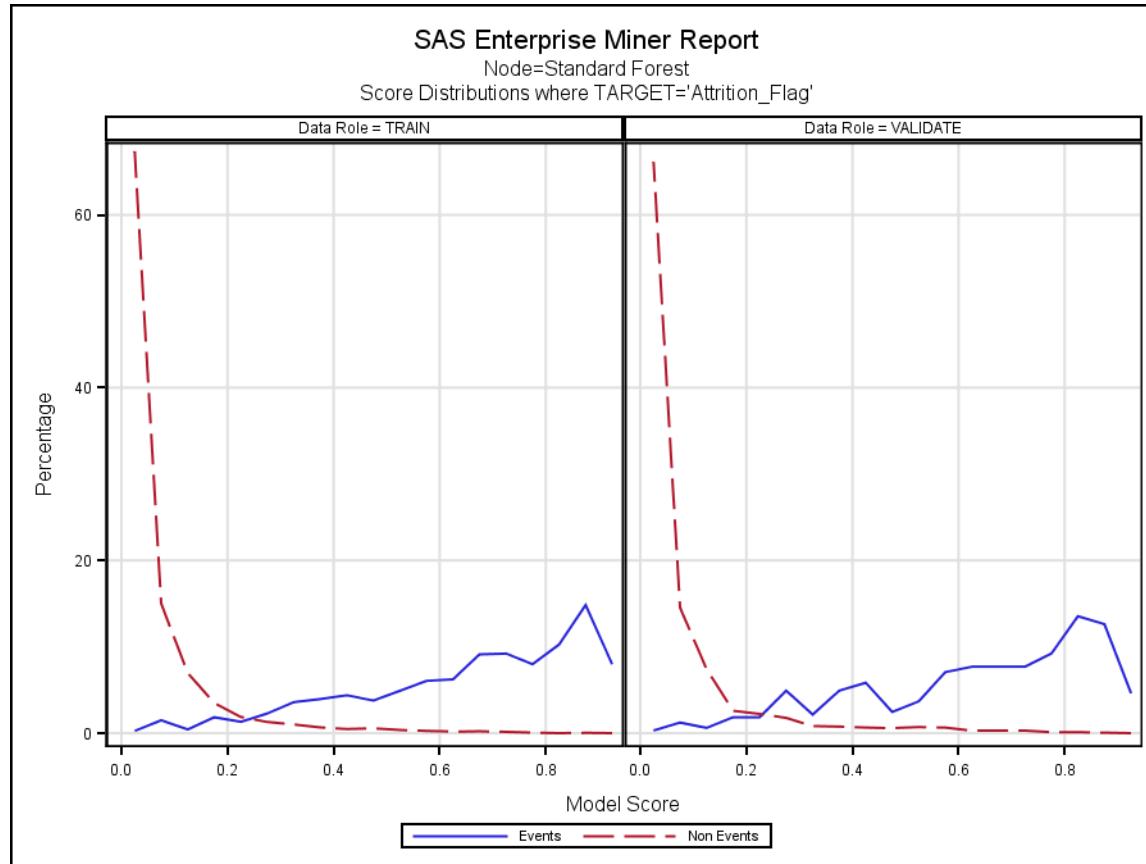
Variable Name	Number of Splitting Rules	Train: Gini Reduction	Train: Margin Reduction	OOB: Gini Reduction	OOB: Margin Reduction	Valid: Gini Reduction	Valid: Margin Reduction	Label
RANGE_LOG_Total_Trans_Amt	1190	0.033811	0.067623	0.02538	0.058209	0.02688	0.060109	Transformed: Transformed Total_Trans_Amt
G_Total_Trans_Ct	829	0.040545	0.081090	0.03736	0.079659	0.03237	0.072588	Grouped Levels for Total_Trans_Ct
RANGE_SQRT_Total_Ct_Chng_Q4_Q1	564	0.022079	0.044158	0.01691	0.038627	0.01766	0.040918	Transformed: Transformed Total_Ct_Chng_Q4_Q1
G_Total_Relationship_Count	557	0.012200	0.024400	0.00994	0.021817	0.01299	0.024707	Grouped Levels for Total_Relationship_Count
RANGE_Total_Revolving_Bal	520	0.025255	0.050511	0.02129	0.046662	0.02193	0.047201	Transformed Total_Revolving_Bal
RANGE_SQRT_Total_Amt_Chng_Q4_Q1	412	0.005810	0.011620	0.00180	0.007253	0.00248	0.007726	Transformed: Transformed Total_Amt_Chng_Q4_Q1
G_Contacts_Count_12_mon	401	0.004393	0.008787	0.00313	0.008265	0.00276	0.008216	Grouped Levels for Contacts_Count_12_mon
G_Months_Inactive_12_mon	384	0.003981	0.007962	0.00225	0.006443	0.00363	0.006873	Grouped Levels for Months_Inactive_12_mon
RANGE_SQRT_Avg_Utilization_Ratio	286	0.016393	0.032786	0.01400	0.030340	0.01207	0.028800	Transformed: Transformed Avg_Utilization_Ratio
G_Customer_Age	215	0.001988	0.003975	0.00049	0.002972	0.00016	0.002520	Grouped Levels for Customer_Age
G_Months_on_book	157	0.000689	0.001377	-0.00028	0.000757	-0.00041	0.000610	Grouped Levels for Months_on_book



## **Node=Standard Forest**

## Model Assessment Scores where TARGET='Attrition\_Flag'





**Node=Standard Forest**  
**Score Distributions**

Target Variable=Attrition\_Flag Data Role=TRAIN

Posterior Probability Range	Number of Events	Percentage of Events	Percentage of Nonevents	Cumulative Percentage of Events	Cumulative Percentage of Nonevents
0.90-0.95	91	7.9895	0.0000	7.989	0.000
0.85-0.90	169	14.8376	0.0336	22.827	0.034
0.80-0.85	117	10.2722	0.0000	33.099	0.034
0.75-0.80	91	7.9895	0.0672	41.089	0.101
0.70-0.75	105	9.2186	0.1513	50.307	0.252
0.65-0.70	104	9.1308	0.2185	59.438	0.471
0.60-0.65	71	6.2335	0.1849	65.672	0.656
0.55-0.60	69	6.0579	0.2690	71.730	0.925
0.50-0.55	56	4.9166	0.3698	76.646	1.294
0.45-0.50	43	3.7752	0.5547	80.421	1.849
0.40-0.45	50	4.3898	0.4875	84.811	2.337
0.35-0.40	45	3.9508	0.6724	88.762	3.009
0.30-0.35	41	3.5996	1.0086	92.362	4.017
0.25-0.30	26	2.2827	1.2943	94.644	5.312
0.20-0.25	15	1.3169	1.8827	95.961	7.194
0.15-0.20	21	1.8437	3.4964	97.805	10.691
0.10-0.15	5	0.4390	6.9592	98.244	17.650
0.05-0.10	17	1.4925	14.9941	99.737	32.644
0.00-0.05	3	0.2634	67.3559	100.000	100.000

Target Variable=Attrition\_Flag Data Role=VALIDATE

Posterior Probability Range	Number of Events	Percentage of Events	Percentage of Nonevents	Cumulative Percentage of Events	Cumulative Percentage of Nonevents
0.90-0.95	15	4.6154	0.0000	4.615	0.000
0.85-0.90	41	12.6154	0.0588	17.231	0.059
0.80-0.85	44	13.5385	0.1176	30.769	0.176
0.75-0.80	30	9.2308	0.1176	40.000	0.294
0.70-0.75	25	7.6923	0.2941	47.692	0.588
0.65-0.70	25	7.6923	0.2941	55.385	0.882
0.60-0.65	25	7.6923	0.2941	63.077	1.176
0.55-0.60	23	7.0769	0.6471	70.154	1.824
0.50-0.55	12	3.6923	0.7059	73.846	2.529
0.45-0.50	8	2.4615	0.5882	76.308	3.118
0.40-0.45	19	5.8462	0.6471	82.154	3.765
0.35-0.40	16	4.9231	0.7647	87.077	4.529
0.30-0.35	7	2.1538	0.8235	89.231	5.353
0.25-0.30	16	4.9231	1.7647	94.154	7.118
0.20-0.25	6	1.8462	2.2353	96.000	9.353
0.15-0.20	6	1.8462	2.5882	97.846	11.941
0.10-0.15	2	0.6154	7.4118	98.462	19.353
0.05-0.10	4	1.2308	14.5294	99.692	33.882
0.00-0.05	1	0.3077	66.1176	100.000	100.000

## SAS Enterprise Miner Report

### Node=Modified Tree 3 Summary

Node id = Tree4  
 Node label = Modified Tree 3  
 Meta path = Ids => Varsel => Trans => Meta => Trans2 => Meta2 => Part2 => Tree4  
 Notes =

### Node=Modified Tree 3 Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	DecisionTree		Kass	Y		Pred	N	
AVG	Y		KassApply	BEFORE		Predict	Y	
AssessMeasure	MISC	PROFIT/LOSS	LeafSize	5		ProfitLoss	NONE	
AssessPercentage	0.25		Leafid	Y		RASE	N	
CV	N		Maxbranch	2		SampleMethod	RANDOM	
CVNIter	10		Maxdepth	10	6	SampleSeed	12345	
CVRepeat	1		MinCatSize	5		SampleSize	10000	
CVSeed	12345		MissingValue	USEINSEARCH		ShowNodeld	Y	
ClassColorBy	PERCENTCORRECT		NSubtree	1		ShowValid	Y	
Count	Y		NodeRole	SEGMENT		SigLevel	0.2	
CreateSample	DEFAULT		NodeSample	20000		SplitPrecision	4	
Criterion	DEFAULT		NominalCriterion	GINI	PROBCHISQ	Splitsize	.	
Depth	Y		Nrules	5		Subtree	ASSESSMENT	
Dummy	N		Nsurrs	0		Target	ALL	
Exhaustive	5000		NumInputs	1		ToolType	MODEL	
Freeze	N		NumSingleImp	5		TrainMode	BATCH	
ImportModel	N		ObsImportance	N		UseDecision	N	
ImportedTreeData			OrdinalCriterion	GINI	ENTROPY	UseMultipleTarget	N	
Inputs	N		PercentCorrect	N		UsePriors	N	
IntColorBy	AVG		Performance	DISK		UseVarOnce	N	
IntervalCriterion	PROBF		Precision	4		VarSelection	Y	

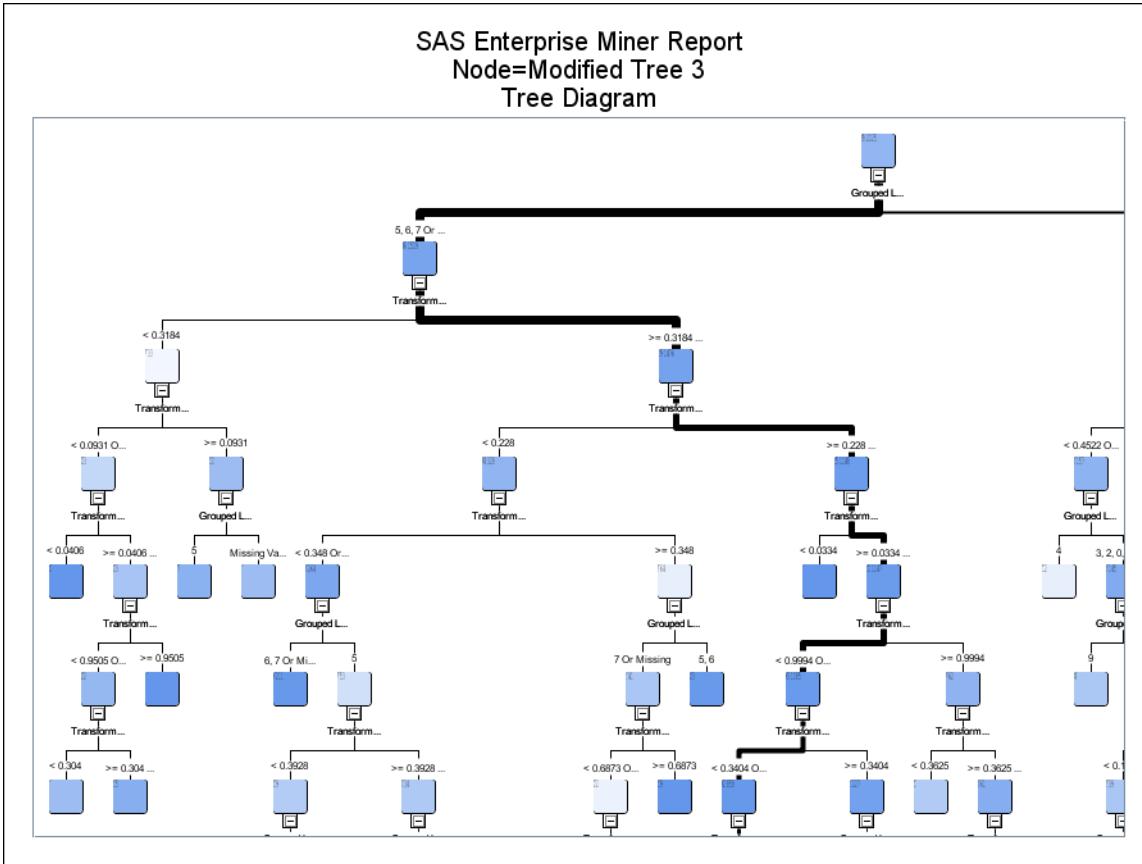
### Node=Modified Tree 3 Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag
INPUT	INTERVAL	5	RANGE_LOG_Total_Trans_Amt RANGE_SQRT_Avg_Utilization_Ratio RANGE_SQRT_Total_Amt_Chng_Q4_Q1 RANGE_SQRT_Total_Ct_Chng_Q4_Q1 RANGE_Total_Revolving_Bal
INPUT	NOMINAL	6	G_Contacts_Count_12_mon G_Customer_Age G_Months_Inactive_12_mon G_Months_on_book G_Total_Relationship_Count G_Total_Trans_Ct
ID	INTERVAL	1	_dataobs_

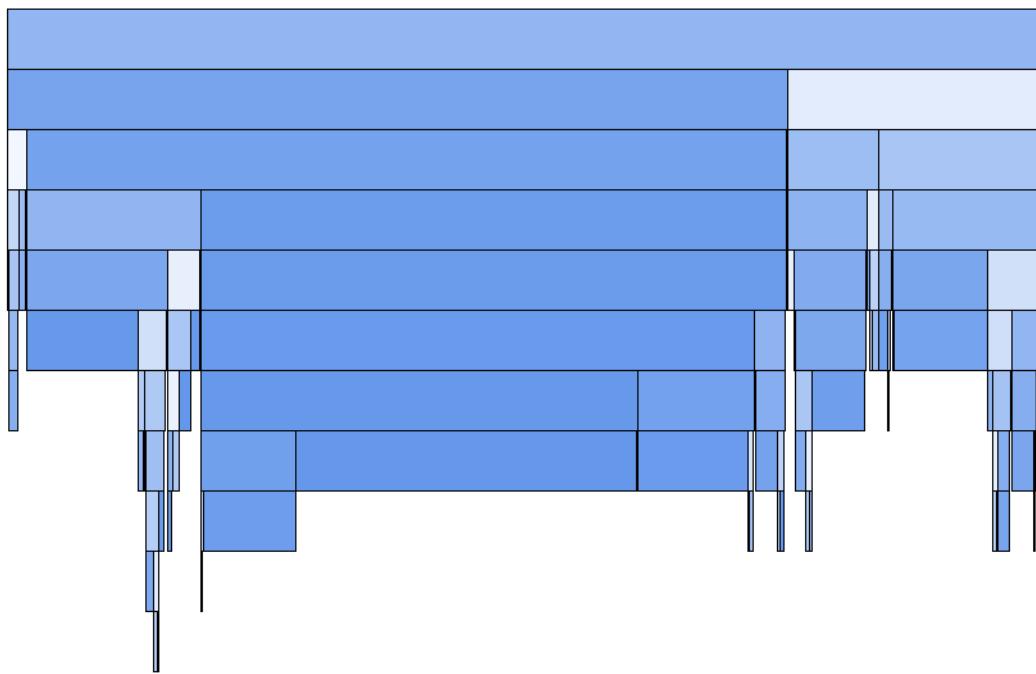
### Node=Modified Tree 3 Model Fit Statistics

Target=Attrition Flag Target Label=' '

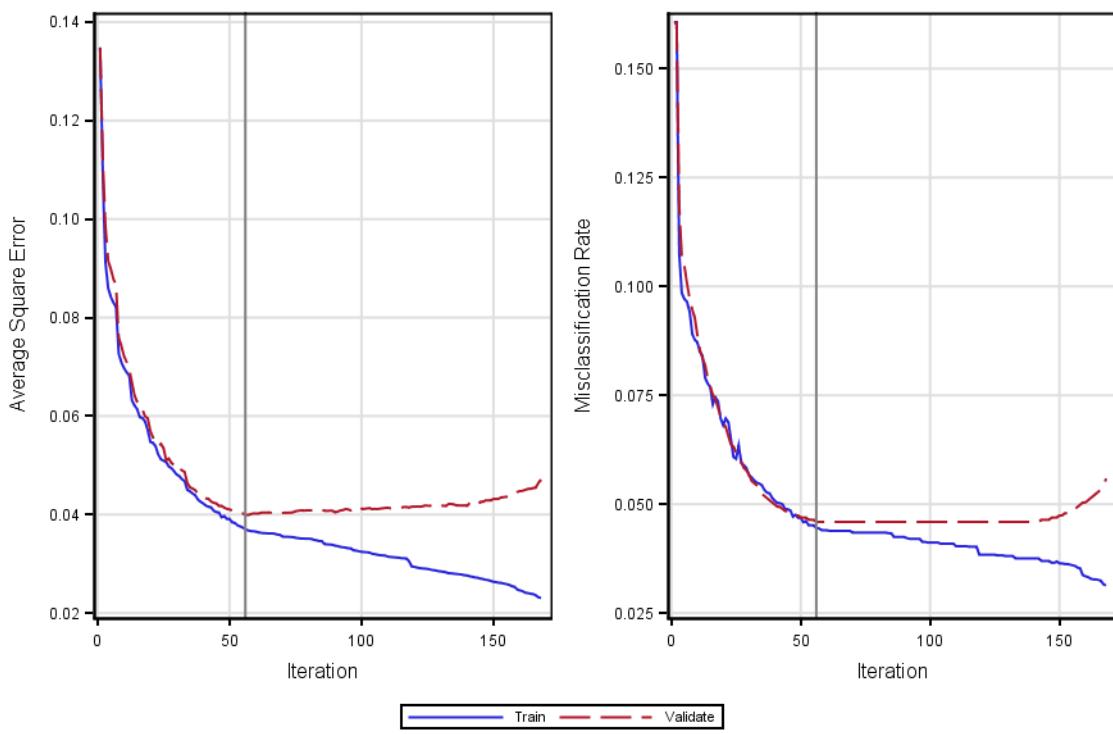
Label of Statistic	Train	Validation	Test
Sum of Frequencies	7088.00	2025.00	1014.00
Misclassification Rate	0.04	0.05	0.07
Maximum Absolute Error	1.00	1.00	0.99
Sum of Squared Errors	524.93	161.86	101.64
Average Squared Error	0.04	0.04	0.05
Root Average Squared Error	0.19	0.20	0.22
Divisor for ASE	14176.00	4050.00	2028.00
Total Degrees of Freedom	7088.00	.	.



SAS Enterprise Miner Report  
Node=Modified Tree 3  
Treemap



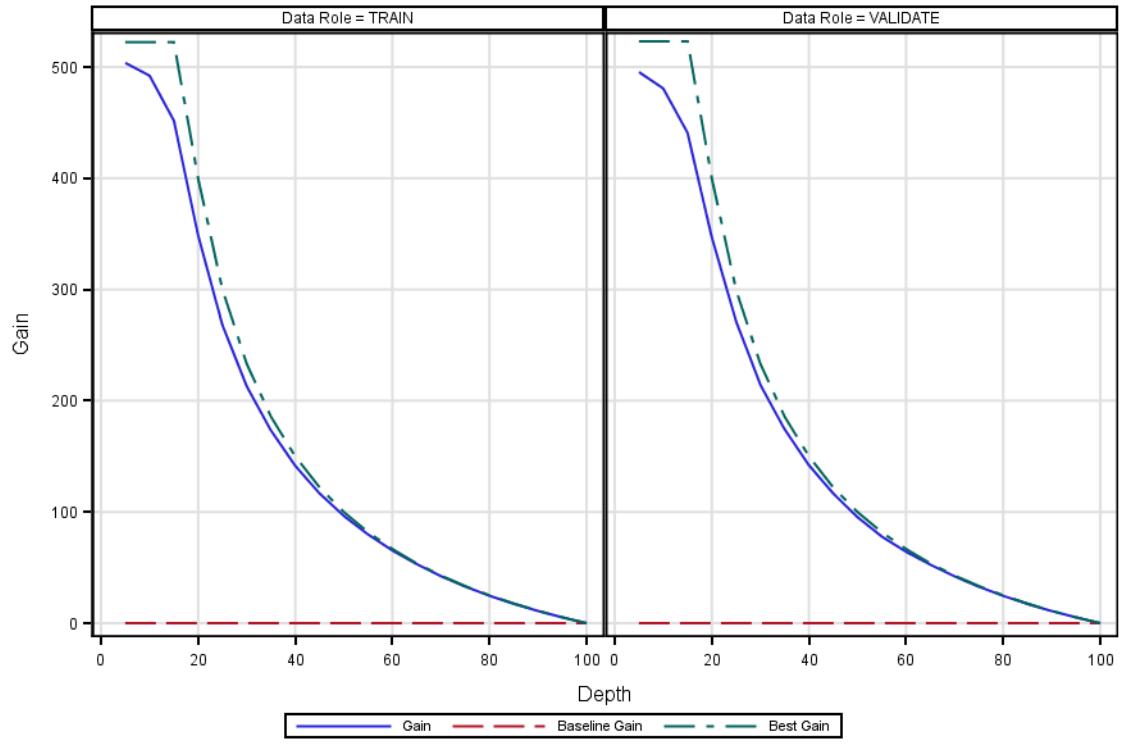
SAS Enterprise Miner Report  
Node=Modified Tree 3  
Model Iteration Plots



## SAS Enterprise Miner Report

Node=Modified Tree 3

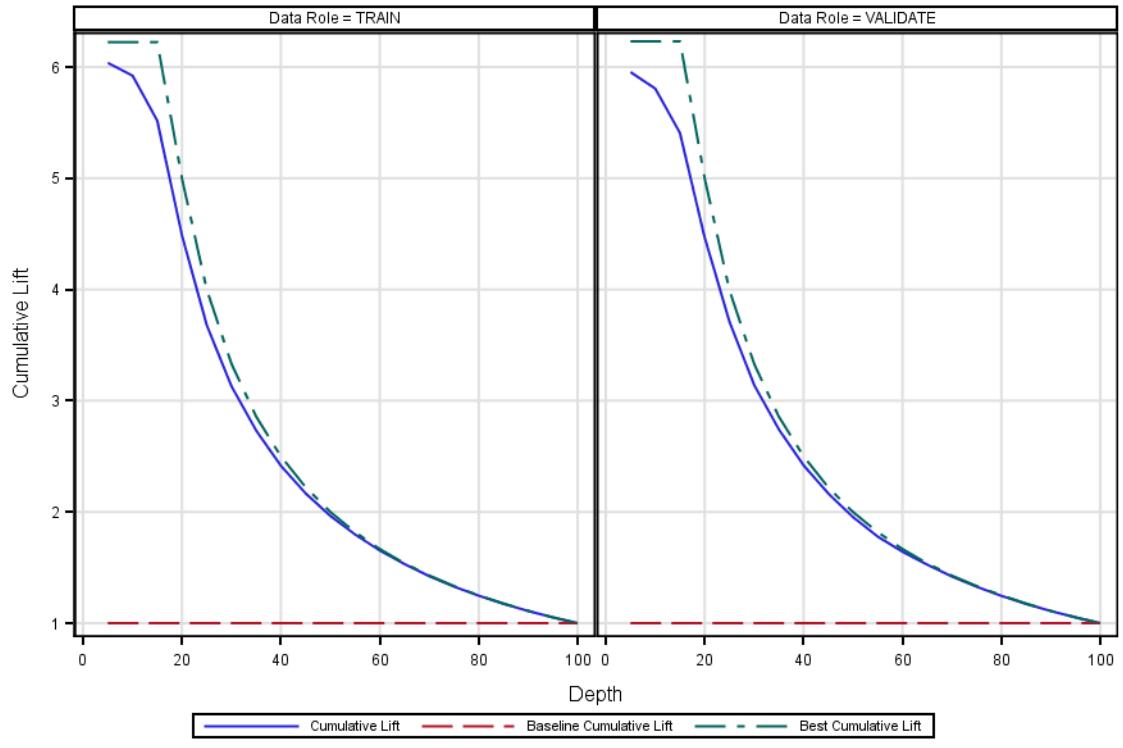
Model Assessment Scores where TARGET='Attrition\_Flag'

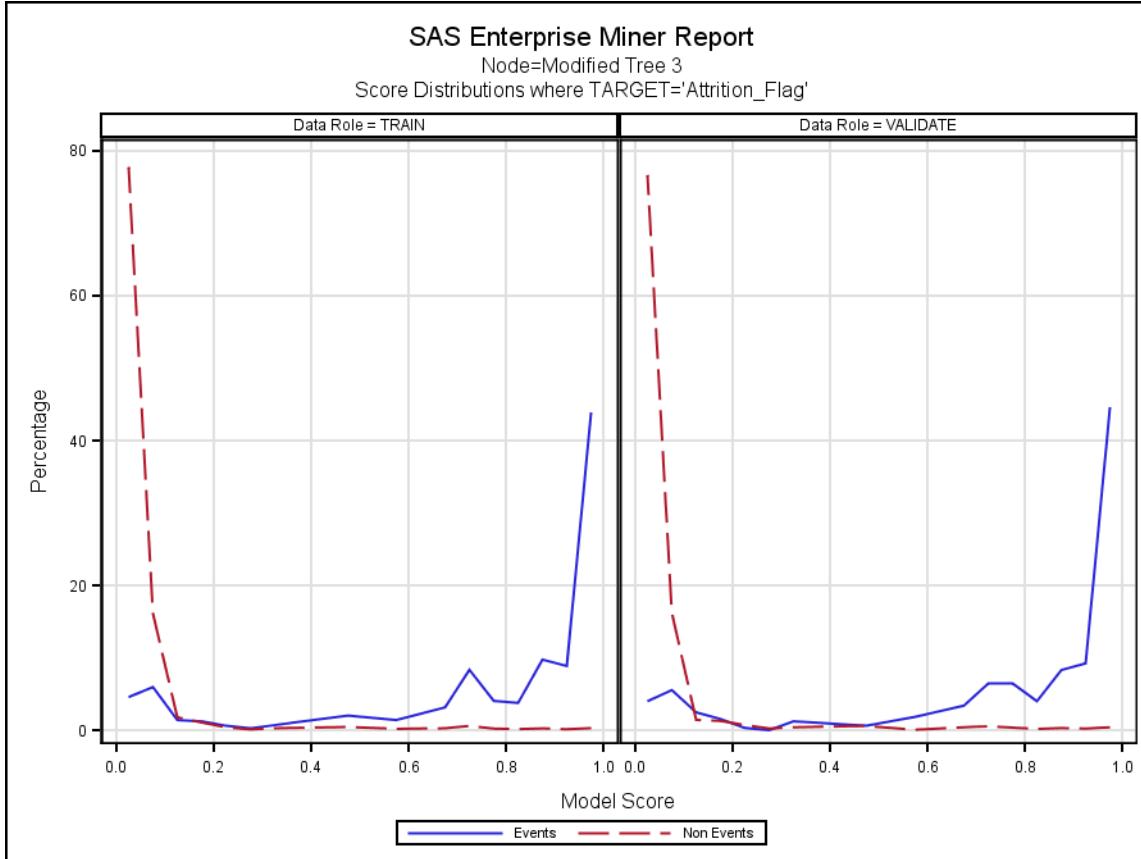
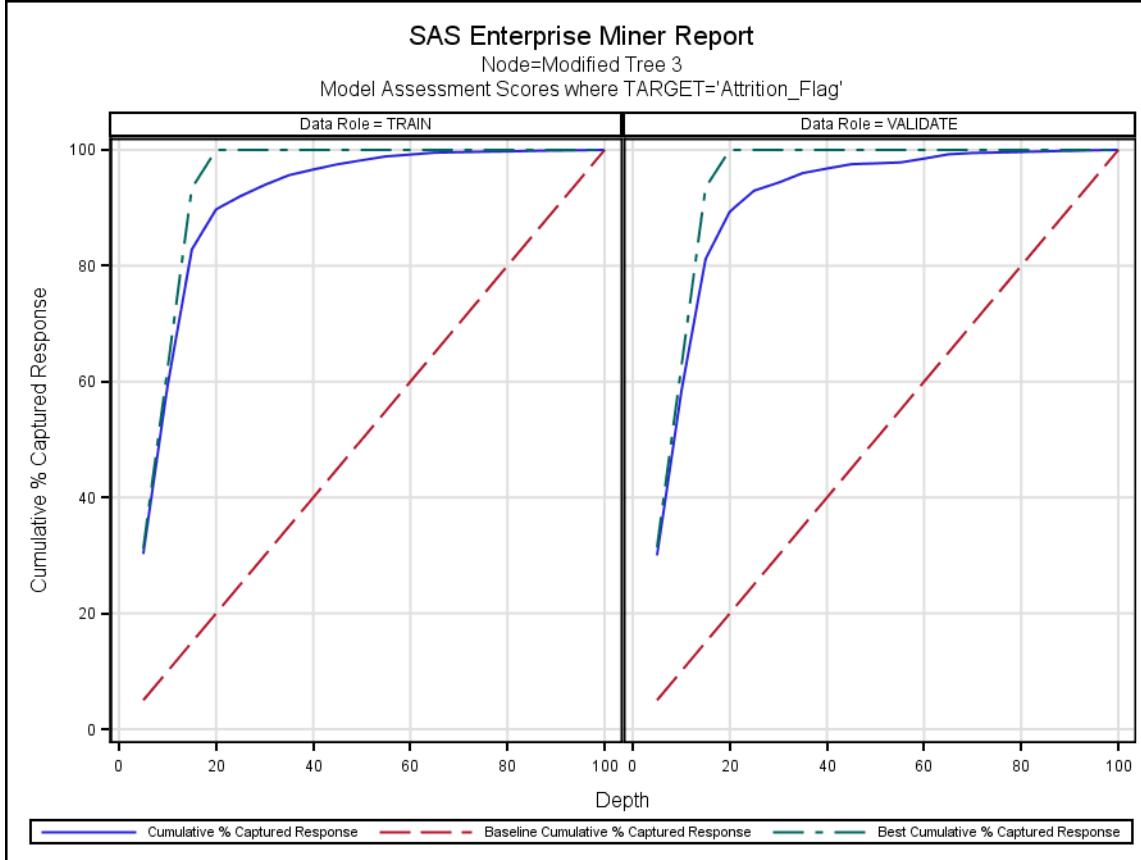


## SAS Enterprise Miner Report

Node=Modified Tree 3

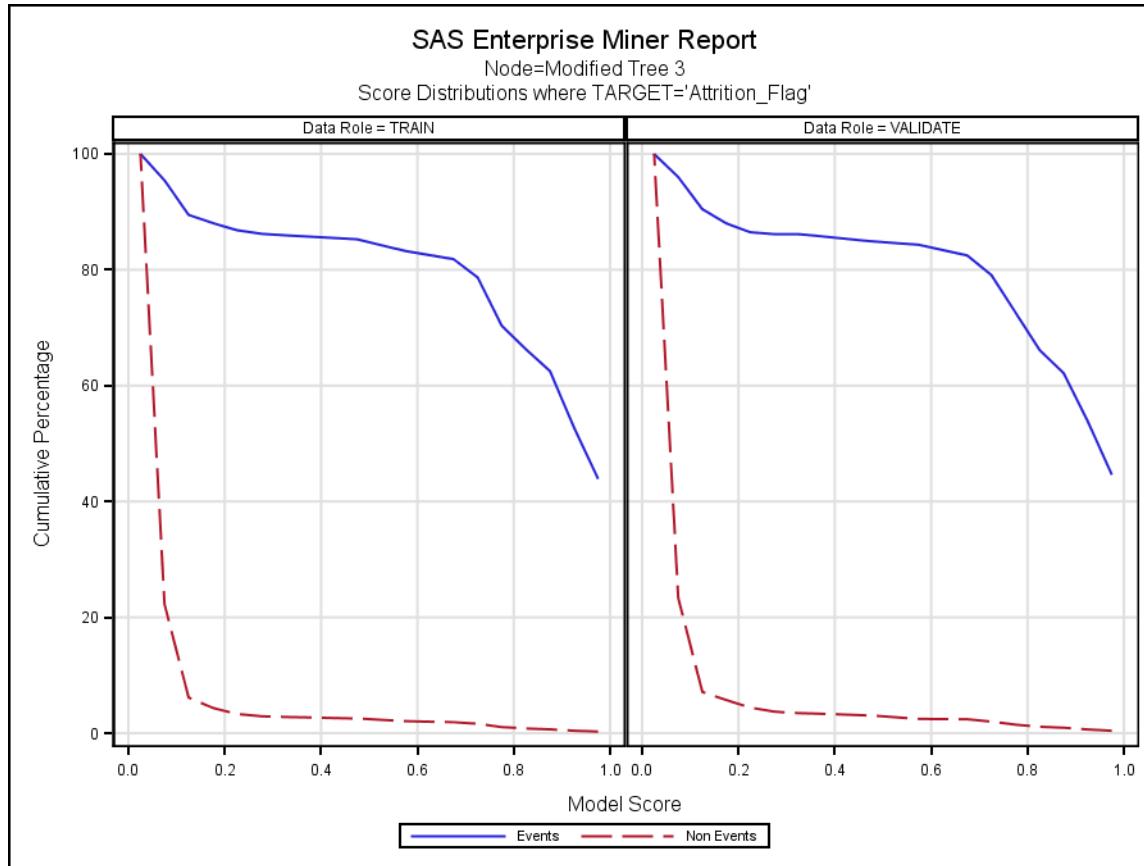
Model Assessment Scores where TARGET='Attrition\_Flag'





Node=Modified Tree 3

Score Distributions where TARGET='Attrition\_Flag'

**Node=Modified Tree 3****Score Distributions**

Target Variable=Attrition\_Flag 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	500	43.8982	0.2858	43.898	0.286
0.90-0.95	101	8.8674	0.1345	52.766	0.420
0.85-0.90	111	9.7454	0.2521	62.511	0.672
0.80-0.85	43	3.7752	0.1513	66.286	0.824
0.75-0.80	46	4.0386	0.2185	70.325	1.042
0.70-0.75	95	8.3406	0.5883	78.665	1.631
0.65-0.70	36	3.1607	0.2690	81.826	1.899
0.55-0.60	16	1.4047	0.1849	83.231	2.084
0.45-0.50	23	2.0193	0.4539	85.250	2.538
0.30-0.35	8	0.7024	0.2690	85.953	2.807
0.25-0.30	3	0.2634	0.1177	86.216	2.925
0.20-0.25	7	0.6146	0.3866	86.831	3.311
0.15-0.20	14	1.2291	1.0590	88.060	4.370
0.10-0.15	16	1.4047	1.7818	89.464	6.152
0.05-0.10	68	5.9701	16.1035	95.435	22.256
0.00-0.05	52	4.5654	77.7442	100.000	100.000

Target Variable=Attrition\_Flag 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	145	44.6154	0.4118	44.615	0.412
0.90-0.95	30	9.2308	0.2353	53.846	0.647
0.85-0.90	27	8.3077	0.2941	62.154	0.941
0.80-0.85	13	4.0000	0.1765	66.154	1.118
0.75-0.80	21	6.4615	0.3529	72.615	1.471
0.70-0.75	21	6.4615	0.5294	79.077	2.000
0.65-0.70	11	3.3846	0.4118	82.462	2.412
0.55-0.60	6	1.8462	0.0588	84.308	2.471
0.45-0.50	2	0.6154	0.5882	84.923	3.059
0.30-0.35	4	1.2308	0.4118	86.154	3.471
0.25-0.30	0	0.0000	0.2353	86.154	3.706
0.20-0.25	1	0.3077	0.7059	86.462	4.412
0.15-0.20	5	1.5385	1.2941	88.000	5.706
0.10-0.15	8	2.4615	1.4118	90.462	7.118
0.05-0.10	18	5.5385	16.2353	96.000	23.353
0.00-0.05	13	4.0000	76.6471	100.000	100.000

## SAS Enterprise Miner Report

### Node=Modified Tree 2 Summary

Node id = Tree3  
 Node label = Modified Tree 2  
 Meta path = Ids => Varsel => Trans => Meta => Trans2 => Meta2 => Part2 => Tree3  
 Notes =

### Node=Modified Tree 2 Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	DecisionTree		Kass	Y		Pred	N	
AVG	Y		KassApply	BEFORE		Predict	Y	
AssessMeasure	MISC	PROFIT/LOSS	LeafSize	5		ProfitLoss	NONE	
AssessPercentage	0.25		Leafid	Y		RASE	N	
CV	N		Maxbranch	6	2	SampleMethod	RANDOM	
CVNIter	10		Maxdepth	6		SampleSeed	12345	
CVRepeat	1		MinCatSize	5		SampleSize	10000	
CVSeed	12345		MissingValue	USEINSEARCH		ShowNodeld	Y	
ClassColorBy	PERCENTCORRECT		NSubtree	1		ShowValid	Y	
Count	Y		NodeRole	SEGMENT		SigLevel	0.2	
CreateSample	DEFAULT		NodeSample	20000		SplitPrecision	4	
Criterion	DEFAULT		NominalCriterion	ENTROPY	PROBCHISQ	Splitsize	.	
Depth	Y		Nrules	5		Subtree	ASSESSMENT	
Dummy	N		Nsurrs	0		Target	ALL	
Exhaustive	5000		NumInputs	1		ToolType	MODEL	
Freeze	N		NumSingleImp	5		TrainMode	BATCH	
ImportModel	N		ObsImportance	N		UseDecision	N	
ImportedTreeData			OrdinalCriterion	GINI	ENTROPY	UseMultipleTarget	N	
Inputs	N		PercentCorrect	N		UsePriors	N	
IntColorBy	AVG		Performance	DISK		UseVarOnce	N	
IntervalCriterion	VARIANCE	PROBF	Precision	4		VarSelection	Y	

### Node=Modified Tree 2 Variable Summary

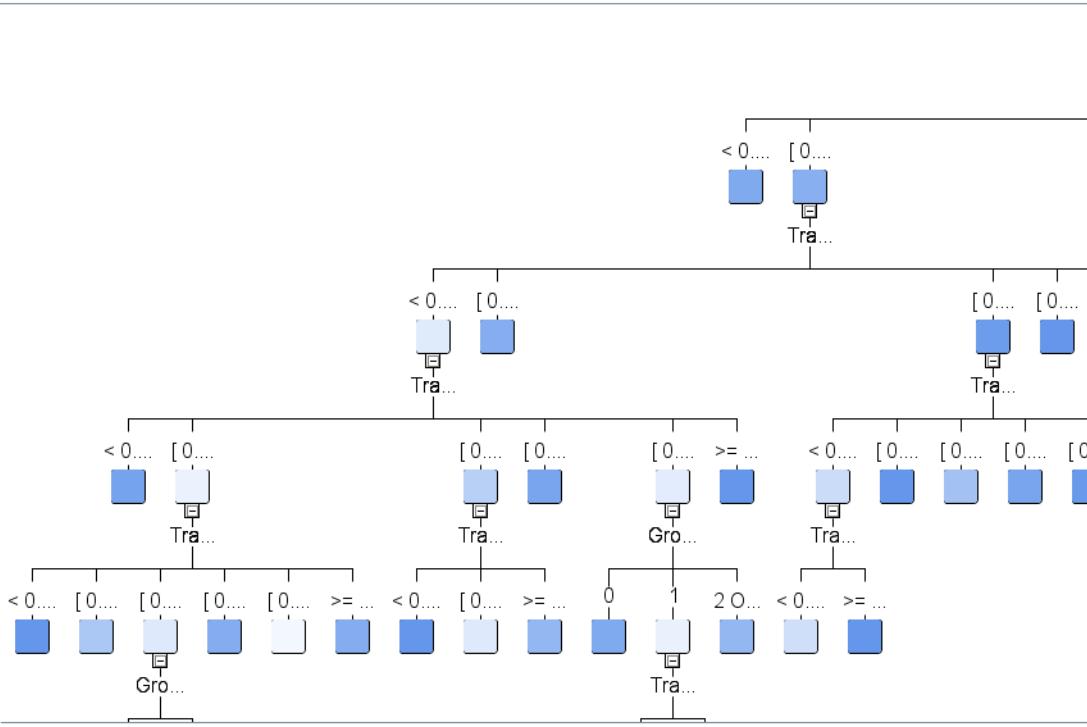
Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag
INPUT	INTERVAL	5	RANGE_LOG_Total_Trans_Amt RANGE_SQRT_Avg_Utilization_Ratio RANGE_SQRT_Total_Amt_Chng_Q4_Q1 RANGE_SQRT_Total_Ct_Chng_Q4_Q1 RANGE_Total_Revolving_Bal
INPUT	NOMINAL	6	G_Contacts_Count_12_mon G_Customer_Age G_Months_Inactive_12_mon G_Months_on_book G_Total_Relationship_Count G_Total_Trans_Ct
ID	INTERVAL	1	_dataobs_

### Node=Modified Tree 2 Model Fit Statistics

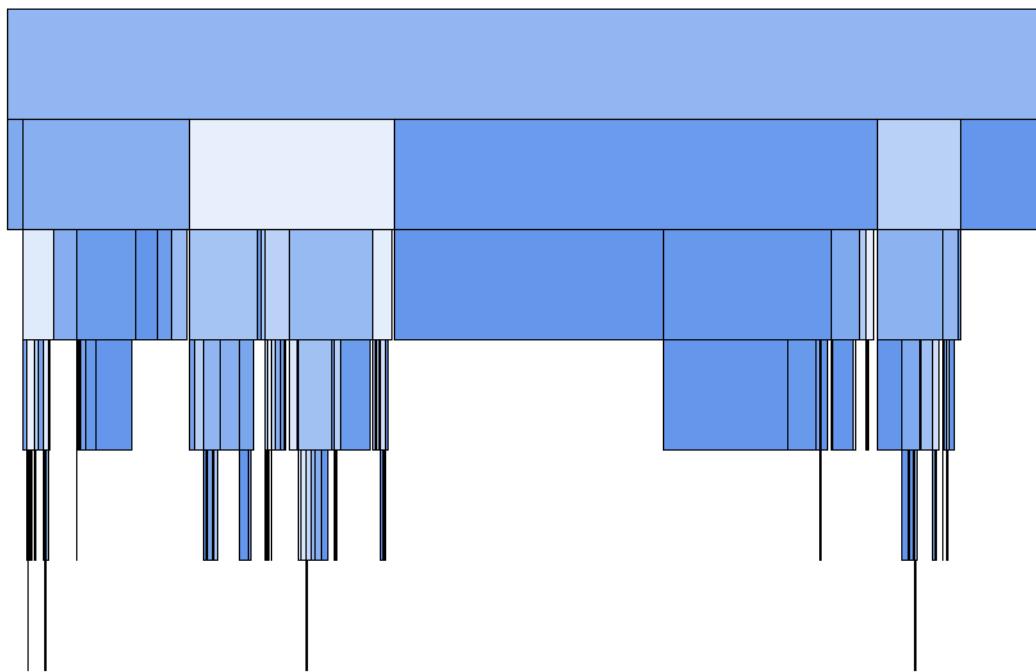
Target=Attrition\_Flag Target Label=' '

Label of Statistic	Train	Validation	Test
Sum of Frequencies	7088.00	2025.00	1014.00
Misclassification Rate	0.05	0.06	0.07
Maximum Absolute Error	1.00	1.00	1.00
Sum of Squared Errors	558.85	197.47	122.79
Average Squared Error	0.04	0.05	0.06
Root Average Squared Error	0.20	0.22	0.25
Divisor for ASE	14176.00	4050.00	2028.00
Total Degrees of Freedom	7088.00	.	.

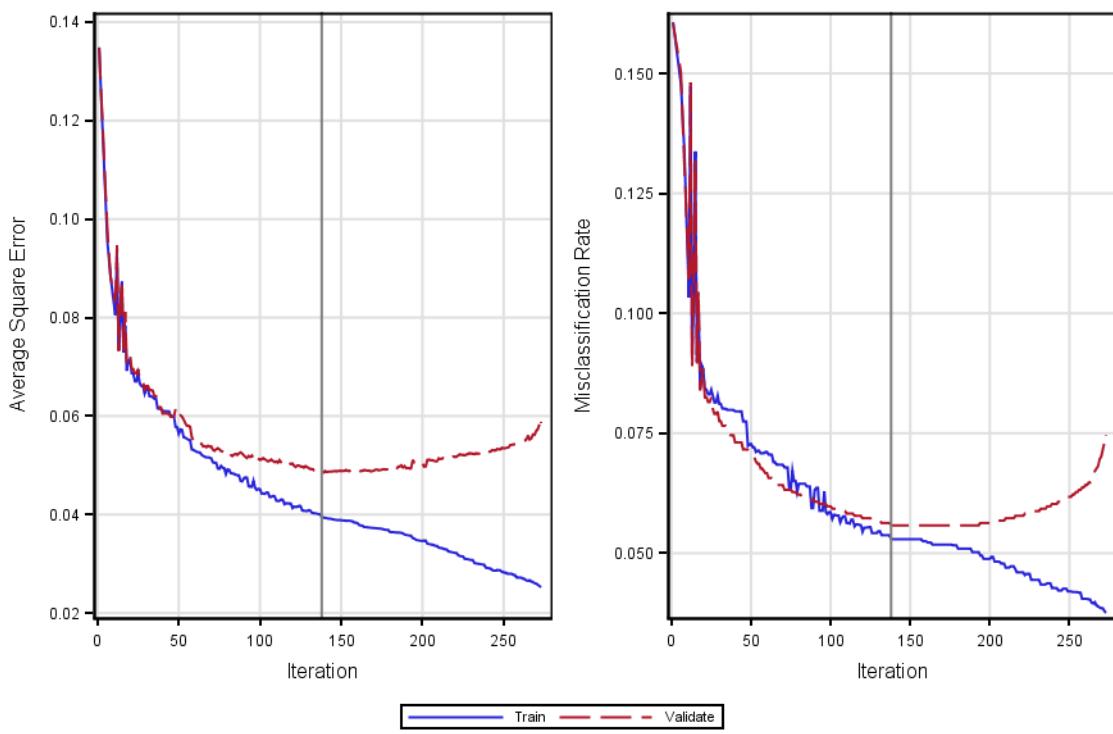
**SAS Enterprise Miner Report**  
**Node=Modified Tree 2**  
**Tree Diagram**



SAS Enterprise Miner Report  
Node=Modified Tree 2  
Treemap



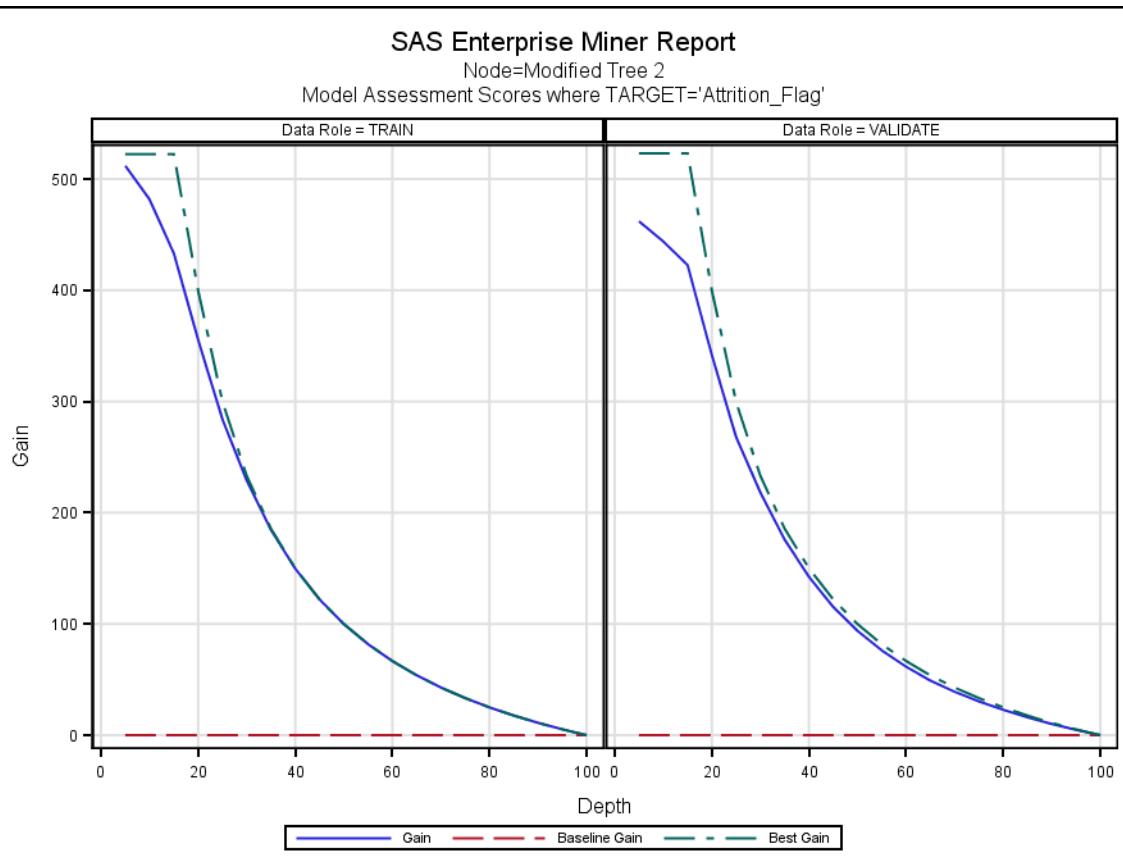
SAS Enterprise Miner Report  
Node=Modified Tree 2  
Model Iteration Plots



## SAS Enterprise Miner Report

Node=Modified Tree 2

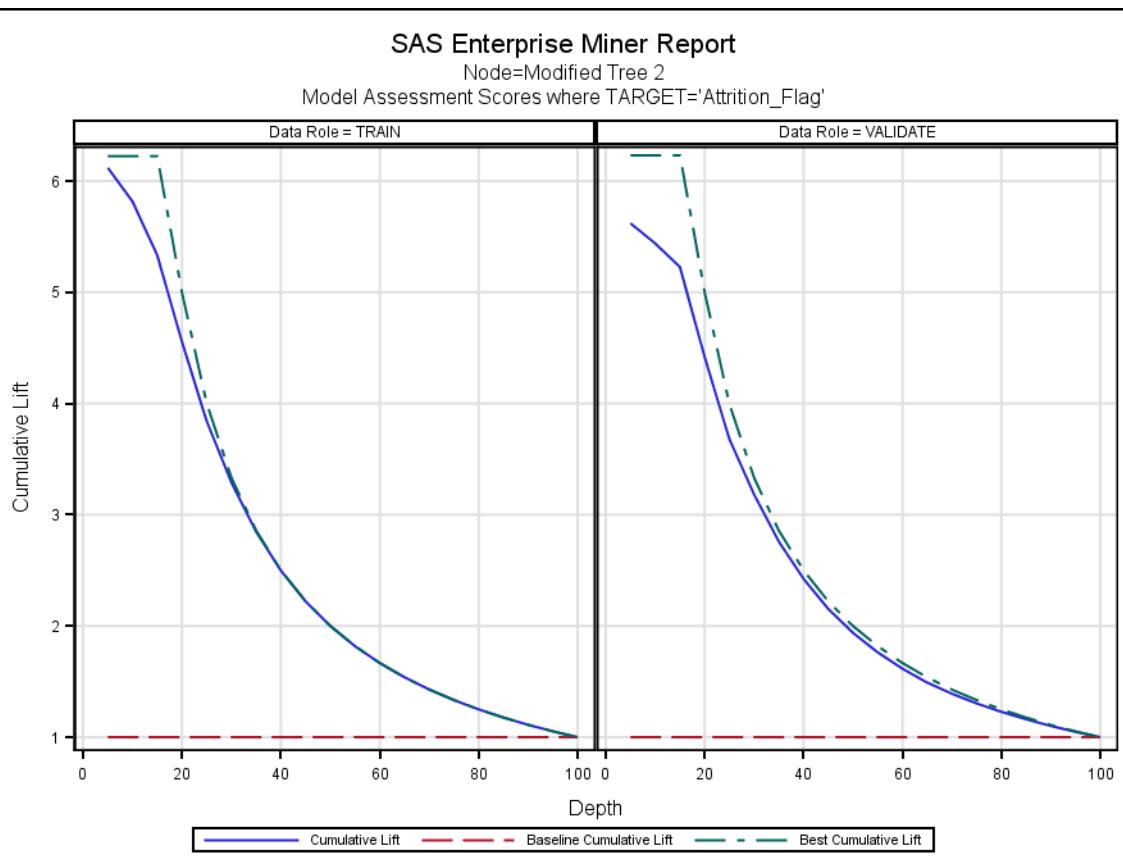
Model Assessment Scores where TARGET='Attrition\_Flag'

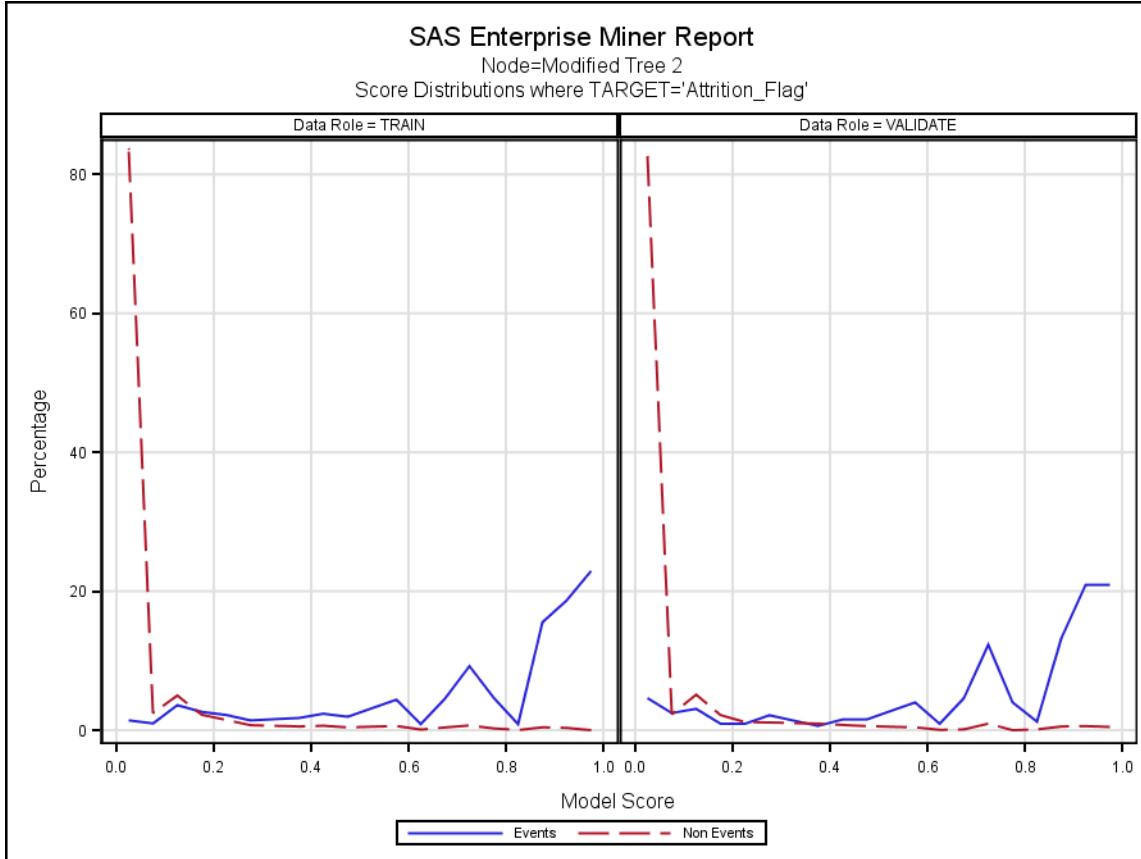
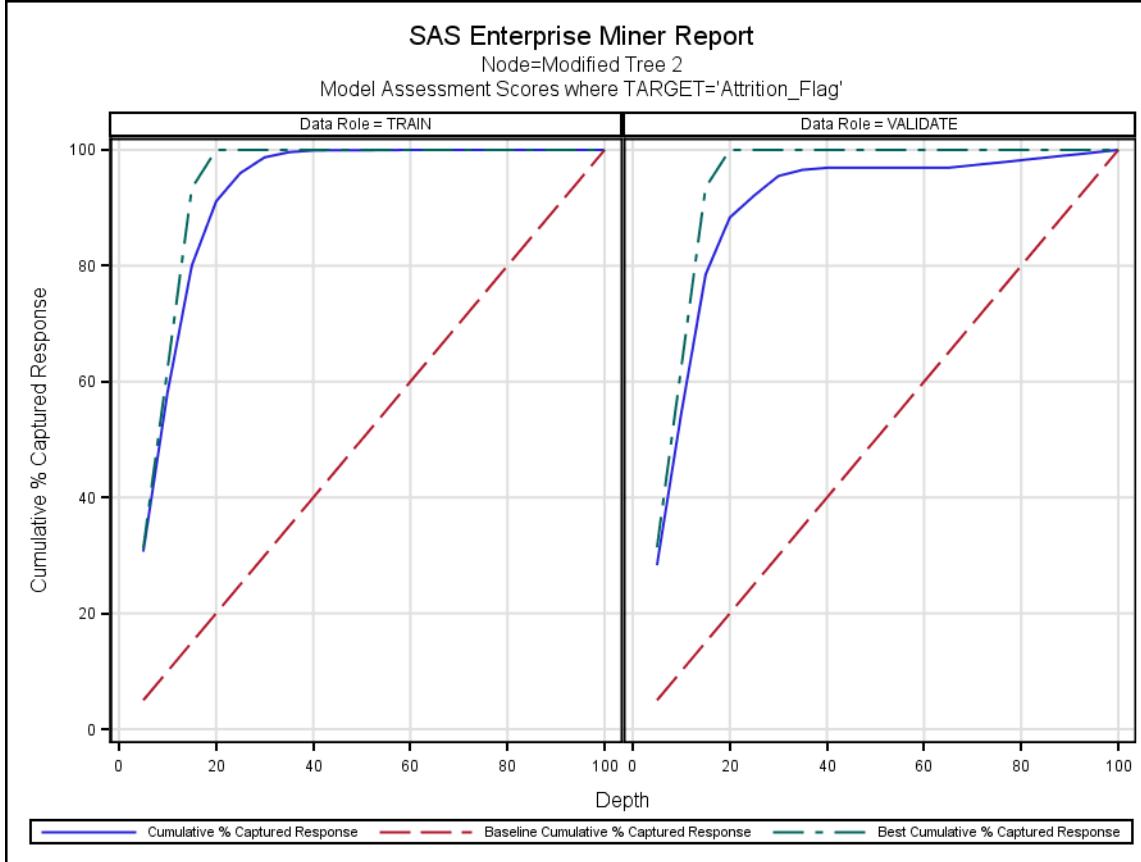


## SAS Enterprise Miner Report

Node=Modified Tree 2

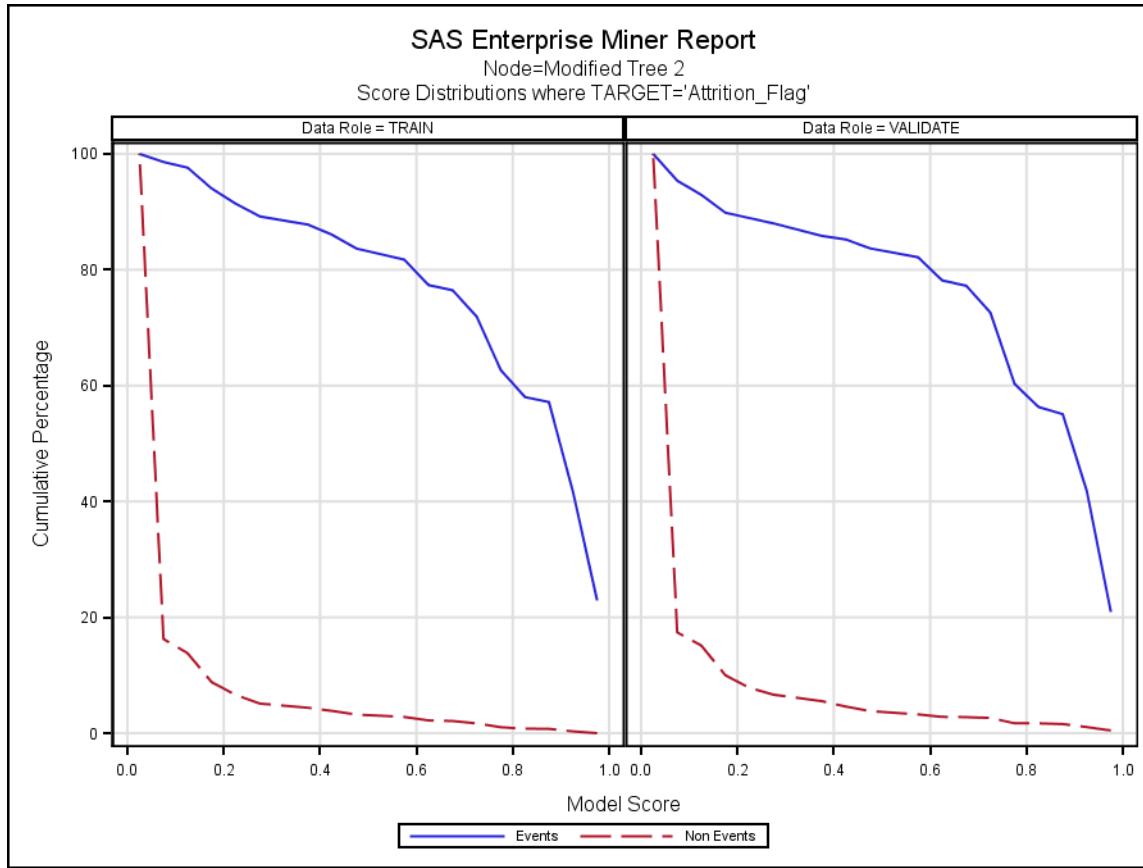
Model Assessment Scores where TARGET='Attrition\_Flag'





Node=Modified Tree 2

Score Distributions where TARGET='Attrition\_Flag'



Node=Modified Tree 2

Score Distributions

Target Variable=Attrition\_Flag 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	261	22.9148	0.0000	22.915	0.000
0.90-0.95	213	18.7006	0.3194	41.615	0.319
0.85-0.90	177	15.5399	0.4202	57.155	0.740
0.80-0.85	10	0.8780	0.0336	58.033	0.773
0.75-0.80	53	4.6532	0.2521	62.687	1.025
0.70-0.75	105	9.2186	0.6724	71.905	1.698
0.65-0.70	52	4.5654	0.4034	76.471	2.101
0.60-0.65	10	0.8780	0.1009	77.349	2.202
0.55-0.60	50	4.3898	0.6051	81.738	2.807
0.45-0.50	22	1.9315	0.4034	83.670	3.211
0.40-0.45	27	2.3705	0.6388	86.040	3.849
0.35-0.40	20	1.7559	0.5379	87.796	4.387
0.25-0.30	16	1.4047	0.7228	89.201	5.110
0.20-0.25	25	2.1949	1.4792	91.396	6.589
0.15-0.20	30	2.6339	2.2189	94.030	8.808
0.10-0.15	41	3.5996	4.9924	97.629	13.801
0.05-0.10	11	0.9658	2.4542	98.595	16.255
0.00-0.05	16	1.4047	83.7452	100.000	100.000

Target Variable=Attrition\_Flag 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	68	20.9231	0.4706	20.923	0.471
0.90-0.95	68	20.9231	0.5882	41.846	1.059
0.85-0.90	43	13.2308	0.5294	55.077	1.588
0.80-0.85	4	1.2308	0.1176	56.308	1.706
0.75-0.80	13	4.0000	0.0000	60.308	1.706
0.70-0.75	40	12.3077	0.9412	72.615	2.647
0.65-0.70	15	4.6154	0.1176	77.231	2.765
0.60-0.65	3	0.9231	0.0588	78.154	2.824
0.55-0.60	13	4.0000	0.4118	82.154	3.235
0.45-0.50	5	1.5385	0.5882	83.692	3.824
0.40-0.45	5	1.5385	0.7647	85.231	4.588
0.35-0.40	2	0.6154	0.9412	85.846	5.529
0.25-0.30	7	2.1538	1.1176	88.000	6.647
0.20-0.25	3	0.9231	1.1765	88.923	7.824
0.15-0.20	3	0.9231	2.1765	89.846	10.000
0.10-0.15	10	3.0769	5.1176	92.923	15.118
0.05-0.10	8	2.4615	2.2941	95.385	17.412
0.00-0.05	15	4.6154	82.5882	100.000	100.000

## SAS Enterprise Miner Report

### Node=Modified Tree 1 Summary

Node id = Tree2  
 Node label = Modified Tree 1  
 Meta path = Ids => Varsel => Trans => Meta => Trans2 => Meta2 => Part2 => Tree2  
 Notes =

### Node=Modified Tree 1 Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	DecisionTree		Kass	Y		Pred	N	
AVG	Y		KassApply	BEFORE		Predict	Y	
AssessMeasure	MISC	PROFIT/LOSS	LeafSize	5		ProfitLoss	NONE	
AssessPercentage	0.25		Leafid	Y		RASE	N	
CV	N		Maxbranch	4	2	SampleMethod	RANDOM	
CVNIter	10		Maxdepth	8	6	SampleSeed	12345	
CVRepeat	1		MinCatSize	5		SampleSize	10000	
CVSeed	12345		MissingValue	USEINSEARCH		ShowNodeld	Y	
ClassColorBy	PERCENTCORRECT		NSubtree	1		ShowValid	Y	
Count	Y		NodeRole	SEGMENT		SigLevel	0.2	
CreateSample	DEFAULT		NodeSample	20000		SplitPrecision	4	
Criterion	DEFAULT		NominalCriterion	GINI	PROBCHISQ	Splitsize	.	
Depth	Y		Nrules	5		Subtree	ASSESSMENT	
Dummy	N		Nsurrs	0		Target	ALL	
Exhaustive	5000		NumInputs	1		ToolType	MODEL	
Freeze	N		NumSingleImp	5		TrainMode	BATCH	
ImportModel	N		ObsImportance	N		UseDecision	N	
ImportedTreeData			OrdinalCriterion	ENTROPY		UseMultipleTarget	N	
Inputs	N		PercentCorrect	N		UsePriors	N	
IntColorBy	AVG		Performance	DISK		UseVarOnce	N	
IntervalCriterion	PROBF		Precision	4		VarSelection	Y	

### Node=Modified Tree 1 Variable Summary

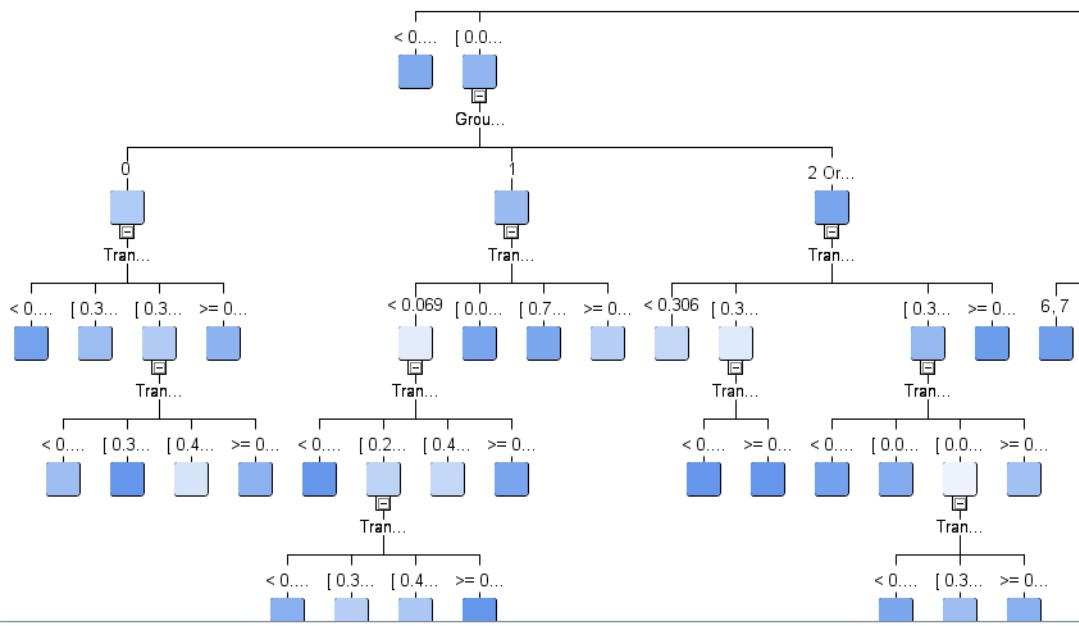
Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag
INPUT	INTERVAL	5	RANGE_LOG_Total_Trans_Amt RANGE_SQRT_Avg_Utilization_Ratio RANGE_SQRT_Total_Amt_Chng_Q4_Q1 RANGE_SQRT_Total_Ct_Chng_Q4_Q1 RANGE_Total_Revolving_Bal
INPUT	NOMINAL	6	G_Contacts_Count_12_mon G_Customer_Age G_Months_Inactive_12_mon G_Months_on_book G_Total_Relationship_Count G_Total_Trans_Ct
ID	INTERVAL	1	_dataobs_

### Node=Modified Tree 1 Model Fit Statistics

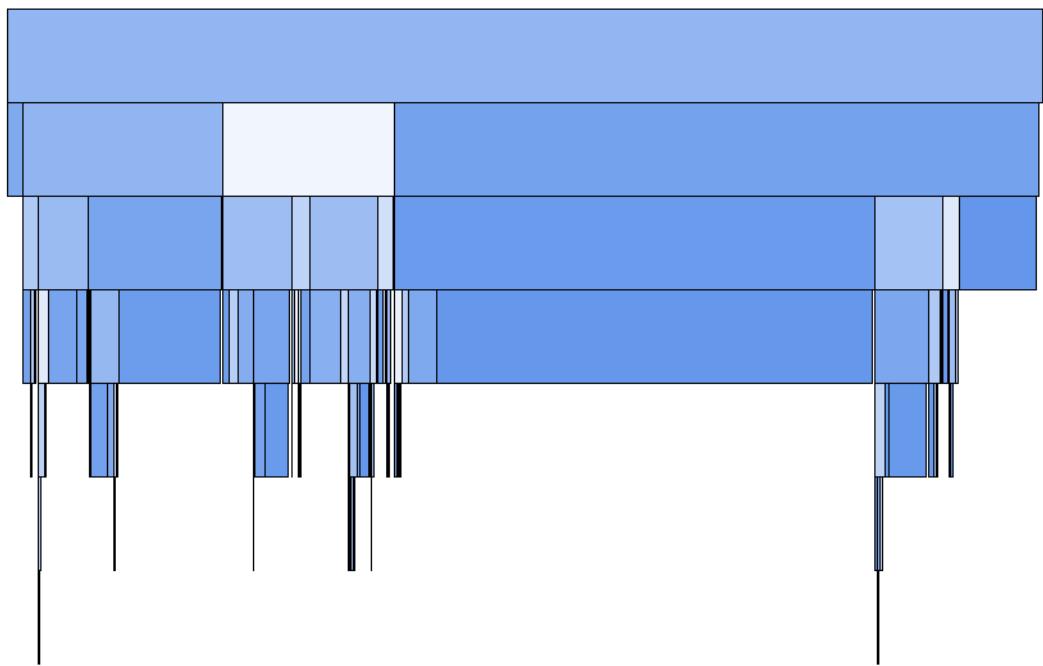
Target=Attrition\_Flag Target Label=' '

Label of Statistic	Train	Validation	Test
Sum of Frequencies	7088.00	2025.00	1014.00
Misclassification Rate	0.05	0.06	0.07
Maximum Absolute Error	1.00	1.00	1.00
Sum of Squared Errors	541.55	206.06	111.79
Average Squared Error	0.04	0.05	0.06
Root Average Squared Error	0.20	0.23	0.23
Divisor for ASE	14176.00	4050.00	2028.00
Total Degrees of Freedom	7088.00	.	.

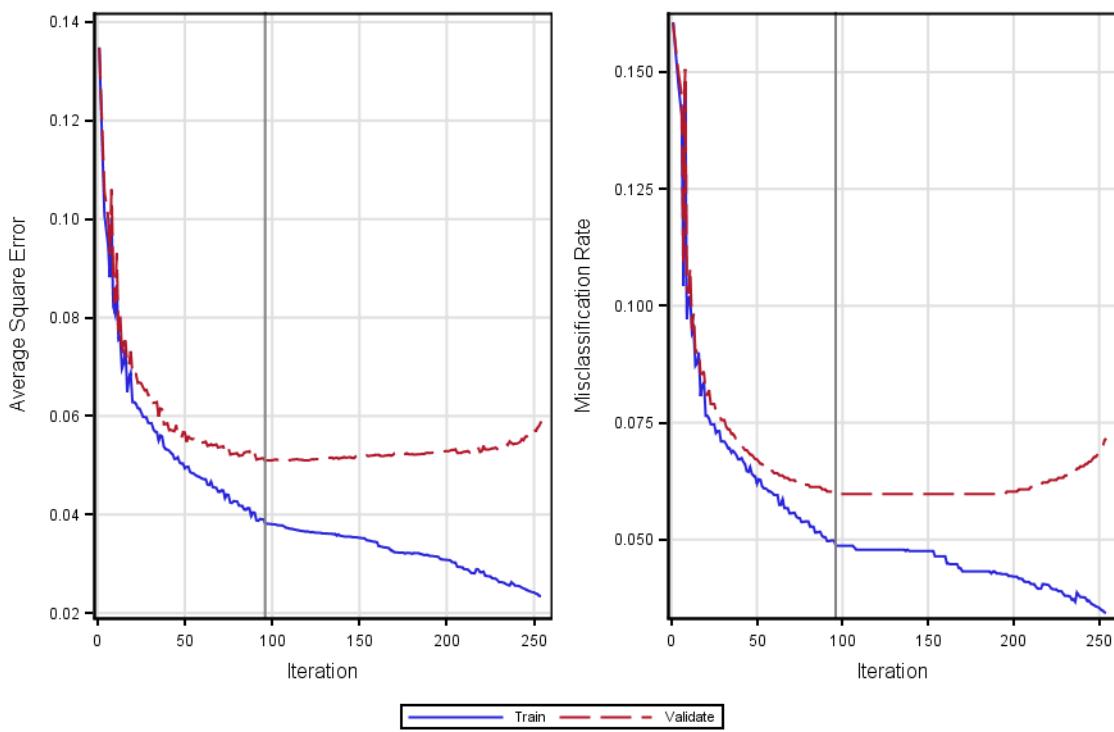
**SAS Enterprise Miner Report**  
**Node=Modified Tree 1**  
**Tree Diagram**



SAS Enterprise Miner Report  
Node=Modified Tree 1  
Treemap



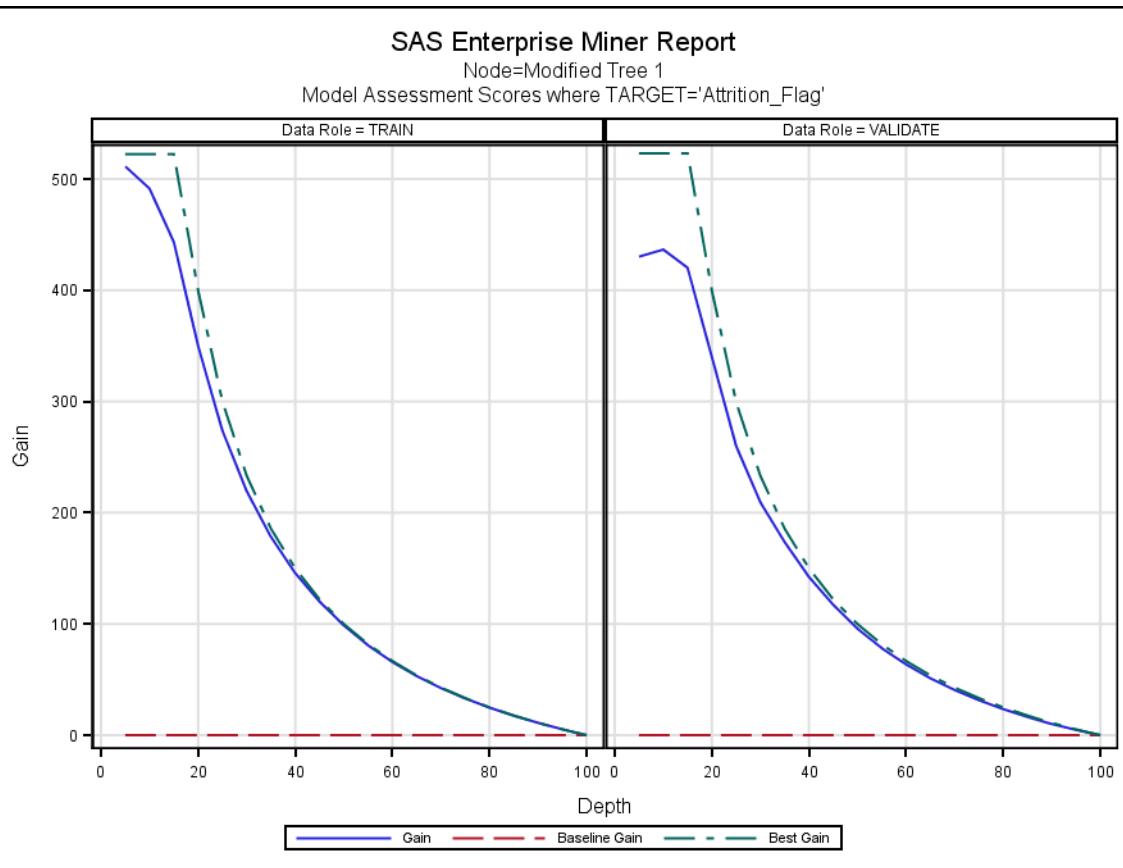
SAS Enterprise Miner Report  
Node=Modified Tree 1  
Model Iteration Plots



## SAS Enterprise Miner Report

Node=Modified Tree 1

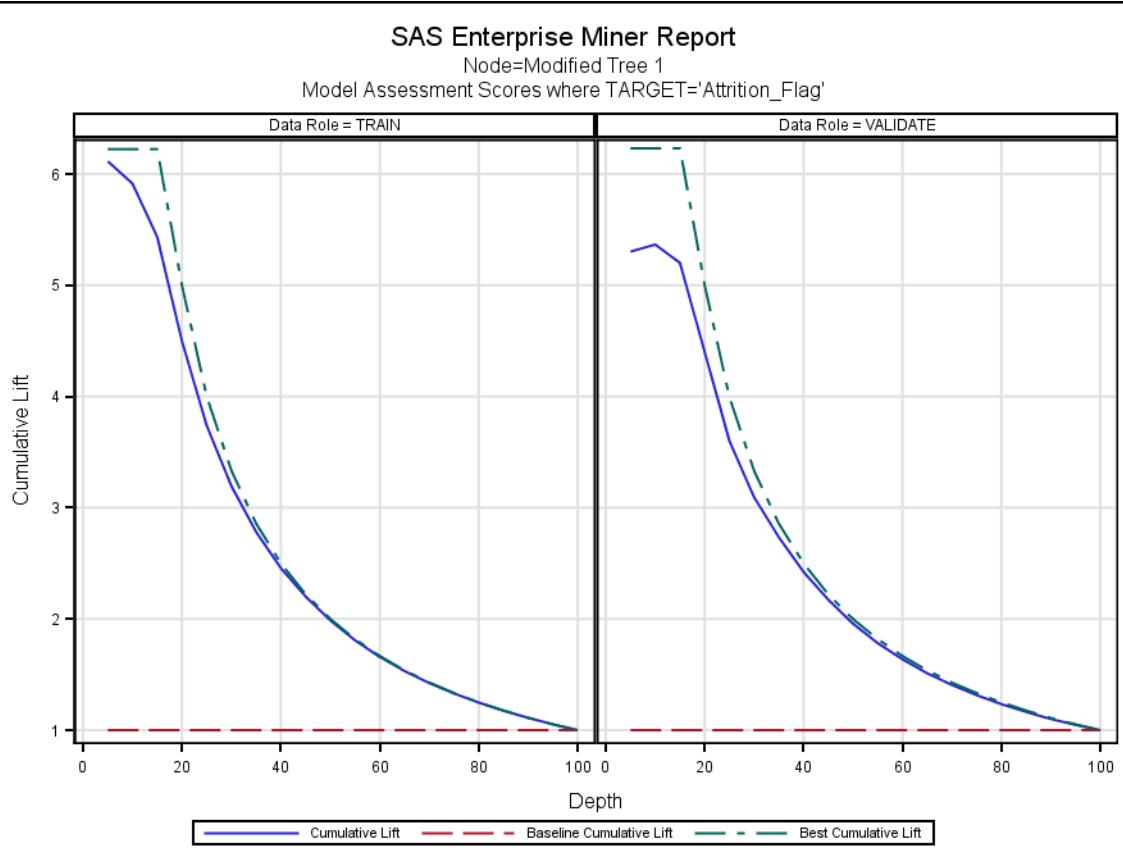
Model Assessment Scores where TARGET='Attrition\_Flag'

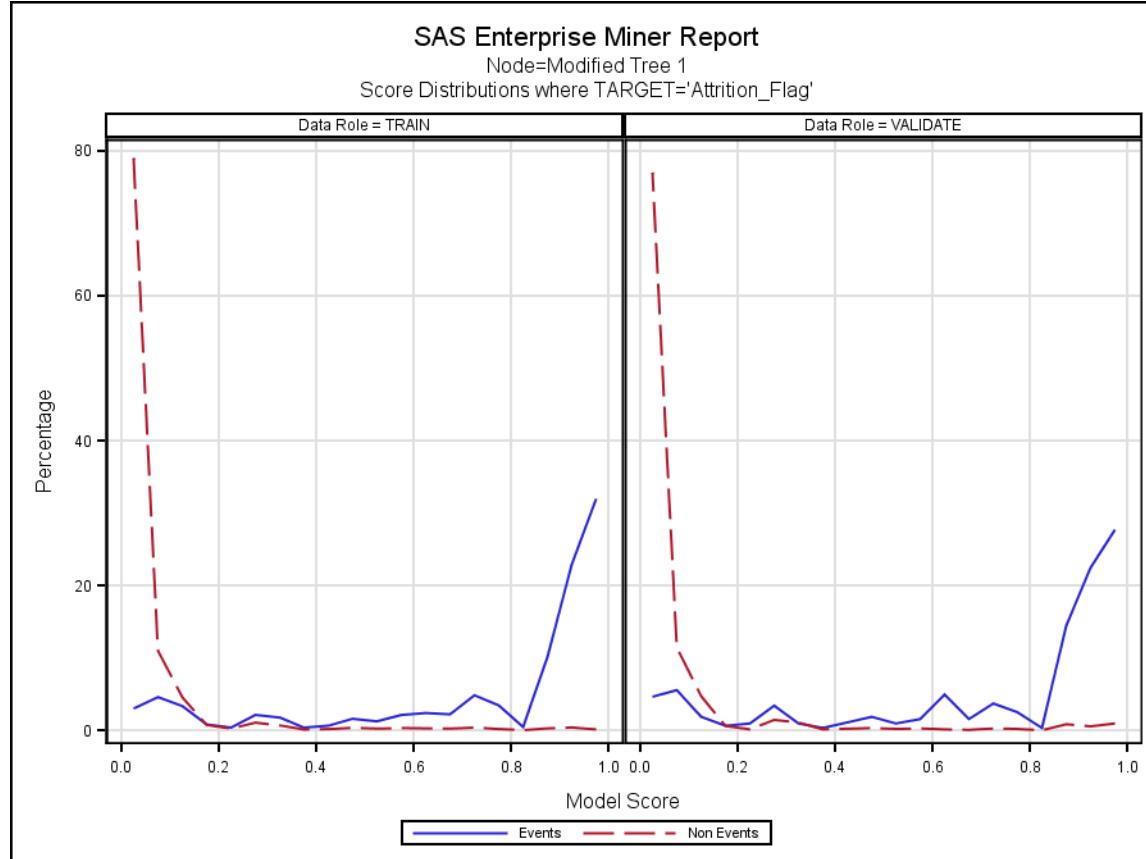
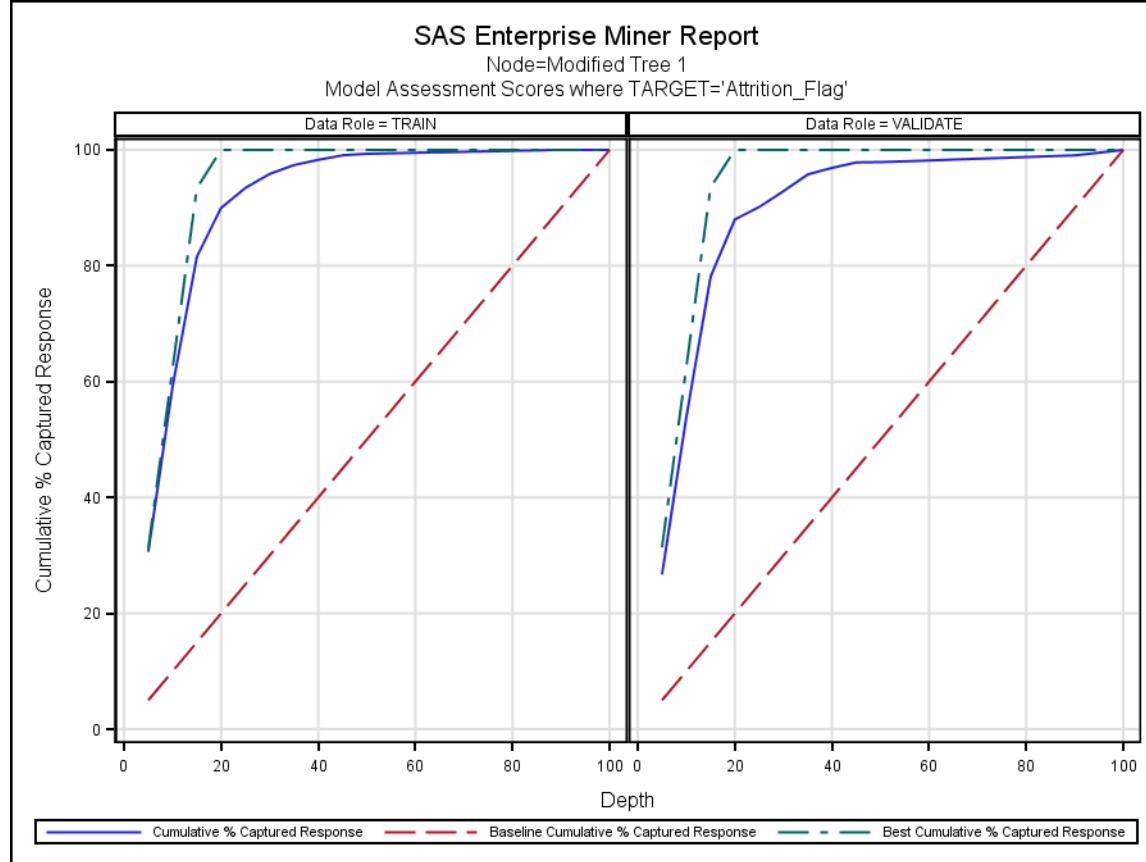


## SAS Enterprise Miner Report

Node=Modified Tree 1

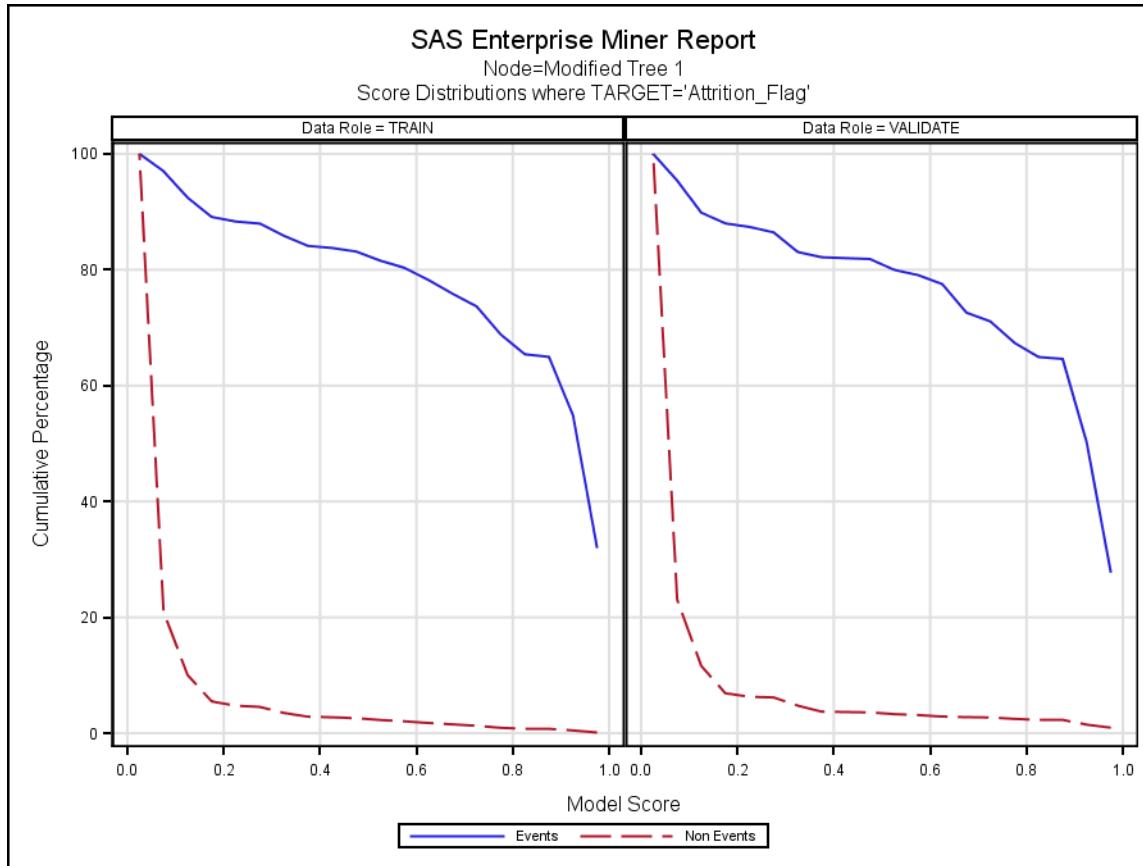
Model Assessment Scores where TARGET='Attrition\_Flag'





Node=Modified Tree 1

Score Distributions where TARGET='Attrition\_Flag'



Node=Modified Tree 1

Score Distributions

Target Variable=Attrition\_Flag 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	364	31.9579	0.1177	31.958	0.118
0.90-0.95	261	22.9148	0.3698	54.873	0.487
0.85-0.90	115	10.0966	0.2521	64.969	0.740
0.80-0.85	5	0.4390	0.0168	65.408	0.756
0.75-0.80	39	3.4241	0.1681	68.832	0.925
0.70-0.75	55	4.8288	0.3698	73.661	1.294
0.65-0.70	25	2.1949	0.2185	75.856	1.513
0.60-0.65	27	2.3705	0.2521	78.227	1.765
0.55-0.60	24	2.1071	0.2858	80.334	2.051
0.50-0.55	14	1.2291	0.2185	81.563	2.269
0.45-0.50	18	1.5803	0.3194	83.143	2.589
0.40-0.45	7	0.6146	0.1513	83.758	2.740
0.35-0.40	4	0.3512	0.1009	84.109	2.841
0.30-0.35	20	1.7559	0.6556	85.865	3.496
0.25-0.30	24	2.1071	1.0422	87.972	4.539
0.20-0.25	4	0.3512	0.2185	88.323	4.757
0.15-0.20	9	0.7902	0.7228	89.113	5.480
0.10-0.15	38	3.3363	4.5554	92.450	10.035
0.05-0.10	52	4.5654	10.9598	97.015	20.995
0.00-0.05	34	2.9851	79.0049	100.000	100.000

Target Variable=Attrition\_Flag 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	90	27.6923	0.9412	27.692	0.941
0.90-0.95	73	22.4615	0.5294	50.154	1.471
0.85-0.90	47	14.4615	0.8235	64.615	2.294
0.80-0.85	1	0.3077	0.0000	64.923	2.294
0.75-0.80	8	2.4615	0.1765	67.385	2.471
0.70-0.75	12	3.6923	0.2353	71.077	2.706
0.65-0.70	5	1.5385	0.0588	72.615	2.765
0.60-0.65	16	4.9231	0.1176	77.538	2.882
0.55-0.60	5	1.5385	0.2353	79.077	3.118
0.50-0.55	3	0.9231	0.1765	80.000	3.294
0.45-0.50	6	1.8462	0.2941	81.846	3.588
0.35-0.40	1	0.3077	0.1176	82.154	3.706
0.30-0.35	3	0.9231	1.0588	83.077	4.765
0.25-0.30	11	3.3846	1.4118	86.462	6.176
0.20-0.25	3	0.9231	0.1176	87.385	6.294
0.15-0.20	2	0.6154	0.5882	88.000	6.882
0.10-0.15	6	1.8462	4.7059	89.846	11.588
0.05-0.10	18	5.5385	11.4118	95.385	23.000
0.00-0.05	15	4.6154	77.0000	100.000	100.000

## SAS Enterprise Miner Report

### Node=Standard Decision Tree Summary

Node id = Tree  
 Node label = Standard Decision Tree  
 Meta path = Ids => Varsel => Trans => Meta => Trans2 => Meta2 => Part2 => Tree  
 Notes =

### Node=Standard Decision Tree Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	DecisionTree		Kass	Y		Pred	N	
AVG	Y		KassApply	BEFORE		Predict	Y	
AssessMeasure	MISC	PROFIT/LOSS	LeafSize	5		ProfitLoss	NONE	
AssessPercentage	0.25		Leafid	Y		RASE	N	
CV	N		Maxbranch	2		SampleMethod	RANDOM	
CVNIter	10		Maxdepth	6		SampleSeed	12345	
CVRepeat	1		MinCatSize	5		SampleSize	10000	
CVSeed	12345		MissingValue	USEINSEARCH		ShowNodeld	Y	
ClassColorBy	PERCENTCORRECT		NSubtree	1		ShowValid	Y	
Count	Y		NodeRole	SEGMENT		SigLevel	0.2	
CreateSample	DEFAULT		NodeSample	20000		SplitPrecision	4	
Criterion	DEFAULT		NominalCriterion	PROBCHISQ		Splitsize	.	
Depth	Y		Nrules	5		Subtree	ASSESSMENT	
Dummy	N		Nsurrs	0		Target	ALL	
Exhaustive	5000		NumInputs	1		ToolType	MODEL	
Freeze	N		NumSingleImp	5		TrainMode	BATCH	
ImportModel	N		ObsImportance	N		UseDecision	N	
ImportedTreeData			OrdinalCriterion	ENTROPY		UseMultipleTarget	N	
Inputs	N		PercentCorrect	N		UsePriors	N	
IntColorBy	AVG		Performance	DISK		UseVarOnce	N	
IntervalCriterion	PROBF		Precision	4		VarSelection	Y	

### Node=Standard Decision Tree Variable Summary

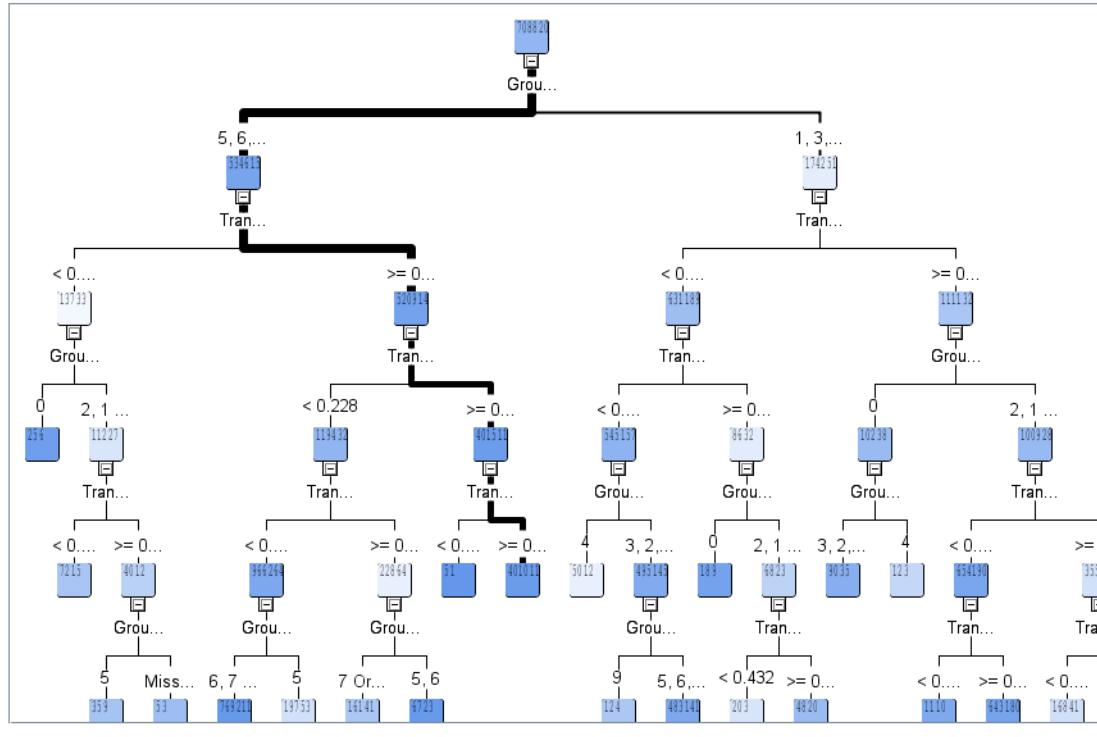
Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag
INPUT	INTERVAL	5	RANGE_LOG_Total_Trans_Amt RANGE_SQRT_Avg_Utilization_Ratio RANGE_SQRT_Total_Amt_Chng_Q4_Q1 RANGE_SQRT_Total_Ct_Chng_Q4_Q1 RANGE_Total_Revolving_Bal
INPUT	NOMINAL	6	G_Contacts_Count_12_mon G_Customer_Age G_Months_Inactive_12_mon G_Months_on_book G_Total_Relationship_Count G_Total_Trans_Ct
ID	INTERVAL	1	_dataobs_

### Node=Standard Decision Tree Model Fit Statistics

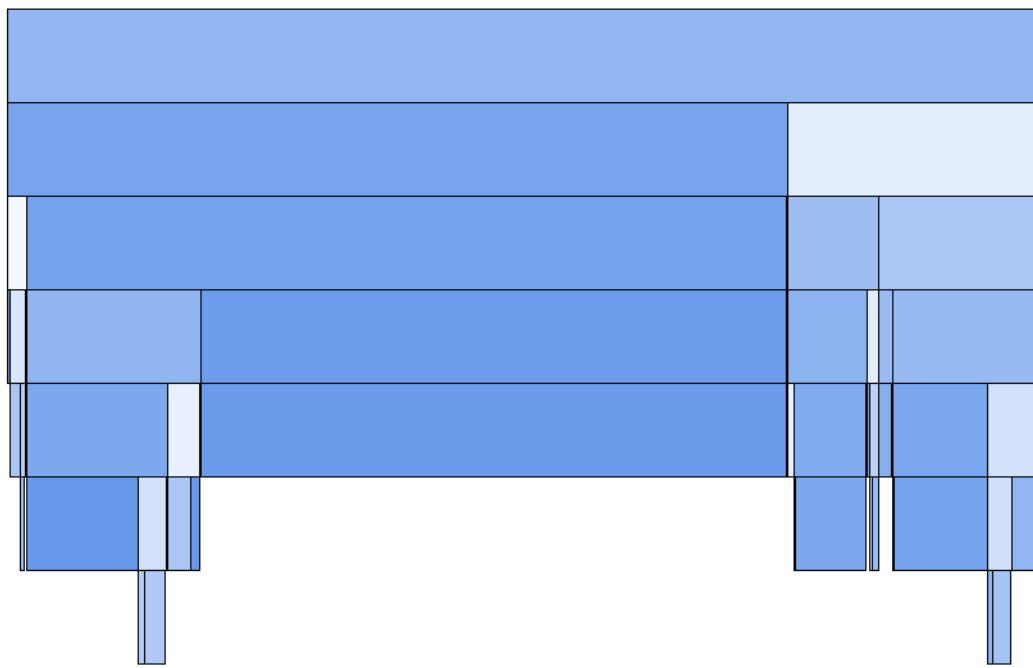
Target=Attrition\_Flag Target Label='1'

Label of Statistic	Train	Validation	Test
Sum of Frequencies	7088.00	2025.00	1014.00
Misclassification Rate	0.06	0.07	0.08
Maximum Absolute Error	0.99	0.99	0.99
Sum of Squared Errors	740.50	226.69	127.89
Average Squared Error	0.05	0.06	0.06
Root Average Squared Error	0.23	0.24	0.25
Divisor for ASE	14176.00	4050.00	2028.00
Total Degrees of Freedom	7088.00	.	.

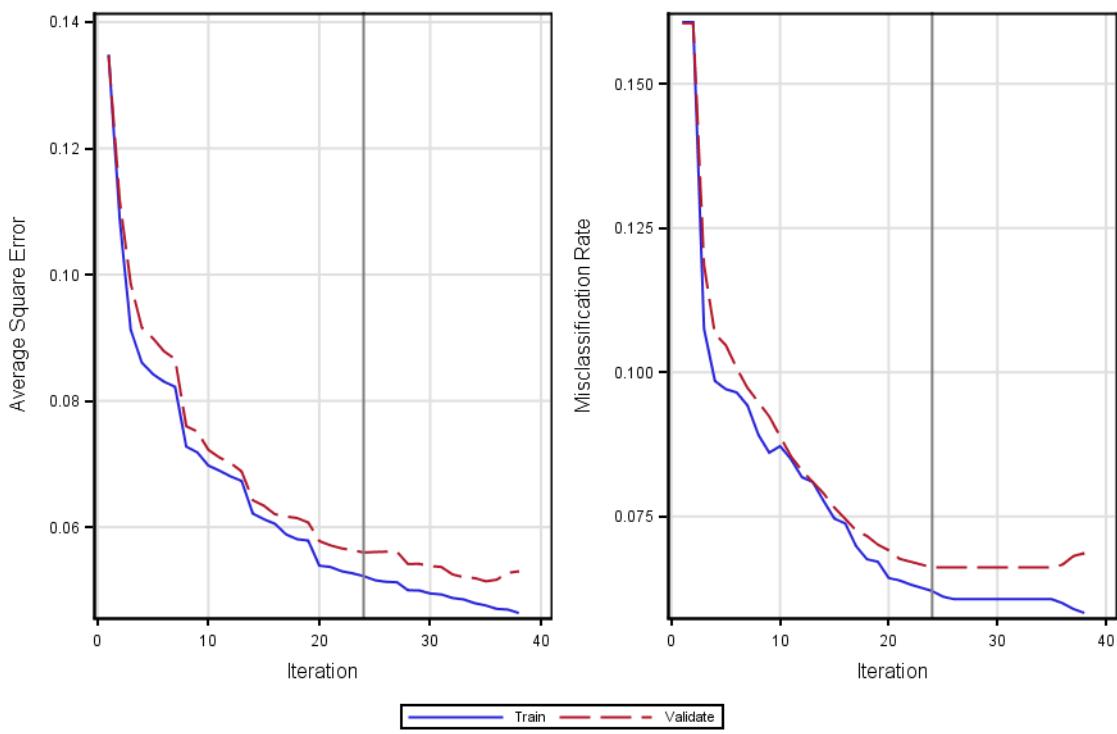
**SAS Enterprise Miner Report**  
**Node=Standard Decision Tree**  
**Tree Diagram**



SAS Enterprise Miner Report  
Node=Standard Decision Tree  
Treemap



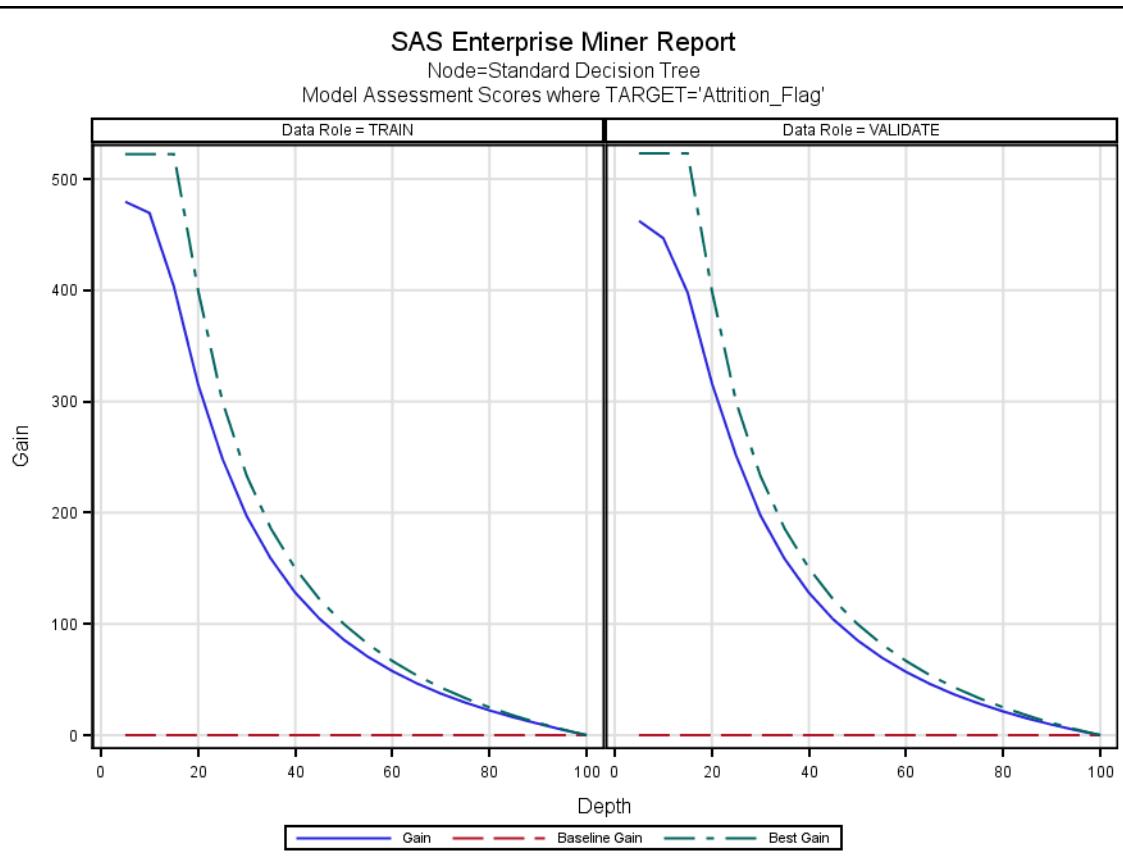
SAS Enterprise Miner Report  
Node=Standard Decision Tree  
Model Iteration Plots



## SAS Enterprise Miner Report

Node=Standard Decision Tree

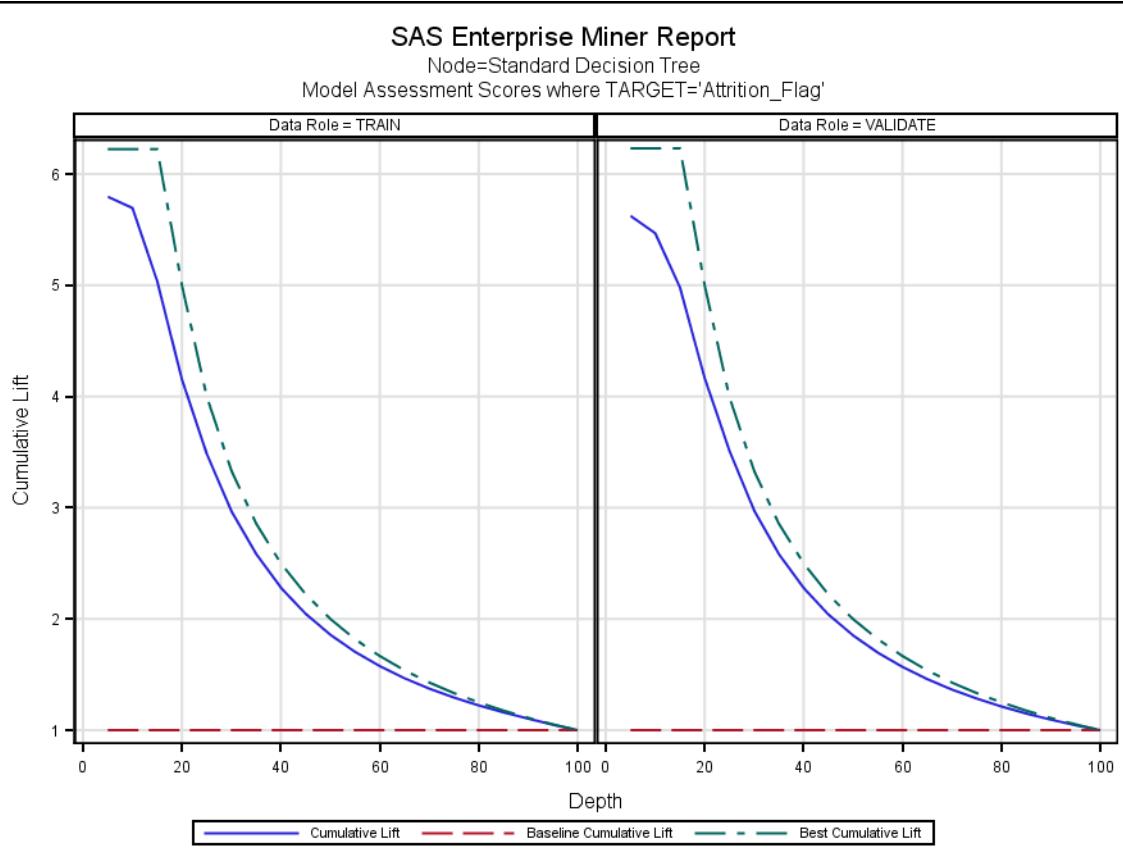
Model Assessment Scores where TARGET='Attrition\_Flag'

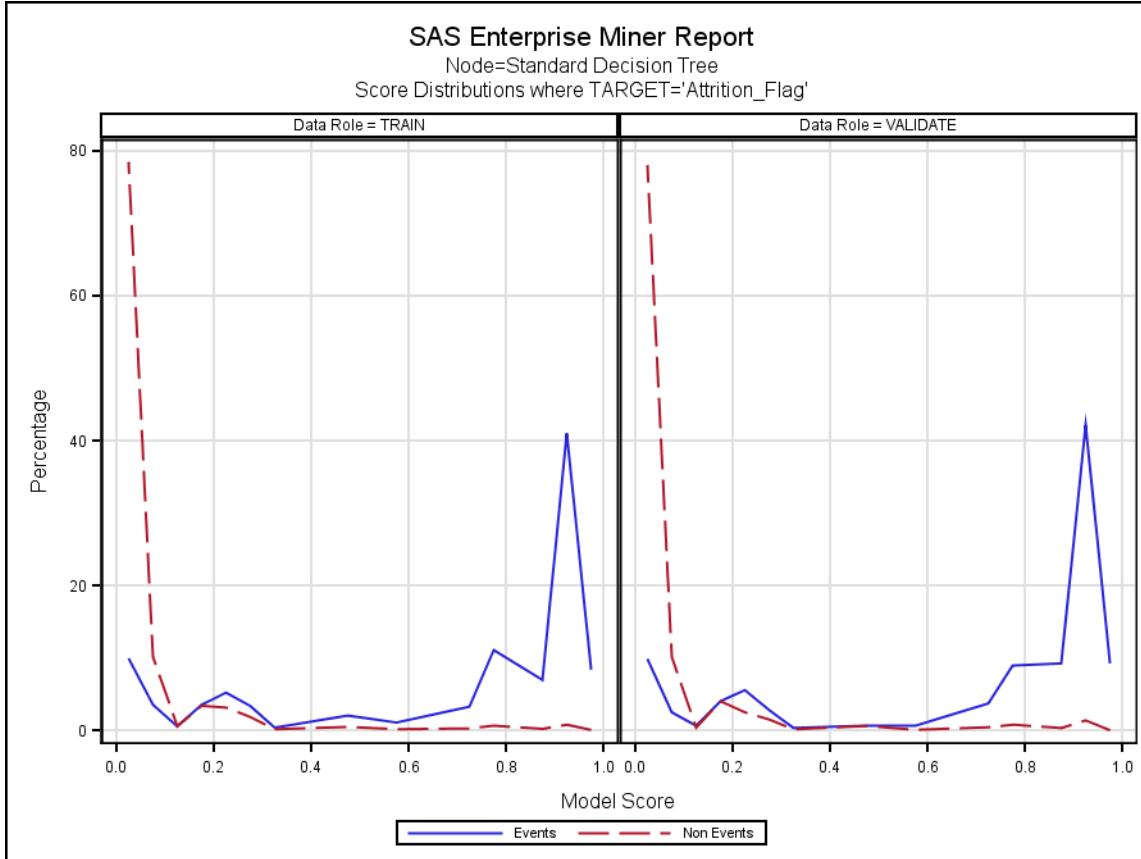
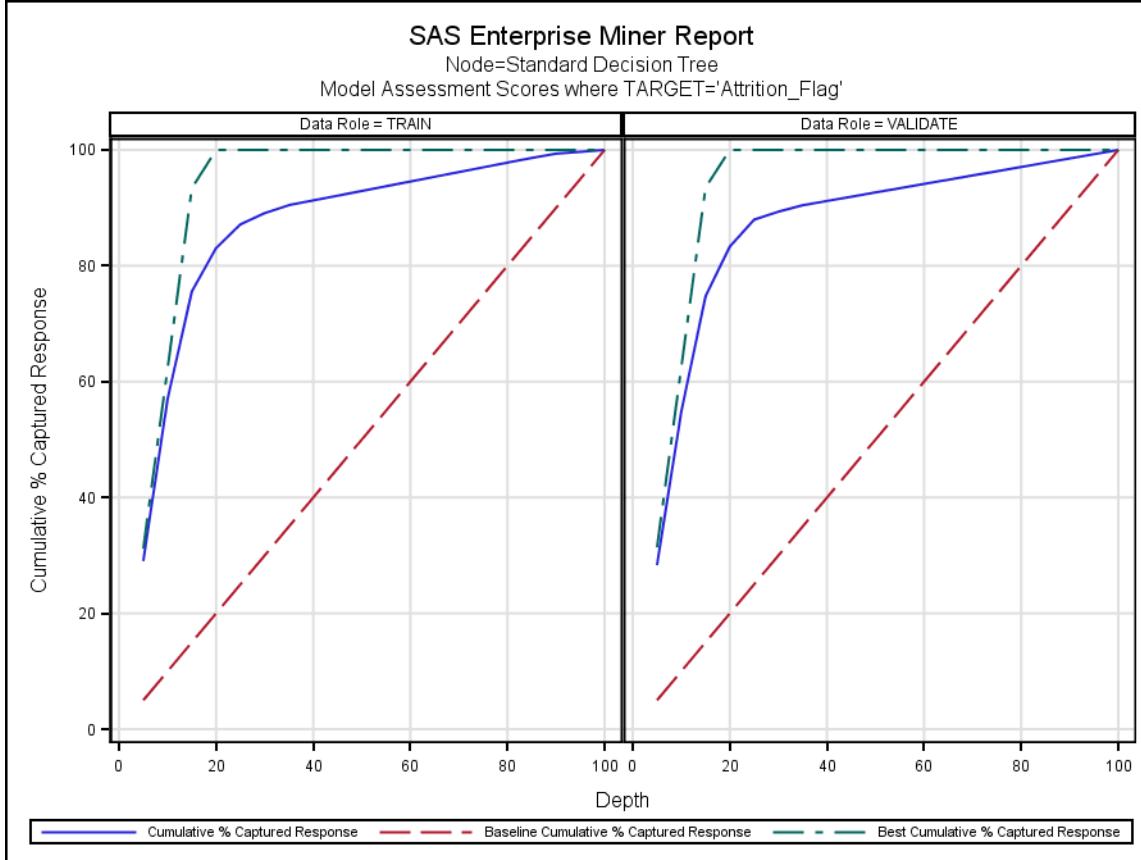


## SAS Enterprise Miner Report

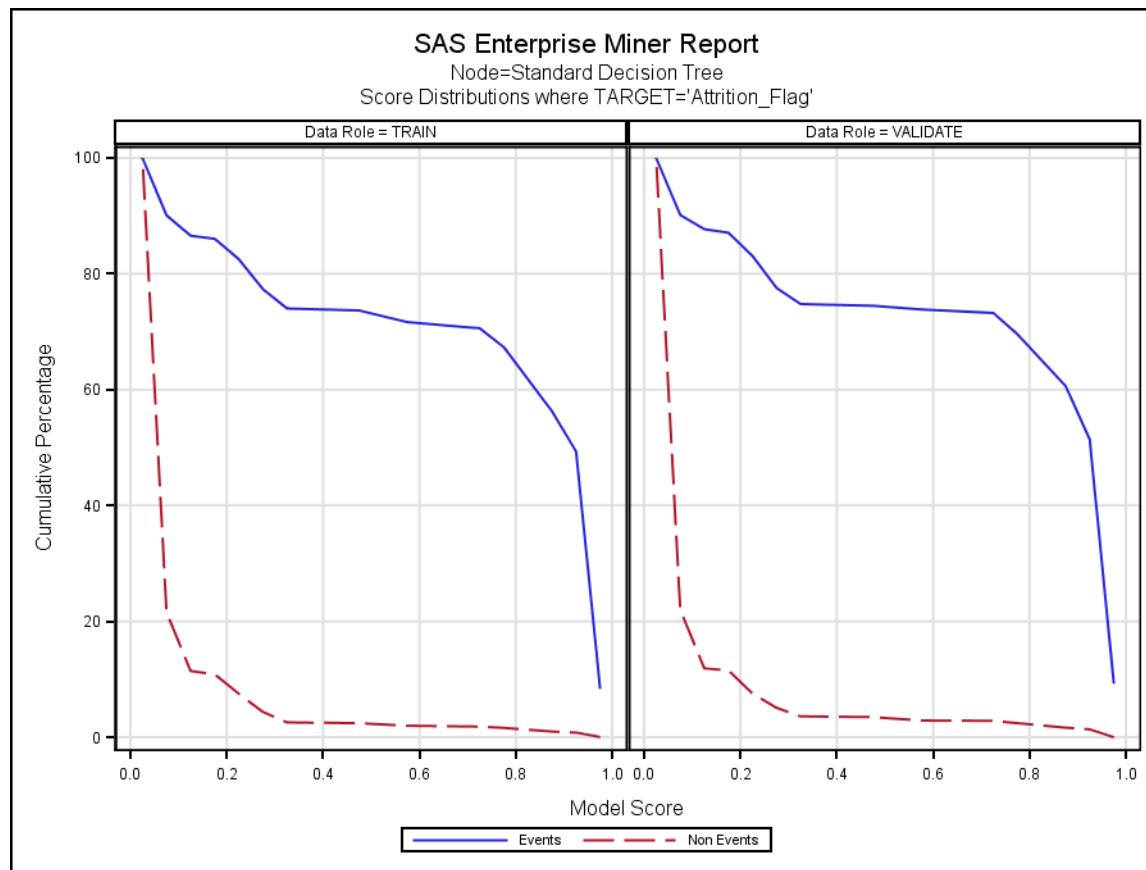
Node=Standard Decision Tree

Model Assessment Scores where TARGET='Attrition\_Flag'





Score Distributions where TARGET='Attrition\_Flag'



Node=Standard Decision Tree  
Score Distributions

Target Variable=Attrition\_Flag 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	95	8.3406	0.0336	8.341	0.034
0.90-0.95	467	41.0009	0.7564	49.342	0.790
0.85-0.90	79	6.9359	0.1849	56.277	0.975
0.75-0.80	126	11.0623	0.6220	67.340	1.597
0.70-0.75	37	3.2485	0.2353	70.588	1.832
0.55-0.60	12	1.0536	0.1345	71.642	1.967
0.45-0.50	23	2.0193	0.4539	73.661	2.421
0.30-0.35	4	0.3512	0.1345	74.012	2.555
0.25-0.30	38	3.3363	1.8154	77.349	4.370
0.20-0.25	59	5.1800	3.1266	82.529	7.497
0.15-0.20	40	3.5119	3.3619	86.040	10.859
0.10-0.15	6	0.5268	0.5715	86.567	11.430
0.05-0.10	40	3.5119	10.1362	90.079	21.567
0.00-0.05	113	9.9210	78.4334	100.000	100.000

Target Variable=Attrition\_Flag 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	30	9.2308	0.0000	9.231	0.000
0.90-0.95	137	42.1538	1.3529	51.385	1.353
0.85-0.90	30	9.2308	0.2941	60.615	1.647
0.75-0.80	29	8.9231	0.7647	69.538	2.412
0.70-0.75	12	3.6923	0.4118	73.231	2.824
0.55-0.60	2	0.6154	0.0588	73.846	2.882
0.45-0.50	2	0.6154	0.5882	74.462	3.471
0.30-0.35	1	0.3077	0.1176	74.769	3.588
0.25-0.30	9	2.7692	1.4706	77.538	5.059
0.20-0.25	18	5.5385	2.4706	83.077	7.529
0.15-0.20	13	4.0000	4.0000	87.077	11.529
0.10-0.15	2	0.6154	0.3529	87.692	11.882
0.05-0.10	8	2.4615	10.1176	90.154	22.000
0.00-0.05	32	9.8462	78.0000	100.000	100.000

## SAS Enterprise Miner Report

### Node=Modified 3 Boost Summary

Node id = Boost4  
 Node label = Modified 3 Boost  
 Meta path = Ids => Varsel => Trans => Meta => Trans2 => Meta2 => Part2 => Boost4  
 Notes =

### Node=Modified 3 Boost Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	Boost		MaxBranch	5	2	Performance	DISK	
AssessMeasure	MISC	PROFIT	MaxDepth	8	2	Precision	0	
CategoricalBins	30		Measure	PROFIT		ReUseVar	1	
CreateHStat	N		MinCatSize	5		Seed	78354	12345
Exhaustive	5000		Missing	USEINSEARCH		Shrinkage	0.1	
Huber	0.9	NO	NSurrs	0		SplitSize	.	
IntervalBins	100		NodeSize	20000		SubSeries	BEST	
IterationNum	1		NumPairImp	0		ToolType	MODEL	
Iterations	50		NumSingleImp	5		TrainProportion	60	
LeafFraction	0.1		ObsImportance	N		VarSelection	Y	

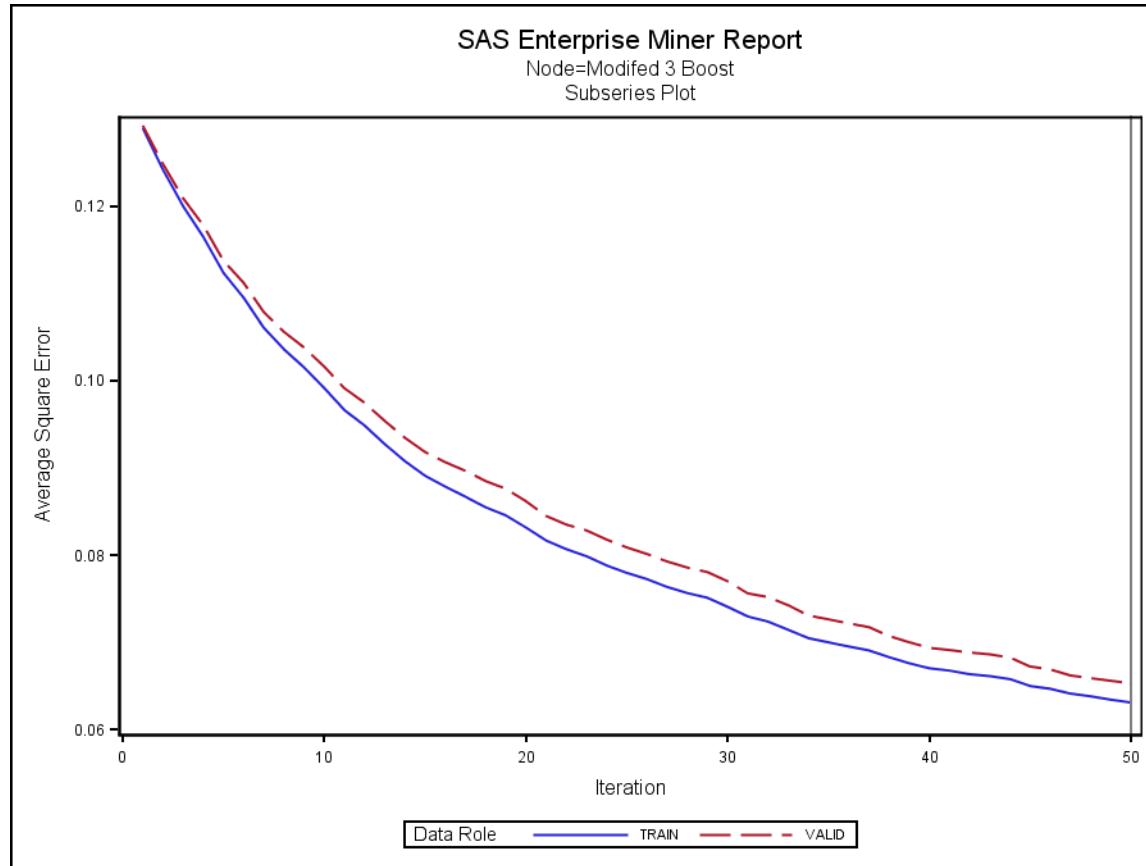
### Node=Modified 3 Boost Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag
INPUT	INTERVAL	5	RANGE_LOG_Total_Trans_Amt RANGE_SQRT_Avg_Utilization_Ratio RANGE_SQRT_Total_Amt_Chng_Q4_Q1 RANGE_SQRT_Total_Ct_Chng_Q4_Q1 RANGE_Total_Revolving_Bal
INPUT	NOMINAL	6	G_Contacts_Count_12_mon G_Customer_Age G_Months_Inactive_12_mon G_Months_on_book G_Total_Relationship_Count G_Total_Trans_Ct
ID	INTERVAL	1	_dataobs_

### Node=Modified 3 Boost Model Fit Statistics

Target=Attrition\_Flag Target Label='1'

Label of Statistic	Train	Validation	Test
Sum of Frequencies	7088.00	2025.00	1014.00
Sum of Case Weights Times Freq	14176.00	4050.00	2028.00
Misclassification Rate	0.09	0.09	0.09
Maximum Absolute Error	0.96	0.95	0.93
Sum of Squared Errors	899.04	265.61	127.87
Average Squared Error	0.06	0.07	0.06
Root Average Squared Error	0.25	0.26	0.25
Divisor for ASE	14176.00	4050.00	2028.00
Total Degrees of Freedom	7088.00	.	.



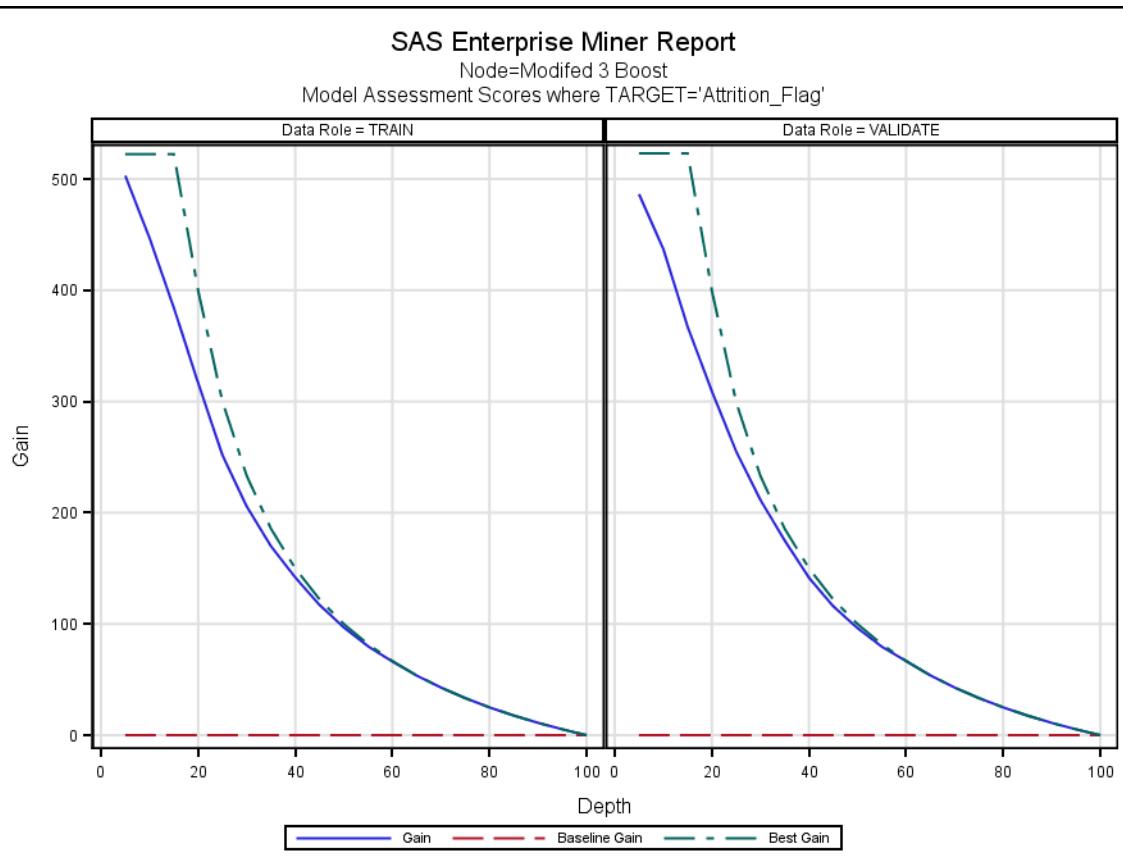
### Node=Modified 3 Boost Variable Importance

Variable Name	Label	Number of Splitting Rules	Importance	Validation Importance	Ratio of Validation to Training Importance
G_Total_Trans_Ct	Grouped Levels for Total_Trans_Ct	14	1.00000	1.00000	1.00000
RANGE_Total_Revolving_Bal	Transformed Total_Revolving_Bal	16	0.82071	0.90709	1.10526
RANGE_LOG_Total_Trans_Amt	Transformed: Transformed Total_Trans_Amt	24	0.78016	0.83819	1.07438
RANGE_SQRT_Total_Ct_Chng_Q4_Q1	Transformed: Transformed Total_Ct_Chng_Q4_Q1	14	0.57123	0.63510	1.11182
G_Total_Relationship_Count	Grouped Levels for Total_Relationship_Count	7	0.34476	0.45744	1.32683
G_Months_Inactive_12_mon	Grouped Levels for Months_Inactive_12_mon	3	0.22226	0.25862	1.16362
RANGE_SQRT_Total_Amt_Chng_Q4_Q1	Transformed: Transformed Total_Amt_Chng_Q4_Q1	5	0.12524	0.14169	1.13137
G_Contacts_Count_12_mon	Grouped Levels for Contacts_Count_12_mon	4	0.10224	0.06092	0.59581
G_Months_on_book	Grouped Levels for Months_on_book	2	0.06488	0.00000	0.00000
G_Customer_Age	Grouped Levels for Customer_Age	1	0.05108	0.05421	1.06117
RANGE_SQRT_Avg_Utilization_Ratio	Transformed: Transformed Avg_Utilization_Ratio	1	0.03091	0.04202	1.35949

## SAS Enterprise Miner Report

Node=Modified 3 Boost

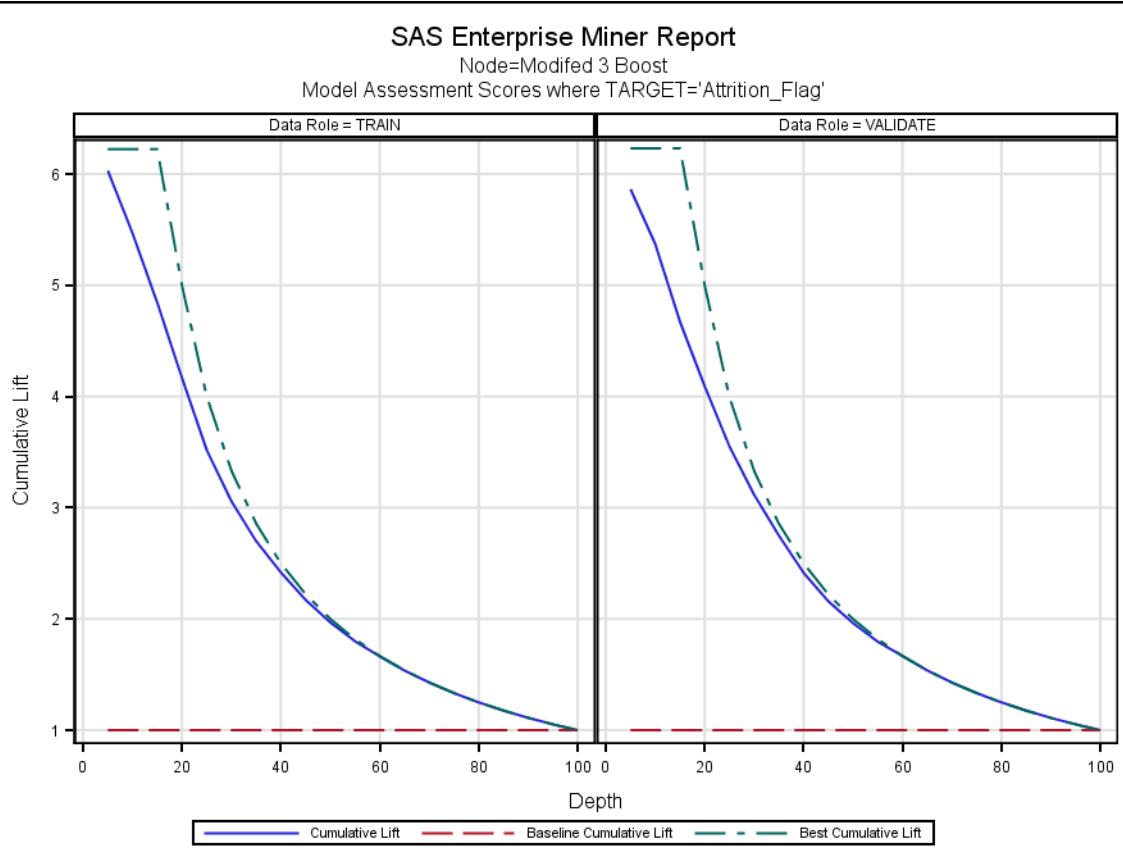
Model Assessment Scores where TARGET='Attrition\_Flag'

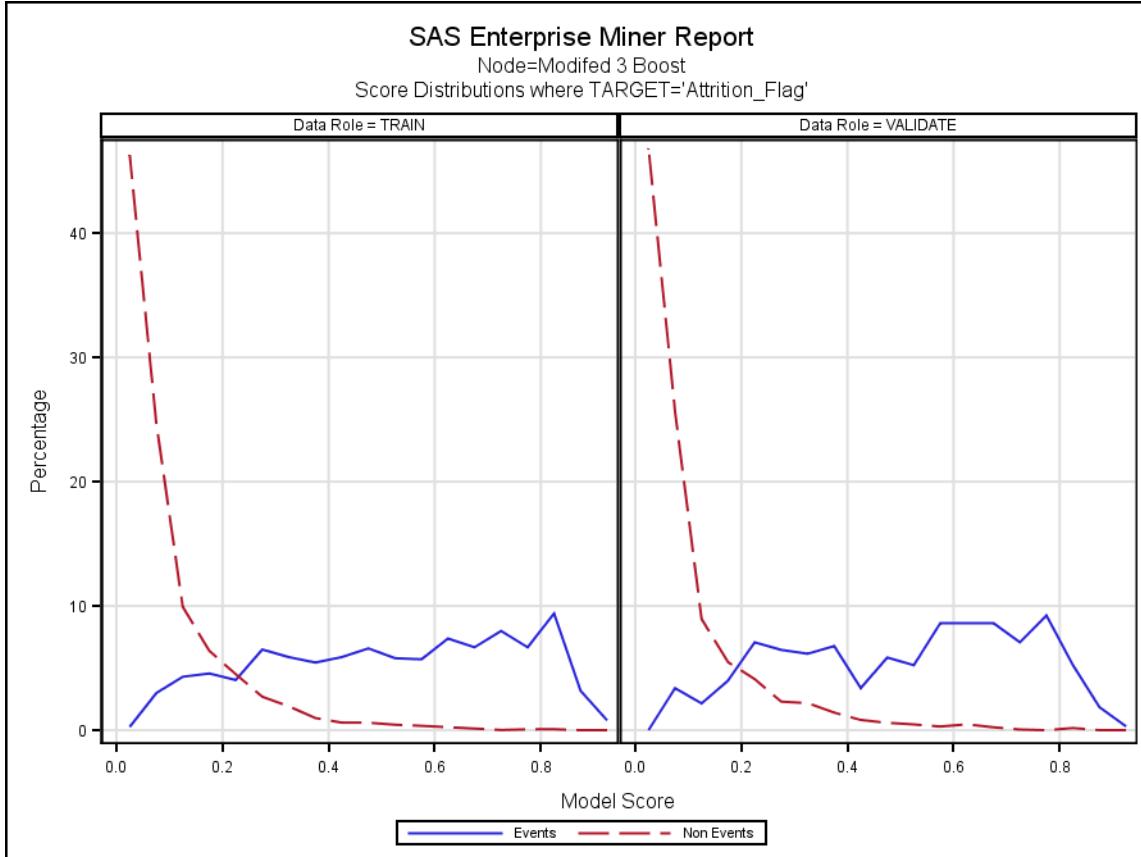
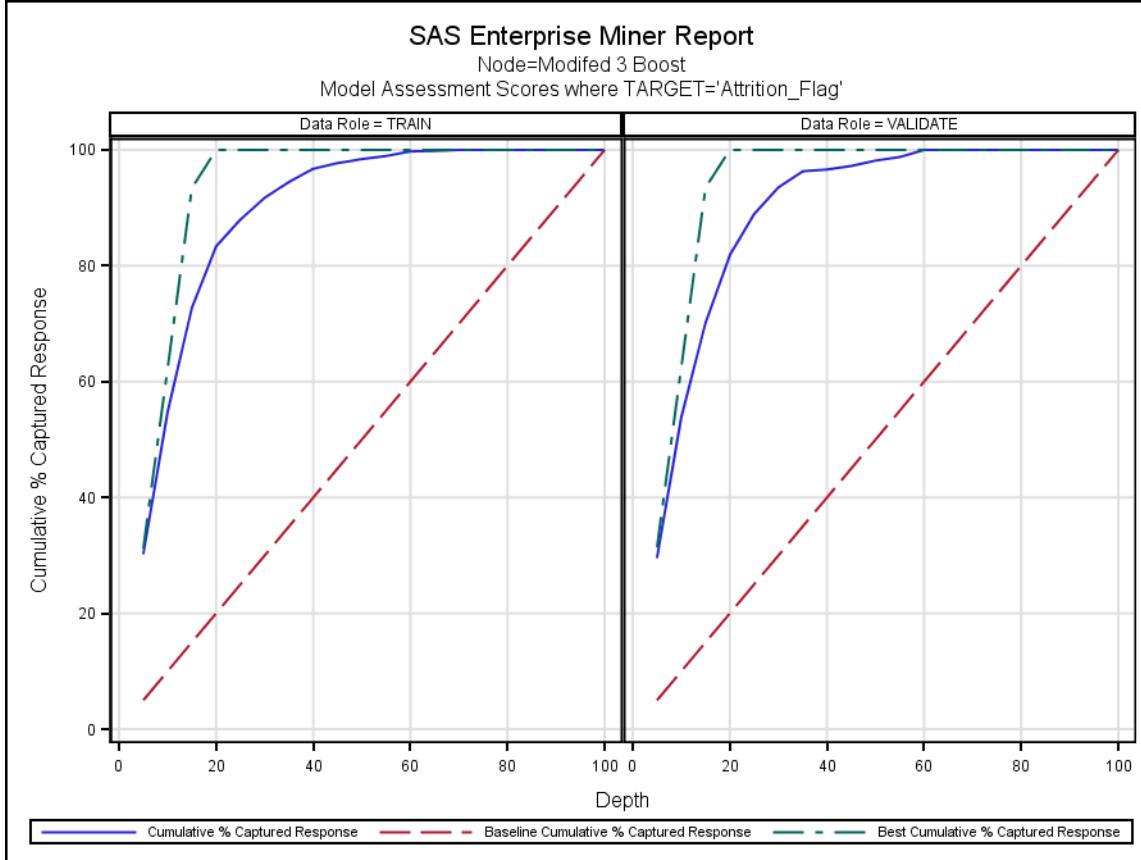


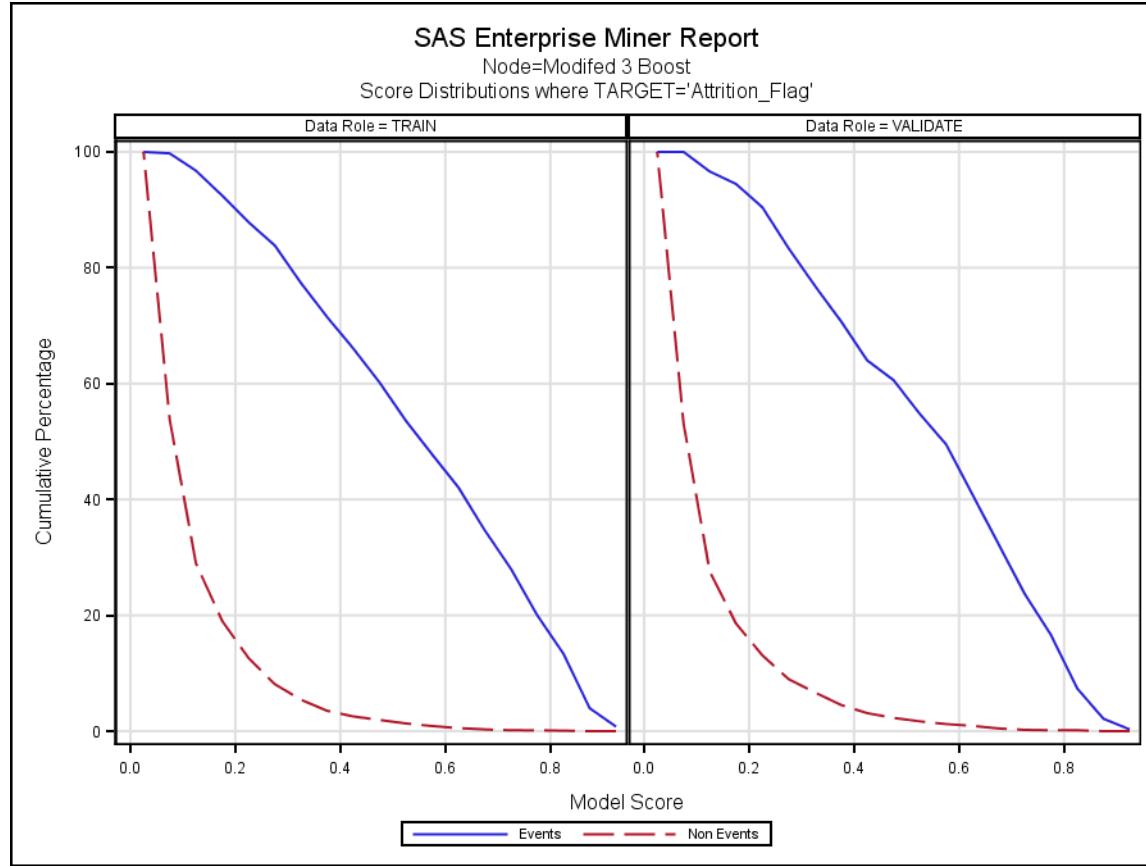
## SAS Enterprise Miner Report

Node=Modified 3 Boost

Model Assessment Scores where TARGET='Attrition\_Flag'





**Node=Modified 3 Boost****Score Distributions**

Target Variable=Attrition\_Flag Data Role=TRAIN

Posterior Probability Range	Number of Events	Percentage of Events	Percentage of Nonevents	Cumulative Percentage of Events	Cumulative Percentage of Nonevents
0.90-0.95	9	0.79017	0.0000	0.790	0.000
0.85-0.90	36	3.16067	0.0000	3.951	0.000
0.80-0.85	107	9.39421	0.0840	13.345	0.084
0.75-0.80	76	6.67252	0.0672	20.018	0.151
0.70-0.75	91	7.98946	0.0168	28.007	0.168
0.65-0.70	76	6.67252	0.1345	34.680	0.303
0.60-0.65	84	7.37489	0.2353	42.054	0.538
0.55-0.60	65	5.70676	0.3530	47.761	0.891
0.50-0.55	66	5.79456	0.4370	53.556	1.328
0.45-0.50	75	6.58472	0.6051	60.140	1.933
0.40-0.45	67	5.88235	0.6051	66.023	2.538
0.35-0.40	62	5.44337	0.9750	71.466	3.513
0.30-0.35	67	5.88235	1.9163	77.349	5.429
0.25-0.30	74	6.49693	2.6895	83.845	8.119
0.20-0.25	46	4.03863	4.5050	87.884	12.624
0.15-0.20	52	4.56541	6.3876	92.450	19.012
0.10-0.15	49	4.30202	9.9344	96.752	28.946
0.05-0.10	34	2.98507	24.7605	99.737	53.707
0.00-0.05	3	0.26339	46.2935	100.000	100.000

Target Variable=Attrition\_Flag Data Role=VALIDATE

Posterior Probability Range	Number of Events	Percentage of Events	Percentage of Nonevents	Cumulative Percentage of Events	Cumulative Percentage of Nonevents
0.90-0.95	1	0.30769	0.0000	0.308	0.000
0.85-0.90	6	1.84615	0.0000	2.154	0.000
0.80-0.85	17	5.23077	0.1765	7.385	0.176
0.75-0.80	30	9.23077	0.0000	16.615	0.176
0.70-0.75	23	7.07692	0.0588	23.692	0.235
0.65-0.70	28	8.61538	0.2353	32.308	0.471
0.60-0.65	28	8.61538	0.4706	40.923	0.941
0.55-0.60	28	8.61538	0.2941	49.538	1.235
0.50-0.55	17	5.23077	0.4706	54.769	1.706
0.45-0.50	19	5.84615	0.5882	60.615	2.294
0.40-0.45	11	3.38462	0.8235	64.000	3.118
0.35-0.40	22	6.76923	1.4118	70.769	4.529
0.30-0.35	20	6.15385	2.1765	76.923	6.706
0.25-0.30	21	6.46154	2.2941	83.385	9.000
0.20-0.25	23	7.07692	4.1176	90.462	13.118
0.15-0.20	13	4.00000	5.4706	94.462	18.588
0.10-0.15	7	2.15385	8.9412	96.615	27.529
0.05-0.10	11	3.38462	25.6471	100.000	53.176
0.00-0.05	0	0.00000	46.8235	100.000	100.000

## SAS Enterprise Miner Report

### Node=Modified 2 Boost Summary

Node id = Boost3  
 Node label = Modified 2 Boost  
 Meta path = Ids => Varsel => Trans => Meta => Trans2 => Meta2 => Part2 => Boost3  
 Notes =

### Node=Modified 2 Boost Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	Boost		MaxBranch	4	2	Performance	DISK	
AssessMeasure	MISC	PROFIT	MaxDepth	6	2	Precision	0	
CategoricalBins	30		Measure	PROFIT		ReUseVar	1	
CreateHStat	N		MinCatSize	5		Seed	78354	12345
Exhaustive	5000		Missing	USEINSEARCH		Shrinkage	0.1	
Huber	0.9	NO	NSurrs	0		SplitSize	.	
IntervalBins	100		NodeSize	20000		SubSeries	BEST	
IterationNum	1		NumPairImp	0		ToolType	MODEL	
Iterations	50		NumSingleImp	5		TrainProportion	60	
LeafFraction	0.1		ObsImportance	N		VarSelection	Y	

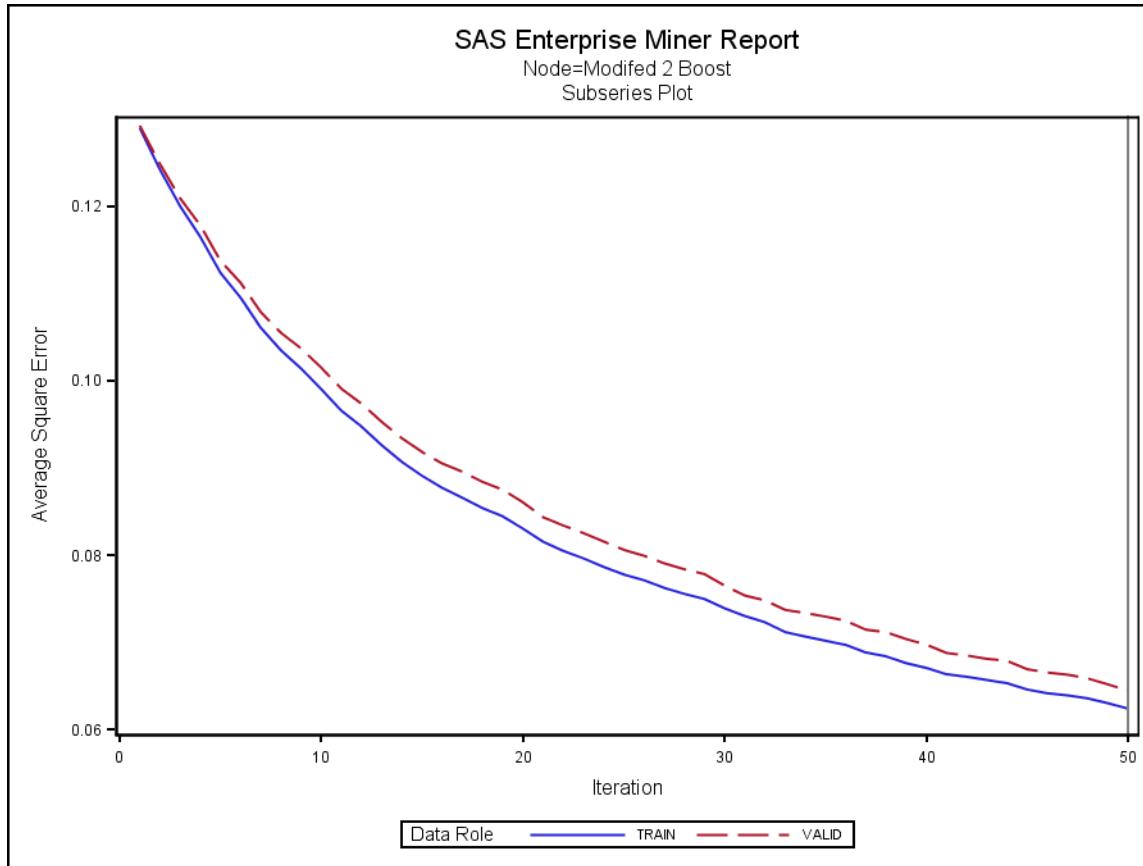
### Node=Modified 2 Boost Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag
INPUT	INTERVAL	5	RANGE_LOG_Total_Trans_Amt RANGE_SQRT_Avg_Utilization_Ratio RANGE_SQRT_Total_Amt_Chng_Q4_Q1 RANGE_SQRT_Total_Ct_Chng_Q4_Q1 RANGE_Total_Revolving_Bal
INPUT	NOMINAL	6	G_Contacts_Count_12_mon G_Customer_Age G_Months_Inactive_12_mon G_Months_on_book G_Total_Relationship_Count G_Total_Trans_Ct
ID	INTERVAL	1	_dataobs_

### Node=Modified 2 Boost Model Fit Statistics

Target=Attrition\_Flag Target Label='1'

Label of Statistic	Train	Validation	Test
Sum of Frequencies	7088.00	2025.00	1014.00
Sum of Case Weights Times Freq	14176.00	4050.00	2028.00
Misclassification Rate	0.09	0.09	0.09
Maximum Absolute Error	0.97	0.96	0.93
Sum of Squared Errors	906.05	268.46	129.18
Average Squared Error	0.06	0.07	0.06
Root Average Squared Error	0.25	0.26	0.25
Divisor for ASE	14176.00	4050.00	2028.00
Total Degrees of Freedom	7088.00	.	.



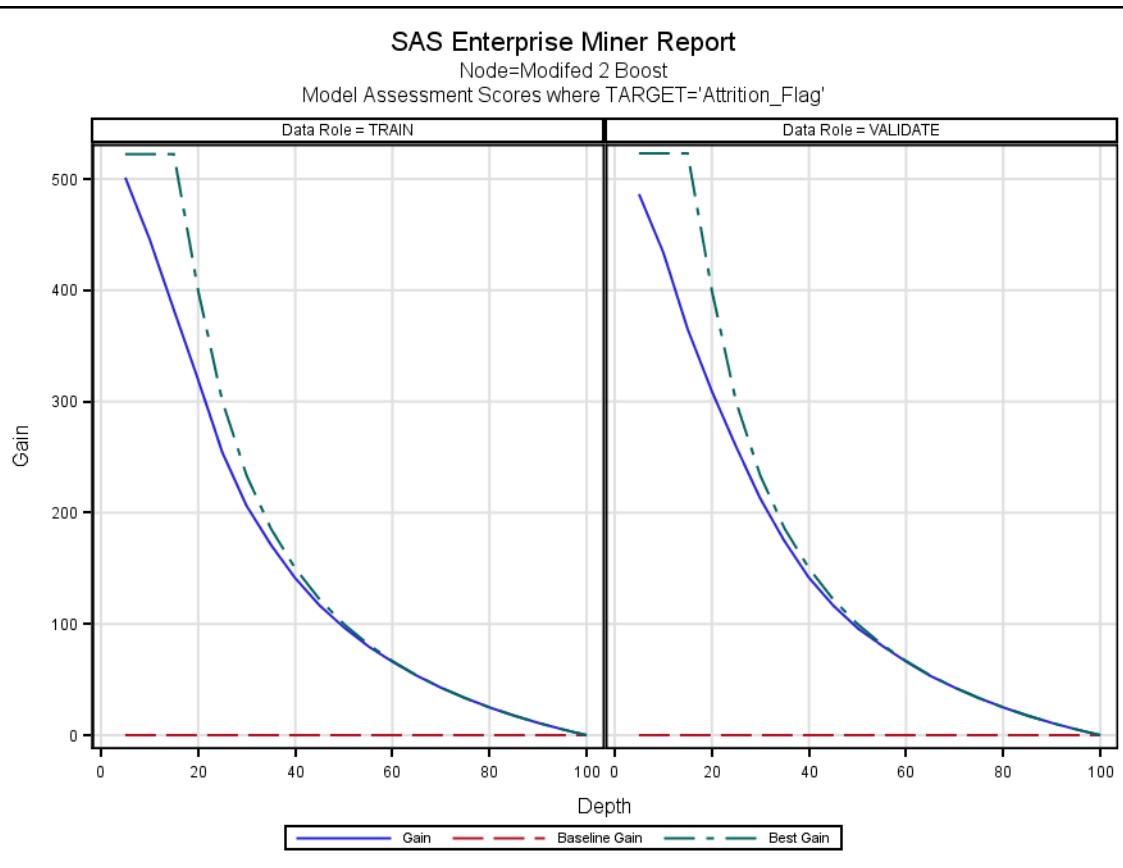
### Node=Modified 2 Boost Variable Importance

Variable Name	Label	Number of Splitting Rules	Importance	Validation Importance	Ratio of Validation to Training Importance
G_Total_Trans_Ct	Grouped Levels for Total_Trans_Ct	13	1.00000	1.00000	1.00000
RANGE_Total_Revolving_Bal	Transformed Total_Revolving_Bal	19	0.82647	0.91685	1.10936
RANGE_LOG_Total_Trans_Amt	Transformed: Transformed Total_Trans_Amt	28	0.78721	0.84707	1.07604
RANGE_SQRT_Total_Ct_Chng_Q4_Q1	Transformed: Transformed Total_Ct_Chng_Q4_Q1	15	0.57968	0.64609	1.11457
G_Total_Relationship_Count	Grouped Levels for Total_Relationship_Count	6	0.33894	0.46751	1.37936
G_Months_Inactive_12_mon	Grouped Levels for Months_Inactive_12_mon	2	0.19009	0.21724	1.14281
RANGE_SQRT_Total_Amt_Chng_Q4_Q1	Transformed: Transformed Total_Amt_Chng_Q4_Q1	6	0.16670	0.19970	1.19795
G_Contacts_Count_12_mon	Grouped Levels for Contacts_Count_12_mon	4	0.11255	0.04033	0.35835
G_Customer_Age	Grouped Levels for Customer_Age	2	0.06697	0.07525	1.12351
G_Months_on_book	Grouped Levels for Months_on_book	1	0.05506	0.00000	0.00000
RANGE_SQRT_Avg_Utilization_Ratio	Transformed: Transformed Avg_Utilization_Ratio	1	0.03118	0.04256	1.36521

## SAS Enterprise Miner Report

Node=Modified 2 Boost

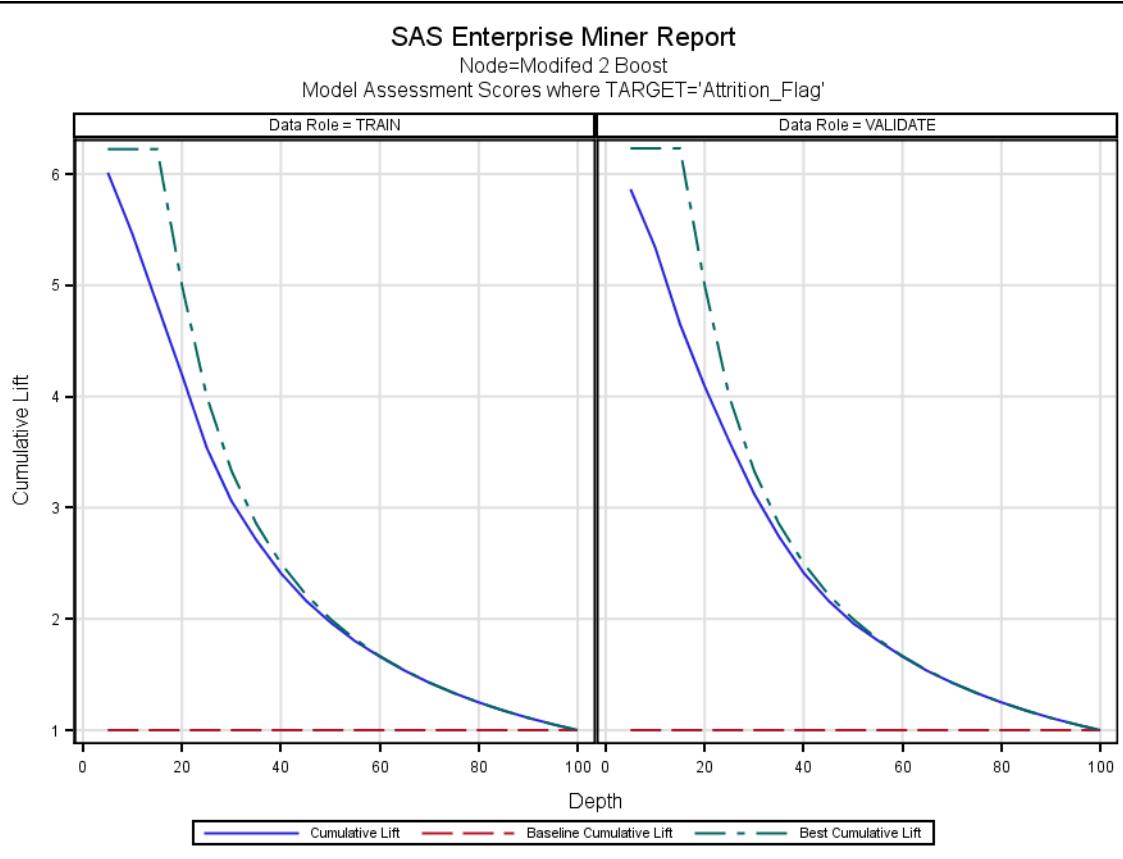
Model Assessment Scores where TARGET='Attrition\_Flag'

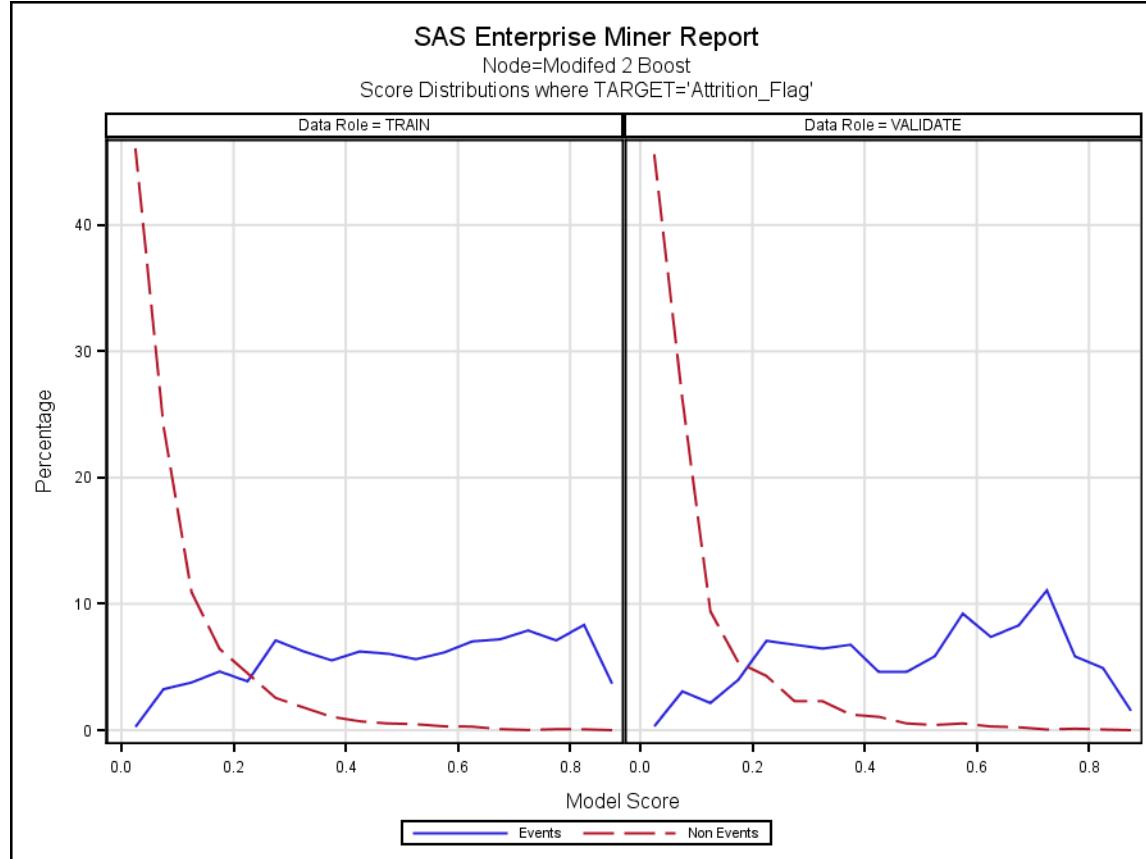
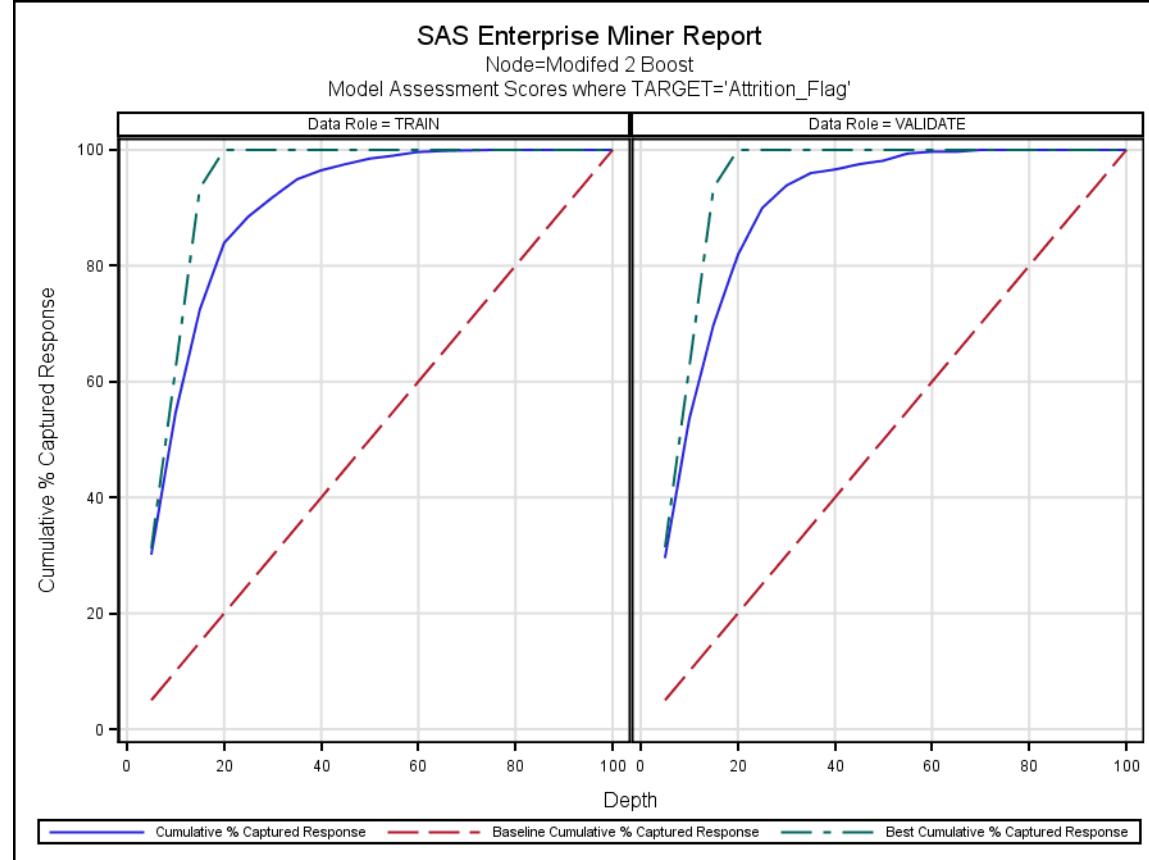


## SAS Enterprise Miner Report

Node=Modified 2 Boost

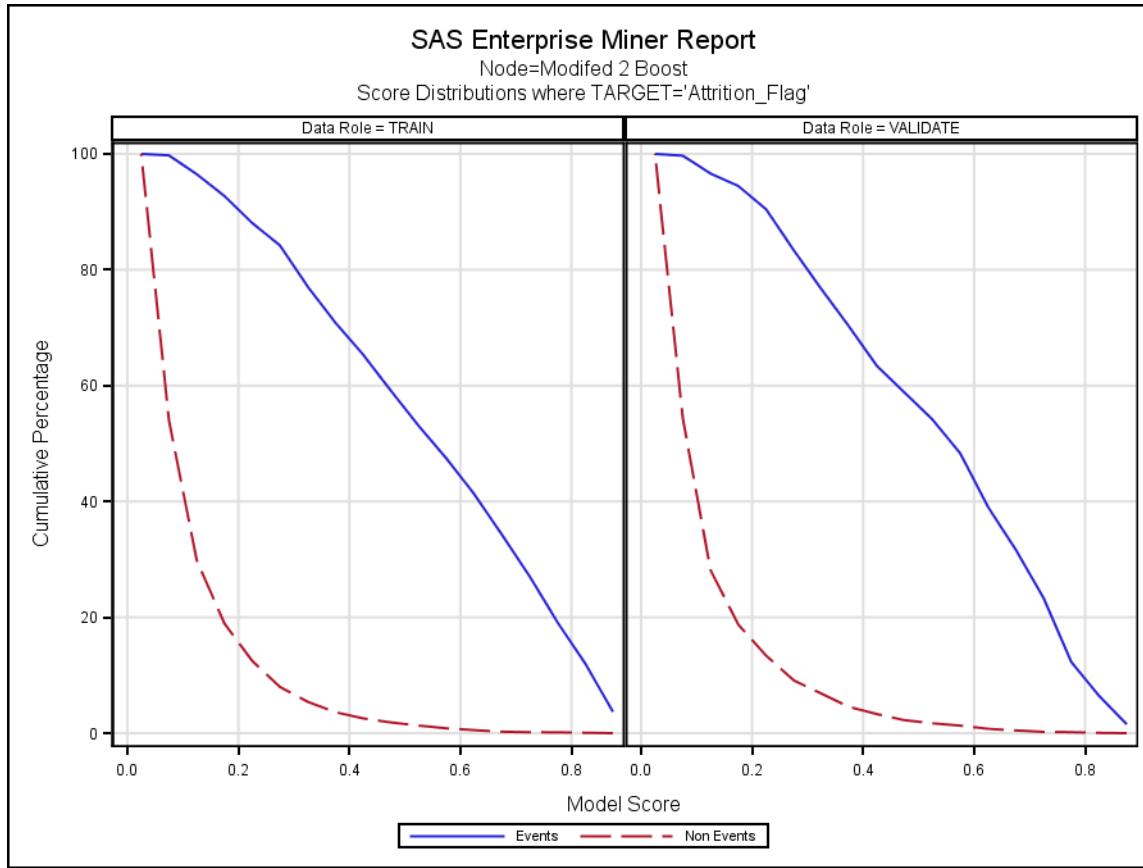
Model Assessment Scores where TARGET='Attrition\_Flag'





Node=Modified 2 Boost

Score Distributions where TARGET='Attrition\_Flag'

**Node=Modified 2 Boost****Score Distributions**

Target Variable=Attrition\_Flag Data Role=TRAIN

Posterior Probability Range	Number of Events	Percentage of Events	Percentage of Nonevents	Cumulative Percentage of Events	Cumulative Percentage of Nonevents
0.85-0.90	42	3.68745	0.0000	3.687	0.000
0.80-0.85	95	8.34065	0.0672	12.028	0.067
0.75-0.80	81	7.11150	0.0840	19.140	0.151
0.70-0.75	90	7.90167	0.0168	27.041	0.168
0.65-0.70	82	7.19930	0.0840	34.241	0.252
0.60-0.65	80	7.02371	0.2858	41.264	0.538
0.55-0.60	70	6.14574	0.3026	47.410	0.840
0.50-0.55	64	5.61896	0.4707	53.029	1.311
0.45-0.50	69	6.05795	0.5379	59.087	1.849
0.40-0.45	71	6.23354	0.7060	65.320	2.555
0.35-0.40	63	5.53117	1.0590	70.852	3.614
0.30-0.35	71	6.23354	1.7986	77.085	5.413
0.25-0.30	81	7.11150	2.5551	84.197	7.968
0.20-0.25	44	3.86304	4.5050	88.060	12.473
0.15-0.20	53	4.65320	6.4381	92.713	18.911
0.10-0.15	43	3.77524	10.9262	96.488	29.837
0.05-0.10	37	3.24846	24.0881	99.737	53.925
0.00-0.05	3	0.26339	46.0750	100.000	100.000

Target Variable=Attrition\_Flag Data Role=VALIDATE

Posterior Probability Range	Number of Events	Percentage of Events	Percentage of Nonevents	Cumulative Percentage of Events	Cumulative Percentage of Nonevents
0.85-0.90	5	1.5385	0.0000	1.538	0.000
0.80-0.85	16	4.9231	0.0588	6.462	0.059
0.75-0.80	19	5.8462	0.1176	12.308	0.176
0.70-0.75	36	11.0769	0.0588	23.385	0.235
0.65-0.70	27	8.3077	0.2353	31.692	0.471
0.60-0.65	24	7.3846	0.2941	39.077	0.765
0.55-0.60	30	9.2308	0.5294	48.308	1.294
0.50-0.55	19	5.8462	0.4118	54.154	1.706
0.45-0.50	15	4.6154	0.5294	58.769	2.235
0.40-0.45	15	4.6154	1.0588	63.385	3.294
0.35-0.40	22	6.7692	1.2353	70.154	4.529
0.30-0.35	21	6.4615	2.2941	76.615	6.824
0.25-0.30	22	6.7692	2.2941	83.385	9.118
0.20-0.25	23	7.0769	4.2941	90.462	13.412
0.15-0.20	13	4.0000	5.3529	94.462	18.765
0.10-0.15	7	2.1538	9.4118	96.615	28.176
0.05-0.10	10	3.0769	26.2353	99.692	54.412
0.00-0.05	1	0.3077	45.5882	100.000	100.000

## SAS Enterprise Miner Report

### Node=Modified 1 Boost Summary

Node id = Boost2  
 Node label = Modified 1 Boost  
 Meta path = Ids => Varsel => Trans => Meta => Trans2 => Meta2 => Part2 => Boost2  
 Notes =

### Node=Modified 1 Boost Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	Boost		MaxBranch	2		Performance	DISK	
AssessMeasure	MISC	PROFIT	MaxDepth	4	2	Precision	0	
CategoricalBins	30		Measure	PROFIT		ReUseVar	1	
CreateHStat	N		MinCatSize	5		Seed	78354	12345
Exhaustive	5000		Missing	USEINSEARCH		Shrinkage	0.1	
Huber	0.9	NO	NSurrs	0		SplitSize	.	
IntervalBins	100		NodeSize	20000		SubSeries	BEST	
IterationNum	1		NumPairImp	0		ToolType	MODEL	
Iterations	50		NumSingleImp	5		TrainProportion	60	
LeafFraction	0.1		ObsImportance	N		VarSelection	Y	

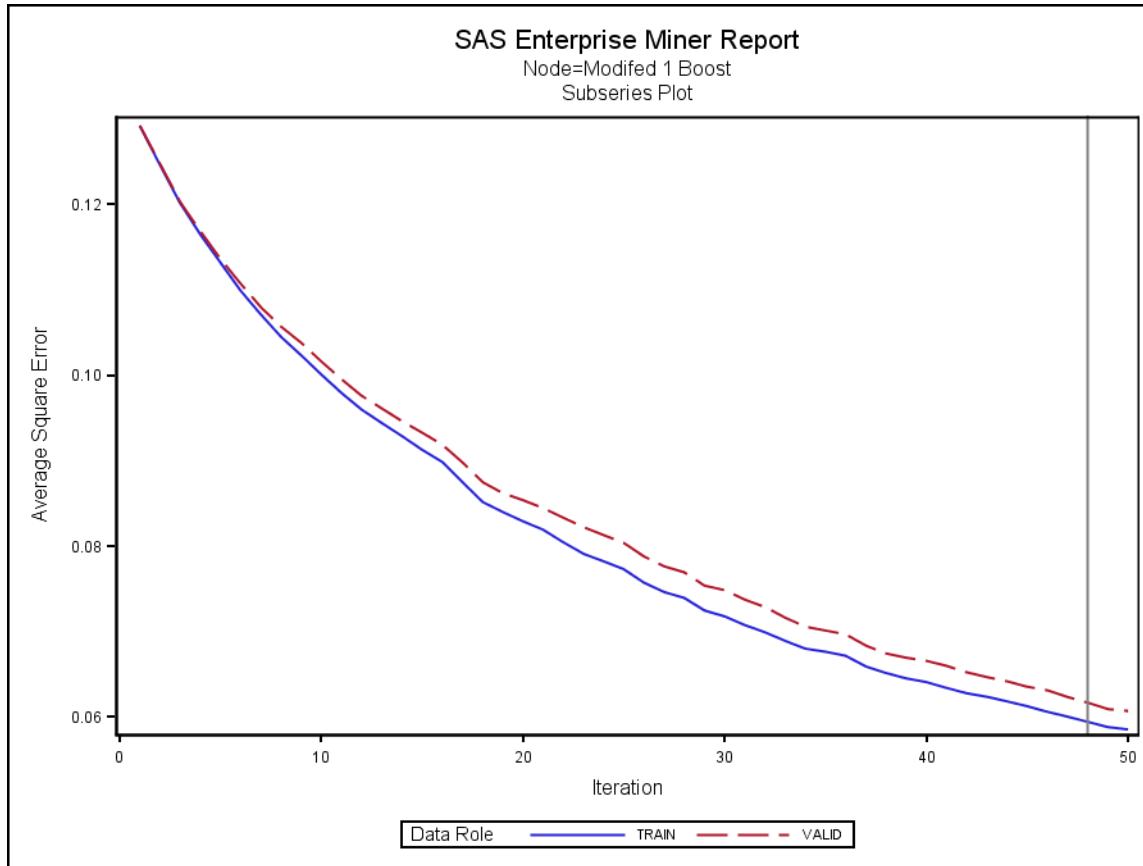
### Node=Modified 1 Boost Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag
INPUT	INTERVAL	5	RANGE_LOG_Total_Trans_Amt RANGE_SQRT_Avg_Utilization_Ratio RANGE_SQRT_Total_Amt_Chng_Q4_Q1 RANGE_SQRT_Total_Ct_Chng_Q4_Q1 RANGE_Total_Revolving_Bal
INPUT	NOMINAL	6	G_Contacts_Count_12_mon G_Customer_Age G_Months_Inactive_12_mon G_Months_on_book G_Total_Relationship_Count G_Total_Trans_Ct
ID	INTERVAL	1	_dataobs_

### Node=Modified 1 Boost Model Fit Statistics

Target=Attrition\_Flag Target Label='1'

Label of Statistic	Train	Validation	Test
Sum of Frequencies	7088.00	2025.00	1014.00
Sum of Case Weights Times Freq	14176.00	4050.00	2028.00
Misclassification Rate	0.08	0.08	0.08
Maximum Absolute Error	0.98	0.97	0.93
Sum of Squared Errors	833.99	246.78	119.06
Average Squared Error	0.06	0.06	0.06
Root Average Squared Error	0.24	0.25	0.24
Divisor for ASE	14176.00	4050.00	2028.00
Total Degrees of Freedom	7088.00	.	.



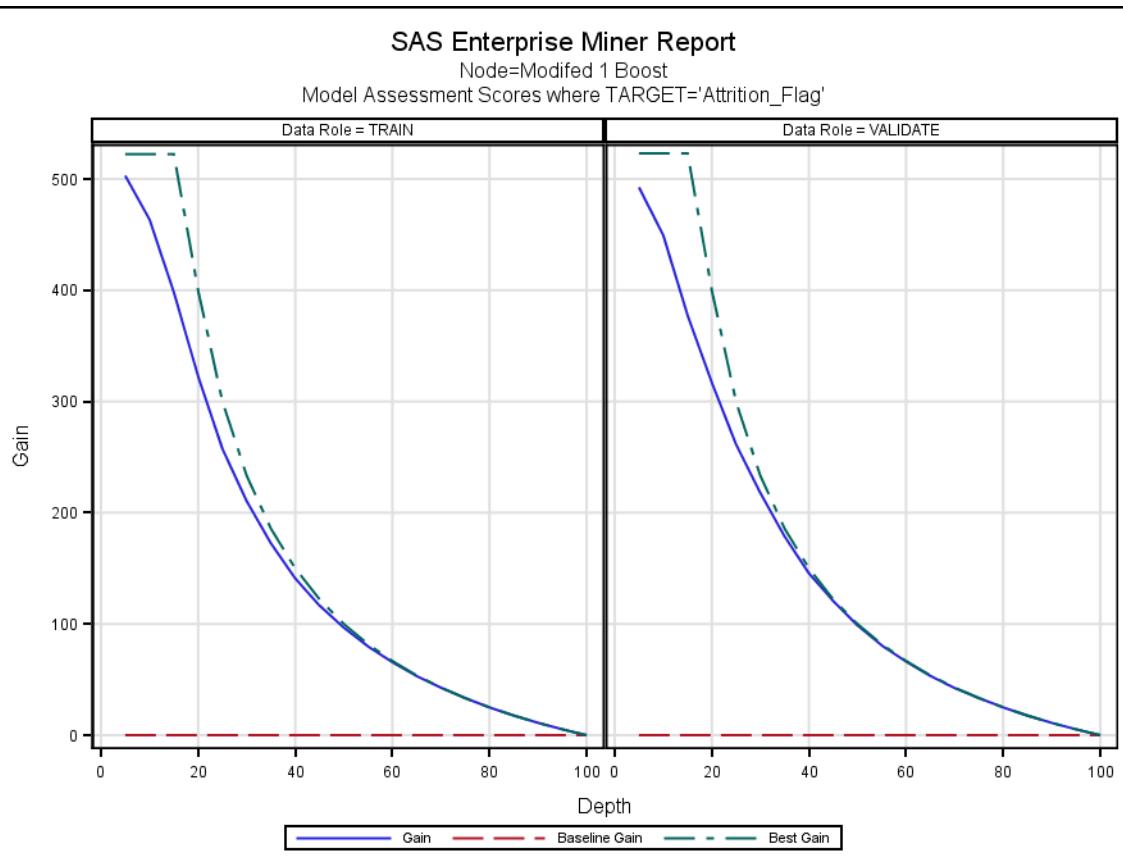
### Node=Modified 1 Boost Variable Importance

Variable Name	Label	Number of Splitting Rules	Importance	Validation Importance	Ratio of Validation to Training Importance
G_Total_Trans_Ct	Grouped Levels for Total_Trans_Ct	37	1.00000	1.00000	1.00000
RANGE_Total_Revolving_Bal	Transformed Total_Revolving_Bal	28	0.76400	0.83850	1.09751
RANGE_SQRT_Total_Ct_Chng_Q4_Q1	Transformed: Transformed Total_Ct_Chng_Q4_Q1	19	0.59160	0.64837	1.09597
RANGE_LOG_Total_Trans_Amt	Transformed: Transformed Total_Trans_Amt	45	0.47192	0.54720	1.15952
G_Total_Relationship_Count	Grouped Levels for Total_Relationship_Count	18	0.37325	0.52687	1.41155
G_Months_Inactive_12_mon	Grouped Levels for Months_Inactive_12_mon	10	0.20395	0.25673	1.25882
RANGE_SQRT_Total_Amt_Chng_Q4_Q1	Transformed: Transformed Total_Amt_Chng_Q4_Q1	13	0.18245	0.18912	1.03658
G_Contacts_Count_12_mon	Grouped Levels for Contacts_Count_12_mon	7	0.16138	0.10106	0.62618
RANGE_SQRT_Avg_Utilization_Ratio	Transformed: Transformed Avg_Utilization_Ratio	5	0.09456	0.06281	0.66428
G_Customer_Age	Grouped Levels for Customer_Age	1	0.05527	0.06035	1.09190
G_Months_on_book	Grouped Levels for Months_on_book	2	0.03991	0.00000	0.00000

## SAS Enterprise Miner Report

Node=Modified 1 Boost

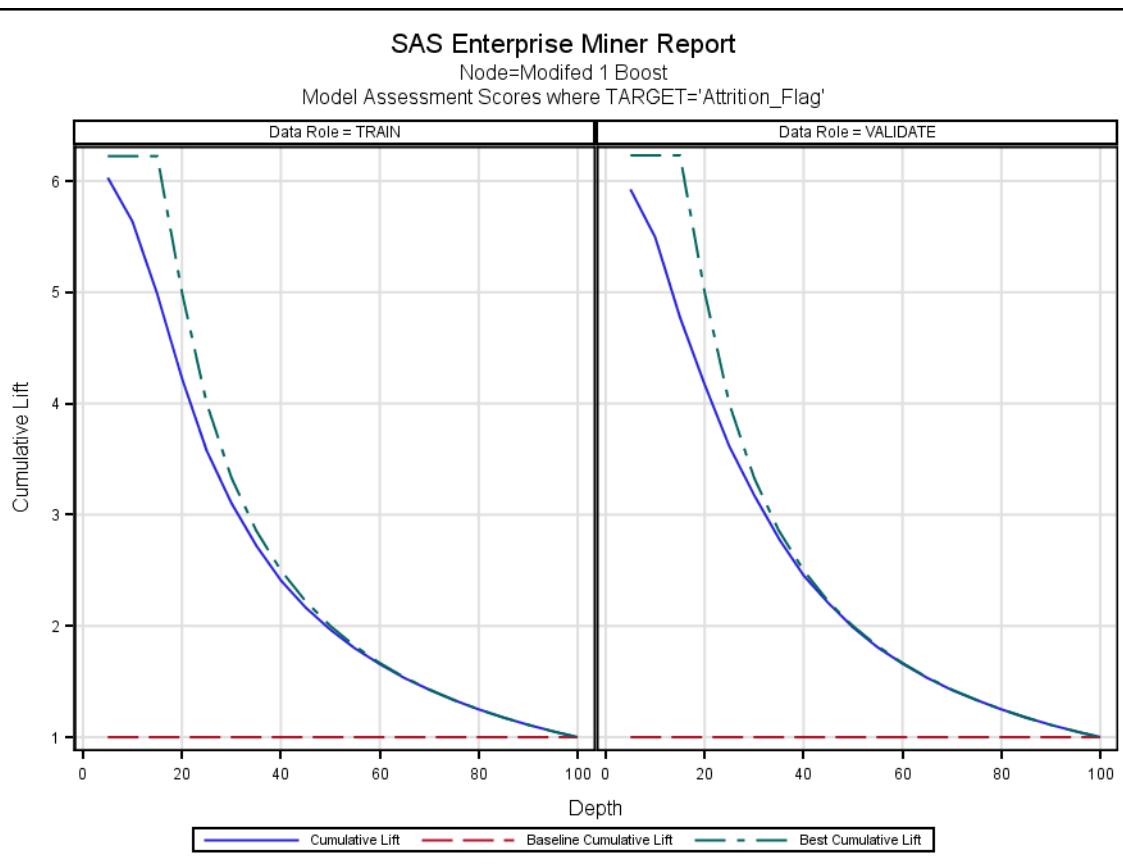
Model Assessment Scores where TARGET='Attrition\_Flag'

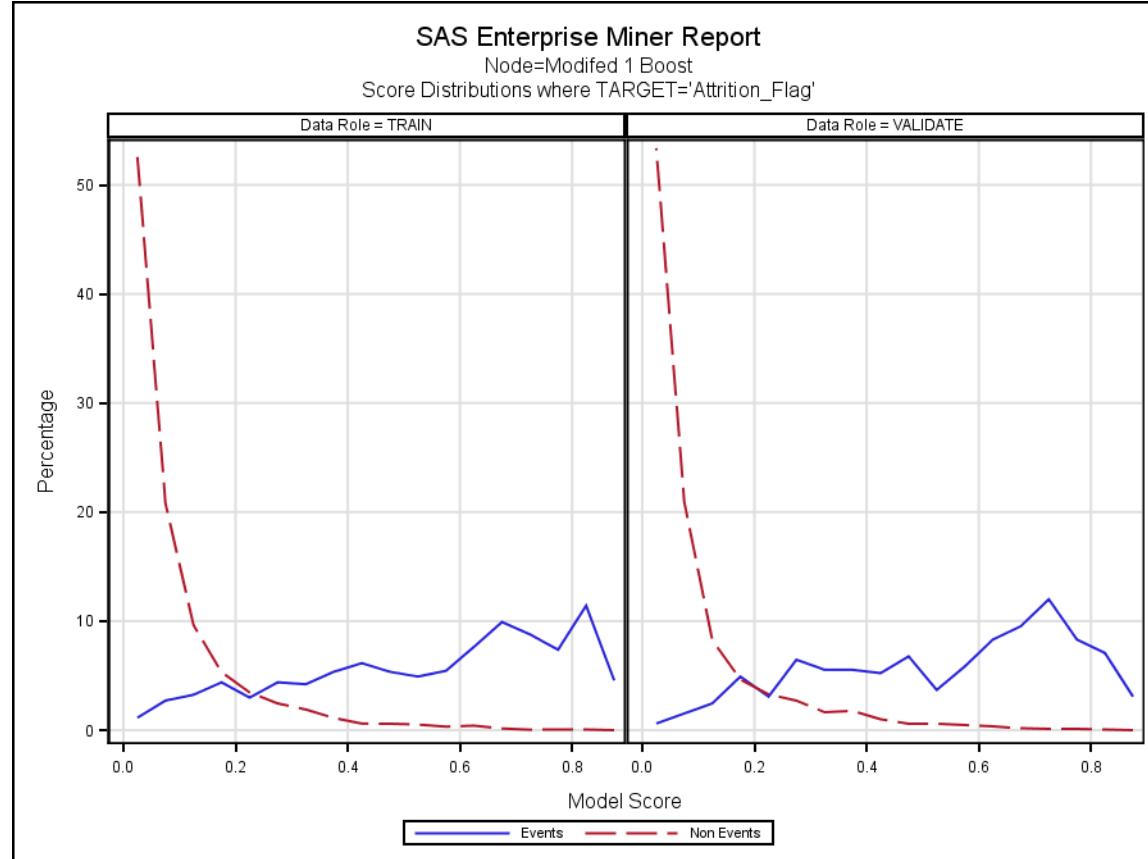
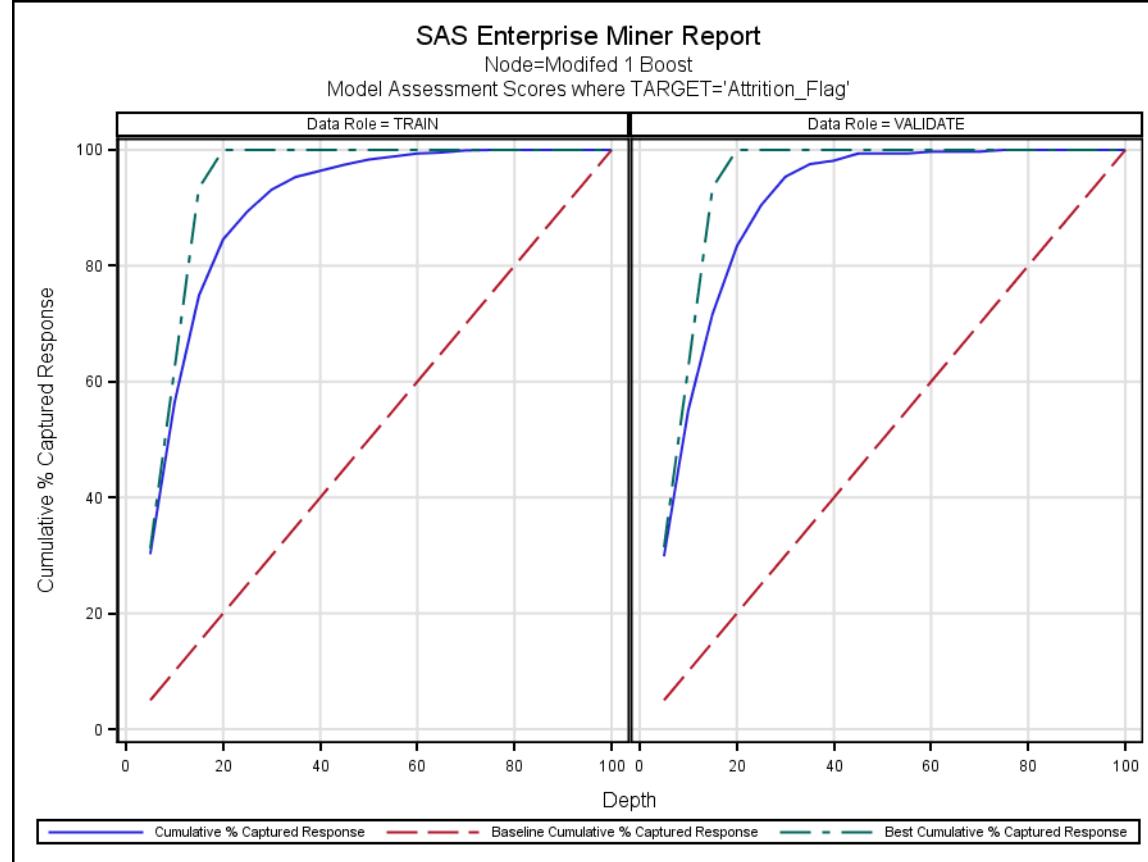


## SAS Enterprise Miner Report

Node=Modified 1 Boost

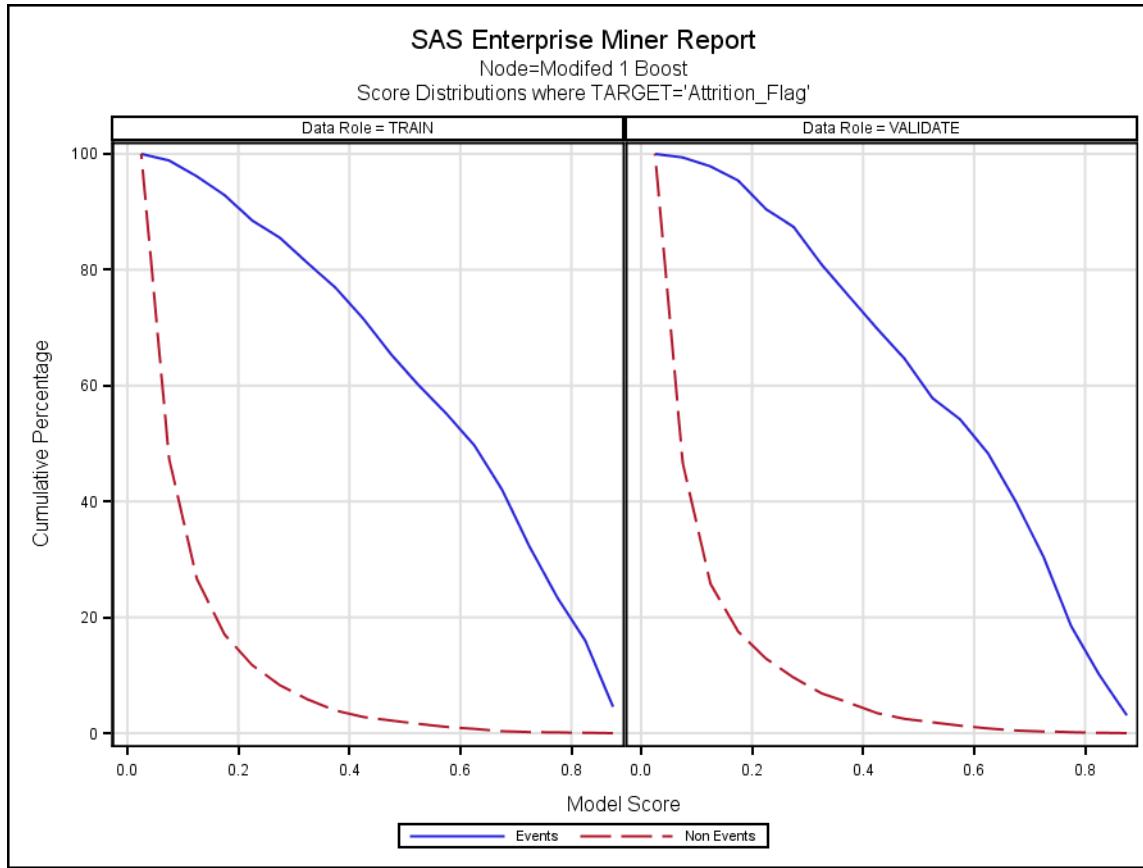
Model Assessment Scores where TARGET='Attrition\_Flag'





Node=Modified 1 Boost

Score Distributions where TARGET='Attrition\_Flag'

**Node=Modified 1 Boost****Score Distributions**

Target Variable=Attrition\_Flag Data Role=TRAIN

Posterior Probability Range	Number of Events	Percentage of Events	Percentage of Nonevents	Cumulative Percentage of Events	Cumulative Percentage of Nonevents
0.85-0.90	52	4.5654	0.0000	4.565	0.000
0.80-0.85	130	11.4135	0.0672	15.979	0.067
0.75-0.80	84	7.3749	0.0672	23.354	0.134
0.70-0.75	100	8.7796	0.0504	32.133	0.185
0.65-0.70	113	9.9210	0.1513	42.054	0.336
0.60-0.65	87	7.6383	0.4202	49.693	0.756
0.55-0.60	62	5.4434	0.3194	55.136	1.076
0.50-0.55	56	4.9166	0.5211	60.053	1.597
0.45-0.50	61	5.3556	0.5883	65.408	2.185
0.40-0.45	70	6.1457	0.6051	71.554	2.790
0.35-0.40	61	5.3556	1.1262	76.910	3.917
0.30-0.35	48	4.2142	1.8995	81.124	5.816
0.25-0.30	50	4.3898	2.4542	85.514	8.270
0.20-0.25	34	2.9851	3.4628	88.499	11.733
0.15-0.20	50	4.3898	5.3118	92.888	17.045
0.10-0.15	37	3.2485	9.6319	96.137	26.677
0.05-0.10	31	2.7217	20.7766	98.859	47.453
0.00-0.05	13	1.1414	52.5466	100.000	100.000

Target Variable=Attrition\_Flag Data Role=VALIDATE

Posterior Probability Range	Number of Events	Percentage of Events	Percentage of Nonevents	Cumulative Percentage of Events	Cumulative Percentage of Nonevents
0.85-0.90	10	3.0769	0.0000	3.077	0.000
0.80-0.85	23	7.0769	0.0588	10.154	0.059
0.75-0.80	27	8.3077	0.1176	18.462	0.176
0.70-0.75	39	12.0000	0.1176	30.462	0.294
0.65-0.70	31	9.5385	0.1765	40.000	0.471
0.60-0.65	27	8.3077	0.3529	48.308	0.824
0.55-0.60	19	5.8462	0.4706	54.154	1.294
0.50-0.55	12	3.6923	0.5882	57.846	1.882
0.45-0.50	22	6.7692	0.5882	64.615	2.471
0.40-0.45	17	5.2308	1.0000	69.846	3.471
0.35-0.40	18	5.5385	1.7647	75.385	5.235
0.30-0.35	18	5.5385	1.6471	80.923	6.882
0.25-0.30	21	6.4615	2.7059	87.385	9.588
0.20-0.25	10	3.0769	3.2941	90.462	12.882
0.15-0.20	16	4.9231	4.6471	95.385	17.529
0.10-0.15	8	2.4615	8.2353	97.846	25.765
0.05-0.10	5	1.5385	20.8824	99.385	46.647
0.00-0.05	2	0.6154	53.3529	100.000	100.000

## SAS Enterprise Miner Report

### Node=Standard Gradient Boost Summary

Node id = Boost  
 Node label = Standard Gradient Boost  
 Meta path = Ids => Varsel => Trans => Meta => Trans2 => Meta2 => Part2 => Boost  
 Notes =

### Node=Standard Gradient Boost Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	Boost		MaxBranch	2		Performance	DISK	
AssessMeasure	MISC	PROFIT	MaxDepth	2		Precision	0	
CategoricalBins	30		Measure	PROFIT		ReUseVar	1	
CreateHStat	N		MinCatSize	5		Seed	78354	12345
Exhaustive	5000		Missing	USEINSEARCH		Shrinkage	0.1	
Huber	NO		NSurrs	0		SplitSize	.	
IntervalBins	100		NodeSize	20000		SubSeries	BEST	
IterationNum	1		NumPairImp	0		ToolType	MODEL	
Iterations	50		NumSingleImp	5		TrainProportion	60	
LeafFraction	0.1		ObsImportance	N		VarSelection	Y	

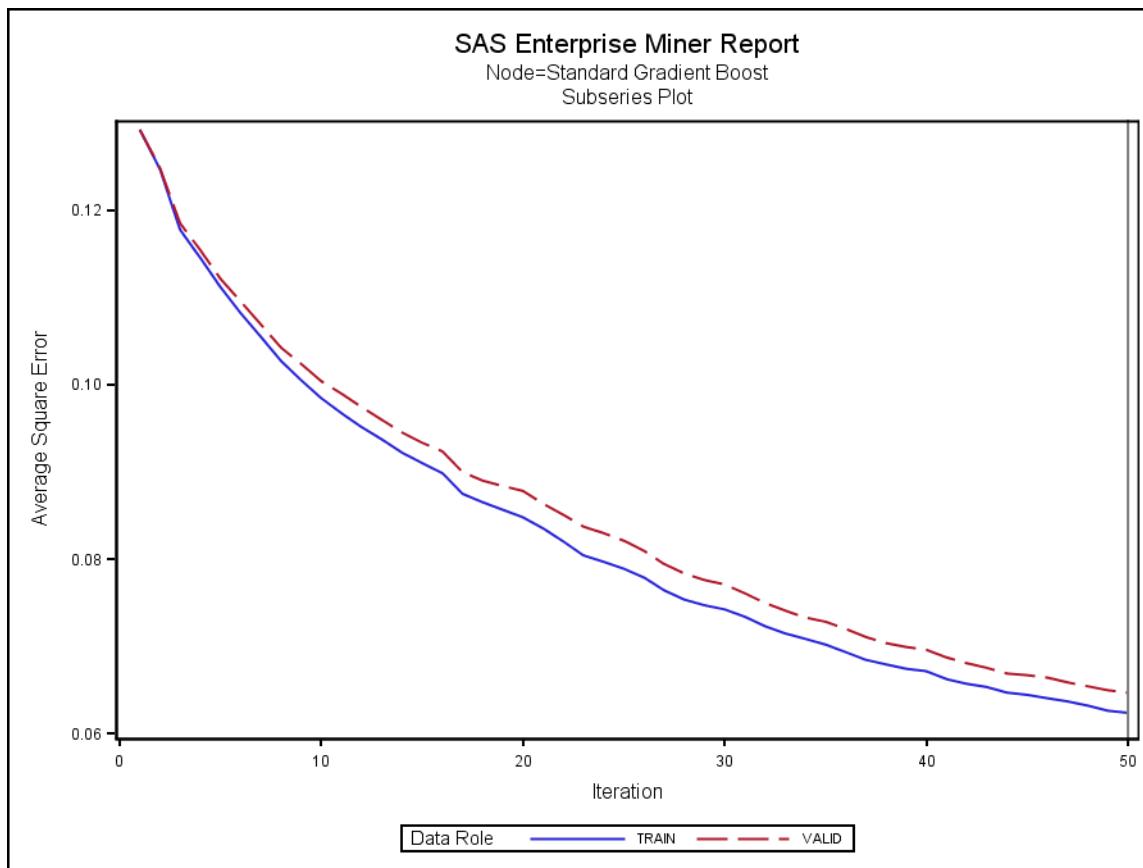
### Node=Standard Gradient Boost Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag
INPUT	INTERVAL	5	RANGE_LOG_Total_Trans_Amt RANGE_SQRT_Avg_Utilization_Ratio RANGE_SQRT_Total_Amt_Chng_Q4_Q1 RANGE_SQRT_Total_Ct_Chng_Q4_Q1 RANGE_Total_Revolving_Bal
INPUT	NOMINAL	6	G_Contacts_Count_12_mon G_Customer_Age G_Months_Inactive_12_mon G_Months_on_book G_Total_Relationship_Count G_Total_Trans_Ct
ID	INTERVAL	1	_dataobs_

### Node=Standard Gradient Boost Model Fit Statistics

Target=Attrition\_Flag Target Label='1'

Label of Statistic	Train	Validation	Test
Sum of Frequencies	7088.00	2025.00	1014.00
Sum of Case Weights Times Freq	14176.00	4050.00	2028.00
Misclassification Rate	0.08	0.09	0.08
Maximum Absolute Error	0.98	0.98	0.93
Sum of Squared Errors	907.99	268.96	126.26
Average Squared Error	0.06	0.07	0.06
Root Average Squared Error	0.25	0.26	0.25
Divisor for ASE	14176.00	4050.00	2028.00
Total Degrees of Freedom	7088.00	.	.

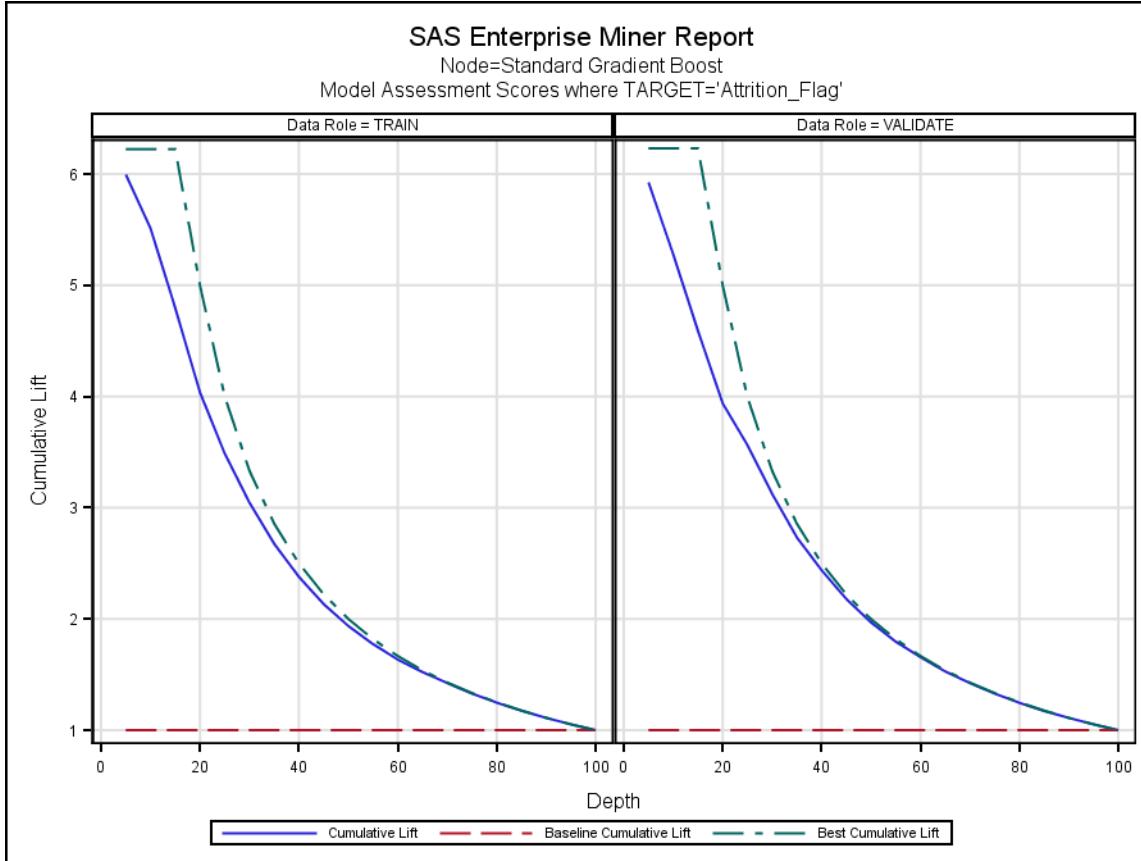
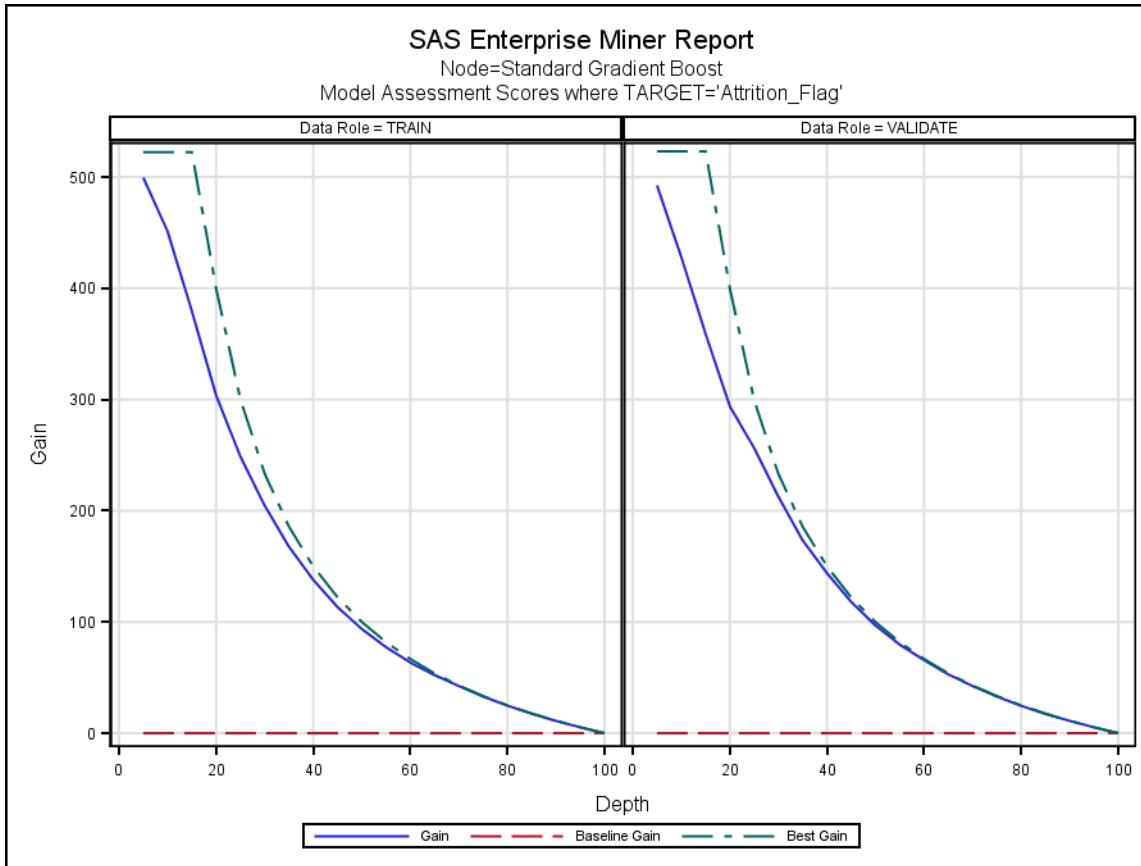


**Node=Standard Gradient Boost**  
**Variable Importance**

Variable Name	Label	Number of Splitting Rules	Importance	Validation Importance	Ratio of Validation to Training Importance
G_Total_Trans_Ct	Grouped Levels for Total_Trans_Ct	24	1.00000	1.00000	1.00000
RANGE_Total_Revolving_Bal	Transformed Total_Revolving_Bal	20	0.75478	0.82042	1.08697
RANGE_SQRT_Total_Ct_Chng_Q4_Q1	Transformed: Transformed Total_Ct_Chng_Q4_Q1	13	0.53335	0.59238	1.11068
RANGE_LOG_Total_Trans_Amt	Transformed: Transformed Total_Trans_Amt	22	0.46191	0.53583	1.16004
G_Total_Relationship_Count	Grouped Levels for Total_Relationship_Count	11	0.37066	0.50384	1.35932
G_Months_Inactive_12_mon	Grouped Levels for Months_Inactive_12_mon	6	0.20615	0.24099	1.16904
G_Contacts_Count_12_mon	Grouped Levels for Contacts_Count_12_mon	4	0.15495	0.10833	0.69915
RANGE_SQRT_Total_Amt_Chng_Q4_Q1	Transformed: Transformed Total_Amt_Chng_Q4_Q1	4	0.12858	0.17313	1.34642
G_Customer_Age	Grouped Levels for Customer_Age	0	0.00000	0.00000	.
G_Months_on_book	Grouped Levels for Months_on_book	0	0.00000	0.00000	.
RANGE_SQRT_Avg_Utilization_Ratio	Transformed: Transformed Avg_Utilization_Ratio	0	0.00000	0.00000	.

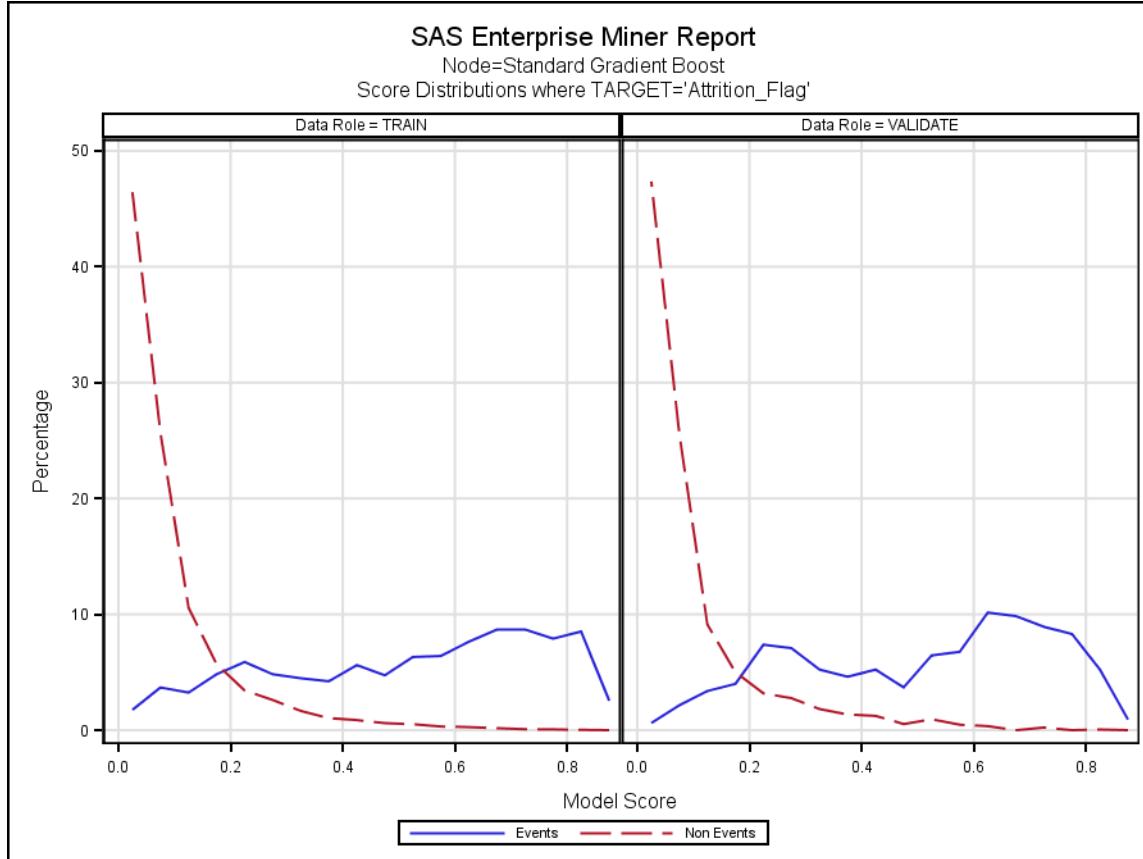
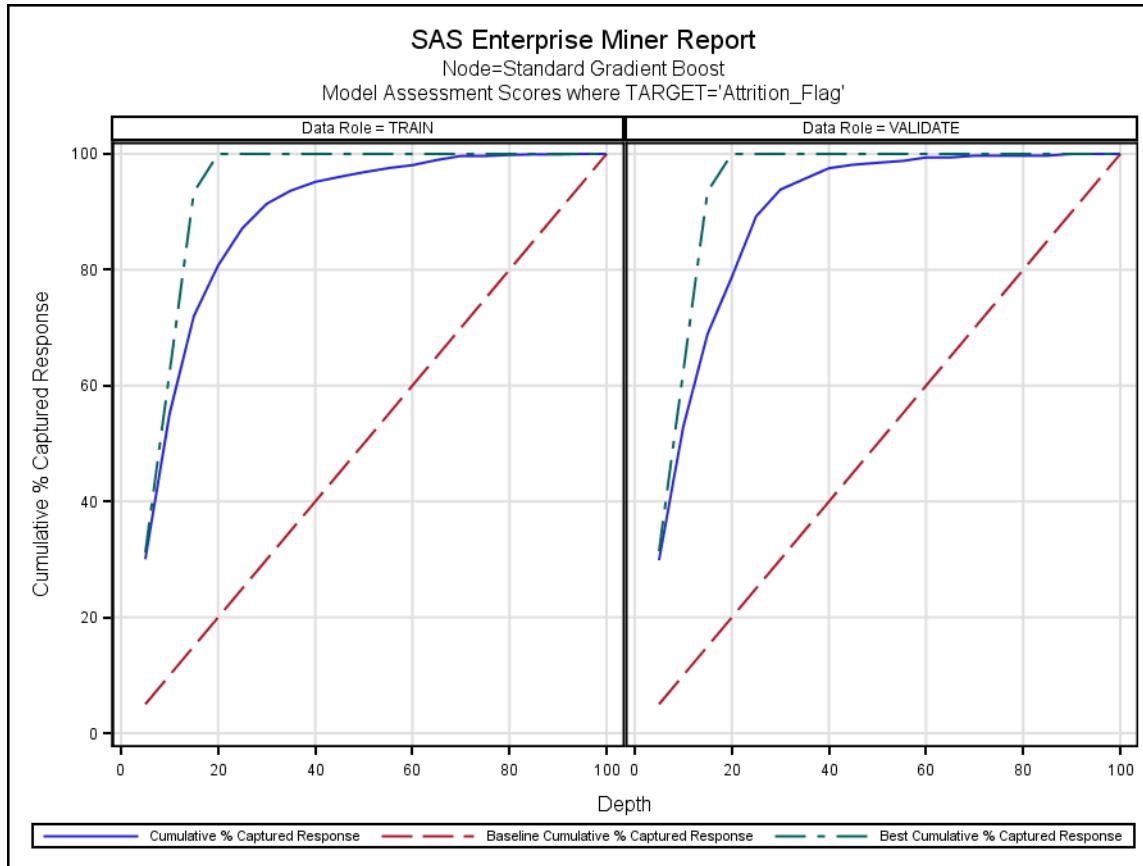
**SAS Enterprise Miner Report**  
**Node=Standard Gradient Boost**  
**Model Assessment Scores where TARGET='Attrition\_Flag'**

96

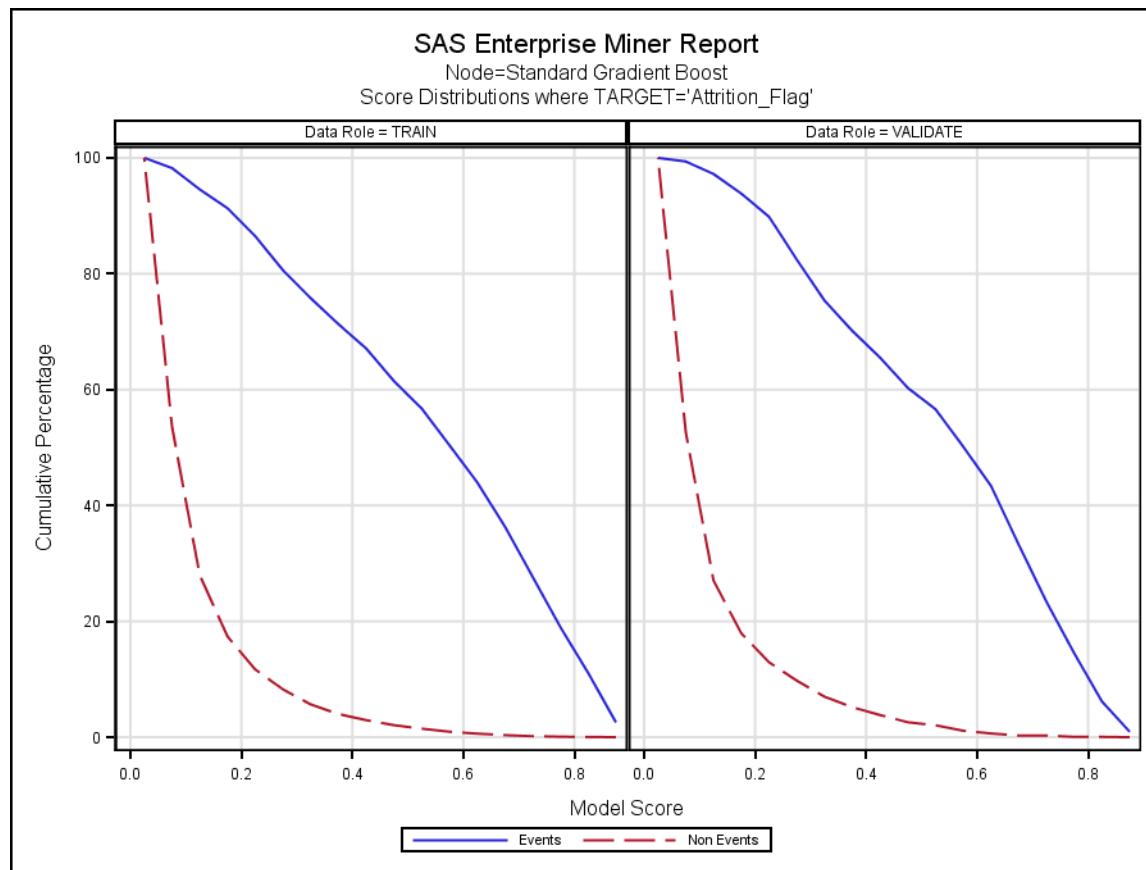


**SAS Enterprise Miner Report**  
**Node=Standard Gradient Boost**  
**Model Assessment Scores where TARGET='Attrition\_Flag'**

97



Score Distributions where TARGET='Attrition\_Flag'



**Node=Standard Gradient Boost**  
**Score Distributions**

Target Variable=Attrition\_Flag Data Role=TRAIN

Posterior Probability Range	Number of Events	Percentage of Events	Percentage of Nonevents	Cumulative Percentage of Events	Cumulative Percentage of Nonevents
0.85-0.90	29	2.54609	0.0000	2.546	0.000
0.80-0.85	97	8.51624	0.0336	11.062	0.034
0.75-0.80	90	7.90167	0.0672	18.964	0.101
0.70-0.75	99	8.69183	0.0840	27.656	0.185
0.65-0.70	99	8.69183	0.1681	36.348	0.353
0.60-0.65	87	7.63828	0.2690	43.986	0.622
0.55-0.60	73	6.40913	0.3194	50.395	0.941
0.50-0.55	72	6.32133	0.5211	56.716	1.462
0.45-0.50	54	4.74100	0.6051	61.457	2.068
0.40-0.45	64	5.61896	0.8741	67.076	2.942
0.35-0.40	48	4.21422	1.0422	71.291	3.984
0.30-0.35	51	4.47761	1.6641	75.768	5.648
0.25-0.30	55	4.82880	2.6055	80.597	8.253
0.20-0.25	67	5.88235	3.4291	86.479	11.683
0.15-0.20	55	4.82880	5.6984	91.308	17.381
0.10-0.15	37	3.24846	10.5732	94.557	27.954
0.05-0.10	42	3.68745	25.6346	98.244	53.589
0.00-0.05	20	1.75593	46.4112	100.000	100.000

Target Variable=Attrition\_Flag Data Role=VALIDATE

Posterior Probability Range	Number of Events	Percentage of Events	Percentage of Nonevents	Cumulative Percentage of Events	Cumulative Percentage of Nonevents
0.85-0.90	3	0.9231	0.0000	0.923	0.000
0.80-0.85	17	5.2308	0.0588	6.154	0.059
0.75-0.80	27	8.3077	0.0000	14.462	0.059
0.70-0.75	29	8.9231	0.2353	23.385	0.294
0.65-0.70	32	9.8462	0.0000	33.231	0.294
0.60-0.65	33	10.1538	0.3529	43.385	0.647
0.55-0.60	22	6.7692	0.4706	50.154	1.118
0.50-0.55	21	6.4615	0.9412	56.615	2.059
0.45-0.50	12	3.6923	0.5294	60.308	2.588
0.40-0.45	17	5.2308	1.2353	65.538	3.824
0.35-0.40	15	4.6154	1.3529	70.154	5.176
0.30-0.35	17	5.2308	1.8235	75.385	7.000
0.25-0.30	23	7.0769	2.7647	82.462	9.765
0.20-0.25	24	7.3846	3.1765	89.846	12.941
0.15-0.20	13	4.0000	5.0000	93.846	17.941
0.10-0.15	11	3.3846	9.1176	97.231	27.059
0.05-0.10	7	2.1538	25.5882	99.385	52.647
0.00-0.05	2	0.6154	47.3529	100.000	100.000

## SAS Enterprise Miner Report

### Node=COMPARE TREE Summary

Node id = MdlComp2  
 Node label = COMPARE TREE  
 Meta path = Ids => Varsel => Trans => Meta => Trans2 => Meta2 => Part2 => Tree4 => MdlComp2  
 Notes =

### Node=COMPARE TREE Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	ModelCompare		NumberOfReportedLevels	1E-6		SelectionData	DEFAULT	
AssessAllTargetLevels	N		NumberofBins	100	20	SelectionDepth	10	
DecileBin	20		ProfitEpsilon	1E-6		SelectionTable	TEST	TABLE
HPCriteria	_MISC_	DEFAULT	RecomputeAssess	N		StatisticUsed	_VMISC_	
LiftEpsilon	1E-6		RocChart	Y		TargetLabel		
ModelCriteria	Valid: Misclassification Rate		RocEpsilon	0.01		TargetName	Attrition_Flag	
ModelDescription	Modified Tree 3		RoiEpsilon	1E-6		classViyaCriteria	DEFAULT	
ModelId	Tree4		ScoreDistBin	20		intervalViyaCriteria	DEFAULT	
NormalizeReportingVariables	Y		SelectionCriteria	DEFAULT				

### Node=COMPARE TREE Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag

### Node=COMPARE TREE 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	Tree4	Tree4	Modified Tree 3	Attrition_Flag		0.045926	0.037029	0.044441	0.837
	Tree3	Tree3	Modified Tree 2	Attrition_Flag		0.055802	0.039422	0.052906	0.852
	Tree2	Tree2	Modified Tree 1	Attrition_Flag		0.059753	0.038202	0.048674	0.837
	Tree	Tree	Standard Decision Tree	Attrition_Flag		0.066173	0.052236	0.062077	0.752

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	Tree4	Tree4	Modified Tree 3	Attrition_Flag		0.045926	0.039966	0.045926	0.835
	Tree3	Tree3	Modified Tree 2	Attrition_Flag		0.055802	0.048759	0.055802	0.815
	Tree2	Tree2	Modified Tree 1	Attrition_Flag		0.059753	0.050880	0.059753	0.812
	Tree	Tree	Standard Decision Tree	Attrition_Flag		0.066173	0.055974	0.066173	0.758

Node=COMPARE TREE

Classification Chart

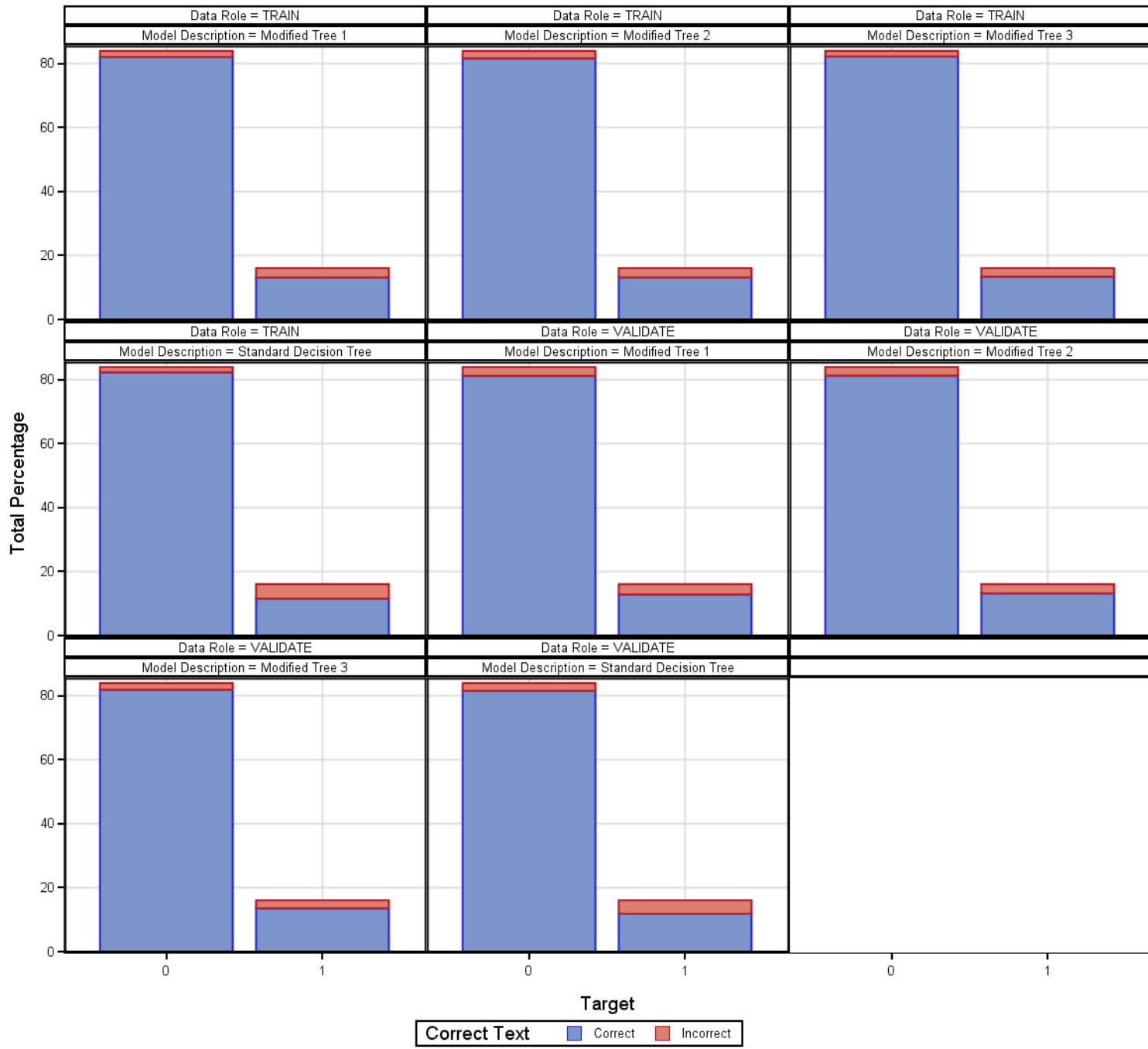
TARGET='Attrition\_Flag' and \_TYPE\_='PREDICTION'

## SAS Enterprise Miner Report

Node=COMPARE TREE

Classification Chart

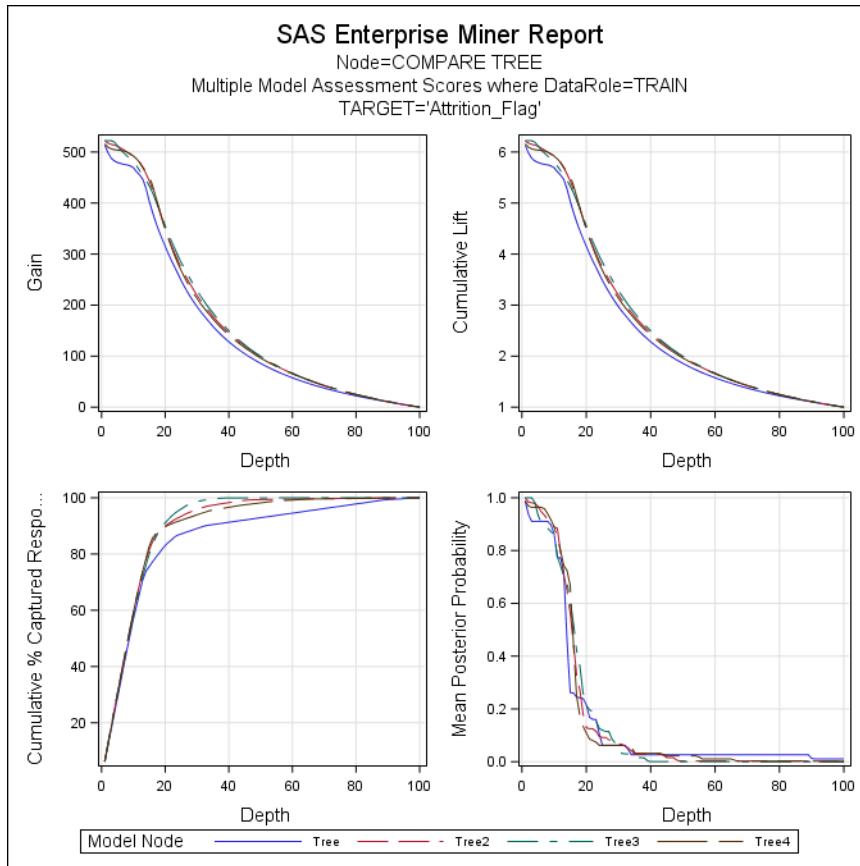
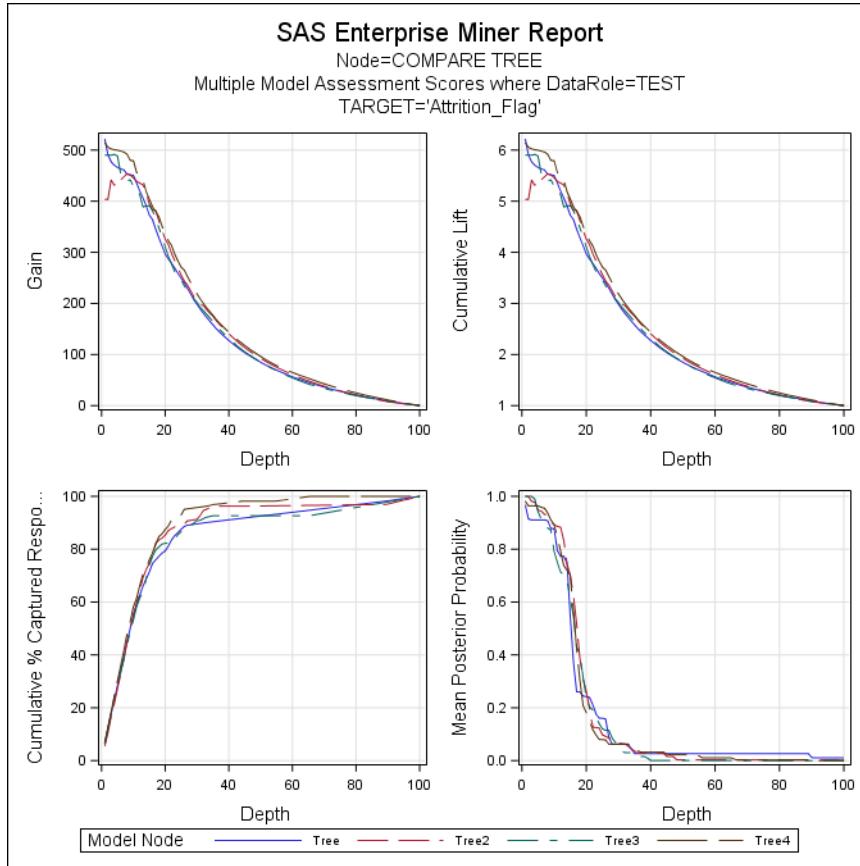
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Node=COMPARE TREE

Multiple Model Assessment Scores where DataRole=TEST

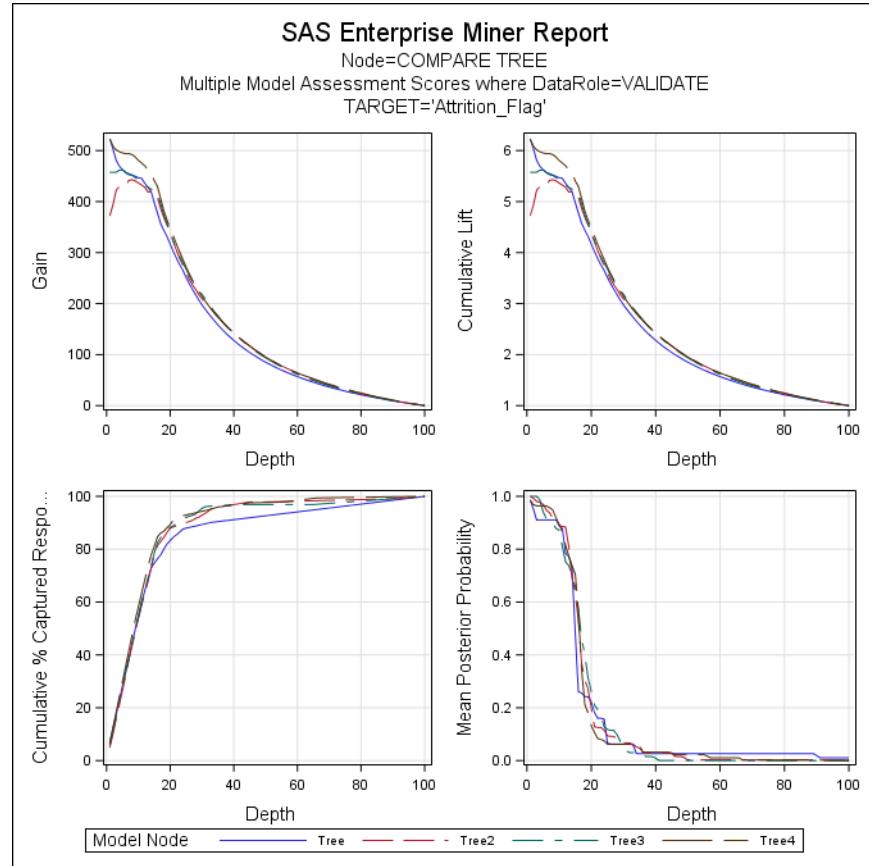
TARGET='Attrition\_Flag'

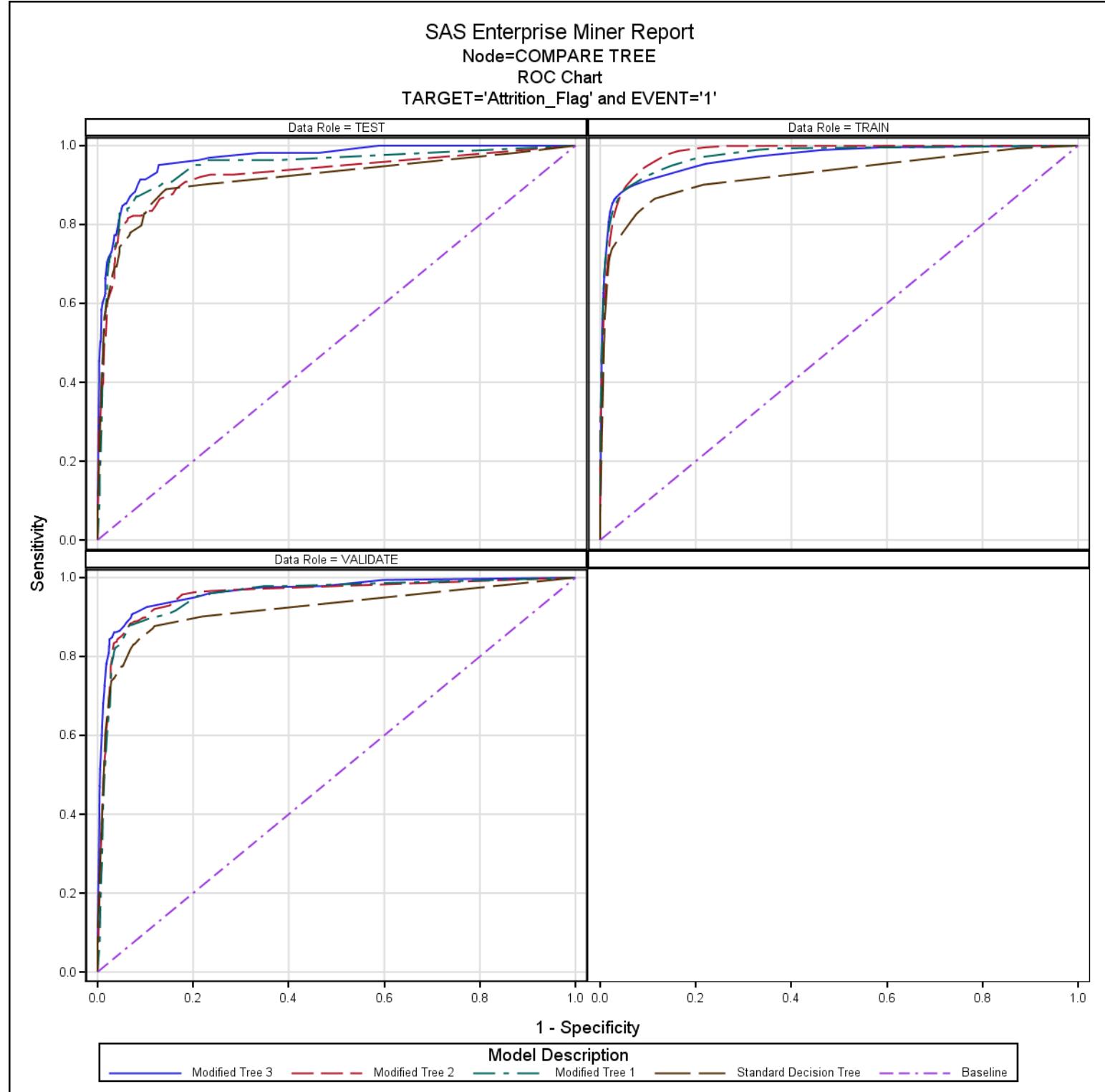


Node=COMPARE TREE

Multiple Model Assessment Scores where DataRole=VALIDATE

TARGET='Attrition\_Flag'





## SAS Enterprise Miner Report

### Node=HP Neural Summary

Node id = HPNNA  
 Node label = HP Neural  
 Meta path = Ids => Varsel => Trans => Meta => Trans2 => Meta2 => Part2 => Tree4 => MdlComp2 => HP  
 NNA  
 Notes =

### Node=HP Neural Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	HPDMNeural		MAXITER	300		TargetActivation	IDENTITY	
ARCHITECTURE	LAYER1		MAXLINKS	1000		TargetError	NORMAL	
DIRECTCONN	N		MISSASLVL	N		TargetStd	RANGE	
HIDDEN	3		NUMTRIES	2		ToolType	MODEL	
HIDDENLAYERS	3		OPTMETHOD	LBFGS		USEINVERSE	N	
InputStd	RANGE		TableEditor			USEVALID	N	

### Node=HP Neural Variable Summary

Role	Level	Frequency Count	Name
INPUT	INTERVAL	5	RANGE_LOG_Total_Trans_Amt RANGE_SQRT_Avg_Utilization_Ratio RANGE_SQRT_Total_Amt_Chng_Q4_Q1 RANGE_SQRT_Total_Ct_Chng_Q4_Q1 RANGE_Total_Revolving_Bal
INPUT	NOMINAL	4	G_Customer_Age G_Months_Inactive_12_mon G_Total_Relationship_Count G_Total_Trans_Ct

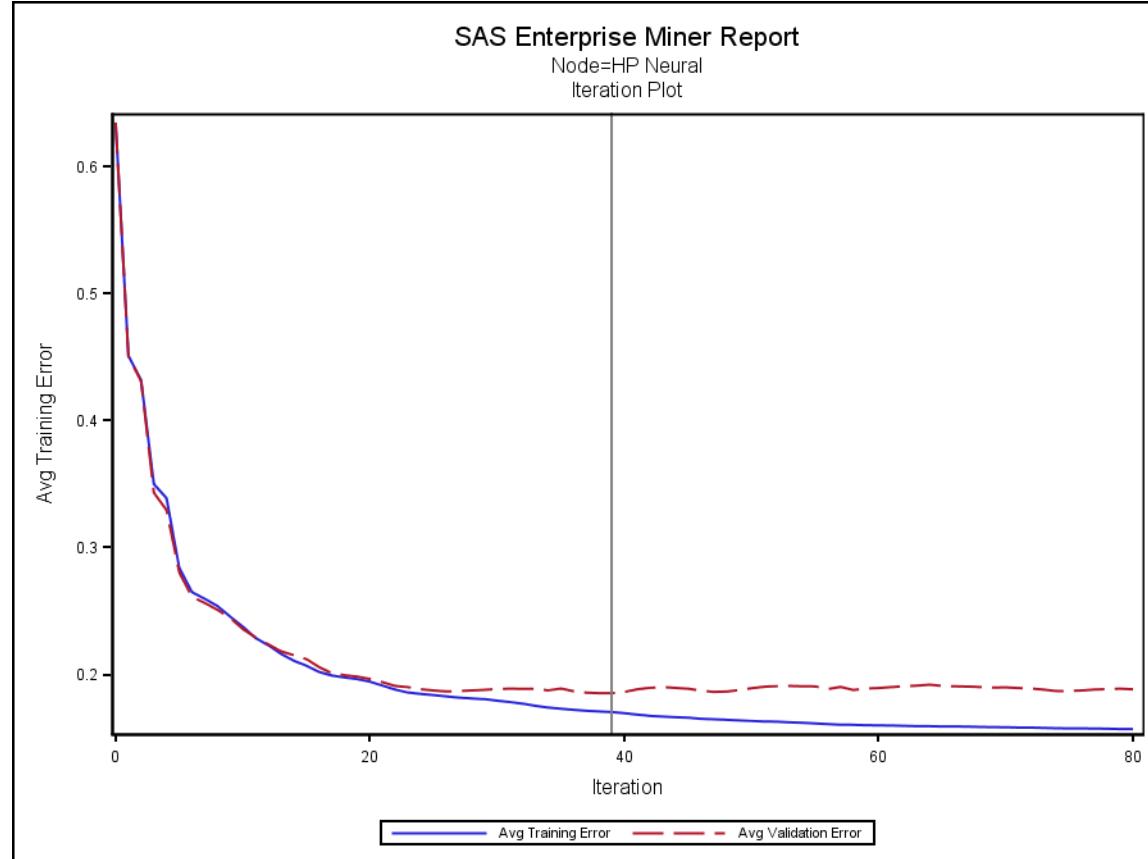
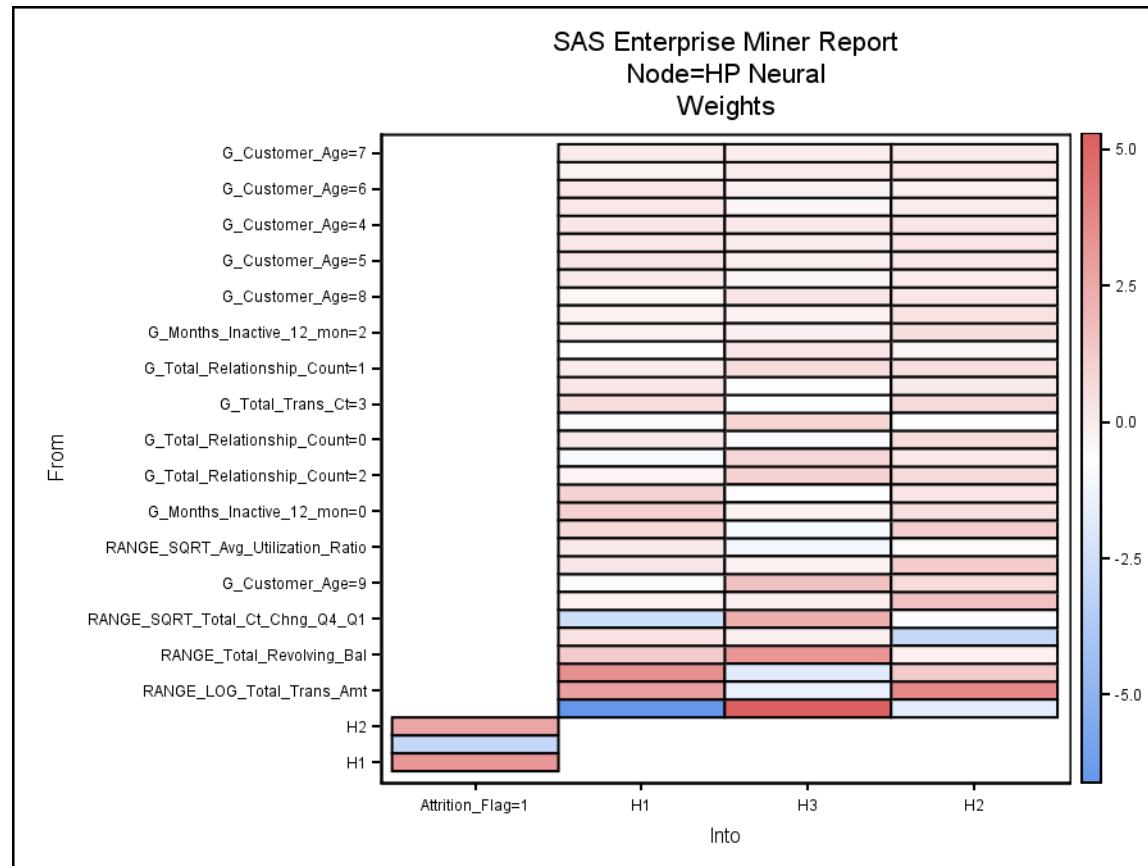
### Node=HP Neural Created Variables Summary

Role	Level	Frequency Count	Name
RESIDUAL	INTERVAL	2	R_Attrition_Flag0 R_Attrition_Flag1
PREDICT	INTERVAL	2	P_Attrition_Flag0 P_Attrition_Flag1
CLASSIFICATION	NOMINAL	3	F_Attrition_Flag I_Attrition_Flag U_Attrition_Flag
ASSESS	NOMINAL	1	_WARN_

### Node=HP Neural Model Fit Statistics

Target=Attrition\_Flag Target Label=''

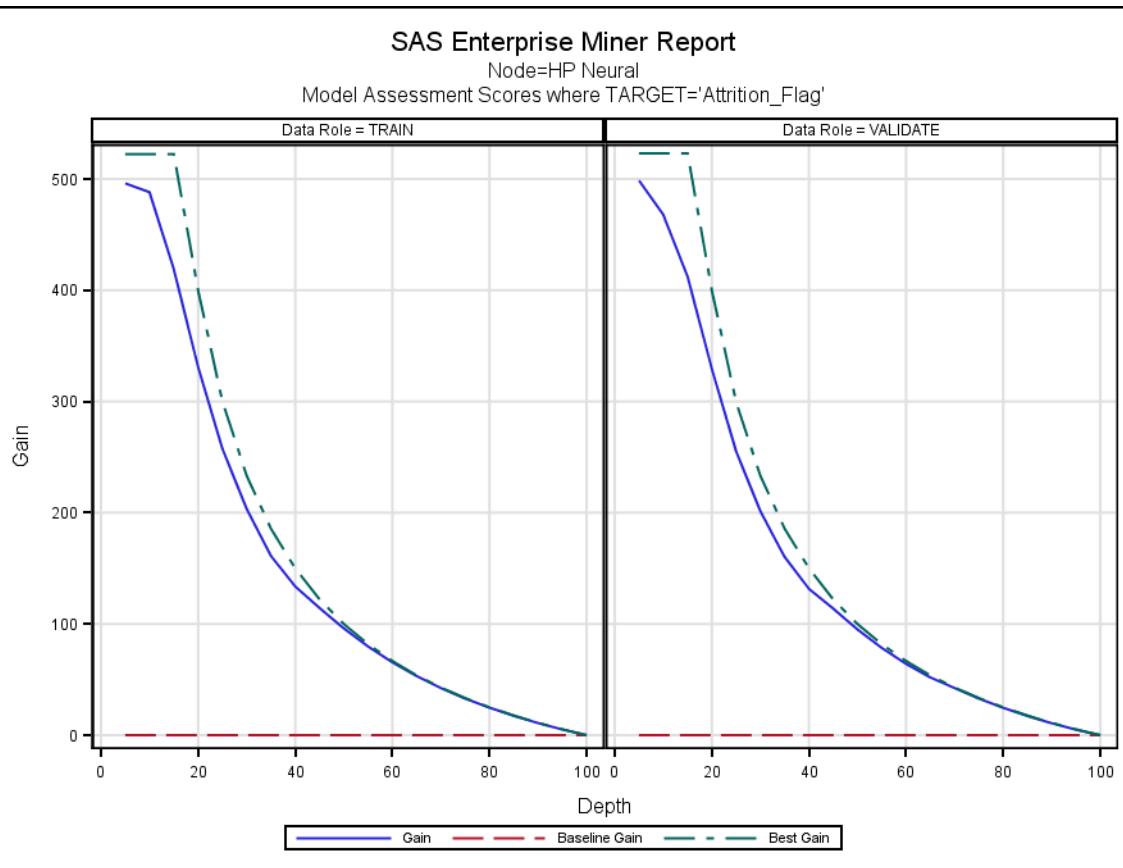
Label of Statistic	Train	Validation	Test
Average Squared Error	0.05	0.05	0.05
Divisor for ASE	14176.00	4050.00	2028.00
Maximum Absolute Error	1.00	1.00	0.99
Sum of Frequencies	7088.00	2025.00	1014.00
Root Average Squared Error	0.22	0.23	0.21
Sum of Squared Errors	666.59	205.89	92.73
Frequency of Classified Cases	7088.00	2025.00	1014.00
Misclassification Rate	0.06	0.07	0.06
Number of Wrong Classifications	431.00	132.00	63.00



## SAS Enterprise Miner Report

Node=HP Neural

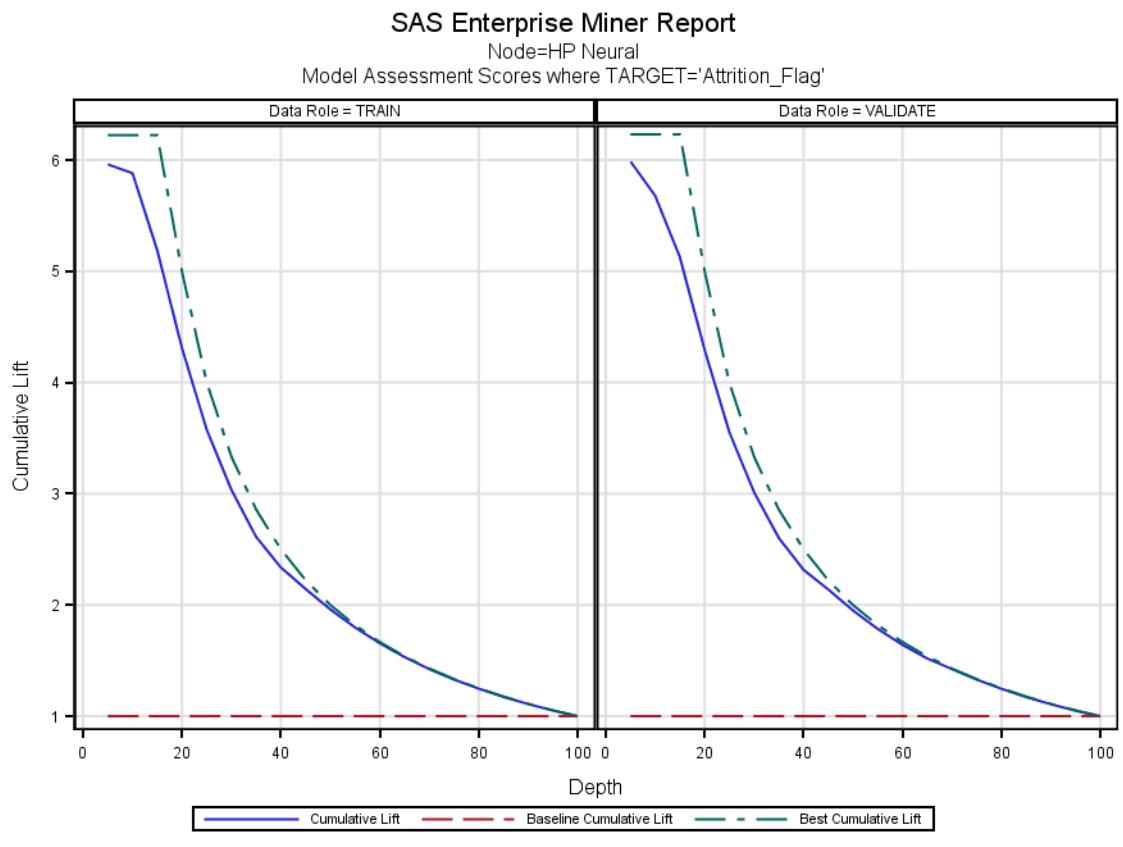
Model Assessment Scores where TARGET='Attrition\_Flag'

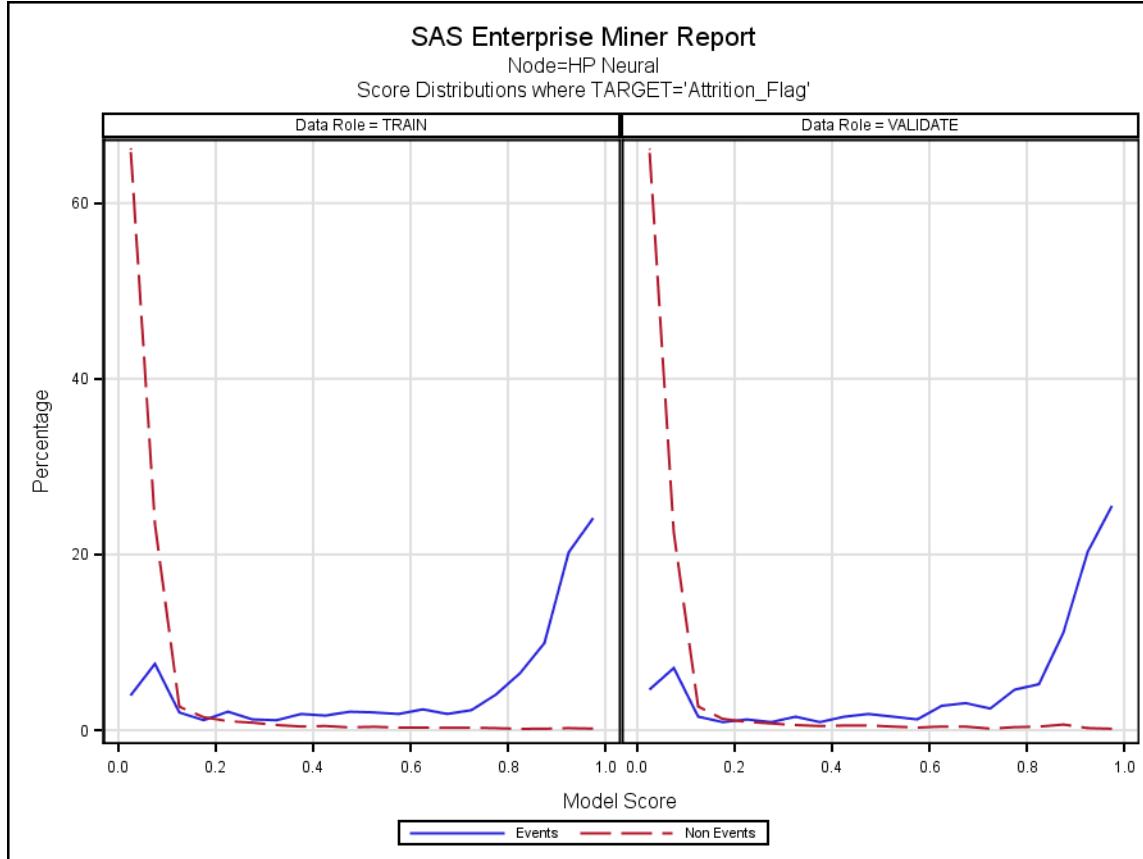
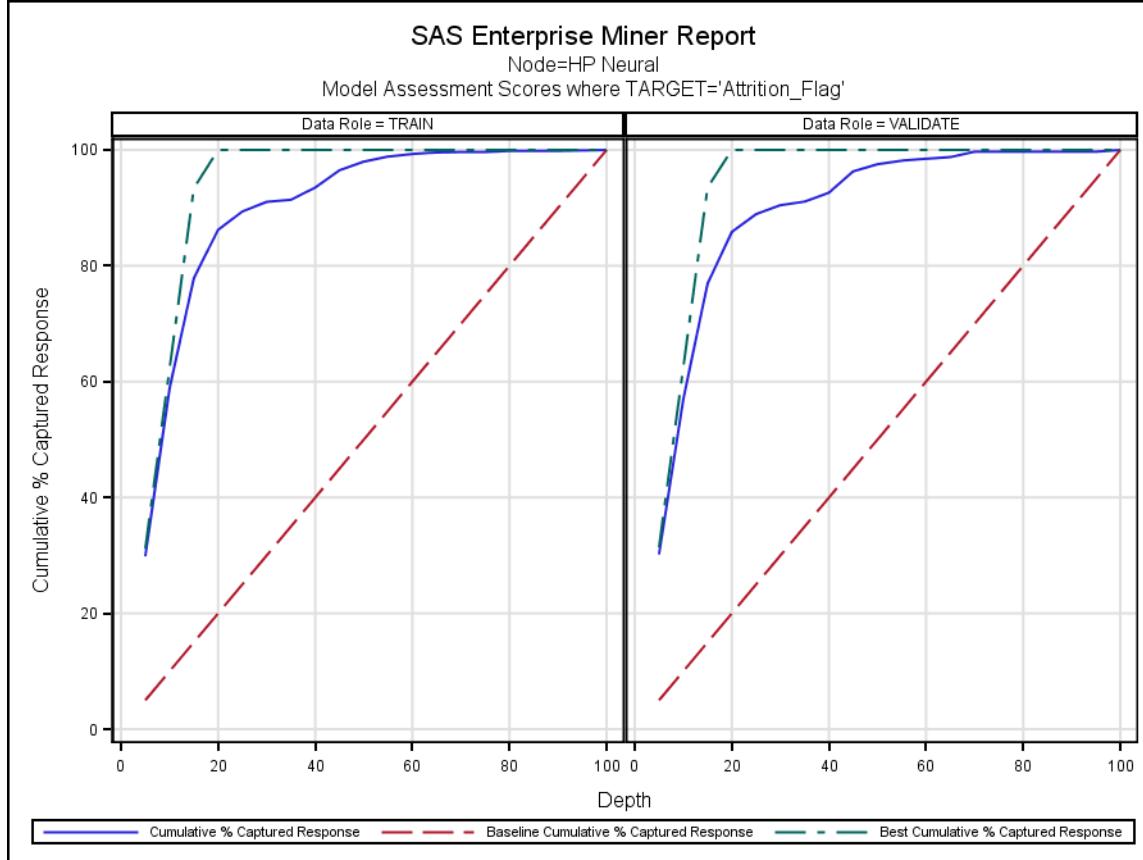


## SAS Enterprise Miner Report

Node=HP Neural

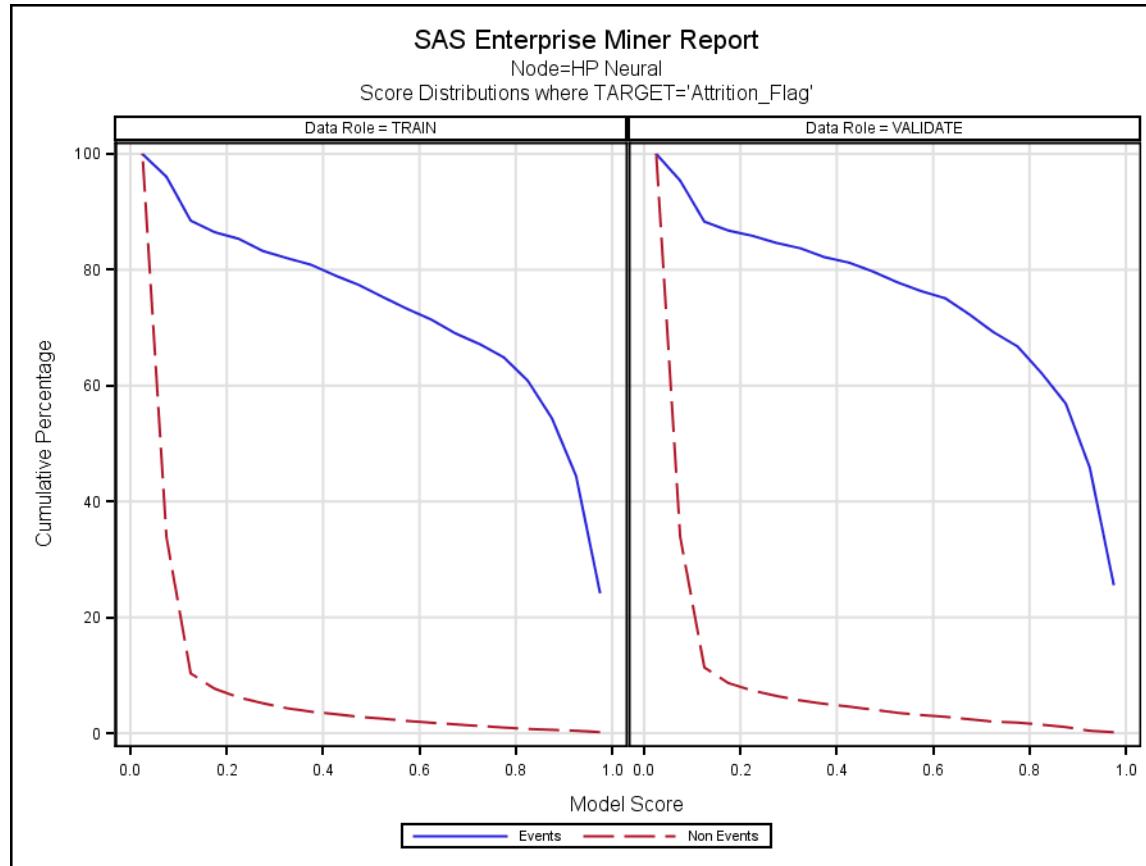
Model Assessment Scores where TARGET='Attrition\_Flag'





Node=HP Neural

## Score Distributions where TARGET='Attrition\_Flag'

**Node=HP Neural**  
**Score Distributions**

Target Variable=Attrition\_Flag 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	275	24.1440	0.1849	24.144	0.185
0.90-0.95	231	20.2809	0.2353	44.425	0.420
0.85-0.90	113	9.9210	0.1681	54.346	0.588
0.80-0.85	74	6.4969	0.1513	60.843	0.740
0.75-0.80	46	4.0386	0.2353	64.881	0.975
0.70-0.75	26	2.2827	0.2690	67.164	1.244
0.65-0.70	21	1.8437	0.2690	69.008	1.513
0.60-0.65	27	2.3705	0.3026	71.378	1.815
0.55-0.60	21	1.8437	0.3026	73.222	2.118
0.50-0.55	23	2.0193	0.3866	75.241	2.505
0.45-0.50	24	2.1071	0.3194	77.349	2.824
0.40-0.45	19	1.6681	0.4707	79.017	3.295
0.35-0.40	21	1.8437	0.4202	80.860	3.715
0.30-0.35	13	1.1414	0.5883	82.002	4.303
0.25-0.30	14	1.2291	0.8573	83.231	5.161
0.20-0.25	24	2.1071	1.0254	85.338	6.186
0.15-0.20	13	1.1414	1.4792	86.479	7.665
0.10-0.15	23	2.0193	2.6727	88.499	10.338
0.05-0.10	86	7.5505	23.4325	96.049	33.770
0.00-0.05	45	3.9508	66.2296	100.000	100.000

Target Variable=Attrition\_Flag 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	83	25.5385	0.1765	25.538	0.176
0.90-0.95	66	20.3077	0.2353	45.846	0.412
0.85-0.90	36	11.0769	0.6471	56.923	1.059
0.80-0.85	17	5.2308	0.4118	62.154	1.471
0.75-0.80	15	4.6154	0.3529	66.769	1.824
0.70-0.75	8	2.4615	0.1765	69.231	2.000
0.65-0.70	10	3.0769	0.4118	72.308	2.412
0.60-0.65	9	2.7692	0.4118	75.077	2.824
0.55-0.60	4	1.2308	0.2941	76.308	3.118
0.50-0.55	5	1.5385	0.4118	77.846	3.529
0.45-0.50	6	1.8462	0.5294	79.692	4.059
0.40-0.45	5	1.5385	0.5294	81.231	4.588
0.35-0.40	3	0.9231	0.4706	82.154	5.059
0.30-0.35	5	1.5385	0.5882	83.692	5.647
0.25-0.30	3	0.9231	0.7647	84.615	6.412
0.20-0.25	4	1.2308	0.9412	85.846	7.353
0.15-0.20	3	0.9231	1.2941	86.769	8.647
0.10-0.15	5	1.5385	2.7059	88.308	11.353
0.05-0.10	23	7.0769	22.4706	95.385	33.824
0.00-0.05	15	4.6154	66.1765	100.000	100.000

## SAS Enterprise Miner Report

### Node=AutoNeural 3 Summary

Node id = AutoNeural4  
 Node label = AutoNeural 3  
 Meta path = Ids => Varsel => Trans => Meta => Trans2 => Meta2 => Part2 => AutoNeural4  
 Notes =

### Node=AutoNeural 3 Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	AutoNeural		HistoryDs			Tanh	Y	
AdjustIterations	Y		Identity	N		TargetError	DEFAULT	
Architecture	SINGLE LAYER		Logistic	N		Termination	OVERFITTING	
Beststds			MaxIter	15	8	Tolerance	MEDIUM	
Direct	Y		Normal	Y		TotalHidden	30	
Exponential	N		Reciprocal	N		TotalTime	1 HOUR	1 Hour
FinalIter	5		Residuals	Y		TrainAction	SEARCH	
FinalTrain	Y		Sine	Y		estds		
Freeze	N		Softmax	N		outfit		
Hidden	4	2	Square	N		weights		
HiddenUnits	N		Standardizations	N				

### Node=AutoNeural 3 Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag
INPUT	INTERVAL	5	RANGE_LOG_Total_Trans_Amt RANGE_SQRT_Avg_Utilization_Ratio RANGE_SQRT_Total_Amt_Chng_Q4_Q1 RANGE_SQRT_Total_Ct_Chng_Q4_Q1 RANGE_Total_Revolving_Bal
INPUT	NOMINAL	6	G_Contacts_Count_12_mon G_Customer_Age G_Months_Inactive_12_mon G_Months_on_book G_Total_Relationship_Count G_Total_Trans_Ct

### Node=AutoNeural 3 Model Fit Statistics

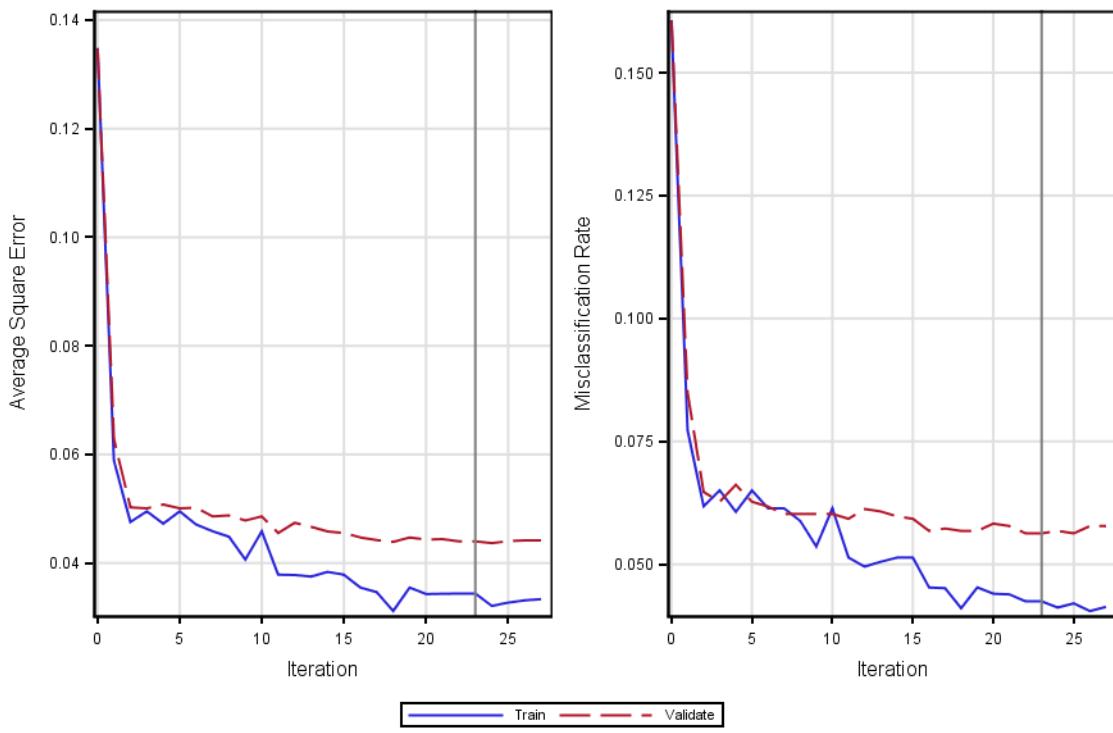
Target=Attrition\_Flag Target Label=' '

Label of Statistic	Train	Validation	Test
Total Degrees of Freedom	7088.00	.	.
Degrees of Freedom for Error	6415.00	.	.
Model Degrees of Freedom	673.00	.	.
Number of Estimated Weights	673.00	.	.
Akaike's Information Criterion	3572.04	.	.
Schwarz's Bayesian Criterion	8192.97	.	.
Average Squared Error	0.05	0.05	0.05
Maximum Absolute Error	1.00	1.00	0.99
Divisor for ASE	14176.00	4050.00	2028.00
Sum of Frequencies	7088.00	2025.00	1014.00
Root Average Squared Error	0.22	0.23	0.23
Sum of Squared Errors	655.69	216.05	104.25
Sum of Case Weights Times Freq	14176.00	4050.00	2028.00

Target=Attrition\_Flag Target Label=' '

Label of Statistic	Train	Validation	Test
Final Prediction Error	0.06	.	.
Mean Squared Error	0.05	0.05	0.05
Root Final Prediction Error	0.24	.	.
Root Mean Squared Error	0.23	0.23	0.23
Average Error Function	0.16	0.18	0.17
Error Function	2226.04	741.36	340.73
Misclassification Rate	0.06	0.07	0.07
Number of Wrong Classifications	441.00	145.00	70.00

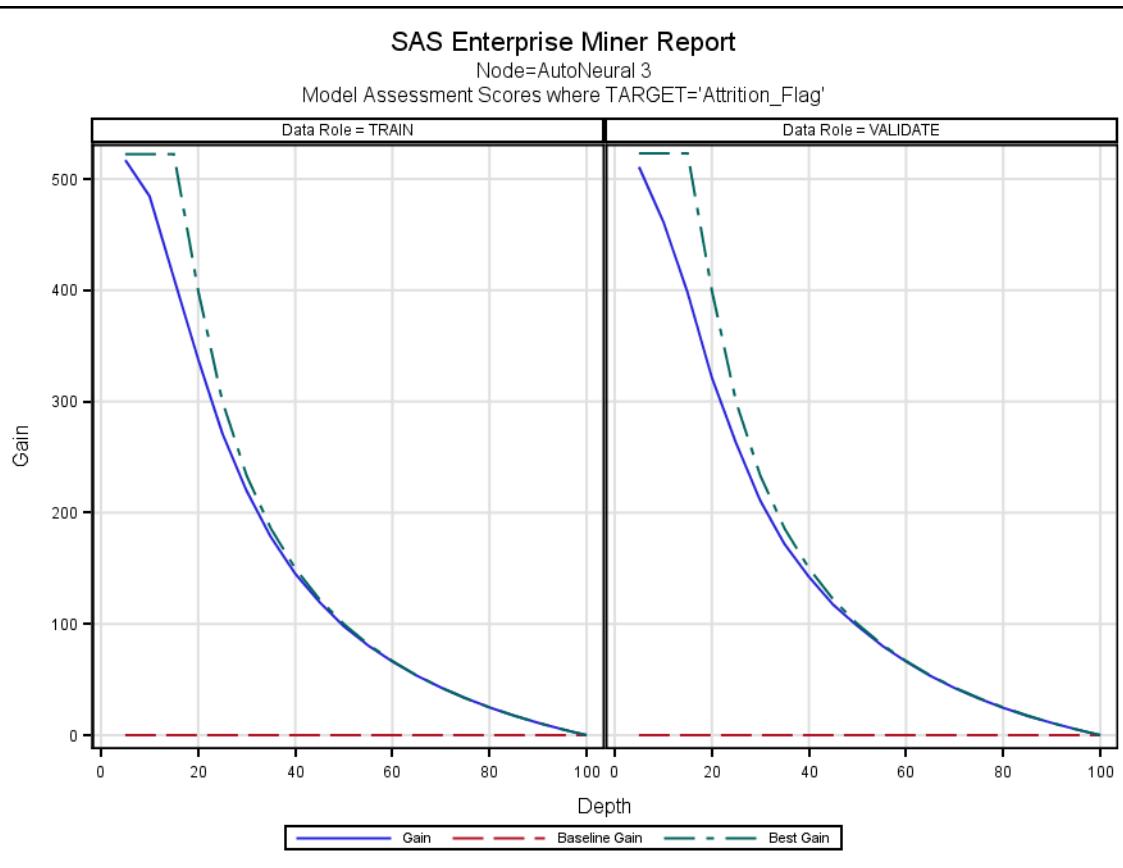
**SAS Enterprise Miner Report**  
**Node=AutoNeural 3**  
**Model Iteration Plots**



## SAS Enterprise Miner Report

Node=AutoNeural 3

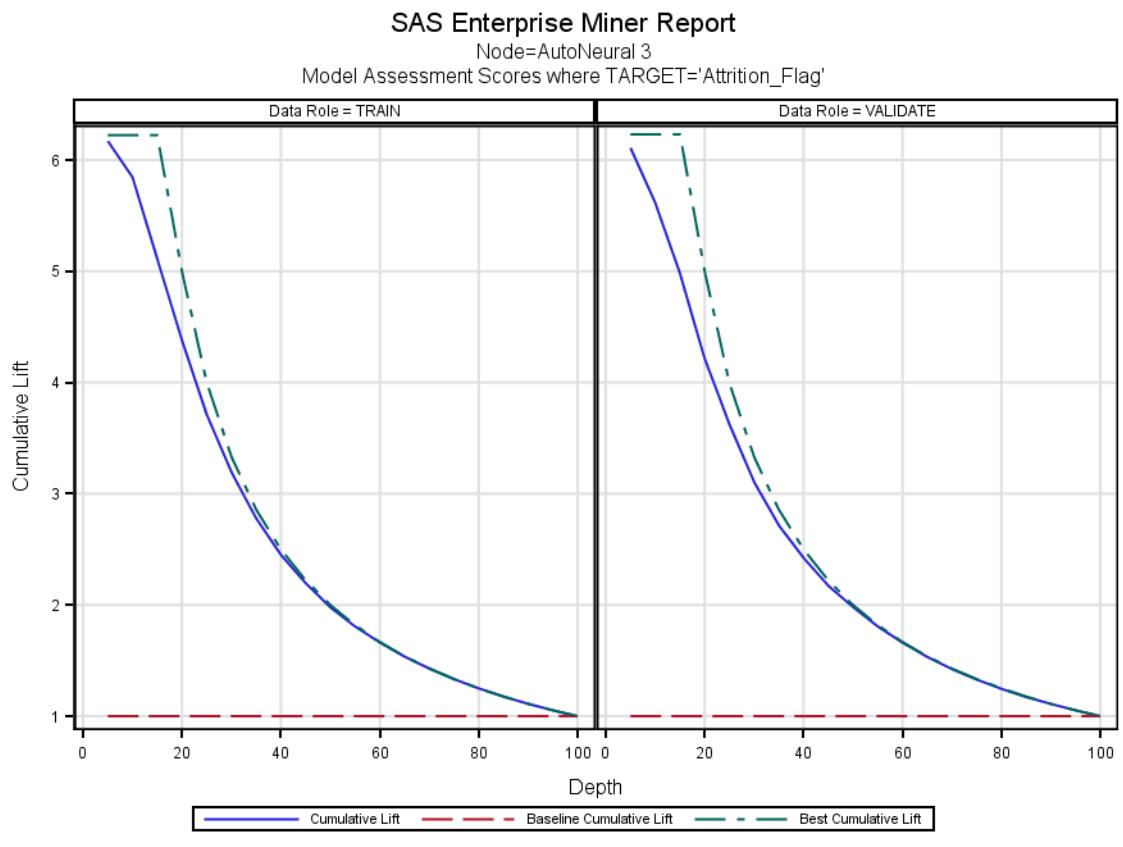
Model Assessment Scores where TARGET='Attrition\_Flag'

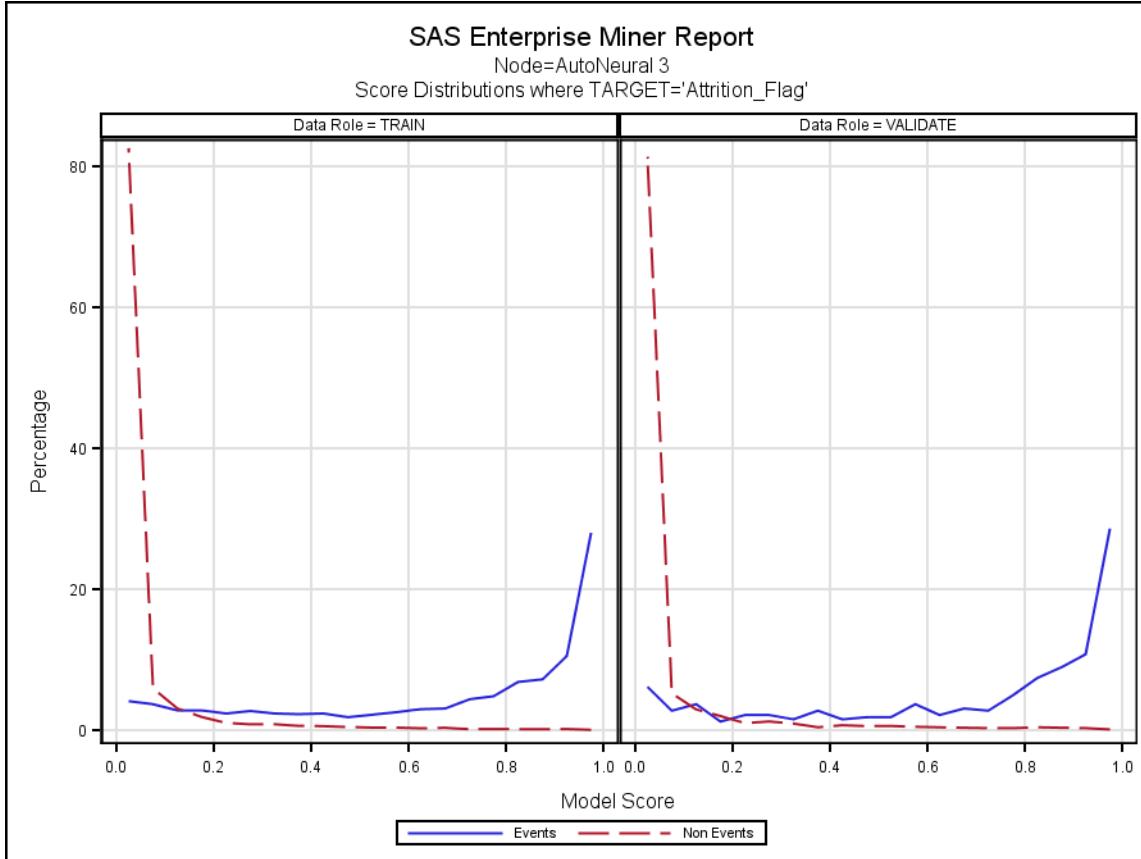
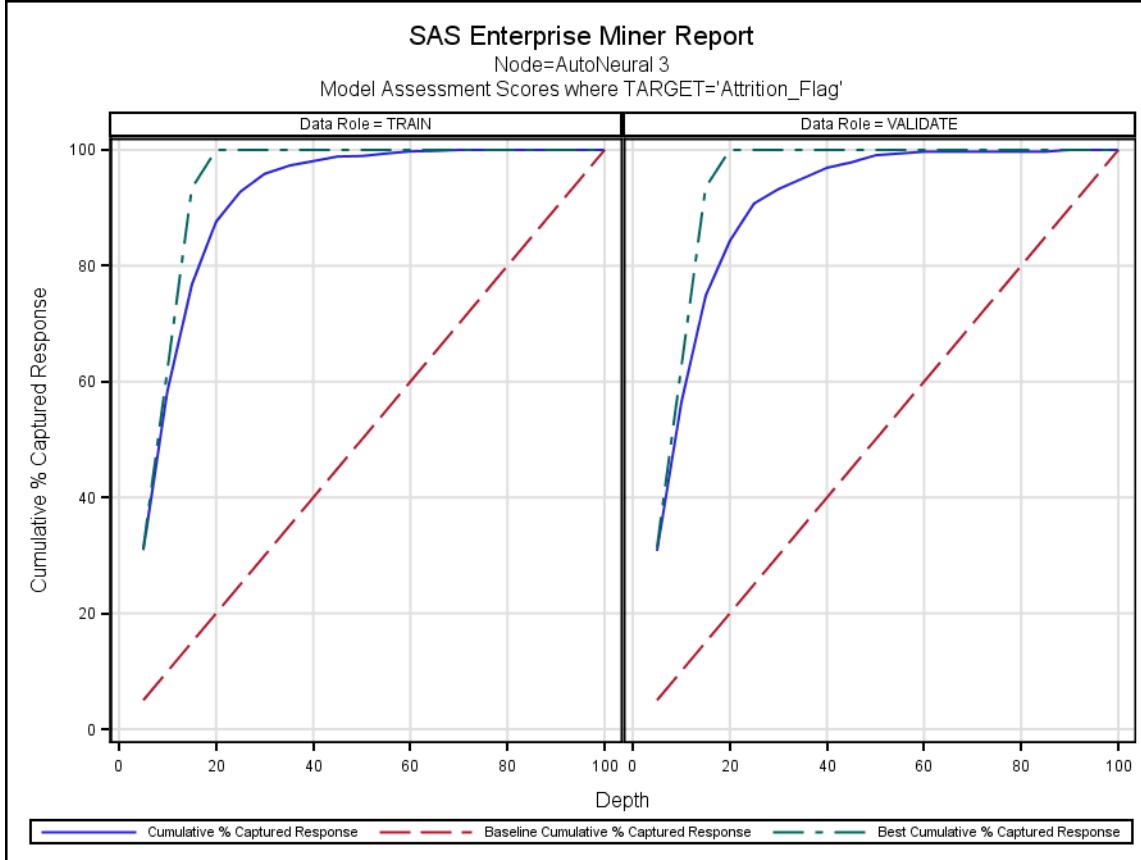


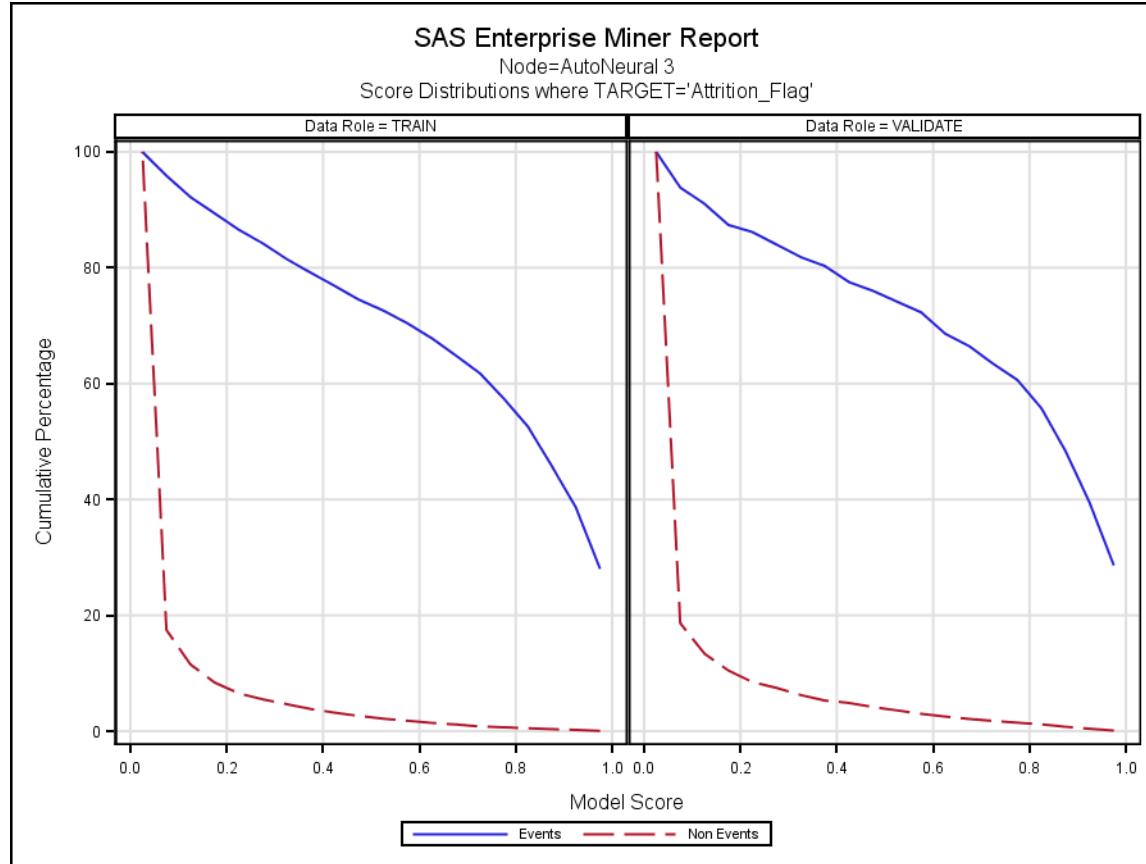
## SAS Enterprise Miner Report

Node=AutoNeural 3

Model Assessment Scores where TARGET='Attrition\_Flag'





**Node=AutoNeural 3****Score Distributions**

Target Variable=Attrition\_Flag 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	319	28.0070	0.0504	28.007	0.050
0.90-0.95	120	10.5356	0.1681	38.543	0.219
0.85-0.90	82	7.1993	0.1345	45.742	0.353
0.80-0.85	78	6.8481	0.1513	52.590	0.504
0.75-0.80	55	4.8288	0.1681	57.419	0.672
0.70-0.75	50	4.3898	0.1513	61.809	0.824
0.65-0.70	35	3.0729	0.3362	64.881	1.160
0.60-0.65	34	2.9851	0.2690	67.867	1.429
0.55-0.60	29	2.5461	0.3698	70.413	1.799
0.50-0.55	25	2.1949	0.3698	72.608	2.168
0.45-0.50	21	1.8437	0.4539	74.451	2.622
0.40-0.45	27	2.3705	0.5715	76.822	3.194
0.35-0.40	26	2.2827	0.6220	79.104	3.816
0.30-0.35	27	2.3705	0.8405	81.475	4.656
0.25-0.30	31	2.7217	0.8405	84.197	5.497
0.20-0.25	27	2.3705	1.0254	86.567	6.522
0.15-0.20	32	2.8095	1.8827	89.377	8.405
0.10-0.15	32	2.8095	3.0930	92.186	11.498
0.05-0.10	42	3.6874	5.9506	95.874	17.448
0.00-0.05	47	4.1264	82.5517	100.000	100.000

Target Variable=Attrition\_Flag 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	93	28.6154	0.1176	28.615	0.118
0.90-0.95	35	10.7692	0.2941	39.385	0.412
0.85-0.90	29	8.9231	0.3529	48.308	0.765
0.80-0.85	24	7.3846	0.4118	55.692	1.176
0.75-0.80	16	4.9231	0.2941	60.615	1.471
0.70-0.75	9	2.7692	0.2941	63.385	1.765
0.65-0.70	10	3.0769	0.3529	66.462	2.118
0.60-0.65	7	2.1538	0.4118	68.615	2.529
0.55-0.60	12	3.6923	0.4706	72.308	3.000
0.50-0.55	6	1.8462	0.5882	74.154	3.588
0.45-0.50	6	1.8462	0.5882	76.000	4.176
0.40-0.45	5	1.5385	0.7059	77.538	4.882
0.35-0.40	9	2.7692	0.4118	80.308	5.294
0.30-0.35	5	1.5385	0.9412	81.846	6.235
0.25-0.30	7	2.1538	1.2353	84.000	7.471
0.20-0.25	7	2.1538	1.0000	86.154	8.471
0.15-0.20	4	1.2308	2.0000	87.385	10.471
0.10-0.15	12	3.6923	2.9412	91.077	13.412
0.05-0.10	9	2.7692	5.2353	93.846	18.647
0.00-0.05	20	6.1538	81.3529	100.000	100.000

## SAS Enterprise Miner Report

### Node=AutoNeural 2 Summary

Node id = AutoNeural2  
 Node label = AutoNeural 2  
 Meta path = Ids => Varsel => Trans => Meta => Trans2 => Meta2 => Part2 => AutoNeural2  
 Notes =

### Node=AutoNeural 2 Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	AutoNeural		HistoryDs			Tanh	Y	
AdjustIterations	Y		Identity	N		TargetError	DEFAULT	
Architecture	BLOCK LAYERS	SINGLE LAYER	Logistic	N		Termination	OVERFITTING	
Beststds			MaxIter	20	8	Tolerance	MEDIUM	
Direct	Y		Normal	Y		TotalHidden	30	
Exponential	N		Reciprocal	N		TotalTime	1 HOUR	1 Hour
FinalIter	5		Residuals	Y		TrainAction	SEARCH	
FinalTrain	Y		Sine	Y		estds		
Freeze	N		Softmax	N		outfit		
Hidden	8	2	Square	N		weights		
HiddenUnits	N		Standardizations	N				

### Node=AutoNeural 2 Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag
INPUT	INTERVAL	5	RANGE_LOG_Total_Trans_Amt RANGE_SQRT_Avg_Utilization_Ratio RANGE_SQRT_Total_Amt_Chng_Q4_Q1 RANGE_SQRT_Total_Ct_Chng_Q4_Q1 RANGE_Total_Revolving_Bal
INPUT	NOMINAL	6	G_Contacts_Count_12_mon G_Customer_Age G_Months_Inactive_12_mon G_Months_on_book G_Total_Relationship_Count G_Total_Trans_Ct

### Node=AutoNeural 2 Model Fit Statistics

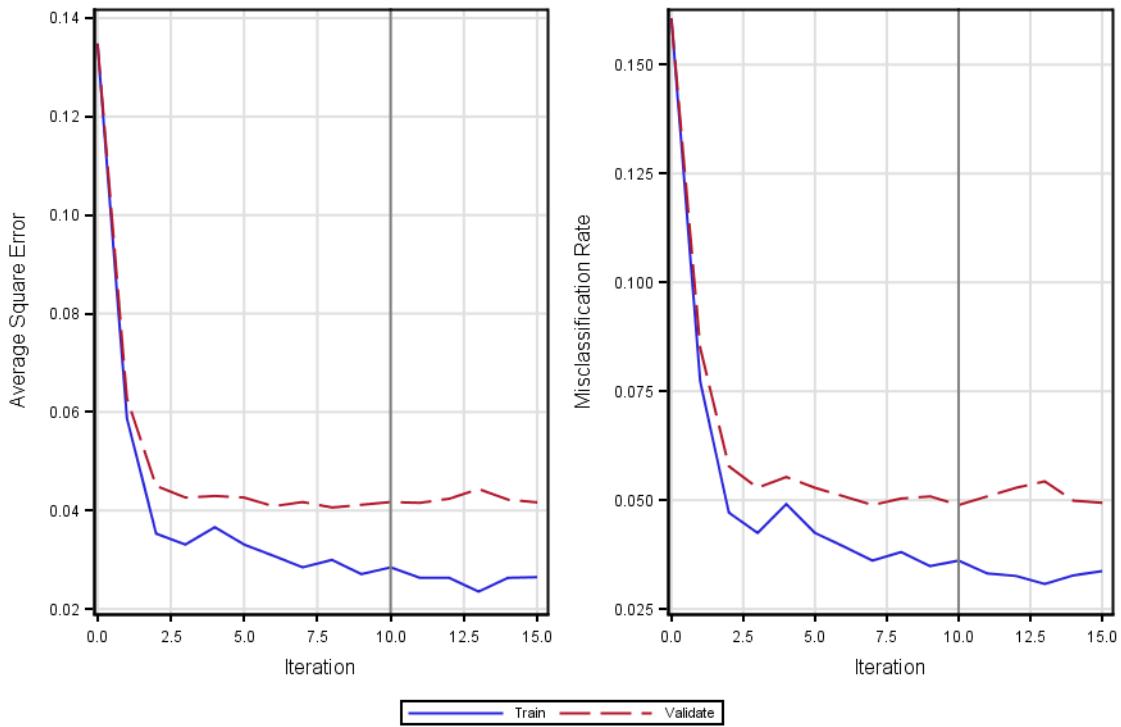
Target=Attrition\_Flag Target Label=' '

Label of Statistic	Train	Validation	Test
Total Degrees of Freedom	7088.00	.	.
Degrees of Freedom for Error	6679.00	.	.
Model Degrees of Freedom	409.00	.	.
Number of Estimated Weights	409.00	.	.
Akaike's Information Criterion	2172.37	.	.
Schwarz's Bayesian Criterion	4980.63	.	.
Average Squared Error	0.03	0.04	0.04
Maximum Absolute Error	1.00	1.00	1.00
Divisor for ASE	14176.00	4050.00	2028.00
Sum of Frequencies	7088.00	2025.00	1014.00
Root Average Squared Error	0.16	0.20	0.20
Sum of Squared Errors	375.19	168.74	80.77
Sum of Case Weights Times Freq	14176.00	4050.00	2028.00

Target=Attrition\_Flag Target Label='1'

Label of Statistic	Train	Validation	Test
Final Prediction Error	0.03	.	.
Mean Squared Error	0.03	0.04	0.04
Root Final Prediction Error	0.17	.	.
Root Mean Squared Error	0.17	0.20	0.20
Average Error Function	0.10	0.15	0.13
Error Function	1354.37	603.84	266.18
Misclassification Rate	0.03	0.05	0.06
Number of Wrong Classifications	239.00	100.00	58.00

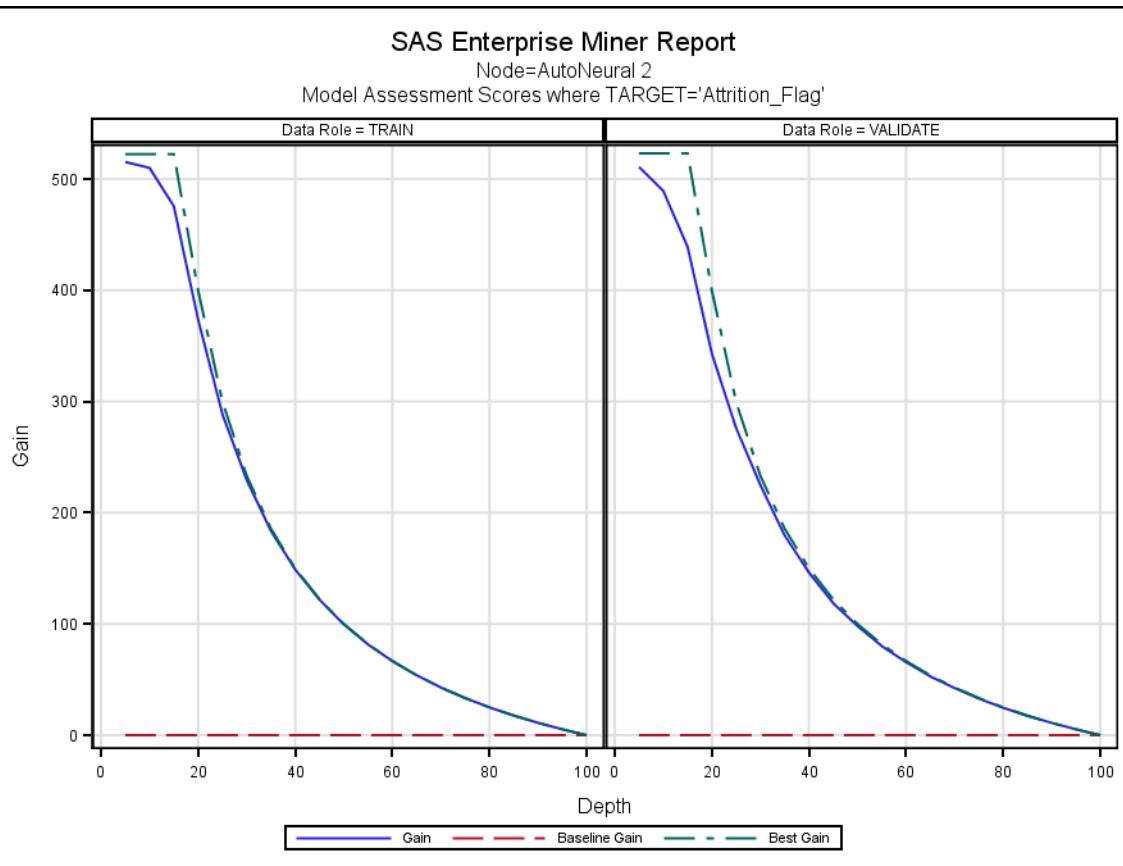
SAS Enterprise Miner Report  
Node=AutoNeural 2  
Model Iteration Plots



## SAS Enterprise Miner Report

Node=AutoNeural 2

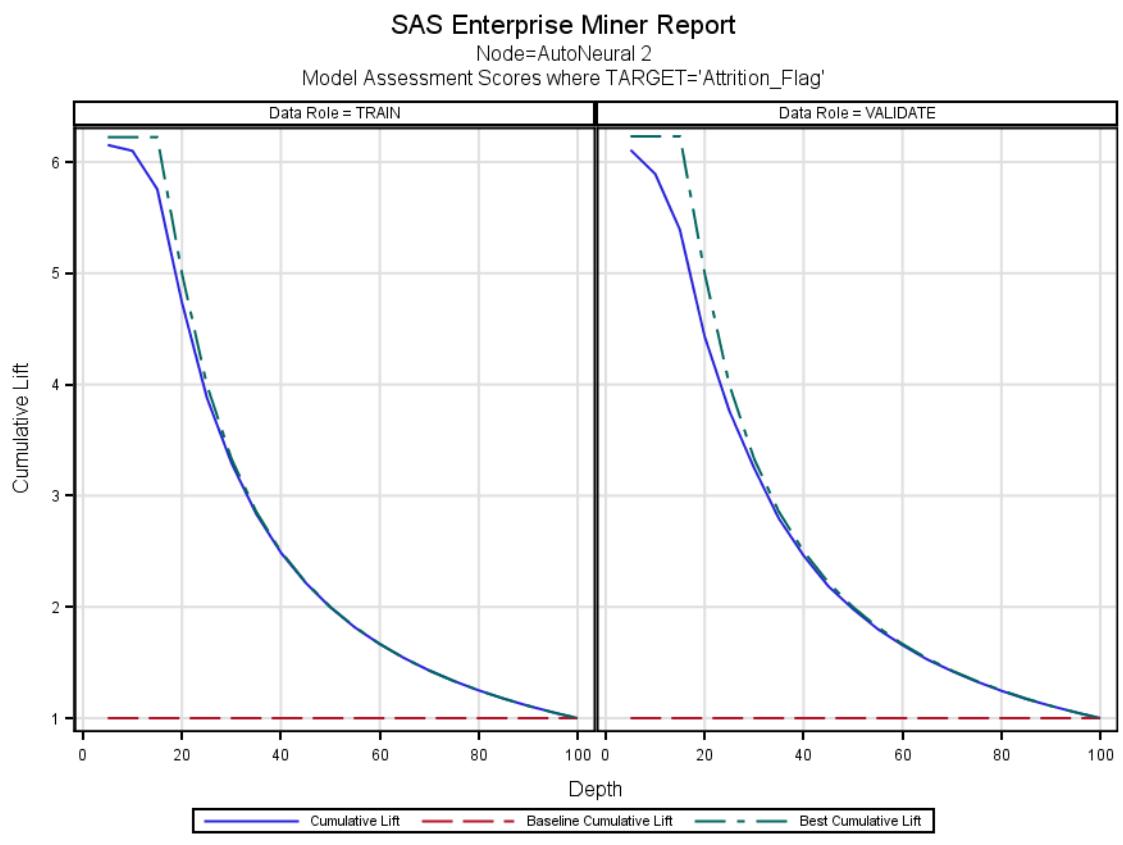
Model Assessment Scores where TARGET='Attrition\_Flag'

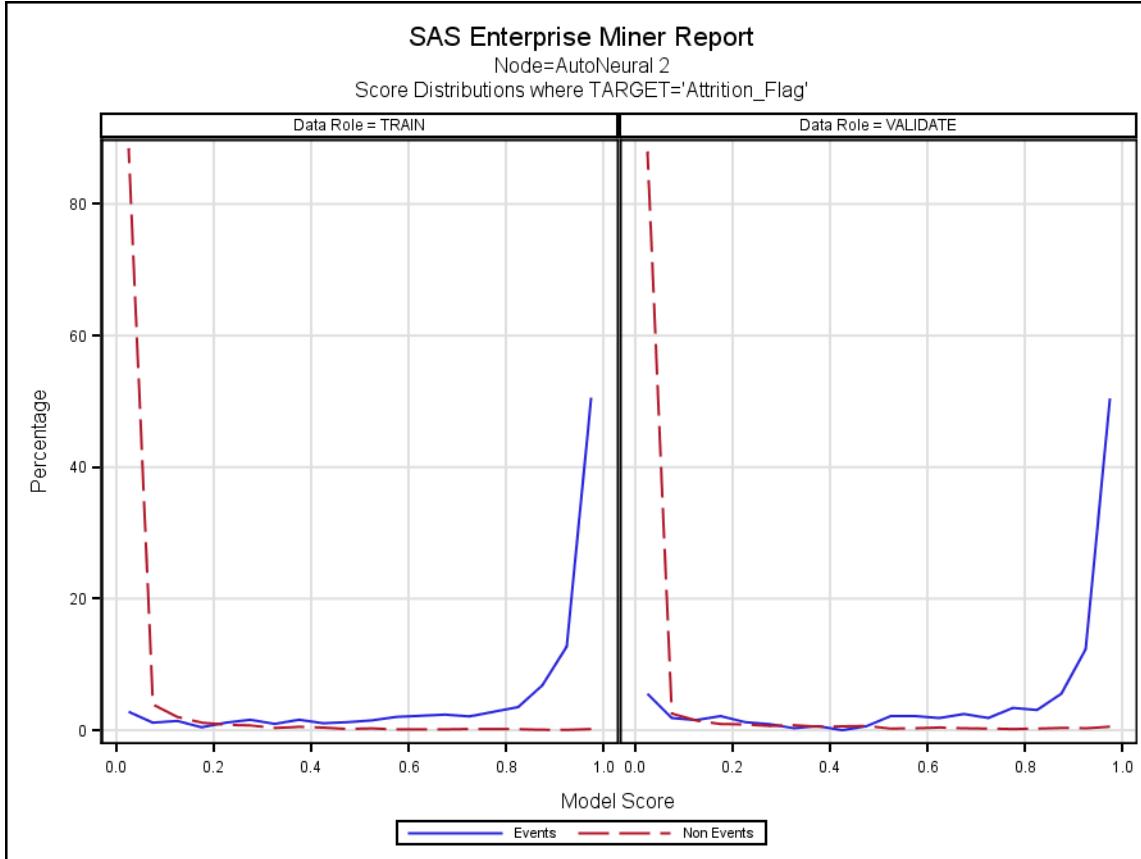
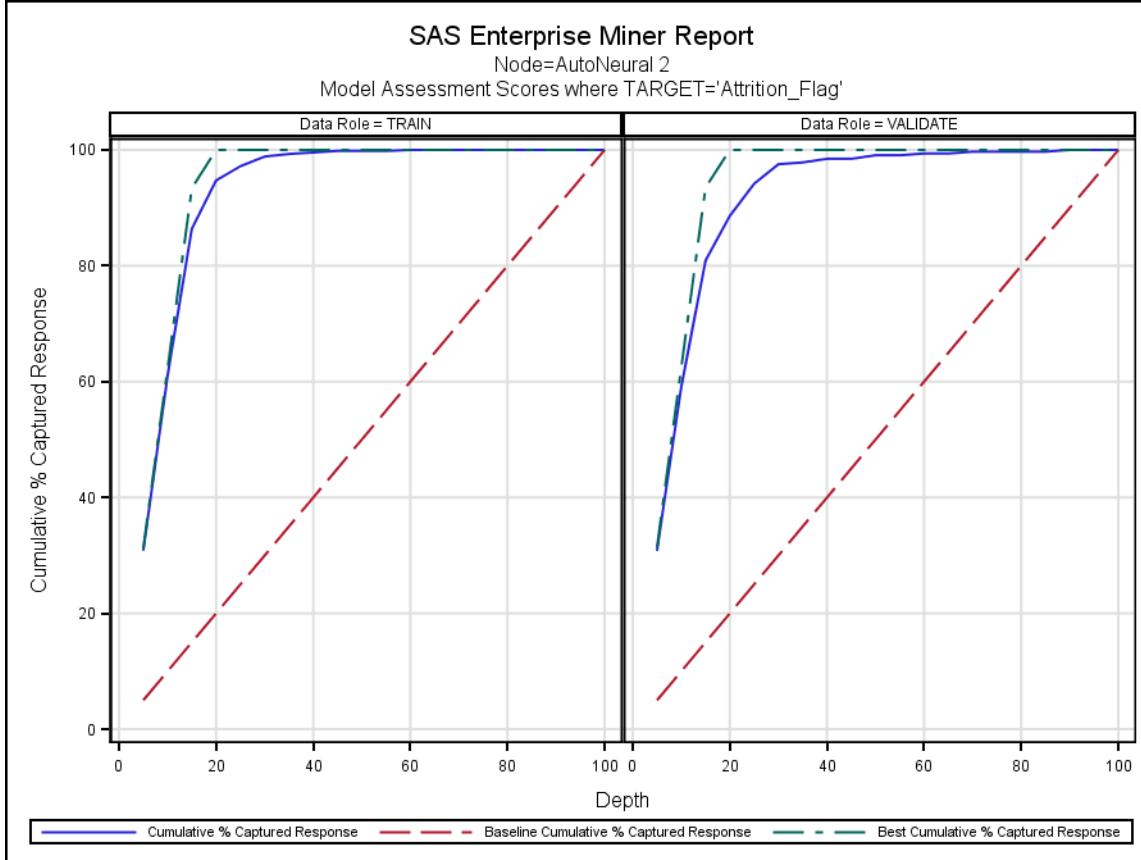


## SAS Enterprise Miner Report

Node=AutoNeural 2

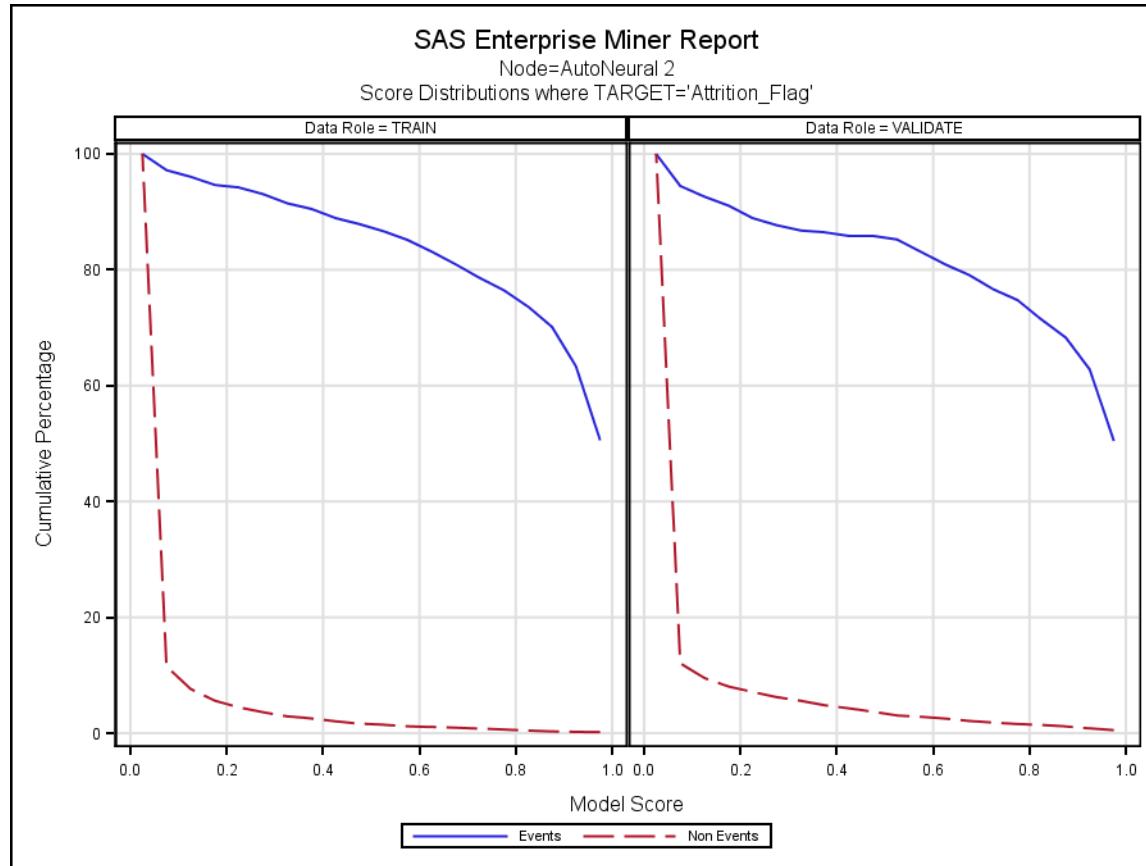
Model Assessment Scores where TARGET='Attrition\_Flag'





Node=AutoNeural 2

Score Distributions where TARGET='Attrition\_Flag'



Node=AutoNeural 2

Score Distributions

Target Variable=Attrition\_Flag 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	576	50.5707	0.1849	50.571	0.185
0.90-0.95	145	12.7305	0.0504	63.301	0.235
0.85-0.90	78	6.8481	0.0672	70.149	0.303
0.80-0.85	40	3.5119	0.1513	73.661	0.454
0.75-0.80	32	2.8095	0.1849	76.471	0.639
0.70-0.75	24	2.1071	0.1681	78.578	0.807
0.65-0.70	27	2.3705	0.1345	80.948	0.941
0.60-0.65	25	2.1949	0.1345	83.143	1.076
0.55-0.60	23	2.0193	0.1177	85.162	1.193
0.50-0.55	17	1.4925	0.2690	86.655	1.462
0.45-0.50	14	1.2291	0.1849	87.884	1.647
0.40-0.45	12	1.0536	0.4034	88.938	2.051
0.35-0.40	18	1.5803	0.5043	90.518	2.555
0.30-0.35	11	0.9658	0.3530	91.484	2.908
0.25-0.30	18	1.5803	0.7228	93.064	3.631
0.20-0.25	13	1.1414	0.8237	94.205	4.455
0.15-0.20	5	0.4390	1.1599	94.644	5.614
0.10-0.15	16	1.4047	2.0171	96.049	7.632
0.05-0.10	13	1.1414	3.8998	97.191	11.531
0.00-0.05	32	2.8095	88.4687	100.000	100.000

Target Variable=Attrition\_Flag 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	164	50.4615	0.5294	50.462	0.529
0.90-0.95	40	12.3077	0.2941	62.769	0.824
0.85-0.90	18	5.5385	0.3529	68.308	1.176
0.80-0.85	10	3.0769	0.2353	71.385	1.412
0.75-0.80	11	3.3846	0.1765	74.769	1.588
0.70-0.75	6	1.8462	0.2353	76.615	1.824
0.65-0.70	8	2.4615	0.2941	79.077	2.118
0.60-0.65	6	1.8462	0.4118	80.923	2.529
0.55-0.60	7	2.1538	0.2941	83.077	2.824
0.50-0.55	7	2.1538	0.2353	85.231	3.059
0.45-0.50	2	0.6154	0.6471	85.846	3.706
0.40-0.45	0	0.0000	0.5882	85.846	4.294
0.35-0.40	2	0.6154	0.5294	86.462	4.824
0.30-0.35	1	0.3077	0.7647	86.769	5.588
0.25-0.30	3	0.9231	0.6471	87.692	6.235
0.20-0.25	4	1.2308	0.8824	88.923	7.118
0.15-0.20	7	2.1538	0.9412	91.077	8.059
0.10-0.15	5	1.5385	1.4706	92.615	9.529
0.05-0.10	6	1.8462	2.5294	94.462	12.059
0.00-0.05	18	5.5385	87.9412	100.000	100.000

## SAS Enterprise Miner Report

### Node=AutoNeural Summary

Node id = AutoNeural  
 Node label = AutoNeural  
 Meta path = Ids => Varsel => Trans => Meta => Trans2 => Meta2 => Part2 => AutoNeural  
 Notes =

### Node=AutoNeural Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	AutoNeural		HistoryDs			Tanh	Y	
AdjustIterations	Y		Identity	N		TargetError	DEFAULT	
Architecture	SINGLE LAYER		Logistic	N		Termination	OVERTFITTING	
Beststds			MaxIter	8		Tolerance	MEDIUM	
Direct	Y		Normal	Y		TotalHidden	30	
Exponential	N		Reciprocal	N		TotalTime	1 HOUR	1 Hour
FinalIter	5		Residuals	Y		TrainAction	SEARCH	
FinalTrain	Y		Sine	Y		estds		
Freeze	N		Softmax	N		outfit		
Hidden	2		Square	N		weights		
HiddenUnits	N		Standardizations	N				

### Node=AutoNeural Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag
INPUT	INTERVAL	5	RANGE_LOG_Total_Trans_Amt RANGE_SQRT_Avg_Utilization_Ratio RANGE_SQRT_Total_Amt_Chng_Q4_Q1 RANGE_SQRT_Total_Ct_Chng_Q4_Q1 RANGE_Total_Revolving_Bal
INPUT	NOMINAL	6	G_Contacts_Count_12_mon G_Customer_Age G_Months_Inactive_12_mon G_Months_on_book G_Total_Relationship_Count G_Total_Trans_Ct

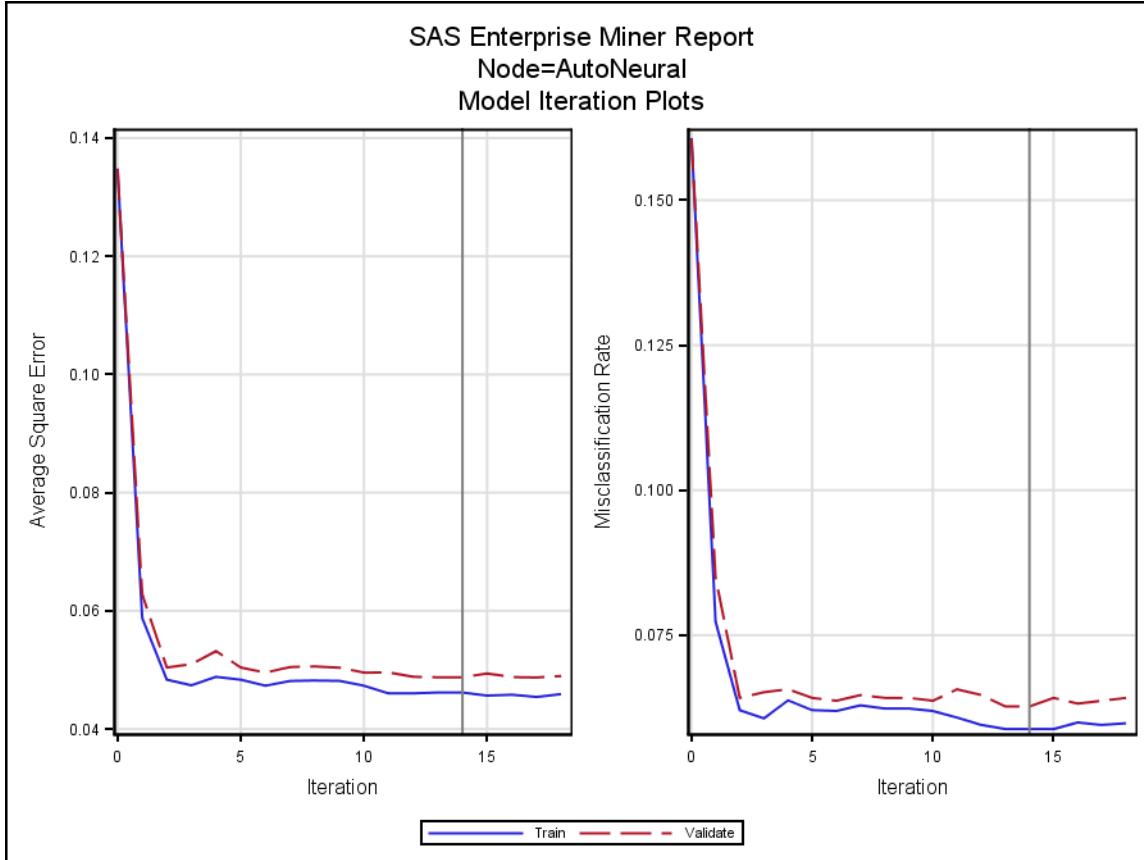
### Node=AutoNeural Model Fit Statistics

Target=Attrition\_Flag Target Label='1'

Label of Statistic	Train	Validation	Test
Total Degrees of Freedom	7088.00	.	.
Degrees of Freedom for Error	6919.00	.	.
Model Degrees of Freedom	169.00	.	.
Number of Estimated Weights	169.00	.	.
Akaike's Information Criterion	3376.71	.	.
Schwarz's Bayesian Criterion	4537.09	.	.
Average Squared Error	0.06	0.06	0.06
Maximum Absolute Error	1.00	1.00	1.00
Divisor for ASE	14176.00	4050.00	2028.00
Sum of Frequencies	7088.00	2025.00	1014.00
Root Average Squared Error	0.25	0.25	0.25
Sum of Squared Errors	859.92	248.03	126.04
Sum of Case Weights Times Freq	14176.00	4050.00	2028.00

Target=Attrition\_Flag Target Label=' '

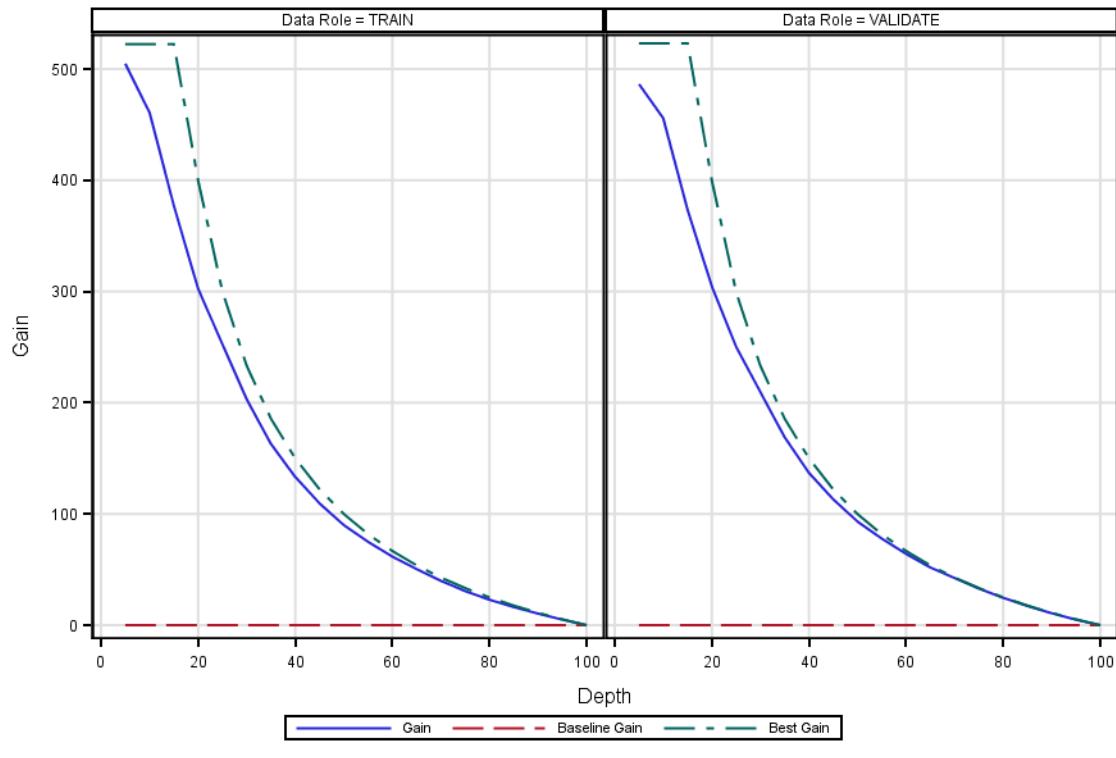
Label of Statistic	Train	Validation	Test
Final Prediction Error	0.06	.	.
Mean Squared Error	0.06	0.06	0.06
Root Final Prediction Error	0.25	.	.
Root Mean Squared Error	0.25	0.25	0.25
Average Error Function	0.21	0.21	0.20
Error Function	3038.71	845.75	406.83
Misclassification Rate	0.08	0.08	0.09
Number of Wrong Classifications	566.00	171.00	91.00



## SAS Enterprise Miner Report

Node=AutoNeural

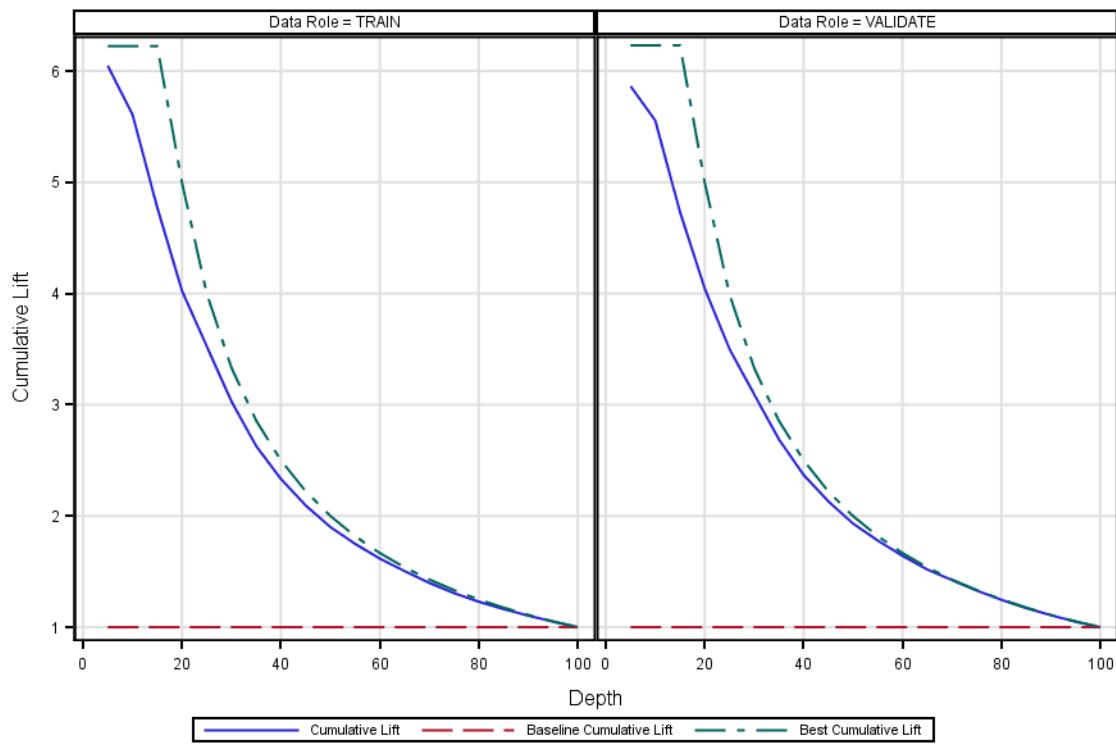
Model Assessment Scores where TARGET='Attrition\_Flag'

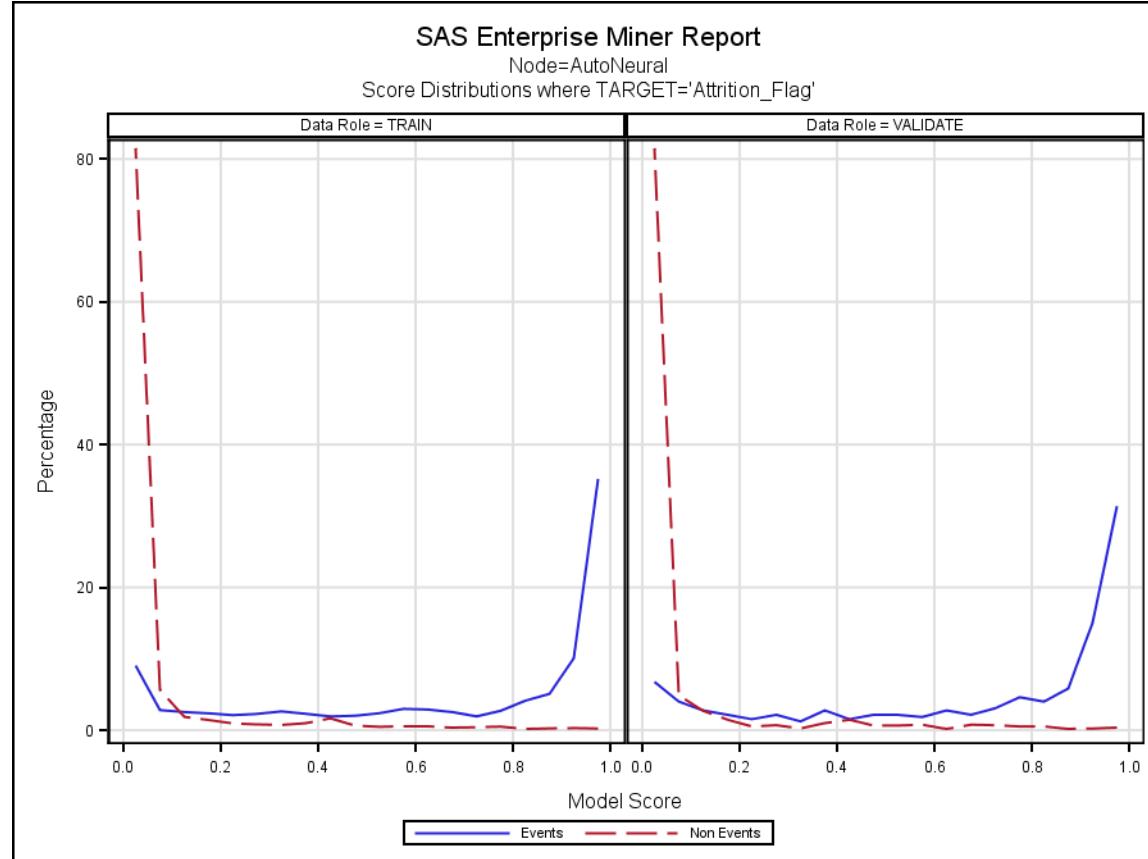
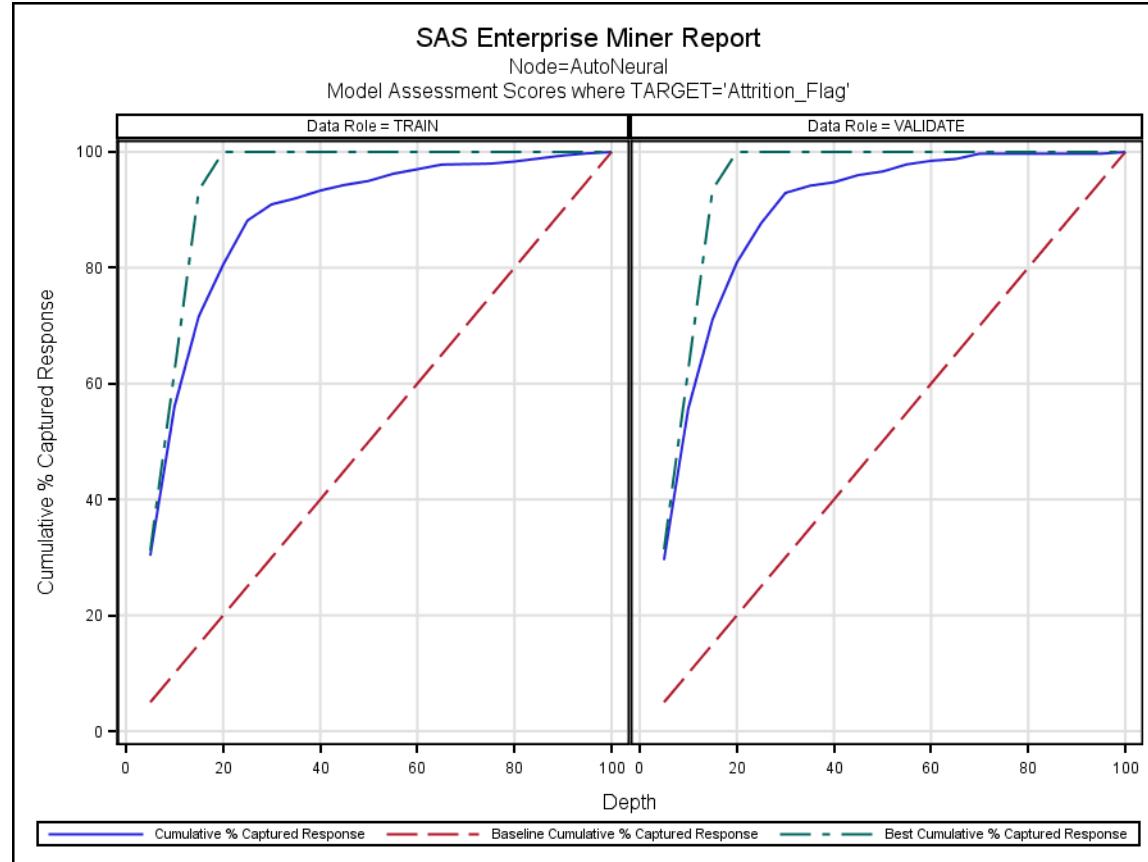


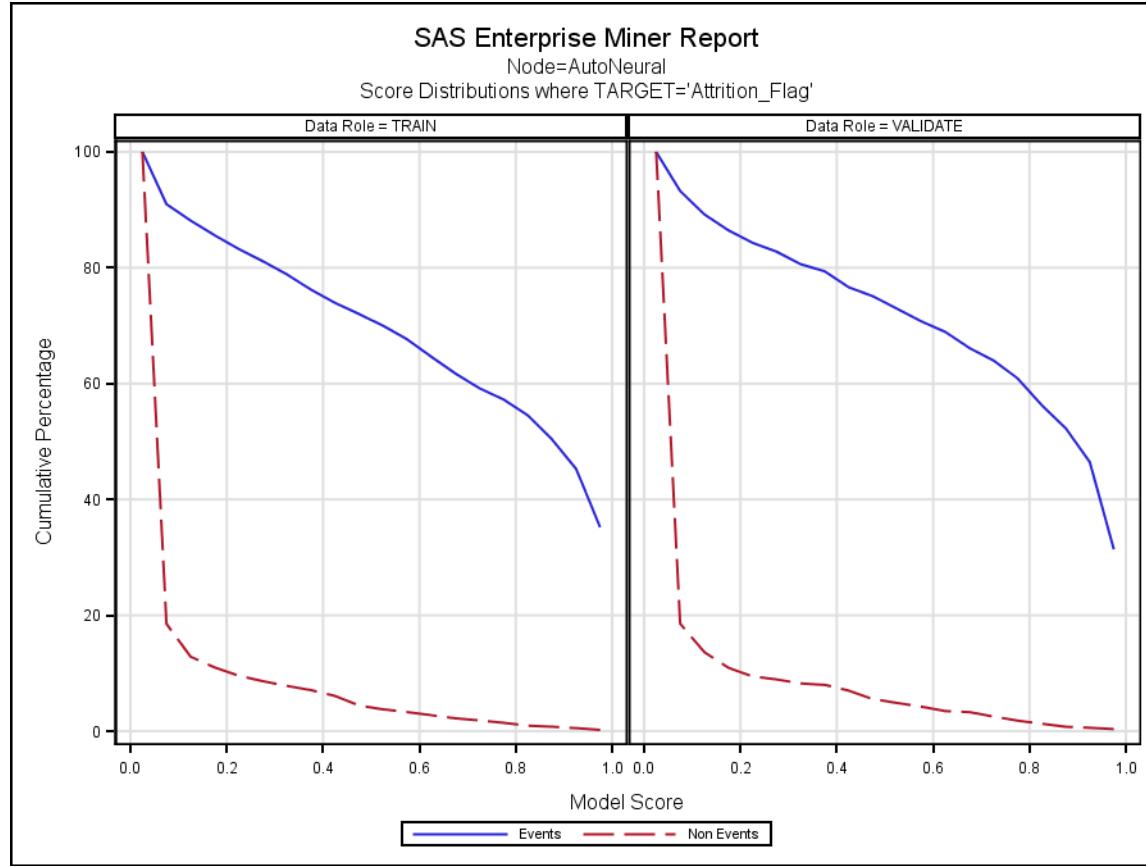
## SAS Enterprise Miner Report

Node=AutoNeural

Model Assessment Scores where TARGET='Attrition\_Flag'






**Node=AutoNeural**  
**Score Distributions**

Target Variable=Attrition\_Flag 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	401	35.2063	0.2353	35.206	0.235
0.90-0.95	115	10.0966	0.2858	45.303	0.521
0.85-0.90	58	5.0922	0.2521	50.395	0.773
0.80-0.85	47	4.1264	0.1849	54.522	0.958
0.75-0.80	31	2.7217	0.4875	57.243	1.446
0.70-0.75	22	1.9315	0.4202	59.175	1.866
0.65-0.70	29	2.5461	0.3530	61.721	2.219
0.60-0.65	33	2.8973	0.5379	64.618	2.757
0.55-0.60	34	2.9851	0.5379	67.603	3.295
0.50-0.55	27	2.3705	0.4707	69.974	3.765
0.45-0.50	23	2.0193	0.6556	71.993	4.421
0.40-0.45	22	1.9315	1.6641	73.924	6.085
0.35-0.40	26	2.2827	0.9918	76.207	7.077
0.30-0.35	30	2.6339	0.7396	78.841	7.816
0.25-0.30	26	2.2827	0.8069	81.124	8.623
0.20-0.25	24	2.1071	0.9413	83.231	9.565
0.15-0.20	27	2.3705	1.4288	85.601	10.993
0.10-0.15	29	2.5461	1.8659	88.147	12.859
0.05-0.10	32	2.8095	5.6480	90.957	18.507
0.00-0.05	103	9.0430	81.4927	100.000	100.000

Target Variable=Attrition\_Flag 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	102	31.3846	0.3529	31.385	0.353
0.90-0.95	49	15.0769	0.2353	46.462	0.588
0.85-0.90	19	5.8462	0.1765	52.308	0.765
0.80-0.85	13	4.0000	0.5294	56.308	1.294
0.75-0.80	15	4.6154	0.5294	60.923	1.824
0.70-0.75	10	3.0769	0.7059	64.000	2.529
0.65-0.70	7	2.1538	0.7647	66.154	3.294
0.60-0.65	9	2.7692	0.1765	68.923	3.471
0.55-0.60	6	1.8462	0.7647	70.769	4.235
0.50-0.55	7	2.1538	0.6471	72.923	4.882
0.45-0.50	7	2.1538	0.6471	75.077	5.529
0.40-0.45	5	1.5385	1.4706	76.615	7.000
0.35-0.40	9	2.7692	1.0000	79.385	8.000
0.30-0.35	4	1.2308	0.2353	80.615	8.235
0.25-0.30	7	2.1538	0.7059	82.769	8.941
0.20-0.25	5	1.5385	0.5294	84.308	9.471
0.15-0.20	7	2.1538	1.4706	86.462	10.941
0.10-0.15	9	2.7692	2.7059	89.231	13.647
0.05-0.10	13	4.0000	4.8824	93.231	18.529
0.00-0.05	22	6.7692	81.4706	100.000	100.000

## SAS Enterprise Miner Report

### Node=Data Partition x2 Summary

Node id = Part  
 Node label = Data Partition x2  
 Meta path = Ids => Varsel => Trans => Meta => Trans2 => Meta2 => Part  
 Notes =

### Node=Data Partition x2 Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	Partition		Method	DEFAULT		TestPct	0	30
ClassDistribution	Y		OutputType	DATA		TrainPct	0.75	40
IntervalDistribution	Y		RandomSeed	78354	12345	ValidatePct	0.25	30

### Node=Data Partition x2 Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag
INPUT	INTERVAL	5	RANGE_LOG_Total_Trans_Amt RANGE_SQRT_Avg_Utilization_Ratio RANGE_SQRT_Total_Amt_Chng_Q4_Q1 RANGE_SQRT_Total_Ct_Chng_Q4_Q1 RANGE_Total_Revolving_Bal
INPUT	NOMINAL	6	G_Contacts_Count_12_mon G_Customer_Age G_Months_Inactive_12_mon G_Months_on_book G_Total_Relationship_Count G_Total_Trans_Ct
ASSESS	NOMINAL	1	_WARN_

## SAS Enterprise Miner Report

### Node=FOWARD LOGIT Summary

Node id = Reg4  
 Node label = FOWARD LOGIT  
 Meta path = Ids => Varsel => Trans => Meta => Trans2 => Meta2 => Part => Reg4  
 Notes =

### Node=FOWARD LOGIT Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	Regression		Force	0		PolynomialDegree	2	
AbsConvValue	-1.34078E154	-7.237006E75	GConvTimes	1		PrintDesignMatrix	N	
AbsFTime	1		GConvValue	1E-6		Rule	NONE	
AbsFValue	0		Hierarchy	CLASS		SASSPDS	N	
AbsGTime	1		InputCoding	DEVIATION		SelectionCriterion	DEFAULT	
AbsGValue	0.00001		Interactions			SelectionDefault	Y	
AbsXTime	1		LinkFunction	LOGIT		Sequential	N	
AbsXValue	1E-8		MainEffect	Y		Simple	N	
CIParam	N		MaxCPUTime	1 HOUR		SIEntry	0.05	
ConvDefaults	Y		MaxFunctionCalls	.		SISStay	0.05	
CorB	N		MaxIterations	.		Start	0	
CovB	N		MaxStep	.		StepOutput	N	
Covout	N		MinResourceUse	N		Stop	0	
Details	N		ModelDefaults	Y		SuppressIntercept	N	
Error	LOGISTIC		ModelSelection	FORWARD	NONE	SuppressOutput	N	
ExcludedVariable	REJECT		OptimizationTechnique	DEFAULT		Terms	N	
FConvTimes	1		Performance	N		TwoFactor	N	
FConvValue	0		Polynomial	N				

### Node=FOWARD LOGIT Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag
INPUT	INTERVAL	5	RANGE_LOG_Total_Trans_Amt RANGE_SQRT_Avg_Utilization_Ratio RANGE_SQRT_Total_Amt_Chng_Q4_Q1 RANGE_SQRT_Total_Ct_Chng_Q4_Q1 RANGE_Total_Revolving_Bal
INPUT	NOMINAL	6	G_Contacts_Count_12_mon G_Customer_Age G_Months_Inactive_12_mon G_Months_on_book G_Total_Relationship_Count G_Total_Trans_Ct

### Node=FOWARD LOGIT Model Fit Statistics

Target=Attrition\_Flag Target Label=''

Label of Statistic	Train	Validation	Test
Akaike's Information Criterion	3234.81	.	.
Average Squared Error	0.06	0.06	.
Average Error Function	0.21	0.20	.
Degrees of Freedom for Error	7553.00	.	.
Model Degrees of Freedom	41.00	.	.
Total Degrees of Freedom	7594.00	.	.

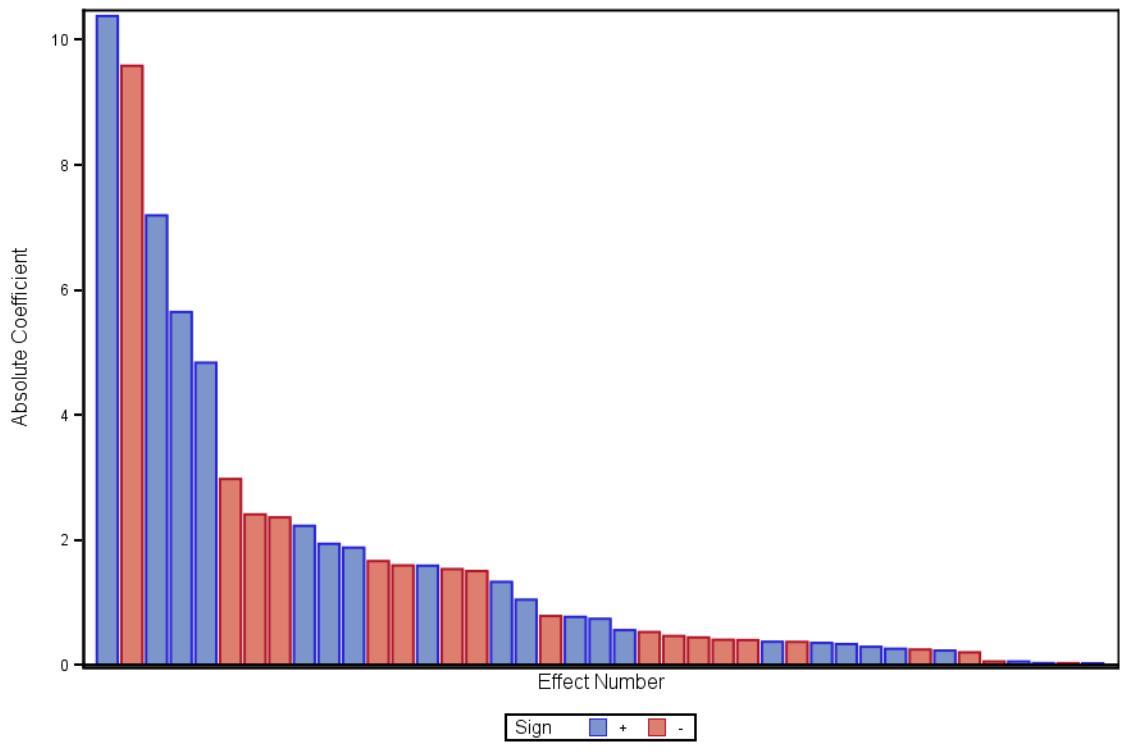
Target=Attrition\_Flag Target Label='1'

Label of Statistic	Train	Validation	Test
Divisor for ASE	15188.00	5066.00	.
Error Function	3152.81	1002.17	.
Final Prediction Error	0.06	.	.
Maximum Absolute Error	1.00	1.00	.
Mean Square Error	0.06	0.06	.
Sum of Frequencies	7594.00	2533.00	.
Number of Estimate Weights	41.00	.	.
Root Average Sum of Squares	0.24	0.24	.
Root Final Prediction Error	0.24	.	.
Root Mean Squared Error	0.24	0.24	.
Schwarz's Bayesian Criterion	3519.15	.	.
Sum of Squared Errors	882.15	296.81	.
Sum of Case Weights Times Freq	15188.00	5066.00	.
Misclassification Rate	0.08	0.08	.

### SAS Enterprise Miner Report

Node=FOWARD LOGIT

Regression Model Effects



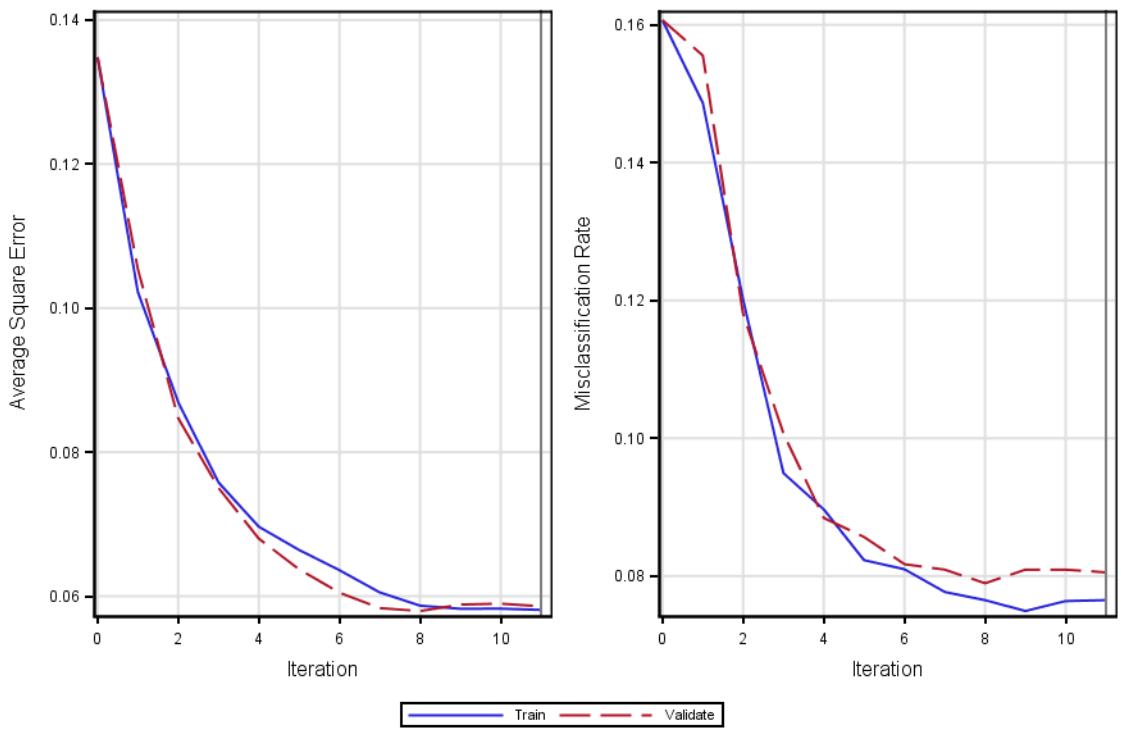
Effect Number	Variable	Level	Coefficient	T-value	P Value	Effect Number	Variable	Level	Coefficient	T-value	P Value
1	G_Contacts_Count_12_mon	0	10.3818	0.4422	0.65833	22	G_Customer_Age	1	0.55397	1.39936	0.16171
2	RANGE_SQRT_Total_Ct_Chng_Q4_Q1		-9.5849	-13.1526	0.00000	23	G_Customer_Age	8	-0.52306	-1.79779	0.07221
3	Intercept	1	7.1910	1.2206	0.22223	24	G_Total_Relationship_Count	1	-0.46000	-5.90845	0.00000
4	RANGE_LOG_Total_Trans_Amt		5.6443	11.6100	0.00000	25	G_Months_Inactive_12_mon	3	-0.43661	-2.41709	0.01565
5	G_Total_Trans_Ct	0	4.8337	6.4358	0.00000	26	G_Months_on_book	6	-0.39934	-2.83204	0.00463
6	G_Contacts_Count_12_mon	3	-2.9725	-0.5064	0.61258	27	G_Months_on_book	7	-0.39418	-2.32333	0.02016
7	G_Total_Trans_Ct	6	-2.4060	-14.8950	0.00000	28	G_Customer_Age	2	0.36763	1.17706	0.23917
8	G_Contacts_Count_12_mon	2	-2.3580	-0.4017	0.68789	29	G_Months_on_book	5	-0.36529	-2.32837	0.01989
9	G_Customer_Age	0	2.2228	1.0645	0.28710	30	G_Customer_Age	5	0.34945	1.30643	0.19141
10	G_Months_Inactive_12_mon	0	1.9344	2.9907	0.00278	31	G_Months_on_book	0	0.33024	0.94387	0.34524

**SAS Enterprise Miner Report**  
**Node=FOWARD LOGIT**  
**Regression Model Effects**

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Effect Number	Variable	Level	Coefficient	T-value	P Value	Effect Number	Variable	Level	Coefficient	T-value	P Value
11	G_Months_on_book	1	1.8741	4.3233	0.00002	32	G_Customer_Age	4	0.28722	1.07663	0.28165
12	RANGE_Total_Revolving_Bal		-1.6585	-7.3220	0.00000	33	G_Months_Inactive_12_mon	1	0.25548	1.11810	0.26352
13	G_Customer_Age	9	-1.5895	-3.9619	0.00007	34	G_Total_Trans_Ct	5	-0.24325	-1.64512	0.09995
14	G_Total_Trans_Ct	1	1.5850	9.2793	0.00000	35	G_Total_Trans_Ct	4	0.22646	1.31411	0.18881
15	RANGE_SQRT_Total_Amt_Chng_Q4_Q1		-1.5306	-2.0664	0.03879	36	G_Months_on_book	4	-0.19786	-1.21962	0.22261
16	G_Contacts_Count_12_mon	1	-1.4988	-0.2552	0.79858	37	G_Months_Inactive_12_mon	2	-0.05200	-0.29240	0.76998
17	G_Total_Relationship_Count	0	1.3258	14.3426	0.00000	38	G_Months_on_book	2	0.05141	0.37751	0.70580
18	G_Total_Trans_Ct	2	1.0411	6.6388	0.00000	39	G_Customer_Age	7	0.02657	0.09854	0.92150
19	RANGE_SQRT_Avg_Utilization_Ratio		-0.7801	-3.1519	0.00162	40	G_Months_on_book	3	-0.02532	-0.22255	0.82389
20	G_Total_Trans_Ct	3	0.7657	4.5440	0.00001	41	G_Customer_Age	6	0.02351	0.09023	0.92811
21	G_Customer_Age	3	0.7353	2.2488	0.02452	.	.	.	.	.	.

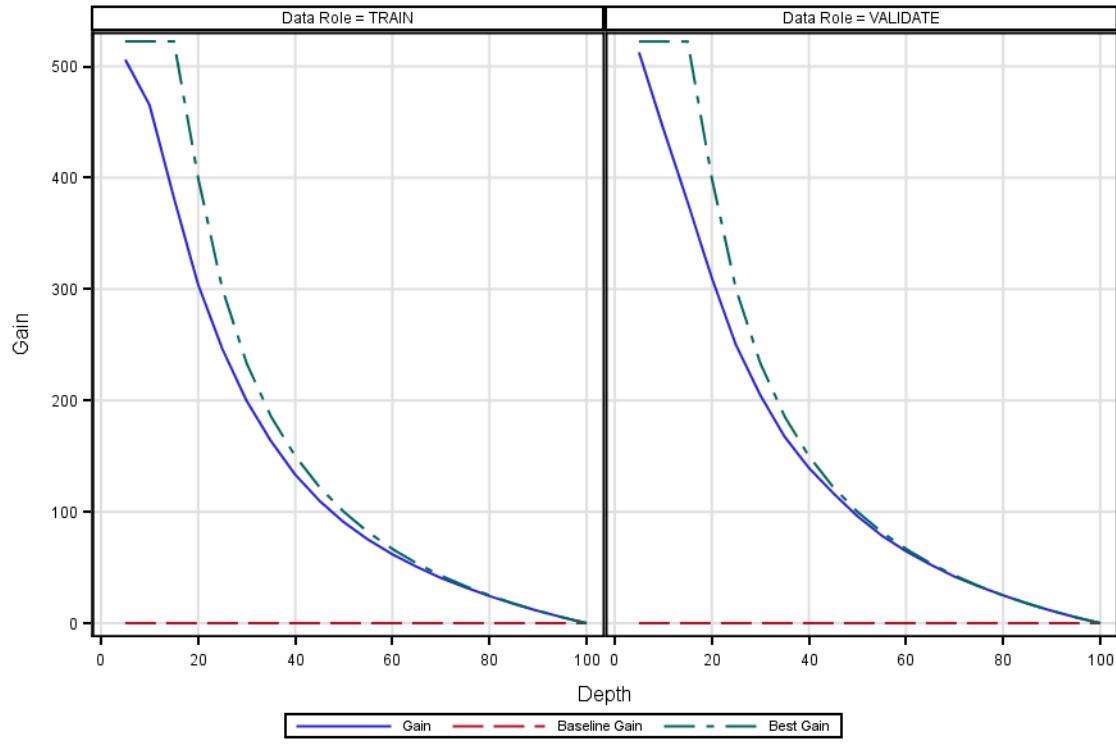
**SAS Enterprise Miner Report**  
**Node=FOWARD LOGIT**  
**Model Iteration Plots**



## SAS Enterprise Miner Report

Node=FOWARD LOGIT

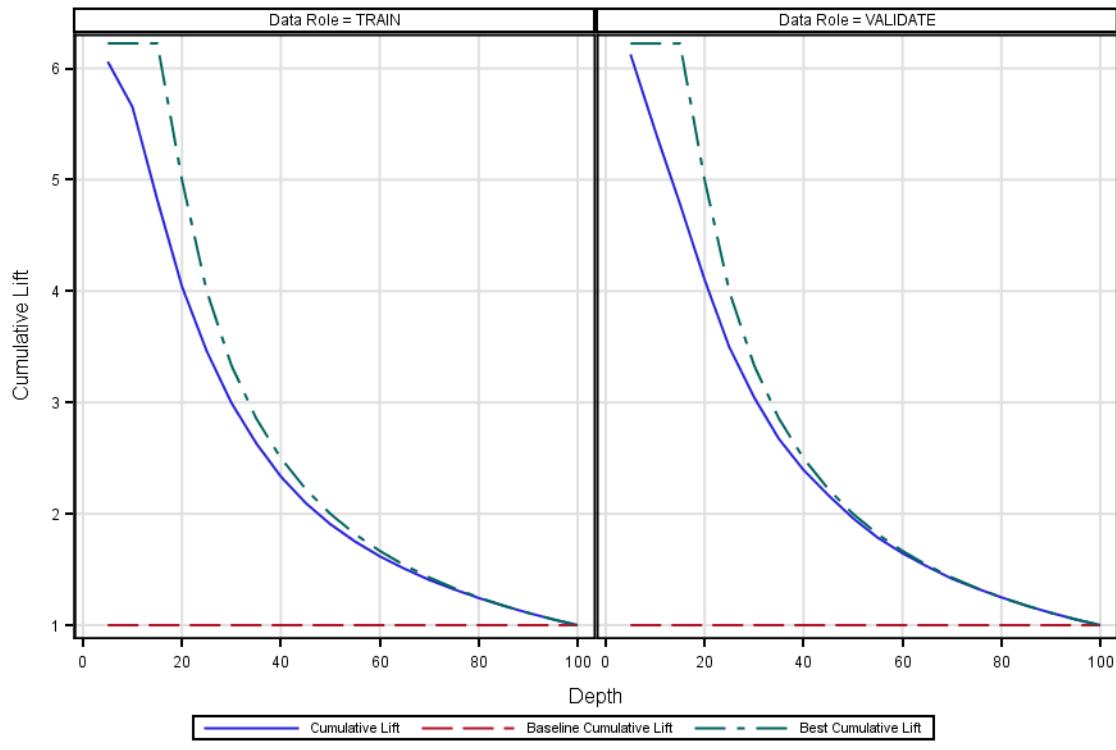
Model Assessment Scores where TARGET='Attrition\_Flag'



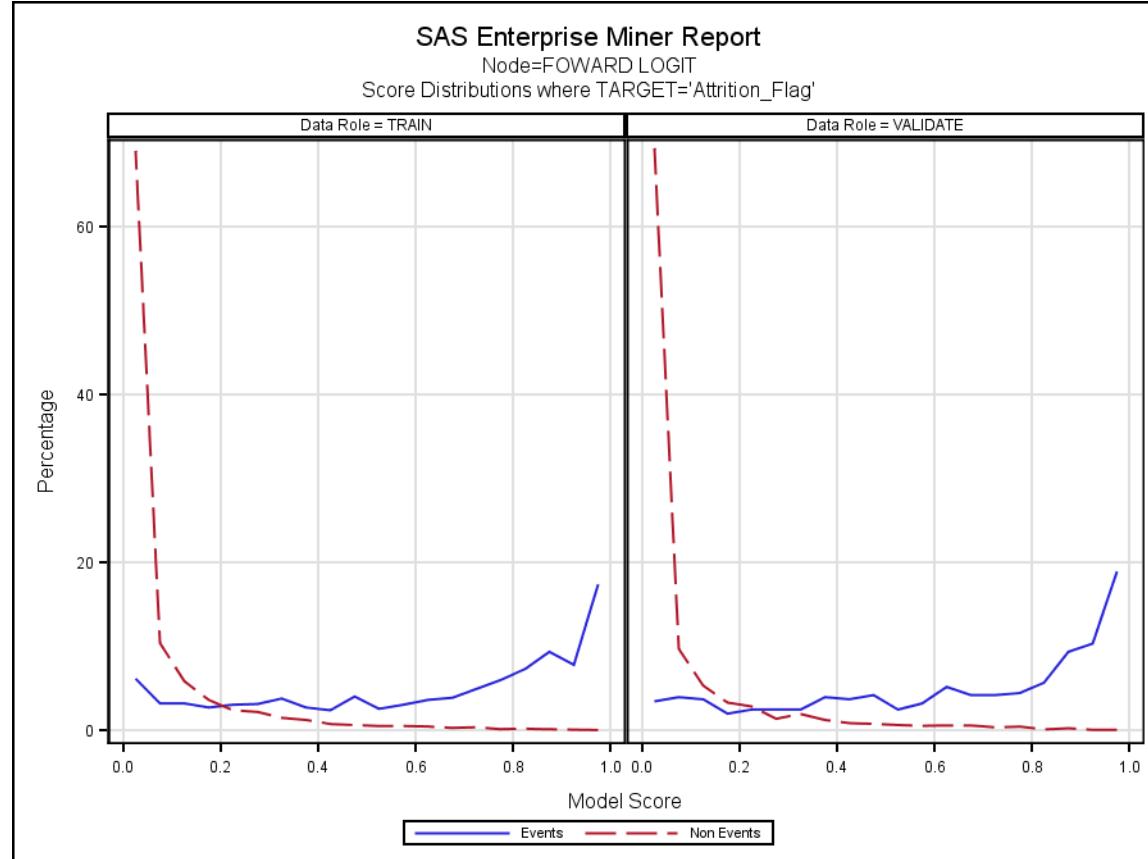
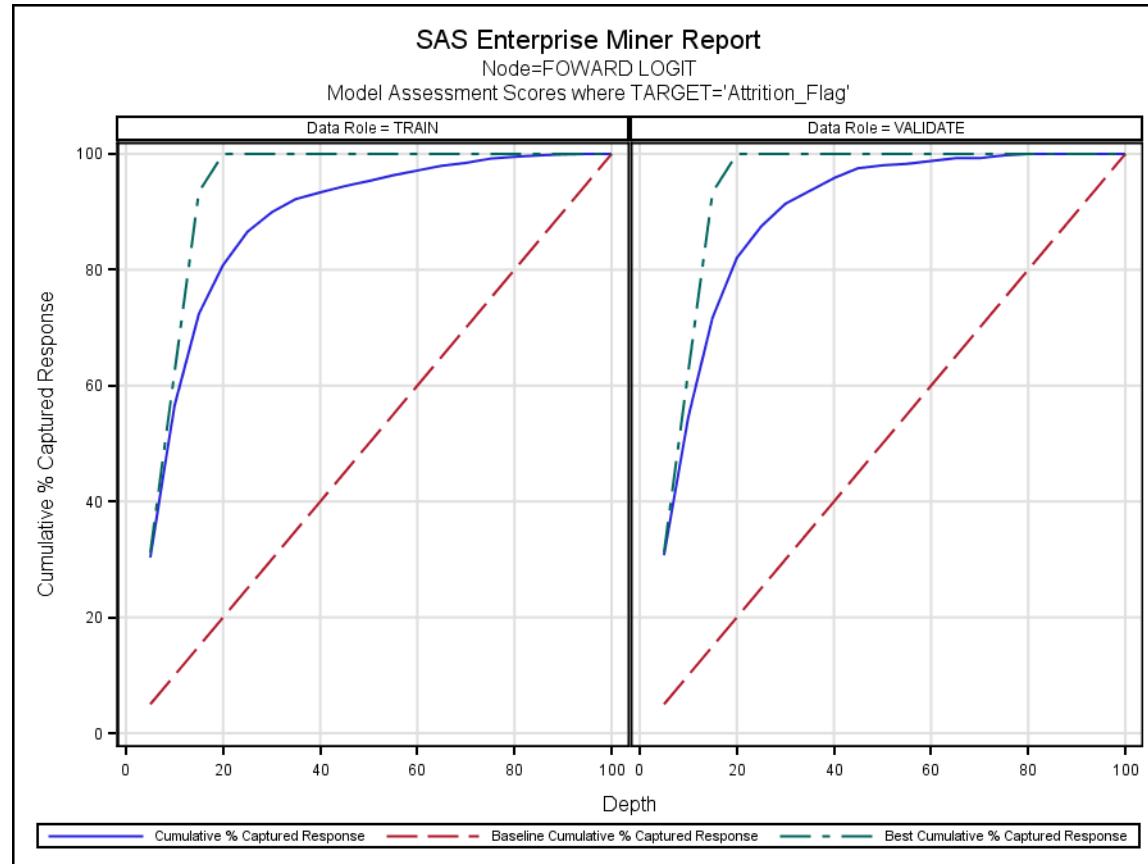
## SAS Enterprise Miner Report

Node=FOWARD LOGIT

Model Assessment Scores where TARGET='Attrition\_Flag'

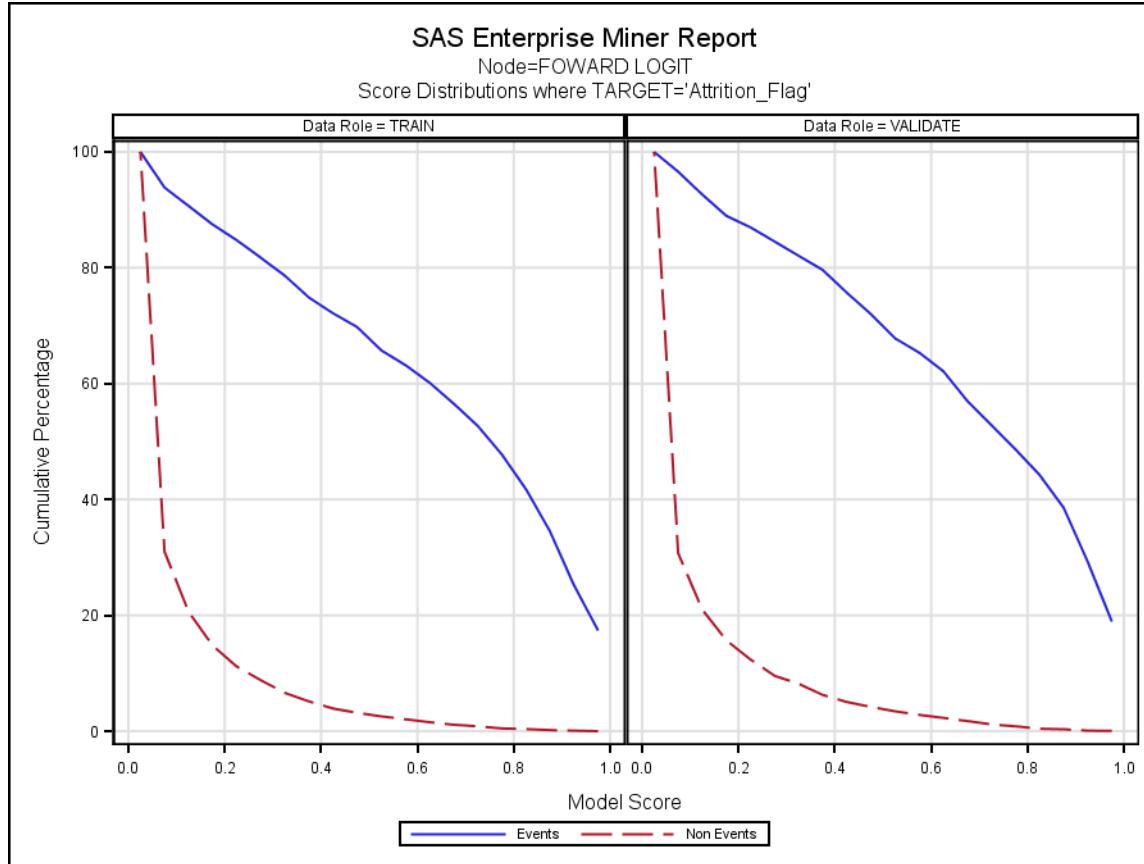


## Model Assessment Scores where TARGET='Attrition\_Flag'



Node=FOWARD LOGIT

Score Distributions where TARGET='Attrition\_Flag'



Node=FOWARD LOGIT

Score Distributions

Target Variable=Attrition\_Flag 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	212	17.3770	0.0157	17.377	0.016
0.90-0.95	95	7.7869	0.0628	25.164	0.078
0.85-0.90	114	9.3443	0.1098	34.508	0.188
0.80-0.85	89	7.2951	0.1726	41.803	0.361
0.75-0.80	73	5.9836	0.1255	47.787	0.486
0.70-0.75	60	4.9180	0.3608	52.705	0.847
0.65-0.70	47	3.8525	0.2667	56.557	1.114
0.60-0.65	44	3.6066	0.4393	60.164	1.553
0.55-0.60	37	3.0328	0.5020	63.197	2.055
0.50-0.55	31	2.5410	0.5020	65.738	2.557
0.45-0.50	49	4.0164	0.6119	69.754	3.169
0.40-0.45	29	2.3770	0.7374	72.131	3.906
0.35-0.40	33	2.7049	1.2237	74.836	5.130
0.30-0.35	46	3.7705	1.4747	78.607	6.605
0.25-0.30	38	3.1148	2.1807	81.721	8.786
0.20-0.25	37	3.0328	2.3690	84.754	11.155
0.15-0.20	33	2.7049	3.6084	87.459	14.763
0.10-0.15	39	3.1967	5.8362	90.656	20.599
0.05-0.10	39	3.1967	10.3859	93.852	30.985
0.00-0.05	75	6.1475	69.0147	100.000	100.000

Target Variable=Attrition\_Flag 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	77	18.9189	0.0470	18.919	0.047
0.90-0.95	42	10.3194	0.0470	29.238	0.094
0.85-0.90	38	9.3366	0.2352	38.575	0.329
0.80-0.85	23	5.6511	0.0941	44.226	0.423
0.75-0.80	18	4.4226	0.4233	48.649	0.847
0.70-0.75	17	4.1769	0.3293	52.826	1.176
0.65-0.70	17	4.1769	0.5644	57.002	1.740
0.60-0.65	21	5.1597	0.5644	62.162	2.305
0.55-0.60	13	3.1941	0.5174	65.356	2.822
0.50-0.55	10	2.4570	0.6115	67.813	3.434
0.45-0.50	17	4.1769	0.7526	71.990	4.186
0.40-0.45	15	3.6855	0.8467	75.676	5.033
0.35-0.40	16	3.9312	1.2230	79.607	6.256
0.30-0.35	10	2.4570	1.9285	82.064	8.184
0.25-0.30	10	2.4570	1.3641	84.521	9.548
0.20-0.25	10	2.4570	2.8222	86.978	12.371
0.15-0.20	8	1.9656	3.2926	88.943	15.663
0.10-0.15	15	3.6855	5.3151	92.629	20.978
0.05-0.10	16	3.9312	9.6896	96.560	30.668
0.00-0.05	14	3.4398	69.3321	100.000	100.000

## SAS Enterprise Miner Report

### Node=STEPWISE LOGIT Summary

Node id = Reg3  
 Node label = STEPWISE LOGIT  
 Meta path = Ids => Varsel => Trans => Meta => Trans2 => Meta2 => Part => Reg3  
 Notes =

### Node=STEPWISE LOGIT Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	Regression		Force	0		PolynomialDegree	2	
AbsConvValue	-1.34078E154	-7.237006E75	GConvTimes	1		PrintDesignMatrix	N	
AbsFTime	1		GConvValue	1E-6		Rule	NONE	
AbsFValue	0		Hierarchy	CLASS		SASSPDS	N	
AbsGTime	1		InputCoding	DEVIATION		SelectionCriterion	DEFAULT	
AbsGValue	0.00001		Interactions			SelectionDefault	Y	
AbsXTime	1		LinkFunction	LOGIT		Sequential	N	
AbsXValue	1E-8		MainEffect	Y		Simple	N	
CIParam	N		MaxCPUTime	1 HOUR		SIEntry	0.05	
ConvDefaults	Y		MaxFunctionCalls	.		SIStay	0.05	
CorB	N		MaxIterations	.		Start	0	
CovB	N		MaxStep	.		StepOutput	N	
Covout	N		MinResourceUse	N		Stop	0	
Details	N		ModelDefaults	Y		SuppressIntercept	N	
Error	LOGISTIC		ModelSelection	STEPWISE	NONE	SuppressOutput	N	
ExcludedVariable	REJECT		OptimizationTechnique	DEFAULT		Terms	N	
FConvTimes	1		Performance	N		TwoFactor	N	
FConvValue	0		Polynomial	N				

### Node=STEPWISE LOGIT Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag
INPUT	INTERVAL	5	RANGE_LOG_Total_Trans_Amt RANGE_SQRT_Avg_Utilization_Ratio RANGE_SQRT_Total_Amt_Chng_Q4_Q1 RANGE_SQRT_Total_Ct_Chng_Q4_Q1 RANGE_Total_Revolving_Bal
INPUT	NOMINAL	6	G_Contacts_Count_12_mon G_Customer_Age G_Months_Inactive_12_mon G_Months_on_book G_Total_Relationship_Count G_Total_Trans_Ct

### Node=STEPWISE LOGIT Model Fit Statistics

Target=Attrition\_Flag Target Label=''

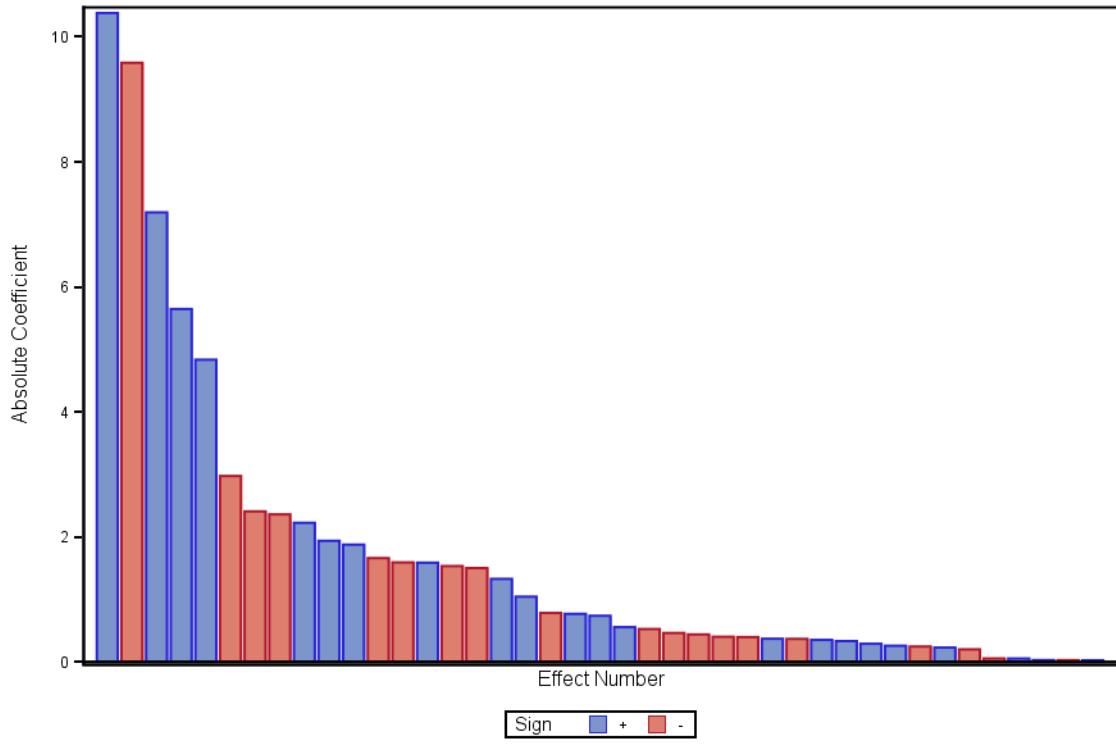
Label of Statistic	Train	Validation	Test
Akaike's Information Criterion	3234.81	.	.
Average Squared Error	0.06	0.06	.
Average Error Function	0.21	0.20	.
Degrees of Freedom for Error	7553.00	.	.
Model Degrees of Freedom	41.00	.	.
Total Degrees of Freedom	7594.00	.	.

Target=Attrition\_Flag Target Label='1'

Label of Statistic	Train	Validation	Test
Divisor for ASE	15188.00	5066.00	.
Error Function	3152.81	1002.17	.
Final Prediction Error	0.06	.	.
Maximum Absolute Error	1.00	1.00	.
Mean Square Error	0.06	0.06	.
Sum of Frequencies	7594.00	2533.00	.
Number of Estimate Weights	41.00	.	.
Root Average Sum of Squares	0.24	0.24	.
Root Final Prediction Error	0.24	.	.
Root Mean Squared Error	0.24	0.24	.
Schwarz's Bayesian Criterion	3519.15	.	.
Sum of Squared Errors	882.15	296.81	.
Sum of Case Weights Times Freq	15188.00	5066.00	.
Misclassification Rate	0.08	0.08	.

### SAS Enterprise Miner Report

Node=STEPWISE LOGIT  
Regression Model Effects



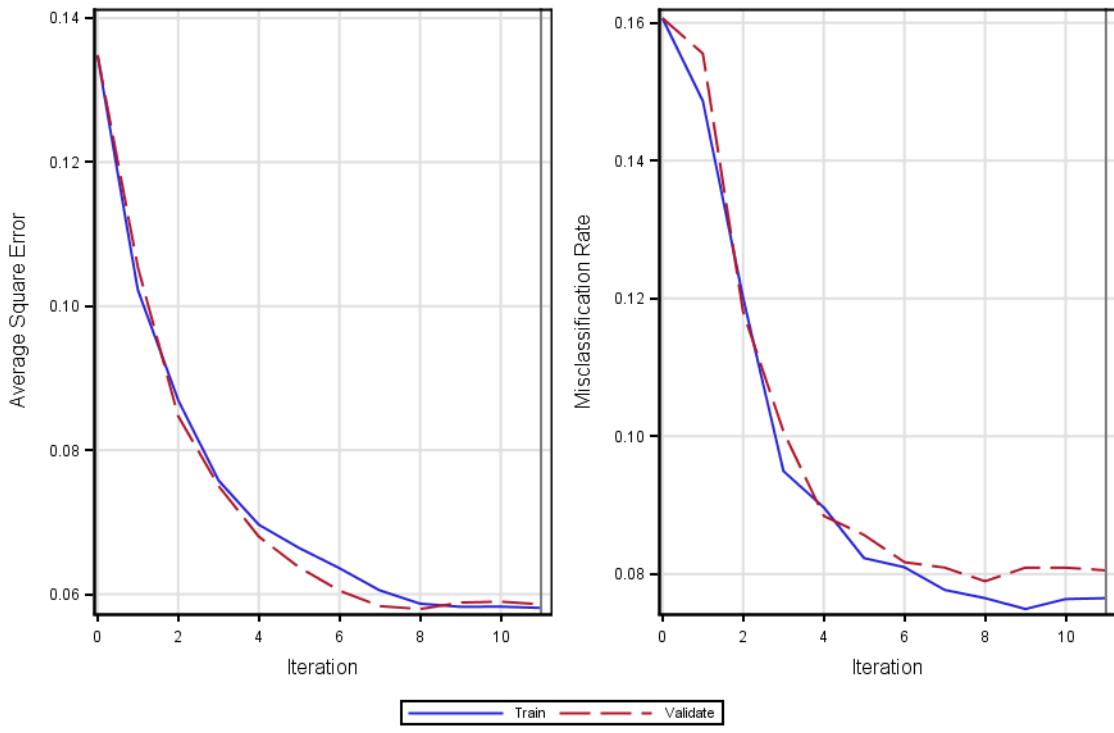
Effect Number	Variable	Level	Coefficient	T-value	P Value	Effect Number	Variable	Level	Coefficient	T-value	P Value
1	G_Contacts_Count_12_mon	0	10.3818	0.4422	0.65833	22	G_Customer_Age	1	0.55397	1.39936	0.16171
2	RANGE_SQRT_Total_Ct_Chng_Q4_Q1		-9.5849	-13.1526	0.00000	23	G_Customer_Age	8	-0.52306	-1.79779	0.07221
3	Intercept	1	7.1910	1.2206	0.22223	24	G_Total_Relationship_Count	1	-0.46000	-5.90845	0.00000
4	RANGE_LOG_Total_Trans_Amt		5.6443	11.6100	0.00000	25	G_Months_Inactive_12_mon	3	-0.43661	-2.41709	0.01565
5	G_Total_Trans_Ct	0	4.8337	6.4358	0.00000	26	G_Months_on_book	6	-0.39934	-2.83204	0.00463
6	G_Contacts_Count_12_mon	3	-2.9725	-0.5064	0.61258	27	G_Months_on_book	7	-0.39418	-2.32333	0.02016
7	G_Total_Trans_Ct	6	-2.4060	-14.8950	0.00000	28	G_Customer_Age	2	0.36763	1.17706	0.23917
8	G_Contacts_Count_12_mon	2	-2.3580	-0.4017	0.68789	29	G_Months_on_book	5	-0.36529	-2.32837	0.01989
9	G_Customer_Age	0	2.2228	1.0645	0.28710	30	G_Customer_Age	5	0.34945	1.30643	0.19141
10	G_Months_Inactive_12_mon	0	1.9344	2.9907	0.00278	31	G_Months_on_book	0	0.33024	0.94387	0.34524

**SAS Enterprise Miner Report**  
**Node=STEPWISE LOGIT**  
**Regression Model Effects**

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Effect Number	Variable	Level	Coefficient	T-value	P Value	Effect Number	Variable	Level	Coefficient	T-value	P Value
11	G_Months_on_book	1	1.8741	4.3233	0.00002	32	G_Customer_Age	4	0.28722	1.07663	0.28165
12	RANGE_Total_Revolving_Bal		-1.6585	-7.3220	0.00000	33	G_Months_Inactive_12_mon	1	0.25548	1.11810	0.26352
13	G_Customer_Age	9	-1.5895	-3.9619	0.00007	34	G_Total_Trans_Ct	5	-0.24325	-1.64512	0.09995
14	G_Total_Trans_Ct	1	1.5850	9.2793	0.00000	35	G_Total_Trans_Ct	4	0.22646	1.31411	0.18881
15	RANGE_SQRT_Total_Amt_Chng_Q4_Q1		-1.5306	-2.0664	0.03879	36	G_Months_on_book	4	-0.19786	-1.21962	0.22261
16	G_Contacts_Count_12_mon	1	-1.4988	-0.2552	0.79858	37	G_Months_Inactive_12_mon	2	-0.05200	-0.29240	0.76998
17	G_Total_Relationship_Count	0	1.3258	14.3426	0.00000	38	G_Months_on_book	2	0.05141	0.37751	0.70580
18	G_Total_Trans_Ct	2	1.0411	6.6388	0.00000	39	G_Customer_Age	7	0.02657	0.09854	0.92150
19	RANGE_SQRT_Avg_Utilization_Ratio		-0.7801	-3.1519	0.00162	40	G_Months_on_book	3	-0.02532	-0.22255	0.82389
20	G_Total_Trans_Ct	3	0.7657	4.5440	0.00001	41	G_Customer_Age	6	0.02351	0.09023	0.92811
21	G_Customer_Age	3	0.7353	2.2488	0.02452	.	.	.	.	.	.

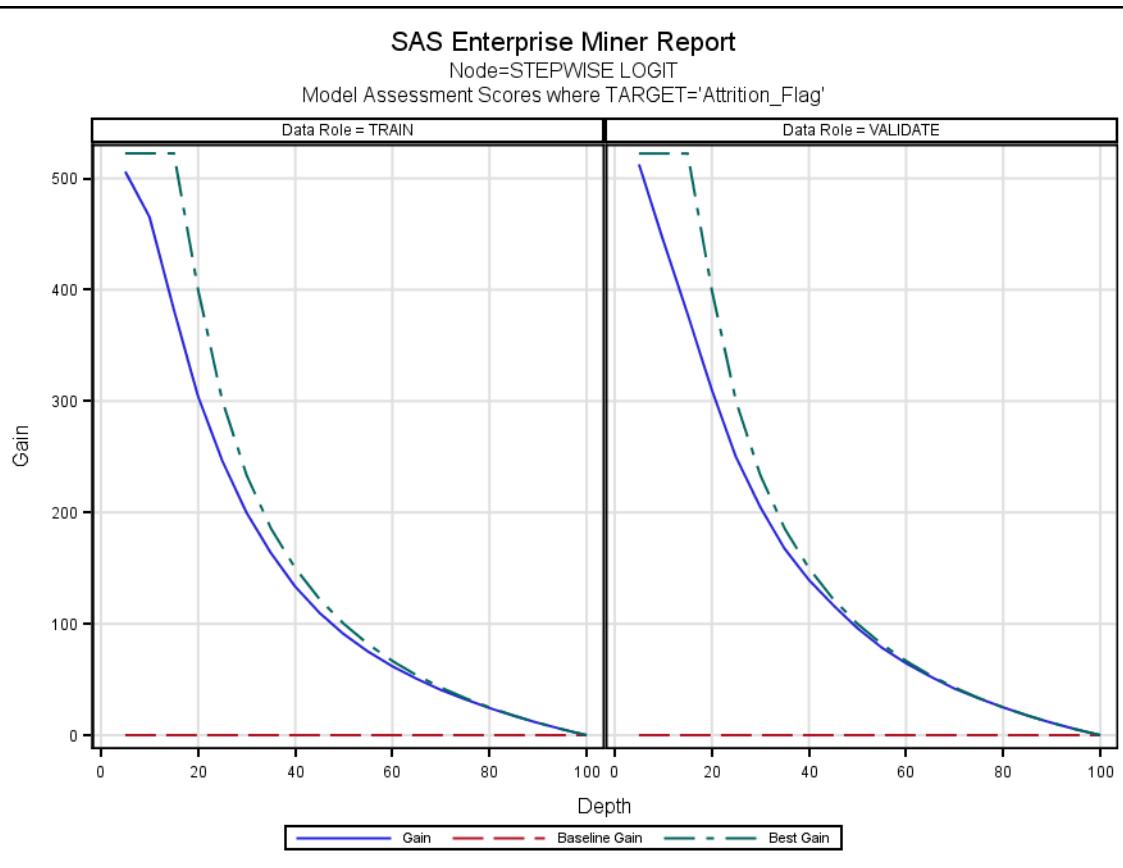
**SAS Enterprise Miner Report**  
**Node=STEPWISE LOGIT**  
**Model Iteration Plots**



## SAS Enterprise Miner Report

Node=STEPWISE LOGIT

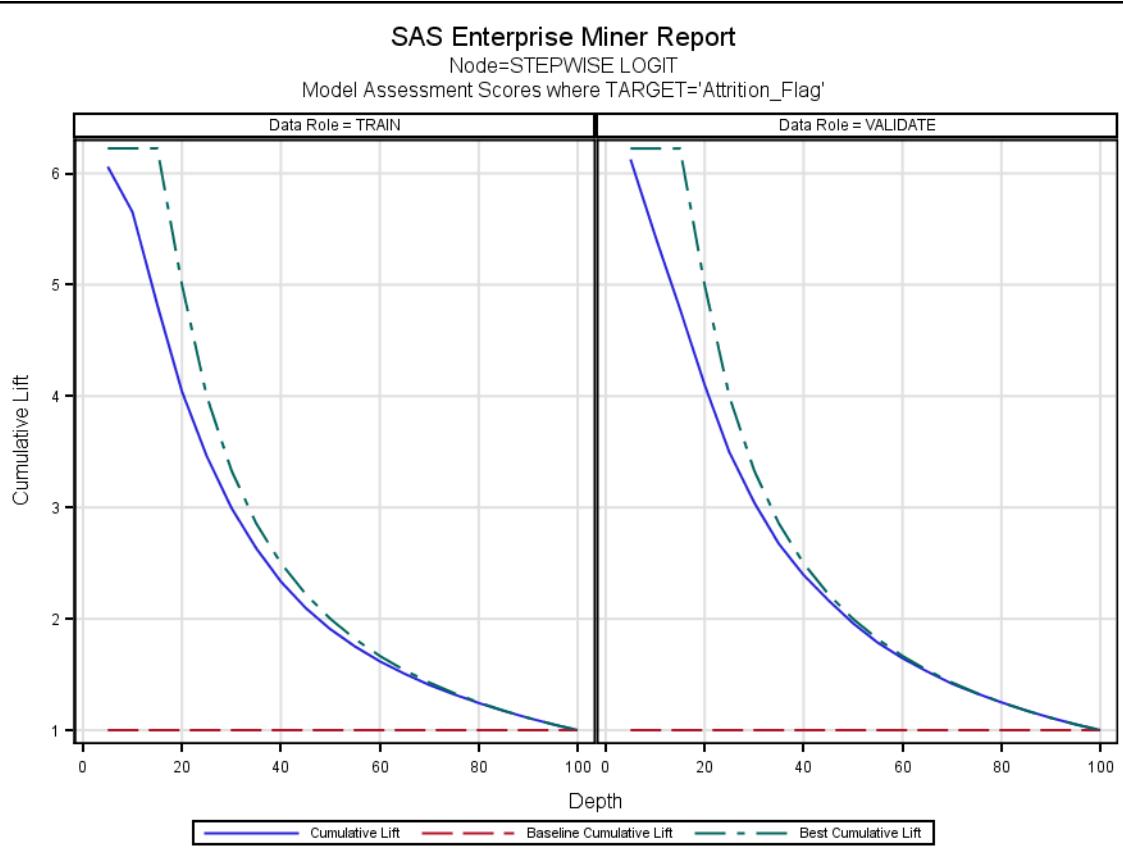
Model Assessment Scores where TARGET='Attrition\_Flag'

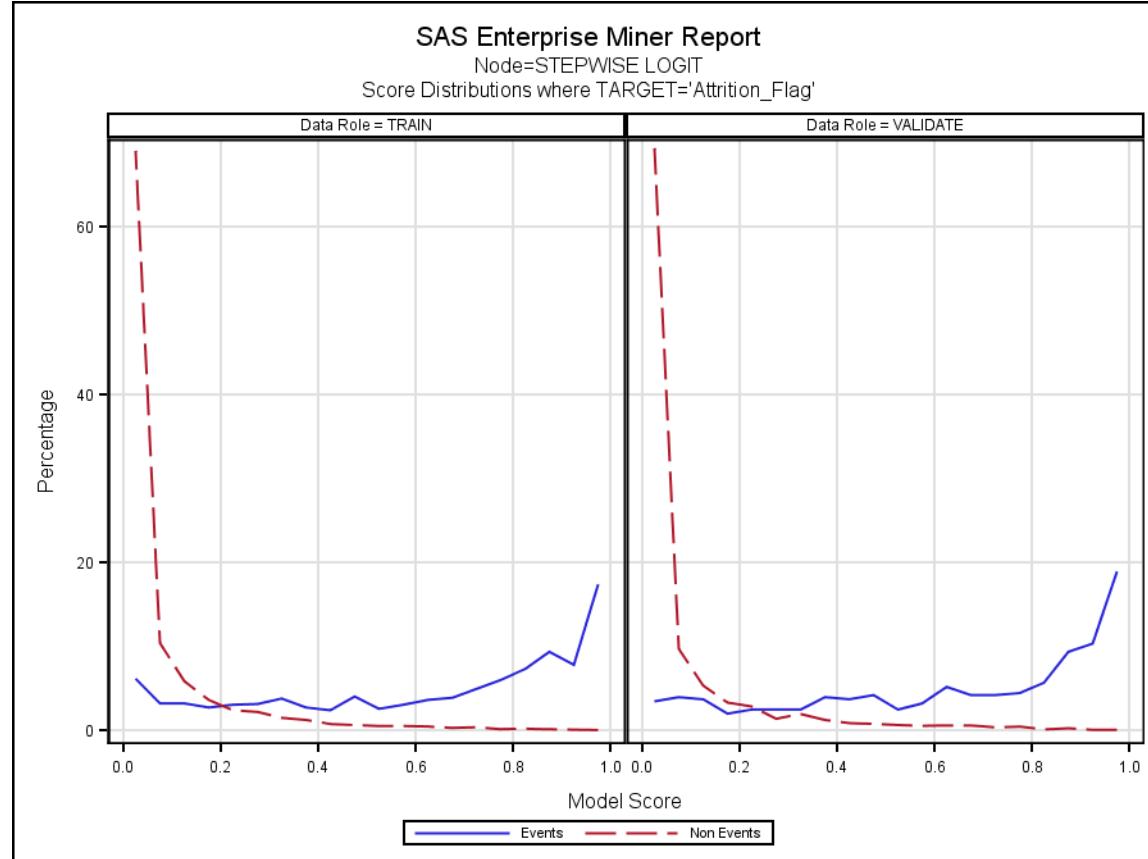
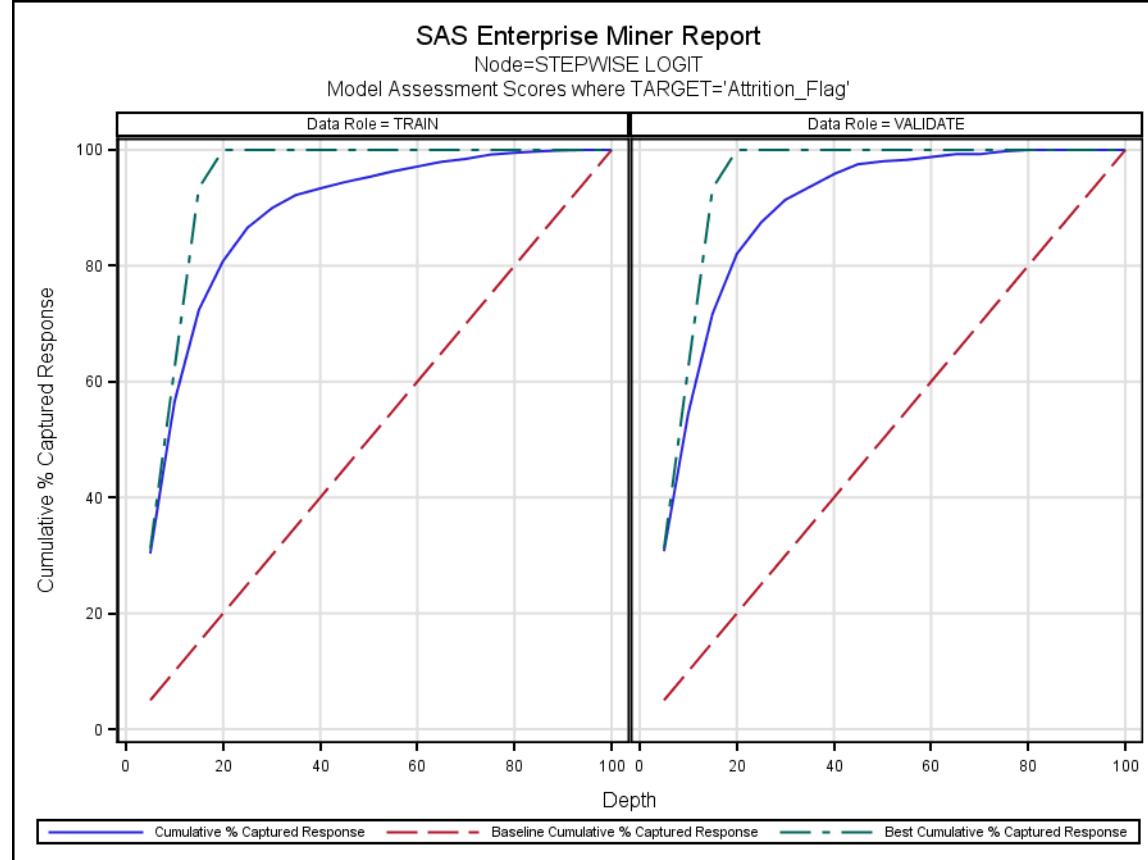


## SAS Enterprise Miner Report

Node=STEPWISE LOGIT

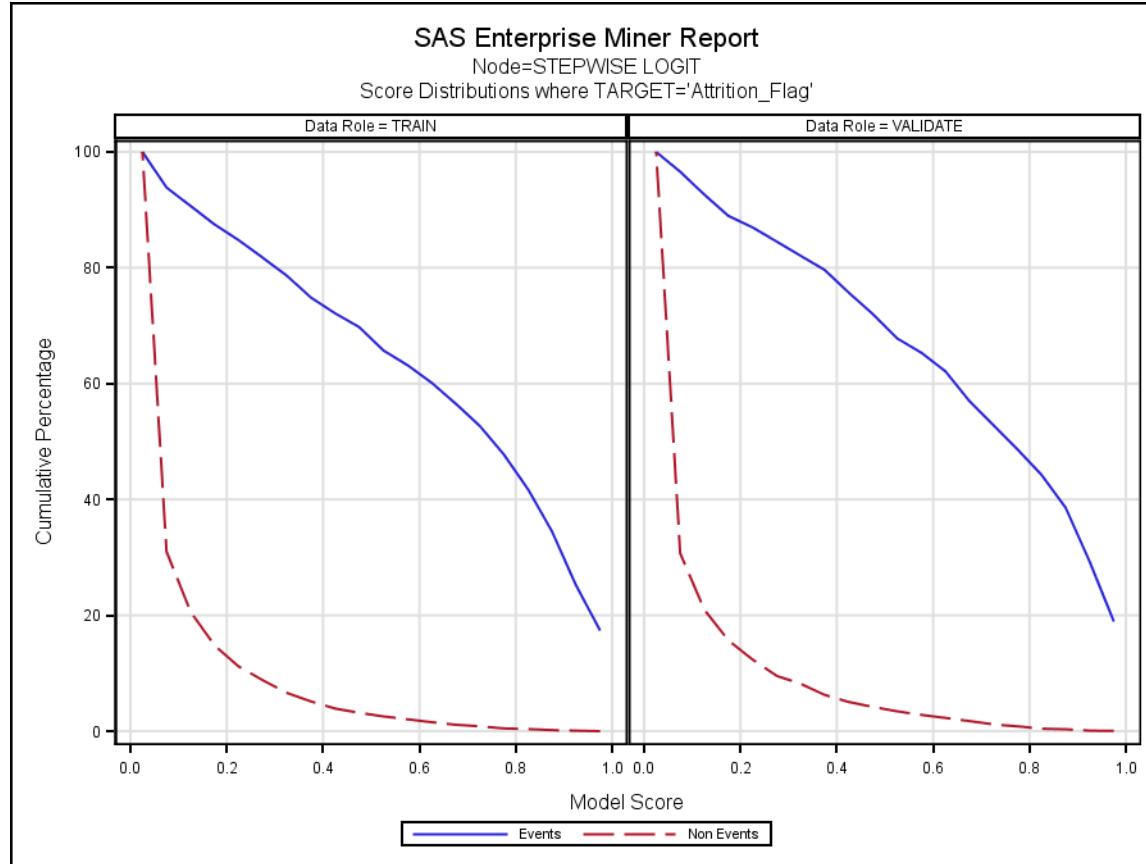
Model Assessment Scores where TARGET='Attrition\_Flag'





Node=STEPWISE LOGIT

Score Distributions where TARGET='Attrition\_Flag'



Node=STEPWISE LOGIT

Score Distributions

Target Variable=Attrition\_Flag 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	212	17.3770	0.0157	17.377	0.016
0.90-0.95	95	7.7869	0.0628	25.164	0.078
0.85-0.90	114	9.3443	0.1098	34.508	0.188
0.80-0.85	89	7.2951	0.1726	41.803	0.361
0.75-0.80	73	5.9836	0.1255	47.787	0.486
0.70-0.75	60	4.9180	0.3608	52.705	0.847
0.65-0.70	47	3.8525	0.2667	56.557	1.114
0.60-0.65	44	3.6066	0.4393	60.164	1.553
0.55-0.60	37	3.0328	0.5020	63.197	2.055
0.50-0.55	31	2.5410	0.5020	65.738	2.557
0.45-0.50	49	4.0164	0.6119	69.754	3.169
0.40-0.45	29	2.3770	0.7374	72.131	3.906
0.35-0.40	33	2.7049	1.2237	74.836	5.130
0.30-0.35	46	3.7705	1.4747	78.607	6.605
0.25-0.30	38	3.1148	2.1807	81.721	8.786
0.20-0.25	37	3.0328	2.3690	84.754	11.155
0.15-0.20	33	2.7049	3.6084	87.459	14.763
0.10-0.15	39	3.1967	5.8362	90.656	20.599
0.05-0.10	39	3.1967	10.3859	93.852	30.985
0.00-0.05	75	6.1475	69.0147	100.000	100.000

Target Variable=Attrition\_Flag 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	77	18.9189	0.0470	18.919	0.047
0.90-0.95	42	10.3194	0.0470	29.238	0.094
0.85-0.90	38	9.3366	0.2352	38.575	0.329
0.80-0.85	23	5.6511	0.0941	44.226	0.423
0.75-0.80	18	4.4226	0.4233	48.649	0.847
0.70-0.75	17	4.1769	0.3293	52.826	1.176
0.65-0.70	17	4.1769	0.5644	57.002	1.740
0.60-0.65	21	5.1597	0.5644	62.162	2.305
0.55-0.60	13	3.1941	0.5174	65.356	2.822
0.50-0.55	10	2.4570	0.6115	67.813	3.434
0.45-0.50	17	4.1769	0.7526	71.990	4.186
0.40-0.45	15	3.6855	0.8467	75.676	5.033
0.35-0.40	16	3.9312	1.2230	79.607	6.256
0.30-0.35	10	2.4570	1.9285	82.064	8.184
0.25-0.30	10	2.4570	1.3641	84.521	9.548
0.20-0.25	10	2.4570	2.8222	86.978	12.371
0.15-0.20	8	1.9656	3.2926	88.943	15.663
0.10-0.15	15	3.6855	5.3151	92.629	20.978
0.05-0.10	16	3.9312	9.6896	96.560	30.668
0.00-0.05	14	3.4398	69.3321	100.000	100.000

## SAS Enterprise Miner Report

### Node=BACKWARD LOGIT Summary

Node id = Reg2  
 Node label = BACKWARD LOGIT  
 Meta path = Ids => Varsel => Trans => Meta => Trans2 => Meta2 => Part => Reg2  
 Notes =

### Node=BACKWARD LOGIT Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	Regression		Force	0		PolynomialDegree	2	
AbsConvValue	-1.34078E154	-7.237006E75	GConvTimes	1		PrintDesignMatrix	N	
AbsFTime	1		GConvValue	1E-6		Rule	NONE	
AbsFValue	0		Hierarchy	CLASS		SASSPDS	N	
AbsGTime	1		InputCoding	DEVIATION		SelectionCriterion	DEFAULT	
AbsGValue	0.00001		Interactions			SelectionDefault	Y	
AbsXTime	1		LinkFunction	LOGIT		Sequential	N	
AbsXValue	1E-8		MainEffect	Y		Simple	N	
CIParam	N		MaxCPUTime	1 HOUR		SIEntry	0.05	
ConvDefaults	Y		MaxFunctionCalls	.		SISStay	0.05	
CorB	N		MaxIterations	.		Start	0	
CovB	N		MaxStep	.		StepOutput	N	
Covout	N		MinResourceUse	N		Stop	0	
Details	N		ModelDefaults	Y		SuppressIntercept	N	
Error	LOGISTIC		ModelSelection	BACKWARD	NONE	SuppressOutput	N	
ExcludedVariable	REJECT		OptimizationTechnique	DEFAULT		Terms	N	
FConvTimes	1		Performance	N		TwoFactor	N	
FConvValue	0		Polynomial	N				

### Node=BACKWARD LOGIT Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag
INPUT	INTERVAL	5	RANGE_LOG_Total_Trans_Amt RANGE_SQRT_Avg_Utilization_Ratio RANGE_SQRT_Total_Amt_Chng_Q4_Q1 RANGE_SQRT_Total_Ct_Chng_Q4_Q1 RANGE_Total_Revolving_Bal
INPUT	NOMINAL	6	G_Contacts_Count_12_mon G_Customer_Age G_Months_Inactive_12_mon G_Months_on_book G_Total_Relationship_Count G_Total_Trans_Ct

### Node=BACKWARD LOGIT Model Fit Statistics

Target=Attrition\_Flag Target Label=''

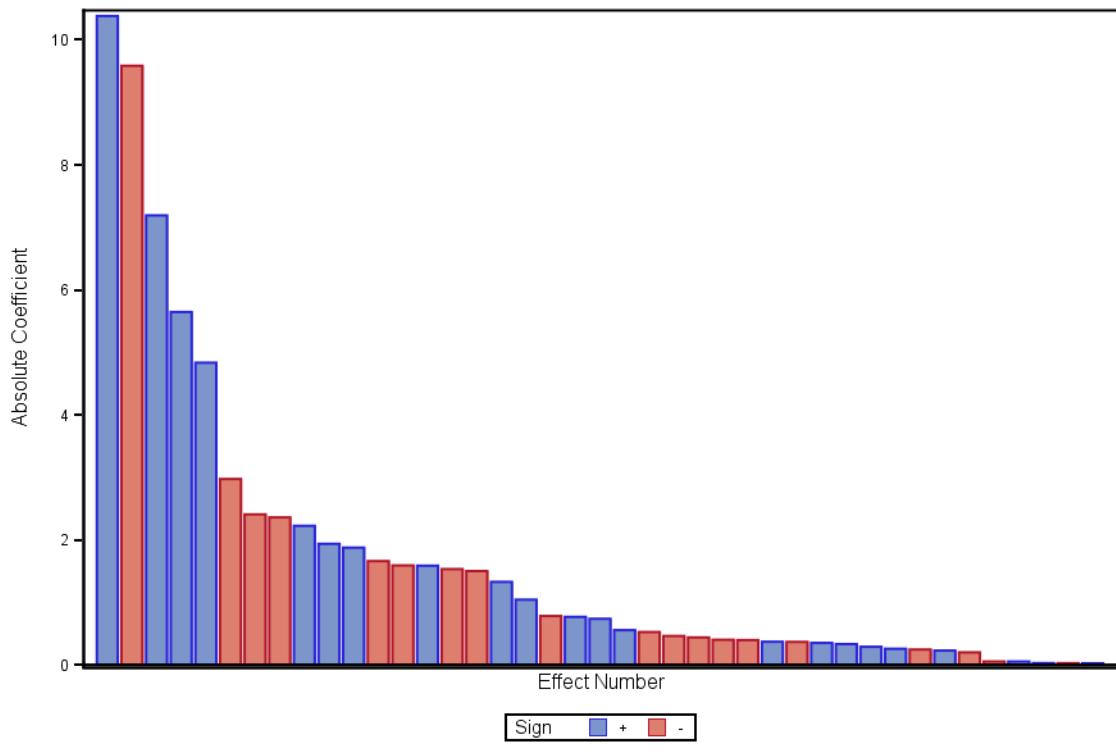
Label of Statistic	Train	Validation	Test
Akaike's Information Criterion	3234.81	.	.
Average Squared Error	0.06	0.06	.
Average Error Function	0.21	0.20	.
Degrees of Freedom for Error	7553.00	.	.
Model Degrees of Freedom	41.00	.	.
Total Degrees of Freedom	7594.00	.	.

Target=Attrition\_Flag Target Label='1'

Label of Statistic	Train	Validation	Test
Divisor for ASE	15188.00	5066.00	.
Error Function	3152.81	1002.17	.
Final Prediction Error	0.06	.	.
Maximum Absolute Error	1.00	1.00	.
Mean Square Error	0.06	0.06	.
Sum of Frequencies	7594.00	2533.00	.
Number of Estimate Weights	41.00	.	.
Root Average Sum of Squares	0.24	0.24	.
Root Final Prediction Error	0.24	.	.
Root Mean Squared Error	0.24	0.24	.
Schwarz's Bayesian Criterion	3519.15	.	.
Sum of Squared Errors	882.15	296.81	.
Sum of Case Weights Times Freq	15188.00	5066.00	.
Misclassification Rate	0.08	0.08	.

### SAS Enterprise Miner Report

Node=BACKWARD LOGIT  
Regression Model Effects



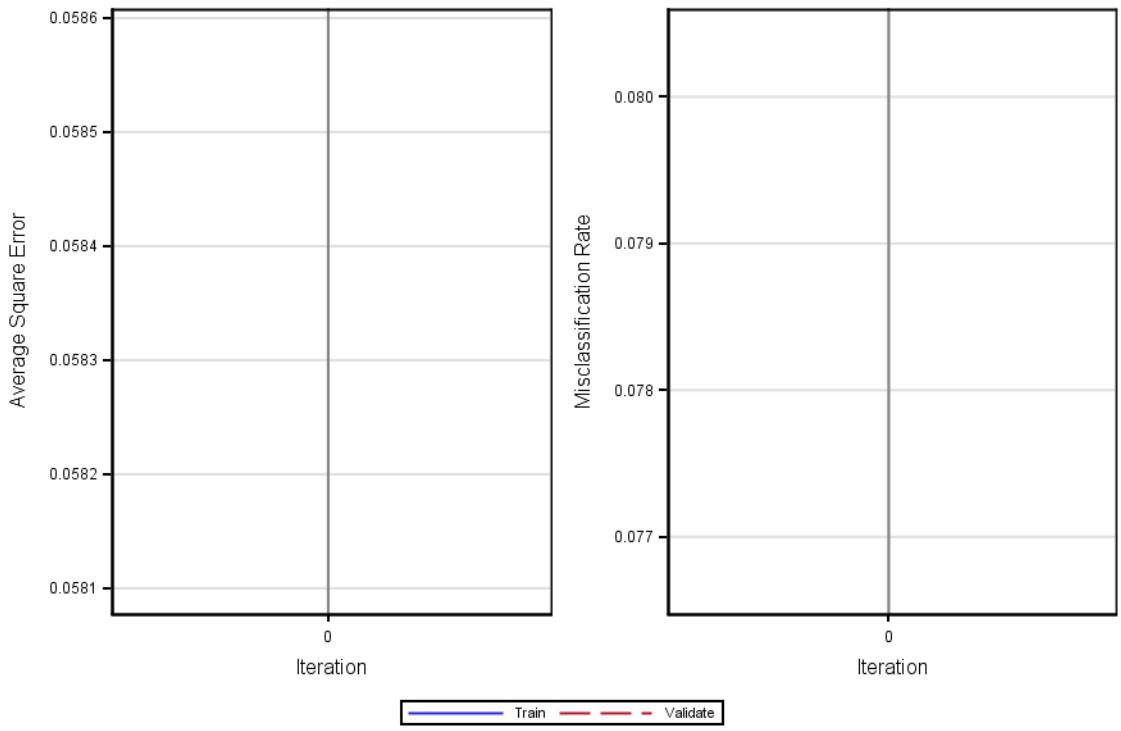
Effect Number	Variable	Level	Coefficient	T-value	P Value	Effect Number	Variable	Level	Coefficient	T-value	P Value
1	G_Contacts_Count_12_mon	0	10.3818	0.4422	0.65833	22	G_Customer_Age	1	0.55397	1.39936	0.16171
2	RANGE_SQRT_Total_Ct_Chng_Q4_Q1		-9.5849	-13.1526	0.00000	23	G_Customer_Age	8	-0.52306	-1.79779	0.07221
3	Intercept	1	7.1910	1.2206	0.22223	24	G_Total_Relationship_Count	1	-0.46000	-5.90845	0.00000
4	RANGE_LOG_Total_Trans_Amt		5.6443	11.6100	0.00000	25	G_Months_Inactive_12_mon	3	-0.43661	-2.41709	0.01565
5	G_Total_Trans_Ct	0	4.8337	6.4358	0.00000	26	G_Months_on_book	6	-0.39934	-2.83204	0.00463
6	G_Contacts_Count_12_mon	3	-2.9725	-0.5064	0.61258	27	G_Months_on_book	7	-0.39418	-2.32333	0.02016
7	G_Total_Trans_Ct	6	-2.4060	-14.8950	0.00000	28	G_Customer_Age	2	0.36763	1.17706	0.23917
8	G_Contacts_Count_12_mon	2	-2.3580	-0.4017	0.68789	29	G_Months_on_book	5	-0.36529	-2.32837	0.01989
9	G_Customer_Age	0	2.2228	1.0645	0.28710	30	G_Customer_Age	5	0.34945	1.30643	0.19141
10	G_Months_Inactive_12_mon	0	1.9344	2.9907	0.00278	31	G_Months_on_book	0	0.33024	0.94387	0.34524

**SAS Enterprise Miner Report**  
**Node=BACKWARD LOGIT**  
**Regression Model Effects**

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Effect Number	Variable	Level	Coefficient	T-value	P Value	Effect Number	Variable	Level	Coefficient	T-value	P Value
11	G_Months_on_book	1	1.8741	4.3233	0.00002	32	G_Customer_Age	4	0.28722	1.07663	0.28165
12	RANGE_Total_Revolving_Bal		-1.6585	-7.3220	0.00000	33	G_Months_Inactive_12_mon	1	0.25548	1.11810	0.26352
13	G_Customer_Age	9	-1.5895	-3.9619	0.00007	34	G_Total_Trans_Ct	5	-0.24325	-1.64512	0.09995
14	G_Total_Trans_Ct	1	1.5850	9.2793	0.00000	35	G_Total_Trans_Ct	4	0.22646	1.31411	0.18881
15	RANGE_SQRT_Total_Amt_Chng_Q4_Q1		-1.5306	-2.0664	0.03879	36	G_Months_on_book	4	-0.19786	-1.21962	0.22261
16	G_Contacts_Count_12_mon	1	-1.4988	-0.2552	0.79858	37	G_Months_Inactive_12_mon	2	-0.05200	-0.29240	0.76998
17	G_Total_Relationship_Count	0	1.3258	14.3426	0.00000	38	G_Months_on_book	2	0.05141	0.37751	0.70580
18	G_Total_Trans_Ct	2	1.0411	6.6388	0.00000	39	G_Customer_Age	7	0.02657	0.09854	0.92150
19	RANGE_SQRT_Avg_Utilization_Ratio		-0.7801	-3.1519	0.00162	40	G_Months_on_book	3	-0.02532	-0.22255	0.82389
20	G_Total_Trans_Ct	3	0.7657	4.5440	0.00001	41	G_Customer_Age	6	0.02351	0.09023	0.92811
21	G_Customer_Age	3	0.7353	2.2488	0.02452	.			.	.	.

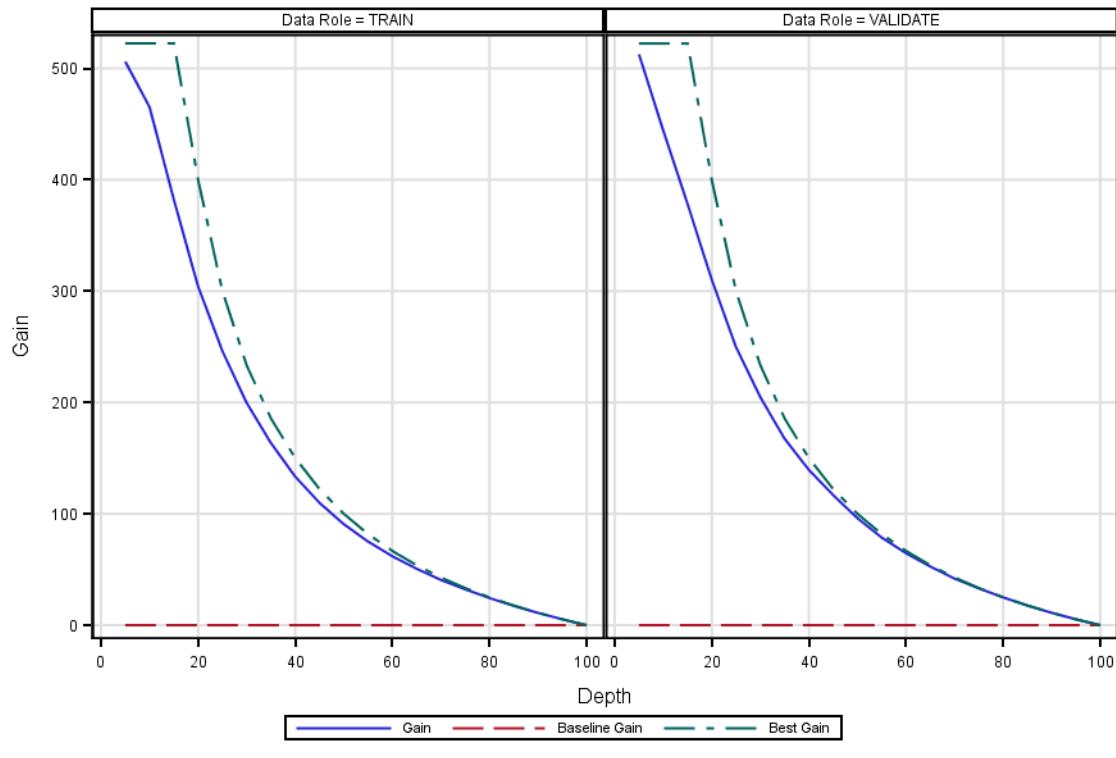
**SAS Enterprise Miner Report**  
**Node=BACKWARD LOGIT**  
**Model Iteration Plots**



## SAS Enterprise Miner Report

Node=BACKWARD LOGIT

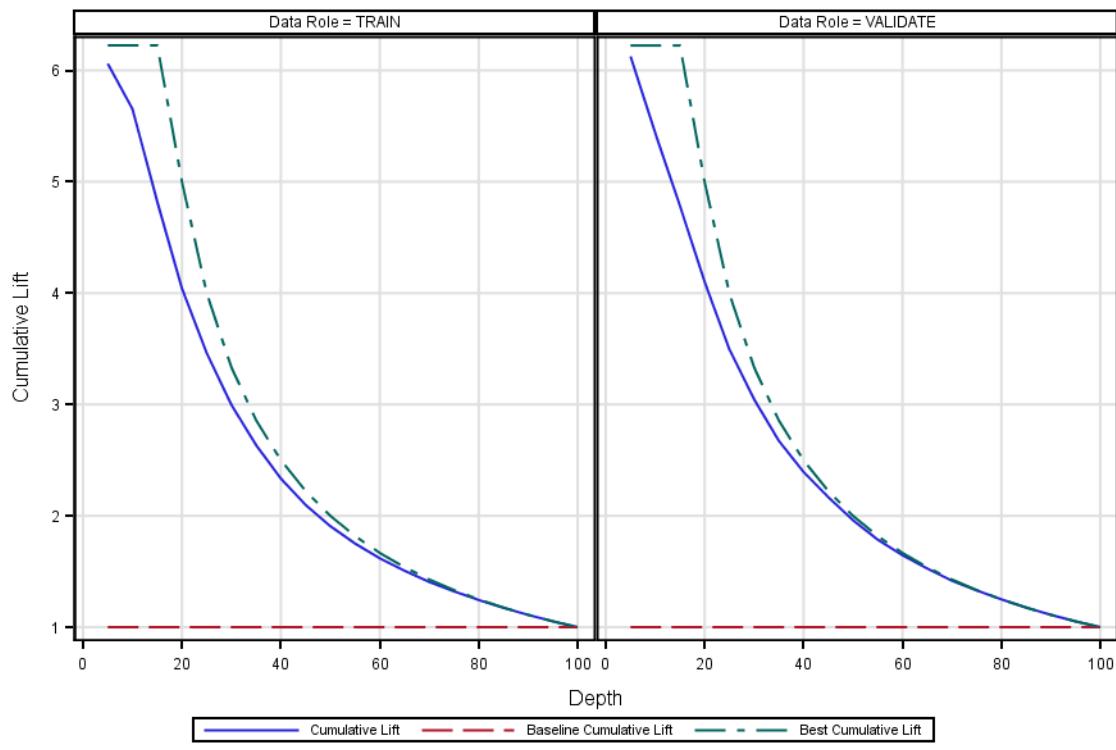
Model Assessment Scores where TARGET='Attrition\_Flag'

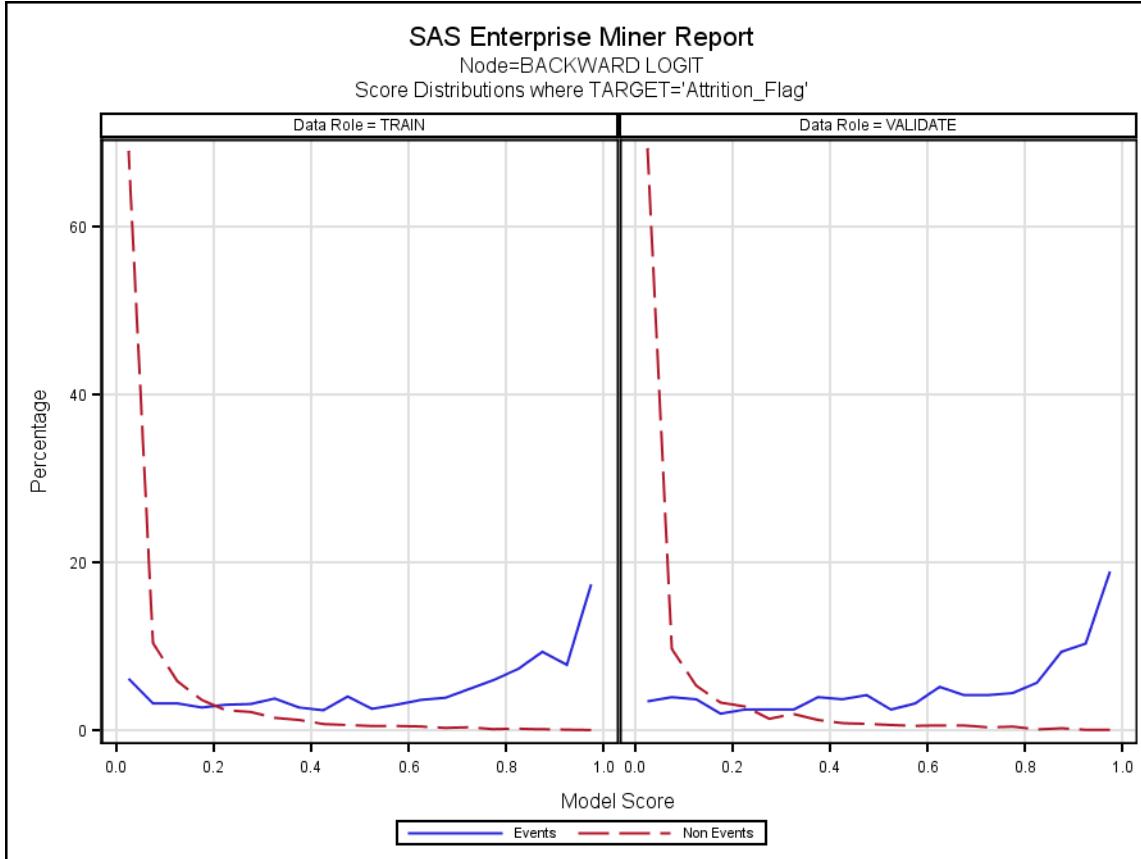
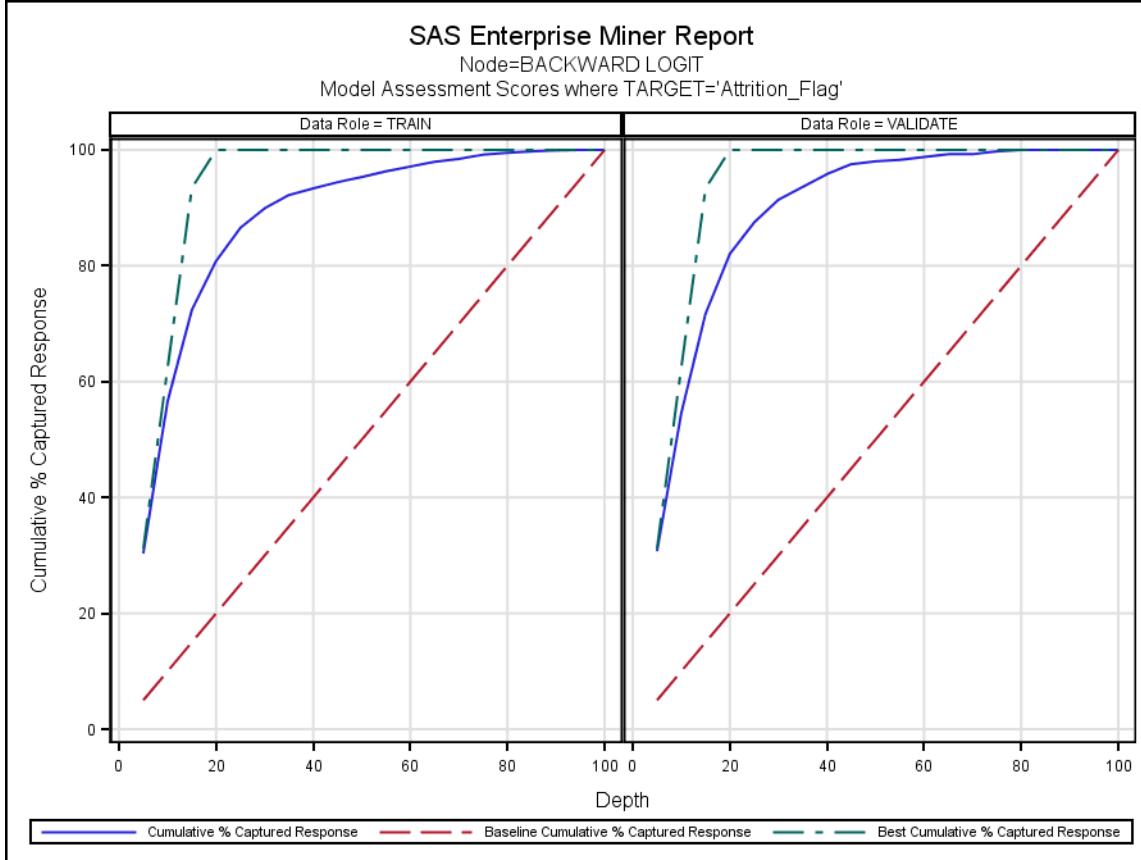


## SAS Enterprise Miner Report

Node=BACKWARD LOGIT

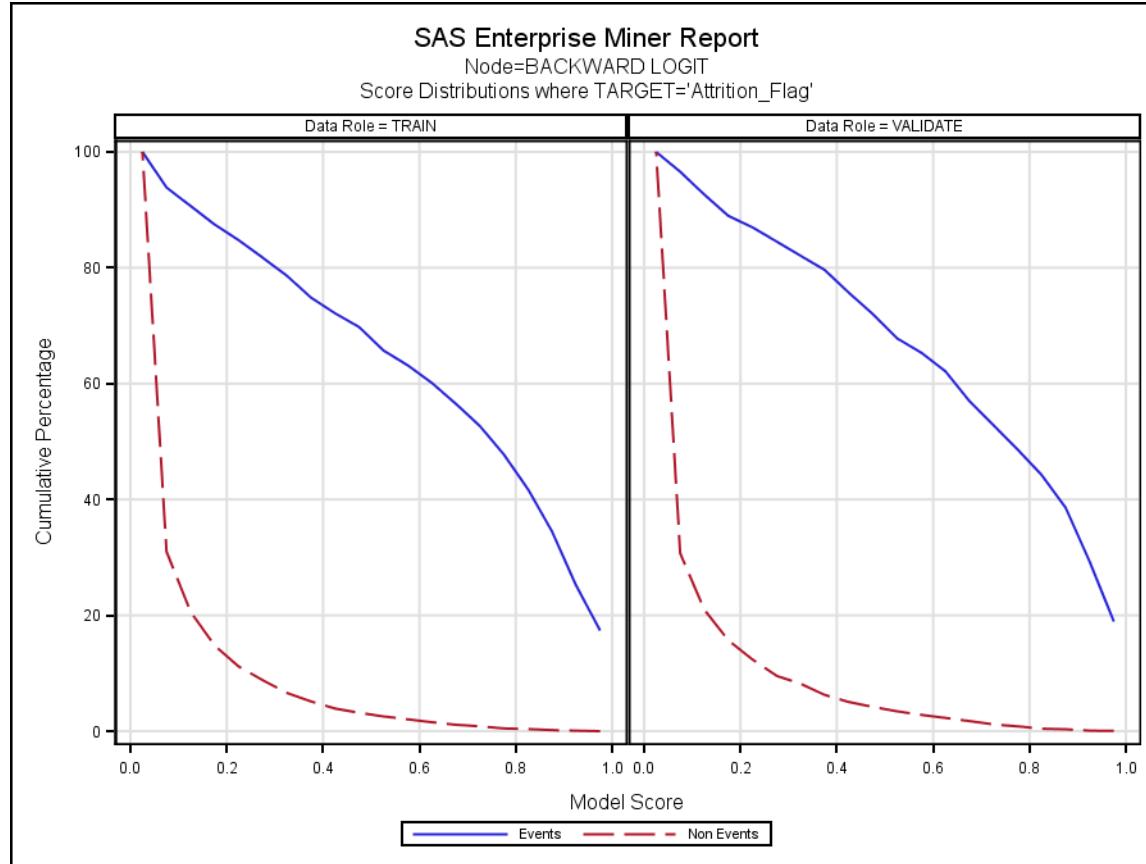
Model Assessment Scores where TARGET='Attrition\_Flag'





Node=BACKWARD LOGIT

Score Distributions where TARGET='Attrition\_Flag'



Node=BACKWARD LOGIT

Score Distributions

Target Variable=Attrition\_Flag 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	212	17.3770	0.0157	17.377	0.016
0.90-0.95	95	7.7869	0.0628	25.164	0.078
0.85-0.90	114	9.3443	0.1098	34.508	0.188
0.80-0.85	89	7.2951	0.1726	41.803	0.361
0.75-0.80	73	5.9836	0.1255	47.787	0.486
0.70-0.75	60	4.9180	0.3608	52.705	0.847
0.65-0.70	47	3.8525	0.2667	56.557	1.114
0.60-0.65	44	3.6066	0.4393	60.164	1.553
0.55-0.60	37	3.0328	0.5020	63.197	2.055
0.50-0.55	31	2.5410	0.5020	65.738	2.557
0.45-0.50	49	4.0164	0.6119	69.754	3.169
0.40-0.45	29	2.3770	0.7374	72.131	3.906
0.35-0.40	33	2.7049	1.2237	74.836	5.130
0.30-0.35	46	3.7705	1.4747	78.607	6.605
0.25-0.30	38	3.1148	2.1807	81.721	8.786
0.20-0.25	37	3.0328	2.3690	84.754	11.155
0.15-0.20	33	2.7049	3.6084	87.459	14.763
0.10-0.15	39	3.1967	5.8362	90.656	20.599
0.05-0.10	39	3.1967	10.3859	93.852	30.985
0.00-0.05	75	6.1475	69.0147	100.000	100.000

Target Variable=Attrition\_Flag 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	77	18.9189	0.0470	18.919	0.047
0.90-0.95	42	10.3194	0.0470	29.238	0.094
0.85-0.90	38	9.3366	0.2352	38.575	0.329
0.80-0.85	23	5.6511	0.0941	44.226	0.423
0.75-0.80	18	4.4226	0.4233	48.649	0.847
0.70-0.75	17	4.1769	0.3293	52.826	1.176
0.65-0.70	17	4.1769	0.5644	57.002	1.740
0.60-0.65	21	5.1597	0.5644	62.162	2.305
0.55-0.60	13	3.1941	0.5174	65.356	2.822
0.50-0.55	10	2.4570	0.6115	67.813	3.434
0.45-0.50	17	4.1769	0.7526	71.990	4.186
0.40-0.45	15	3.6855	0.8467	75.676	5.033
0.35-0.40	16	3.9312	1.2230	79.607	6.256
0.30-0.35	10	2.4570	1.9285	82.064	8.184
0.25-0.30	10	2.4570	1.3641	84.521	9.548
0.20-0.25	10	2.4570	2.8222	86.978	12.371
0.15-0.20	8	1.9656	3.2926	88.943	15.663
0.10-0.15	15	3.6855	5.3151	92.629	20.978
0.05-0.10	16	3.9312	9.6896	96.560	30.668
0.00-0.05	14	3.4398	69.3321	100.000	100.000

## SAS Enterprise Miner Report

### Node=FULL LOGIT Summary

Node id = Reg  
 Node label = FULL LOGIT  
 Meta path = Ids => Varsel => Trans => Meta => Trans2 => Meta2 => Part => Reg  
 Notes =

### Node=FULL LOGIT Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	Regression		Force	0		PolynomialDegree	2	
AbsConvValue	-1.34078E154	-7.237006E75	GConvTimes	1		PrintDesignMatrix	N	
AbsFTime	1		GConvValue	1E-6		Rule	NONE	
AbsFValue	0		Hierarchy	CLASS		SASSPDS	N	
AbsGTime	1		InputCoding	DEVIATION		SelectionCriterion	DEFAULT	
AbsGValue	0.00001		Interactions			SelectionDefault	Y	
AbsXTime	1		LinkFunction	LOGIT		Sequential	N	
AbsXValue	1E-8		MainEffect	Y		Simple	N	
CIParam	N		MaxCPUTime	1 HOUR		SIEntry	0.05	
ConvDefaults	Y		MaxFunctionCalls	.		SISStay	0.05	
CorB	N		MaxIterations	.		Start	0	
CovB	N		MaxStep	.		StepOutput	N	
Covout	N		MinResourceUse	N		Stop	0	
Details	N		ModelDefaults	Y		SuppressIntercept	N	
Error	LOGISTIC		ModelSelection	NONE		SuppressOutput	N	
ExcludedVariable	REJECT		OptimizationTechnique	DEFAULT		Terms	N	
FConvTimes	1		Performance	N		TwoFactor	N	
FConvValue	0		Polynomial	N				

### Node=FULL LOGIT Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag
INPUT	INTERVAL	5	RANGE_LOG_Total_Trans_Amt RANGE_SQRT_Avg_Utilization_Ratio RANGE_SQRT_Total_Amt_Chng_Q4_Q1 RANGE_SQRT_Total_Ct_Chng_Q4_Q1 RANGE_Total_Revolving_Bal
INPUT	NOMINAL	6	G_Contacts_Count_12_mon G_Customer_Age G_Months_Inactive_12_mon G_Months_on_book G_Total_Relationship_Count G_Total_Trans_Ct

### Node=FULL LOGIT Model Fit Statistics

Target=Attrition\_Flag Target Label=''

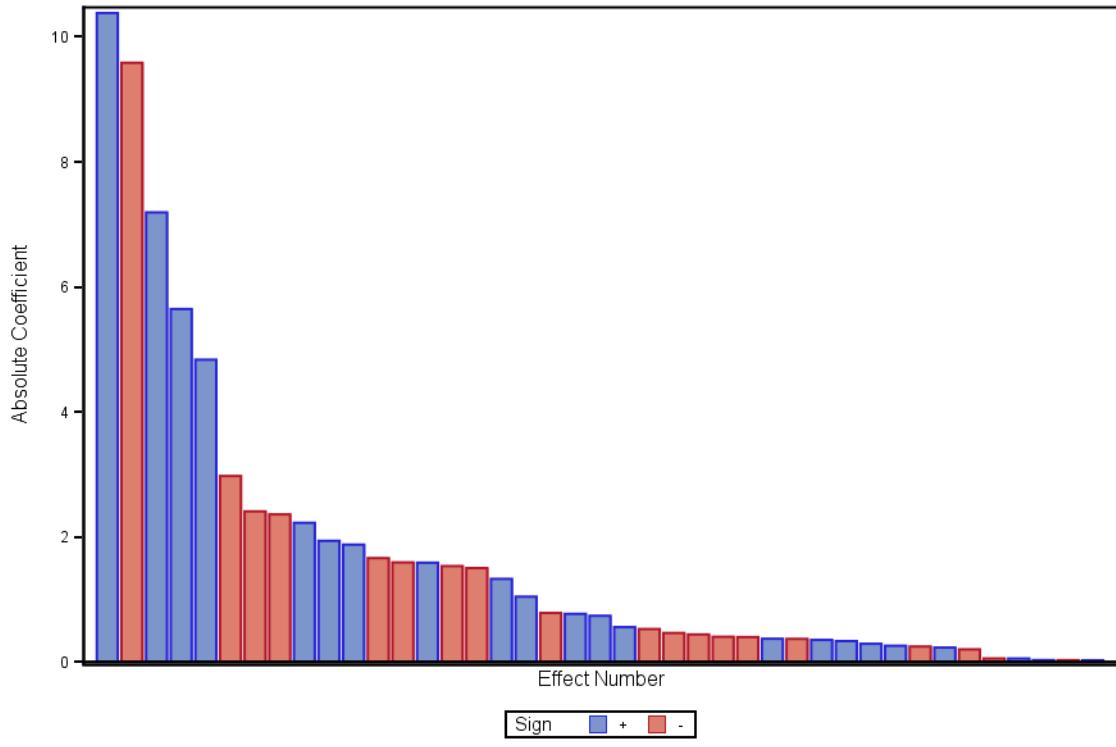
Label of Statistic	Train	Validation	Test
Akaike's Information Criterion	3234.81	.	.
Average Squared Error	0.06	0.06	.
Average Error Function	0.21	0.20	.
Degrees of Freedom for Error	7553.00	.	.
Model Degrees of Freedom	41.00	.	.
Total Degrees of Freedom	7594.00	.	.

Target=Attrition\_Flag Target Label='1'

Label of Statistic	Train	Validation	Test
Divisor for ASE	15188.00	5066.00	.
Error Function	3152.81	1002.17	.
Final Prediction Error	0.06	.	.
Maximum Absolute Error	1.00	1.00	.
Mean Square Error	0.06	0.06	.
Sum of Frequencies	7594.00	2533.00	.
Number of Estimate Weights	41.00	.	.
Root Average Sum of Squares	0.24	0.24	.
Root Final Prediction Error	0.24	.	.
Root Mean Squared Error	0.24	0.24	.
Schwarz's Bayesian Criterion	3519.15	.	.
Sum of Squared Errors	882.15	296.81	.
Sum of Case Weights Times Freq	15188.00	5066.00	.
Misclassification Rate	0.08	0.08	.

### SAS Enterprise Miner Report

Node=FULL LOGIT  
Regression Model Effects

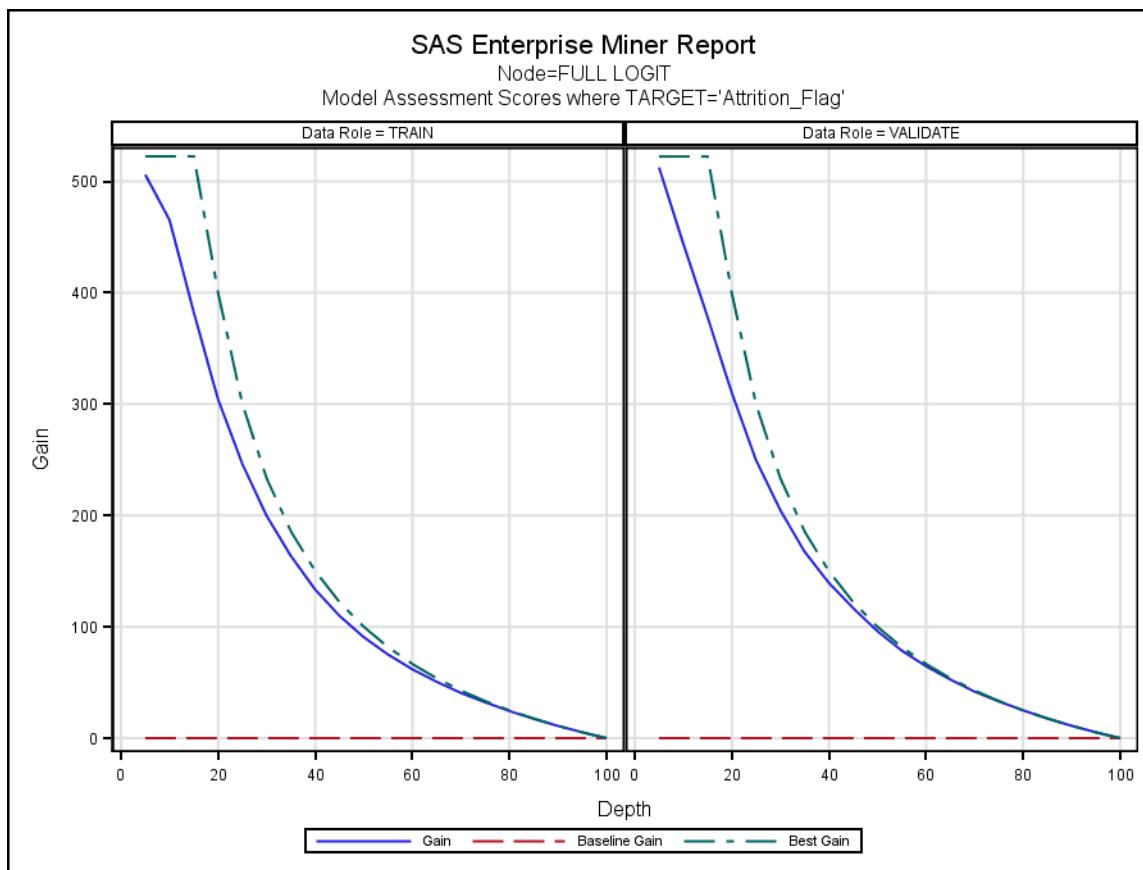


Effect Number	Variable	Level	Coefficient	T-value	P Value	Effect Number	Variable	Level	Coefficient	T-value	P Value
1	G_Contacts_Count_12_mon	0	10.3818	0.4422	0.65833	22	G_Customer_Age	1	0.55397	1.39936	0.16171
2	RANGE_SQRT_Total_Ct_Chng_Q4_Q1		-9.5849	-13.1526	0.00000	23	G_Customer_Age	8	-0.52306	-1.79779	0.07221
3	Intercept	1	7.1910	1.2206	0.22223	24	G_Total_Relationship_Count	1	-0.46000	-5.90845	0.00000
4	RANGE_LOG_Total_Trans_Amt		5.6443	11.6100	0.00000	25	G_Months_Inactive_12_mon	3	-0.43661	-2.41709	0.01565
5	G_Total_Trans_Ct	0	4.8337	6.4358	0.00000	26	G_Months_on_book	6	-0.39934	-2.83204	0.00463
6	G_Contacts_Count_12_mon	3	-2.9725	-0.5064	0.61258	27	G_Months_on_book	7	-0.39418	-2.32333	0.02016
7	G_Total_Trans_Ct	6	-2.4060	-14.8950	0.00000	28	G_Customer_Age	2	0.36763	1.17706	0.23917
8	G_Contacts_Count_12_mon	2	-2.3580	-0.4017	0.68789	29	G_Months_on_book	5	-0.36529	-2.32837	0.01989
9	G_Customer_Age	0	2.2228	1.0645	0.28710	30	G_Customer_Age	5	0.34945	1.30643	0.19141
10	G_Months_Inactive_12_mon	0	1.9344	2.9907	0.00278	31	G_Months_on_book	0	0.33024	0.94387	0.34524

**SAS Enterprise Miner Report**  
**Node=FULL LOGIT**  
**Regression Model Effects**

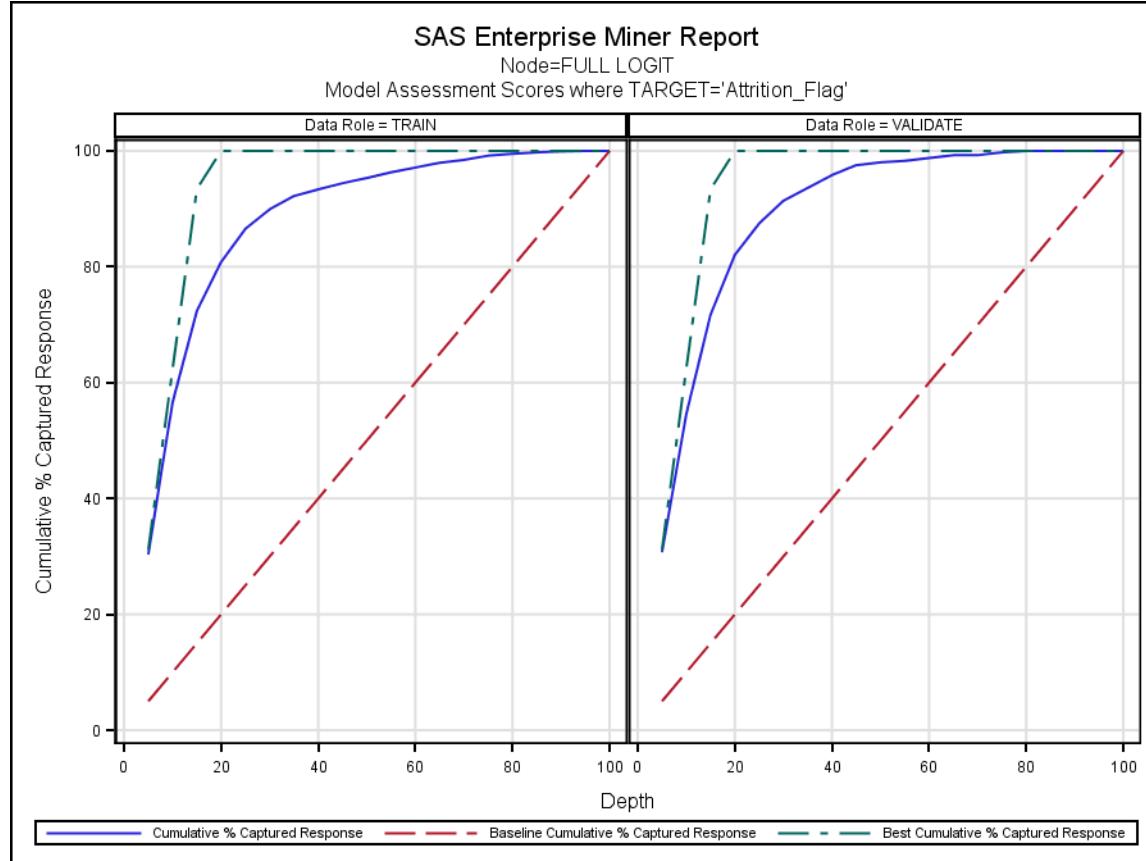
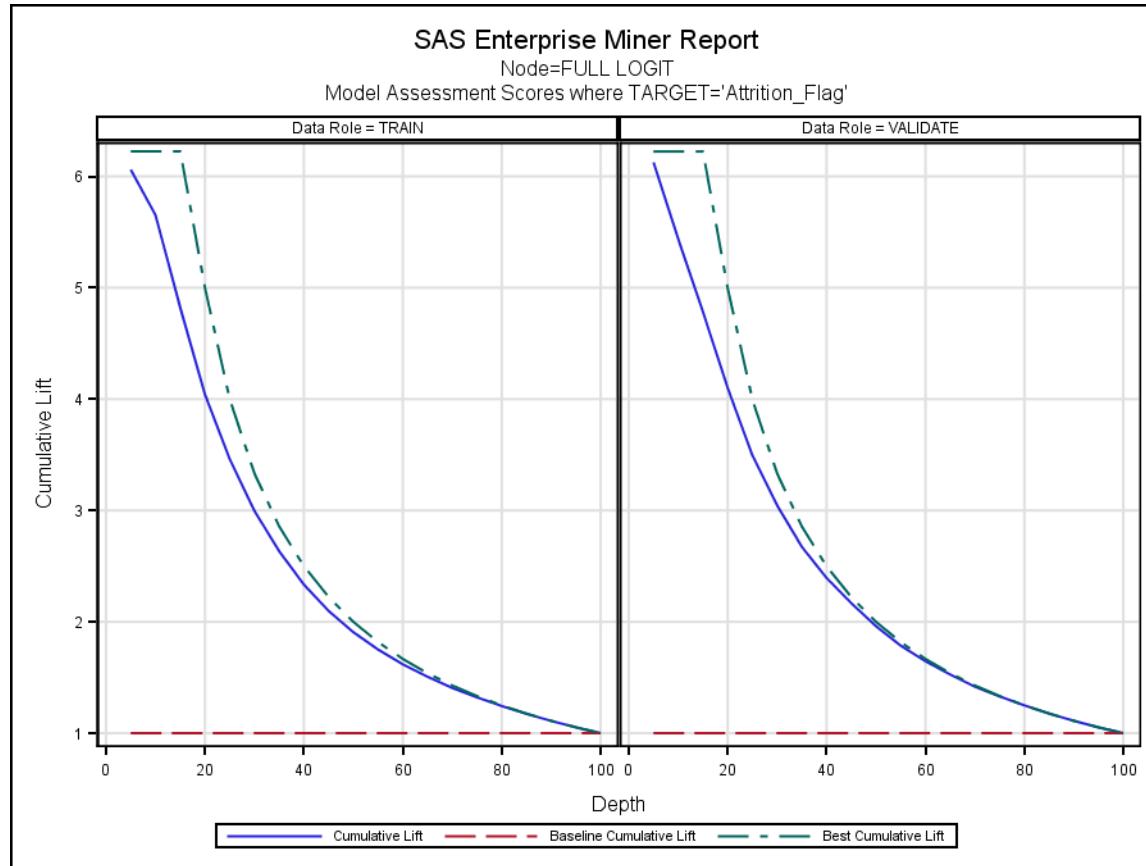
153

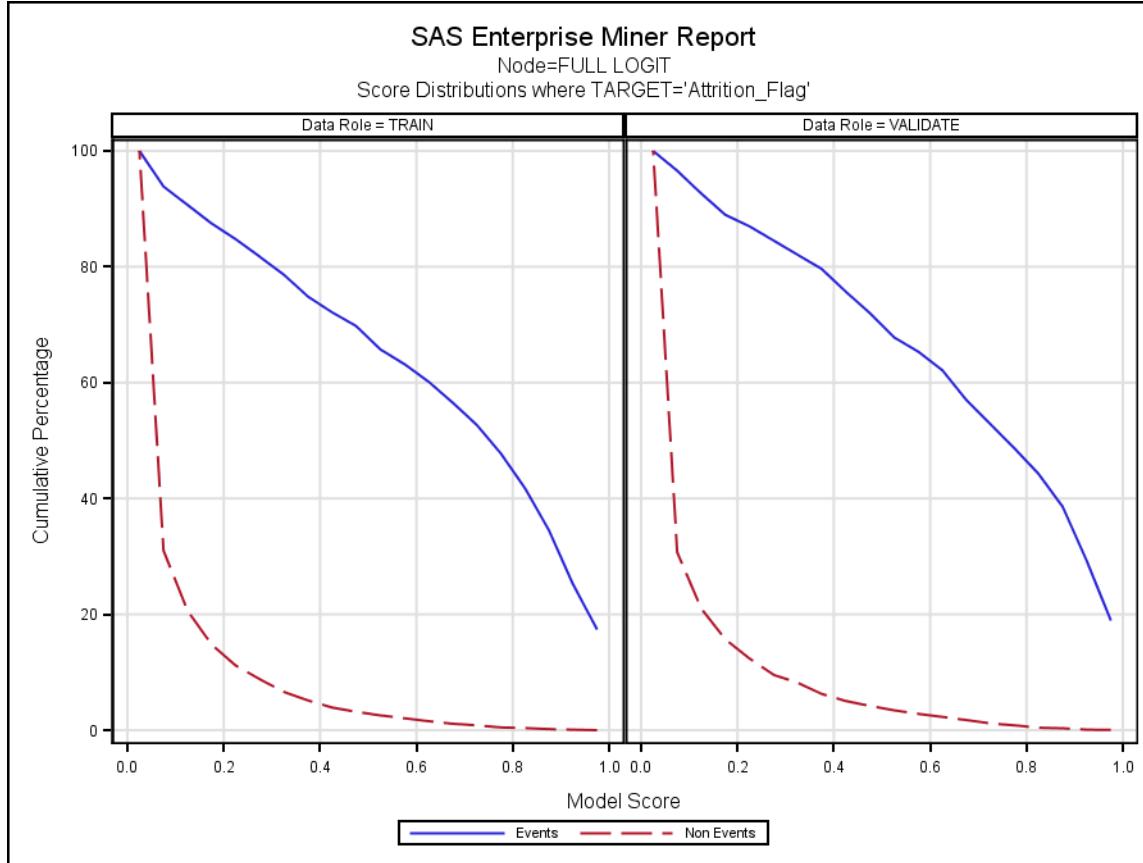
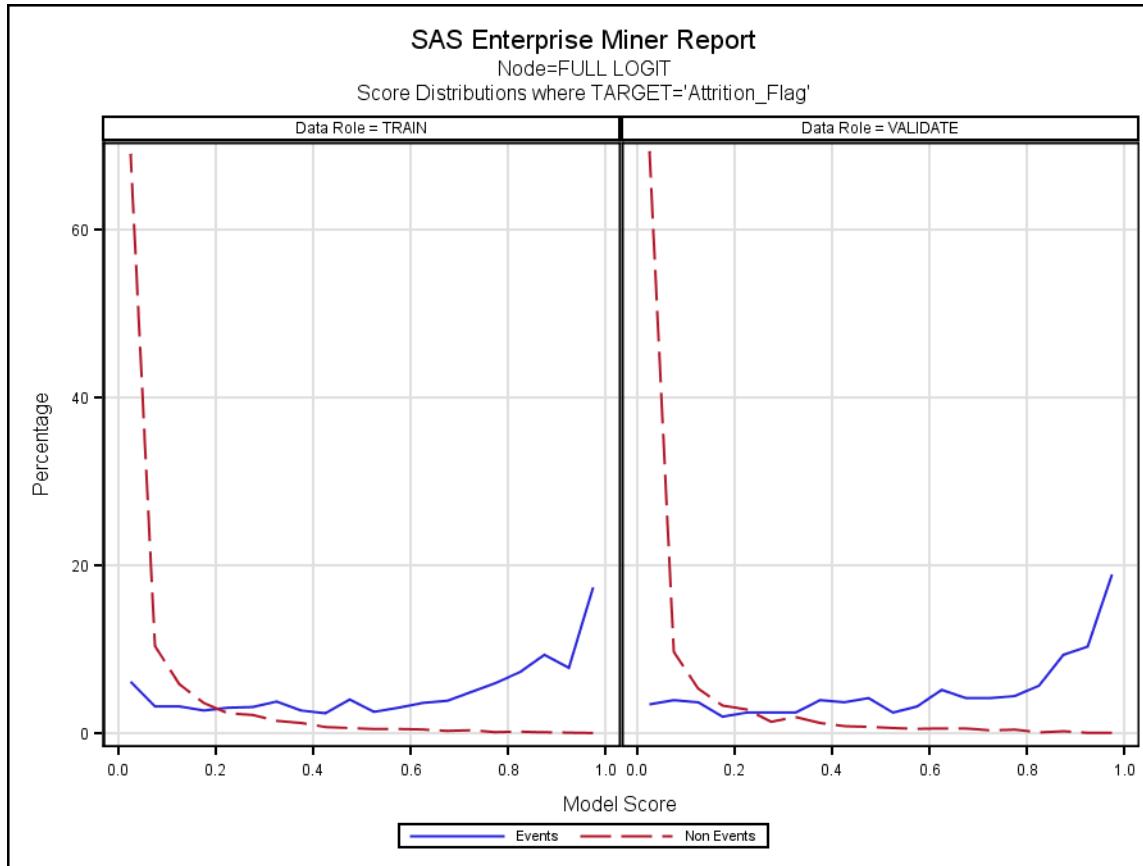
Effect Number	Variable	Level	Coefficient	T-value	P Value	Effect Number	Variable	Level	Coefficient	T-value	P Value
11	G_Months_on_book	1	1.8741	4.3233	0.00002	32	G_Customer_Age	4	0.28722	1.07663	0.28165
12	RANGE_Total_Revolving_Bal		-1.6585	-7.3220	0.00000	33	G_Months_Inactive_12_mon	1	0.25548	1.11810	0.26352
13	G_Customer_Age	9	-1.5895	-3.9619	0.00007	34	G_Total_Trans_Ct	5	-0.24325	-1.64512	0.09995
14	G_Total_Trans_Ct	1	1.5850	9.2793	0.00000	35	G_Total_Trans_Ct	4	0.22646	1.31411	0.18881
15	RANGE_SQRT_Total_Amt_Chng_Q4_Q1		-1.5306	-2.0664	0.03879	36	G_Months_on_book	4	-0.19786	-1.21962	0.22261
16	G_Contacts_Count_12_mon	1	-1.4988	-0.2552	0.79858	37	G_Months_Inactive_12_mon	2	-0.05200	-0.29240	0.76998
17	G_Total_Relationship_Count	0	1.3258	14.3426	0.00000	38	G_Months_on_book	2	0.05141	0.37751	0.70580
18	G_Total_Trans_Ct	2	1.0411	6.6388	0.00000	39	G_Customer_Age	7	0.02657	0.09854	0.92150
19	RANGE_SQRT_Avg_Utilization_Ratio		-0.7801	-3.1519	0.00162	40	G_Months_on_book	3	-0.02532	-0.22255	0.82389
20	G_Total_Trans_Ct	3	0.7657	4.5440	0.00001	41	G_Customer_Age	6	0.02351	0.09023	0.92811
21	G_Customer_Age	3	0.7353	2.2488	0.02452	.			.	.	.



## Node=FULL LOGIT

## Model Assessment Scores where TARGET='Attrition\_Flag'





Node=FULL LOGIT  
Score Distributions

Target Variable=Attrition\_Flag 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	212	17.3770	0.0157	17.377	0.016
0.90-0.95	95	7.7869	0.0628	25.164	0.078
0.85-0.90	114	9.3443	0.1098	34.508	0.188
0.80-0.85	89	7.2951	0.1726	41.803	0.361
0.75-0.80	73	5.9836	0.1255	47.787	0.486
0.70-0.75	60	4.9180	0.3608	52.705	0.847
0.65-0.70	47	3.8525	0.2667	56.557	1.114
0.60-0.65	44	3.6066	0.4393	60.164	1.553
0.55-0.60	37	3.0328	0.5020	63.197	2.055
0.50-0.55	31	2.5410	0.5020	65.738	2.557
0.45-0.50	49	4.0164	0.6119	69.754	3.169
0.40-0.45	29	2.3770	0.7374	72.131	3.906
0.35-0.40	33	2.7049	1.2237	74.836	5.130
0.30-0.35	46	3.7705	1.4747	78.607	6.605
0.25-0.30	38	3.1148	2.1807	81.721	8.786
0.20-0.25	37	3.0328	2.3690	84.754	11.155
0.15-0.20	33	2.7049	3.6084	87.459	14.763
0.10-0.15	39	3.1967	5.8362	90.656	20.599
0.05-0.10	39	3.1967	10.3859	93.852	30.985
0.00-0.05	75	6.1475	69.0147	100.000	100.000

Target Variable=Attrition\_Flag 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	77	18.9189	0.0470	18.919	0.047
0.90-0.95	42	10.3194	0.0470	29.238	0.094
0.85-0.90	38	9.3366	0.2352	38.575	0.329
0.80-0.85	23	5.6511	0.0941	44.226	0.423
0.75-0.80	18	4.4226	0.4233	48.649	0.847
0.70-0.75	17	4.1769	0.3293	52.826	1.176
0.65-0.70	17	4.1769	0.5644	57.002	1.740
0.60-0.65	21	5.1597	0.5644	62.162	2.305
0.55-0.60	13	3.1941	0.5174	65.356	2.822
0.50-0.55	10	2.4570	0.6115	67.813	3.434
0.45-0.50	17	4.1769	0.7526	71.990	4.186
0.40-0.45	15	3.6855	0.8467	75.676	5.033
0.35-0.40	16	3.9312	1.2230	79.607	6.256
0.30-0.35	10	2.4570	1.9285	82.064	8.184
0.25-0.30	10	2.4570	1.3641	84.521	9.548
0.20-0.25	10	2.4570	2.8222	86.978	12.371
0.15-0.20	8	1.9656	3.2926	88.943	15.663
0.10-0.15	15	3.6855	5.3151	92.629	20.978
0.05-0.10	16	3.9312	9.6896	96.560	30.668
0.00-0.05	14	3.4398	69.3321	100.000	100.000

## SAS Enterprise Miner Report

### Node=COMPARE BOOSTING Summary

Node id = MdlComp4  
 Node label = COMPARE BOOSTING  
 Meta path = Ids => Varsel => Trans => Meta => Trans2 => Meta2 => Part2 => Boost2 => MdlComp4  
 Notes =

### Node=COMPARE BOOSTING Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	ModelCompare		NumberOfReportedLevels	1E-6		SelectionData	DEFAULT	
AssessAllTargetLevels	N		NumberofBins	100	20	SelectionDepth	10	
DecileBin	20		ProfitEpsilon	1E-6		SelectionTable	TEST	TABLE
HPCriteria	_MISC_	DEFAULT	RecomputeAssess	N		StatisticUsed	_VMISC_	
LiftEpsilon	1E-6		RocChart	Y		TargetLabel		
ModelCriteria	Valid: Misclassification Rate		RocEpsilon	0.01		TargetName	Attrition_Flag	
ModelDescription	Modified 1 Boost		RoiEpsilon	1E-6		classViyaCriteria	DEFAULT	
ModelId	Boost2		ScoreDistBin	20		intervalViyaCriteria	DEFAULT	
NormalizeReportingVariables	Y		SelectionCriteria	DEFAULT				

### Node=COMPARE BOOSTING Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag

### Node=COMPARE BOOSTING Fit Statistics Table

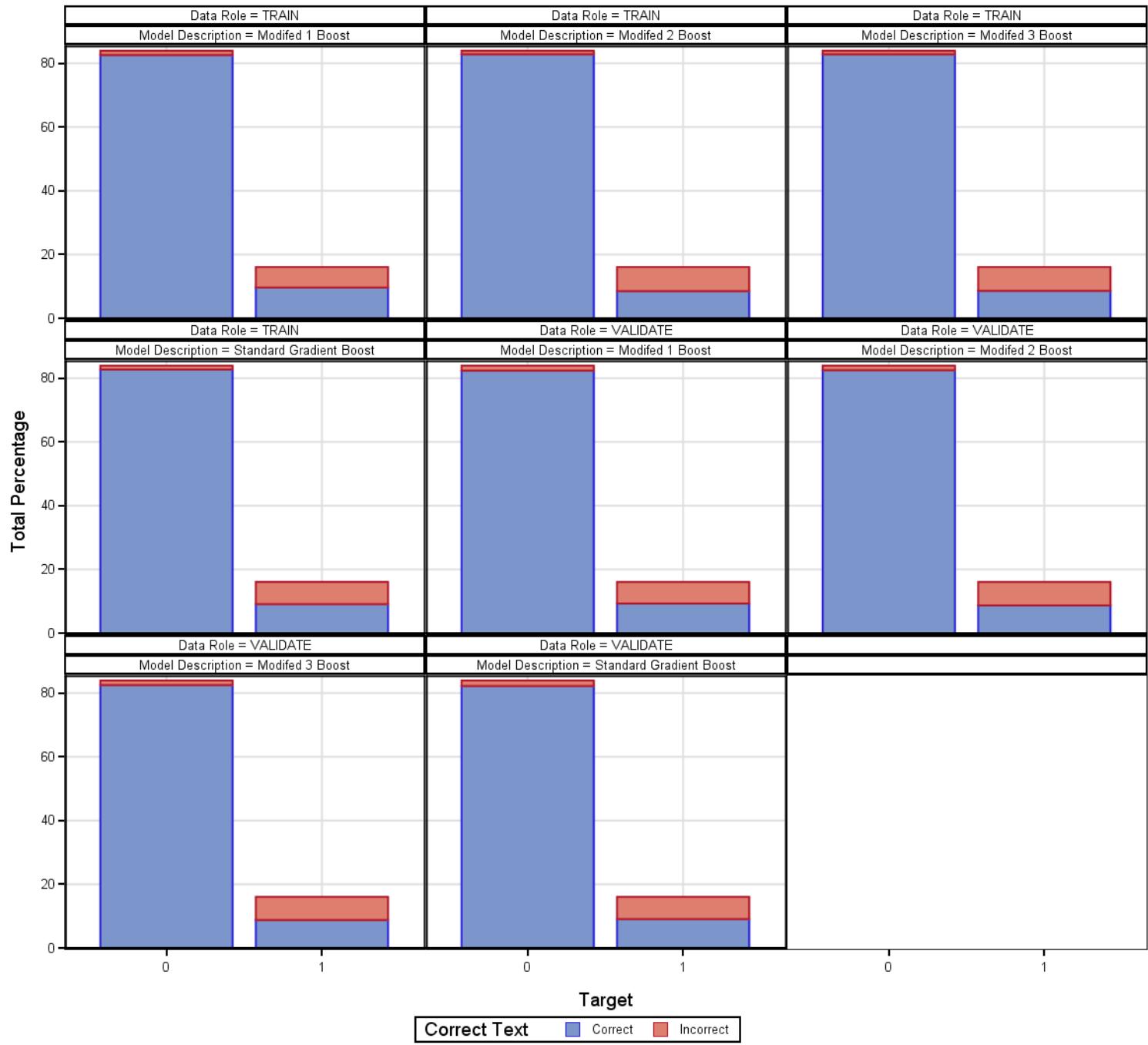
Selected Model	Predecessor Node	Model Node	Model Description	Target Variable	Target Label	Selection Criterion: Valid: Misclassification Rate	Train: Average Squared Error	Train: Misclassification Rate	Train: Kolmogorov-Smirnov Statistic
Y	Boost2	Boost2	Modified 1 Boost	Attrition_Flag		0.083457	0.058831	0.077596	0.772
	Boost4	Boost4	Modified 3 Boost	Attrition_Flag		0.086914	0.063420	0.085779	0.762
	Boost	Boost	Standard Gradient Boost	Attrition_Flag		0.086914	0.064052	0.081828	0.749
	Boost3	Boost3	Modified 2 Boost	Attrition_Flag		0.087901	0.063914	0.086484	0.764

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	Boost2	Boost2	Modified 1 Boost	Attrition_Flag		0.083457	0.060935	0.083457	0.793
	Boost4	Boost4	Modified 3 Boost	Attrition_Flag		0.086914	0.065582	0.086914	0.773
	Boost	Boost	Standard Gradient Boost	Attrition_Flag		0.086914	0.066410	0.086914	0.772
	Boost3	Boost3	Modified 2 Boost	Attrition_Flag		0.087901	0.066286	0.087901	0.771

## Classification Chart

TARGET='Attrition\_Flag' and \_TYPE\_='PREDICTION'

SAS Enterprise Miner Report  
Node=COMPARE BOOSTING  
Classification Chart  
TARGET='Attrition\_Flag' and \_TYPE\_='PREDICTION'



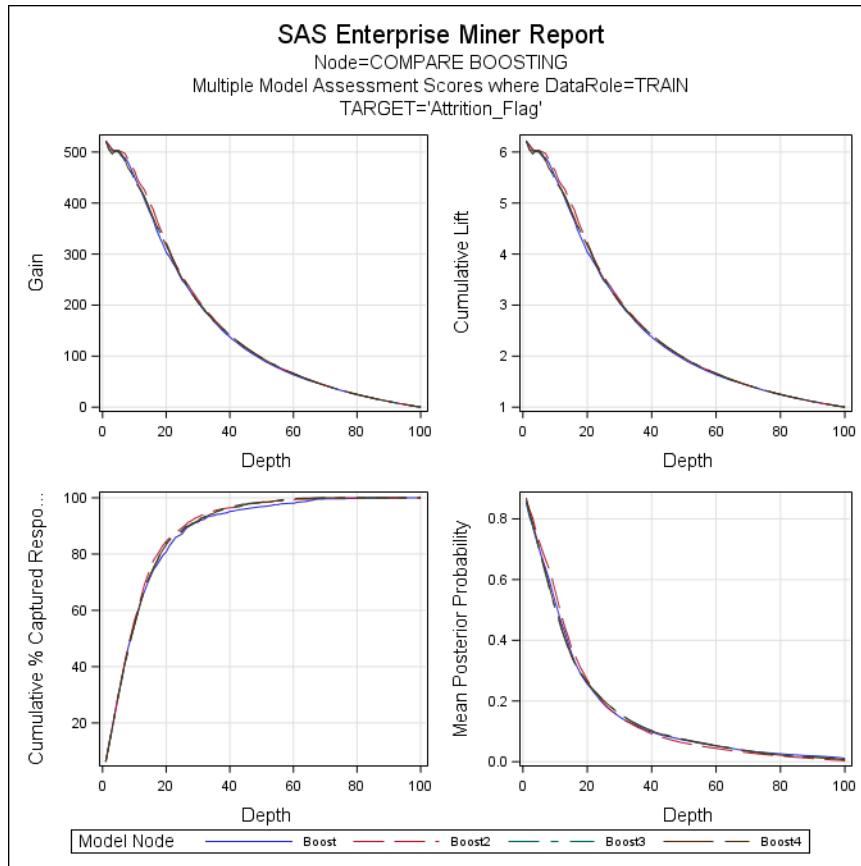
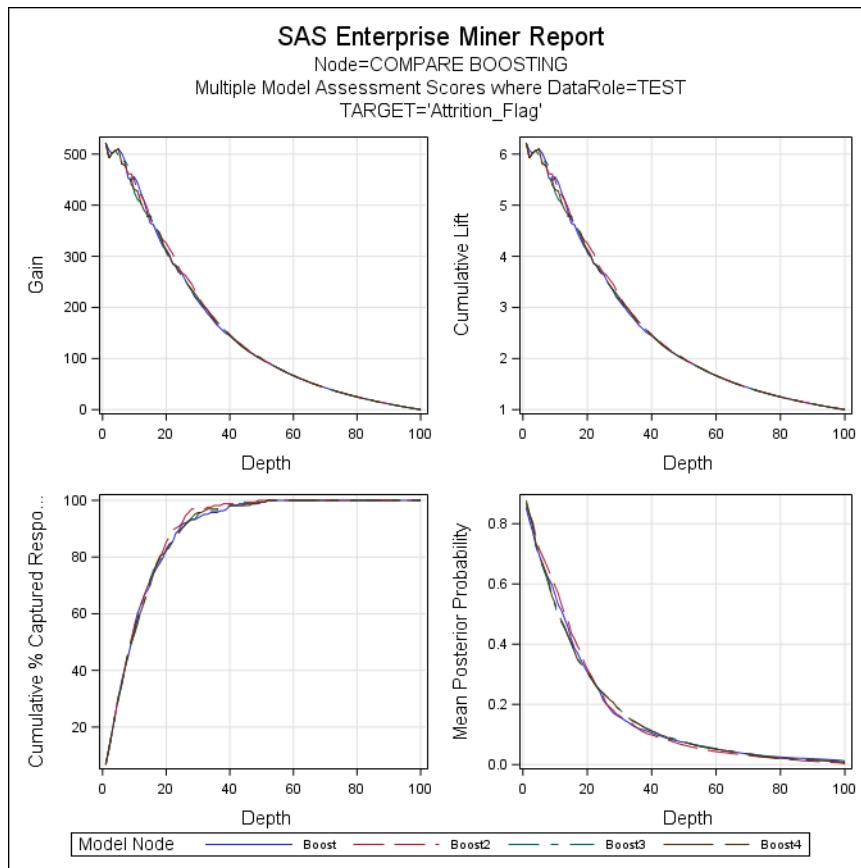
# SAS Enterprise Miner Report

## Node=COMPARE BOOSTING

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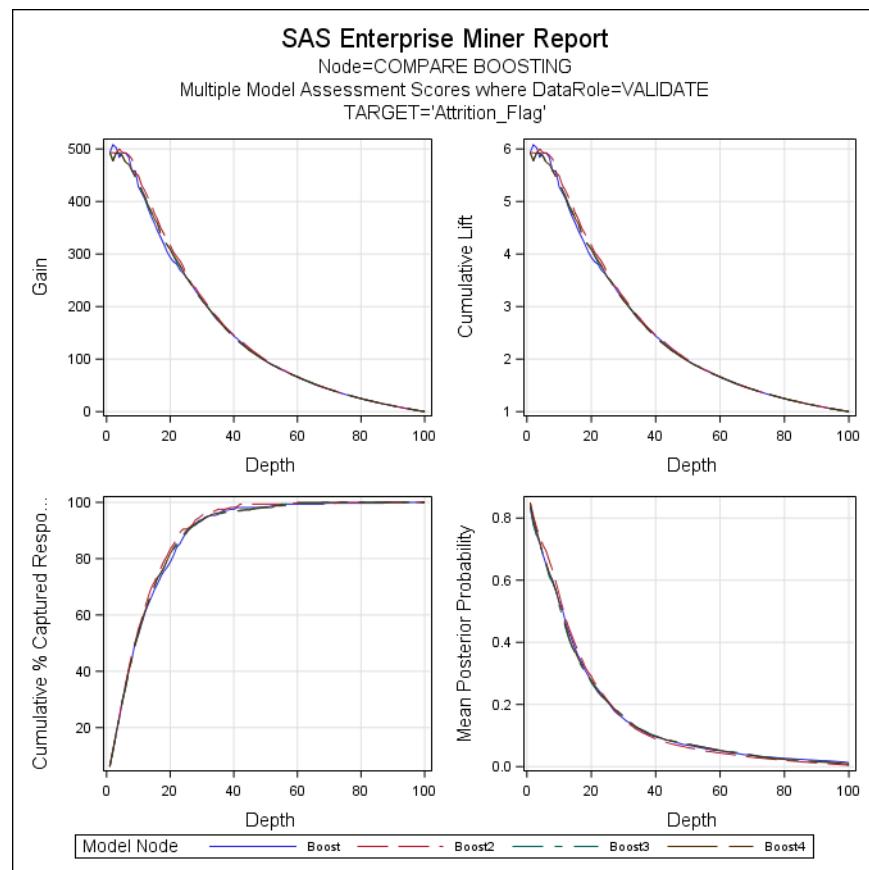
Multiple Model Assessment Scores where DataRole=TEST

TARGET='Attrition\_Flag'

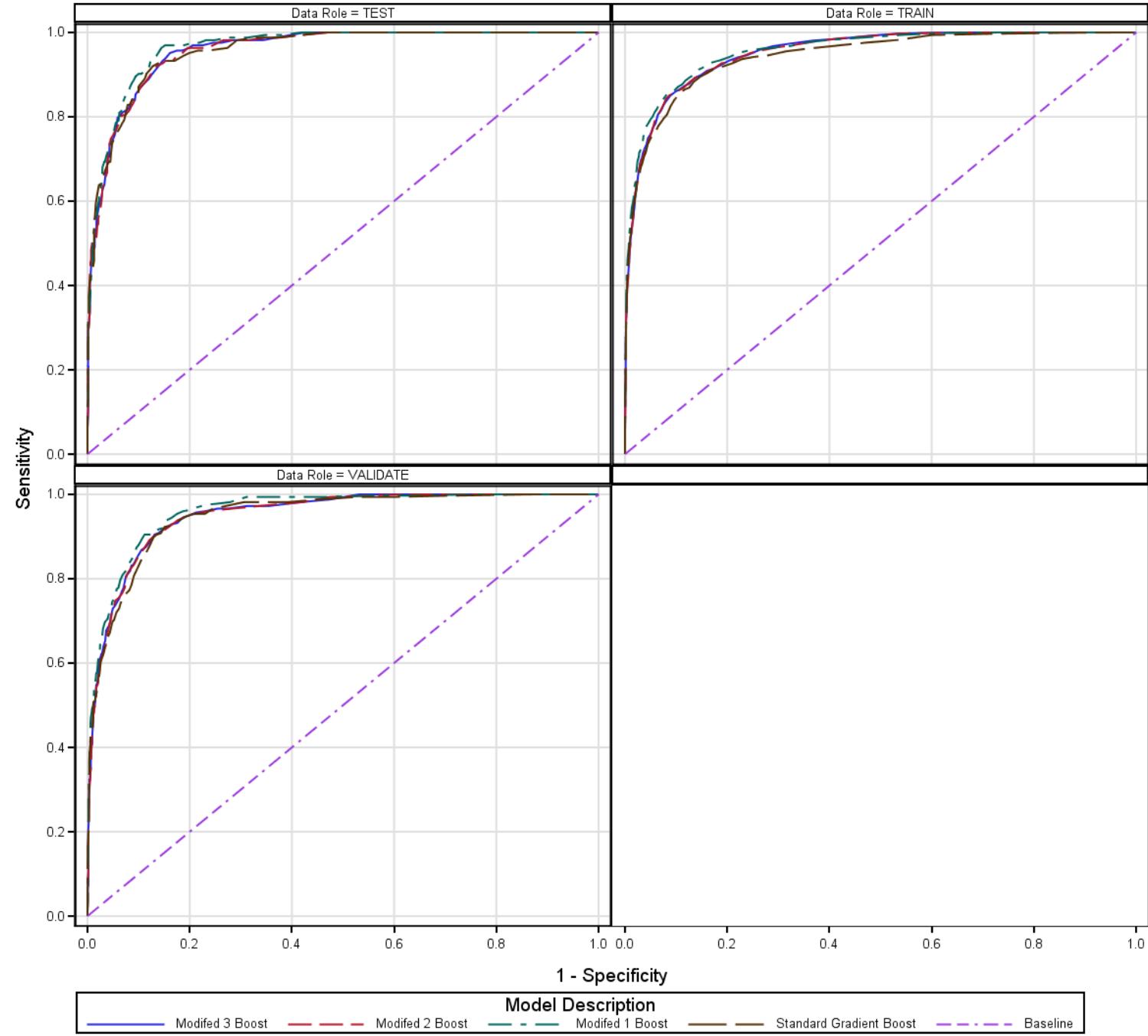


Multiple Model Assessment Scores where DataRole=VALIDATE

TARGET='Attrition\_Flag'



SAS Enterprise Miner Report  
Node=COMPARE BOOSTING  
ROC Chart  
TARGET='Attrition\_Flag' and EVENT='1'



## SAS Enterprise Miner Report

### Node=COMPARE NEURAL Summary

Node id = MdlComp5  
 Node label = COMPARE NEURAL  
 Meta path = Ids => Varsel => Trans => Meta => Trans2 => Meta2 => Part2 => AutoNeural2 => MdlComp5  
 Notes =

### Node=COMPARE NEURAL Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	ModelCompare		NumberOfReportedLevels	1E-6		SelectionData	DEFAULT	
AssessAllTargetLevels	N		NumberofBins	100	20	SelectionDepth	10	
DecileBin	20		ProfitEpsilon	1E-6		SelectionTable	TEST	TABLE
HPCriteria	_MISC_	DEFAULT	RecomputeAssess	N		StatisticUsed	_TMISC_	
LiftEpsilon	1E-6		RocChart	Y		TargetLabel		
ModelCriteria	Test: Misclassification Rate		RocEpsilon	0.01		TargetName	Attrition_Flag	
ModelDescription	AutoNeural 2		RoiEpsilon	1E-6		classViyaCriteria	DEFAULT	
ModelId	AutoNeural2		ScoreDistBin	20		intervalViyaCriteria	DEFAULT	
NormalizeReportingVariables	Y		SelectionCriteria	_MISC_	DEFAULT			

### Node=COMPARE NEURAL Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag

### Node=COMPARE NEURAL Fit Statistics Table

Selected Model	Predecessor Node	Model Node	Model Description	Target Variable	Target Label	Selection Criterion: Test: Misclassification Rate	Train: Average Squared Error	Train: Misclassification Rate	Train: Kolmogorov-Smirnov Statistic
Y	AutoNeural2	AutoNeural2	AutoNeural 2	Attrition_Flag		0.057199	0.026467	0.033719	0.898
	HPNNA	HPNNA	HP Neural	Attrition_Flag		0.062130	0.047023	0.060807	0.792
	AutoNeural4	AutoNeural4	AutoNeural 3	Attrition_Flag		0.069034	0.046253	0.062218	0.810
	AutoNeural	AutoNeural	AutoNeural	Attrition_Flag		0.089744	0.060660	0.079853	0.753

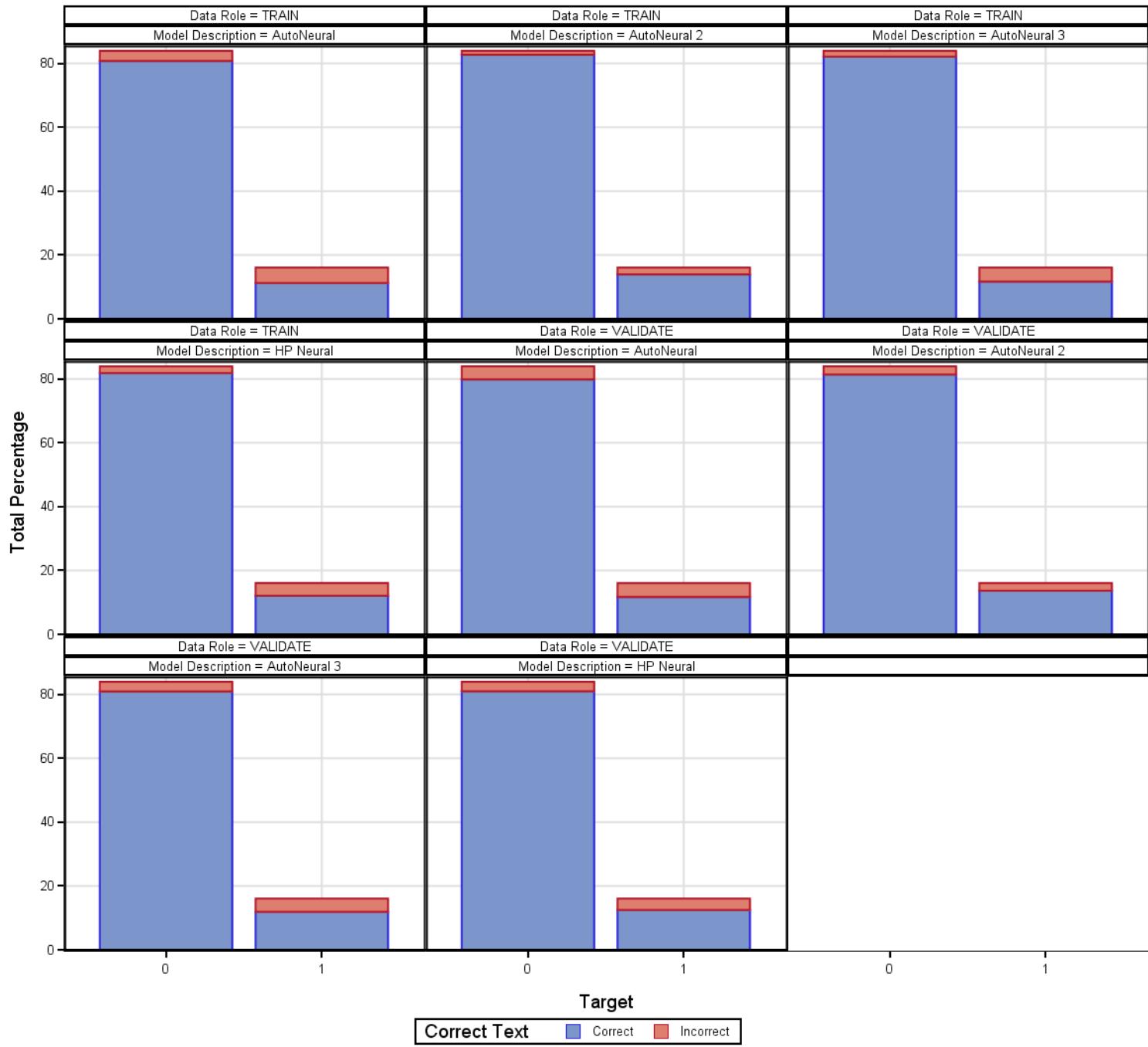
Selected Model	Predecessor Node	Model Node	Model Description	Target Variable	Target Label	Selection Criterion: Test: Misclassification Rate	Valid: Average Squared Error	Valid: Misclassification Rate	Valid: Kolmogorov-Smirnov Statistic
Y	AutoNeural2	AutoNeural2	AutoNeural 2	Attrition_Flag		0.057199	0.041664	0.049383	0.836
	HPNNA	HPNNA	HP Neural	Attrition_Flag		0.062130	0.050837	0.065185	0.786
	AutoNeural4	AutoNeural4	AutoNeural 3	Attrition_Flag		0.069034	0.053345	0.071605	0.783
	AutoNeural	AutoNeural	AutoNeural	Attrition_Flag		0.089744	0.061241	0.084444	0.759

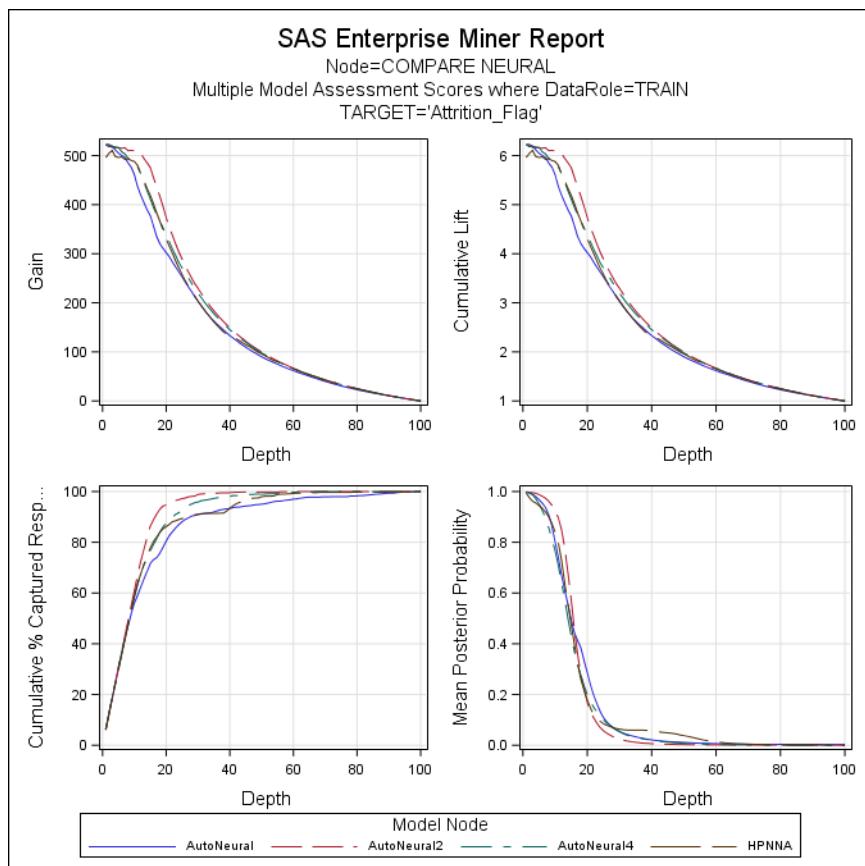
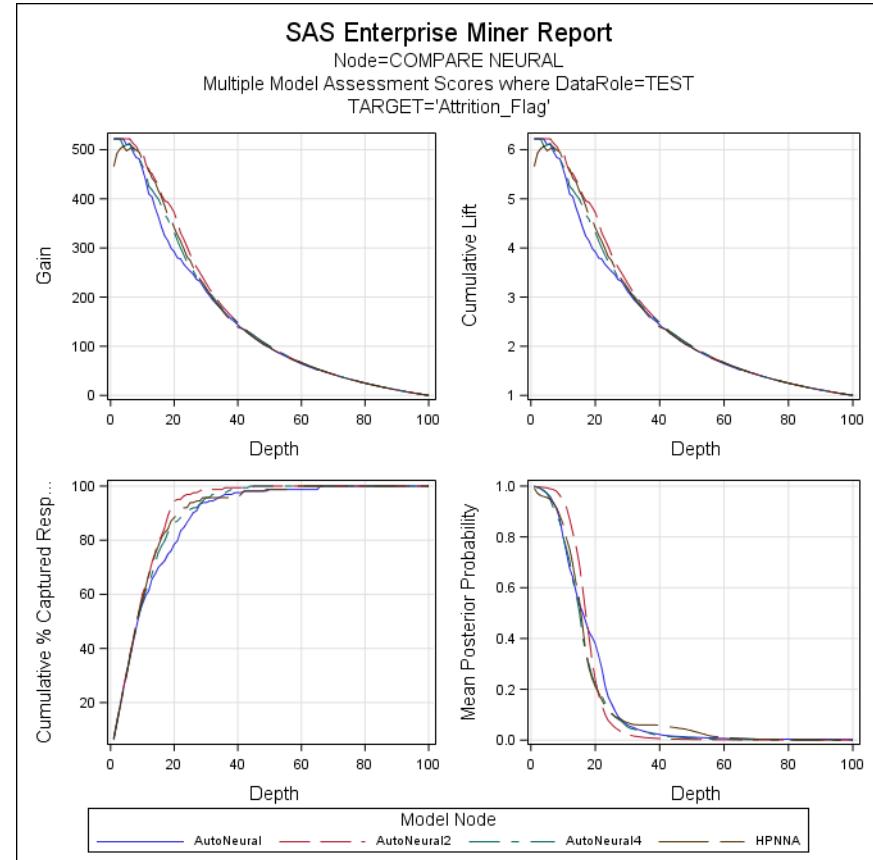
## SAS Enterprise Miner Report

Node=COMPARE NEURAL

Classification Chart

TARGET='Attrition\_Flag' and \_TYPE\_='PREDICTION'

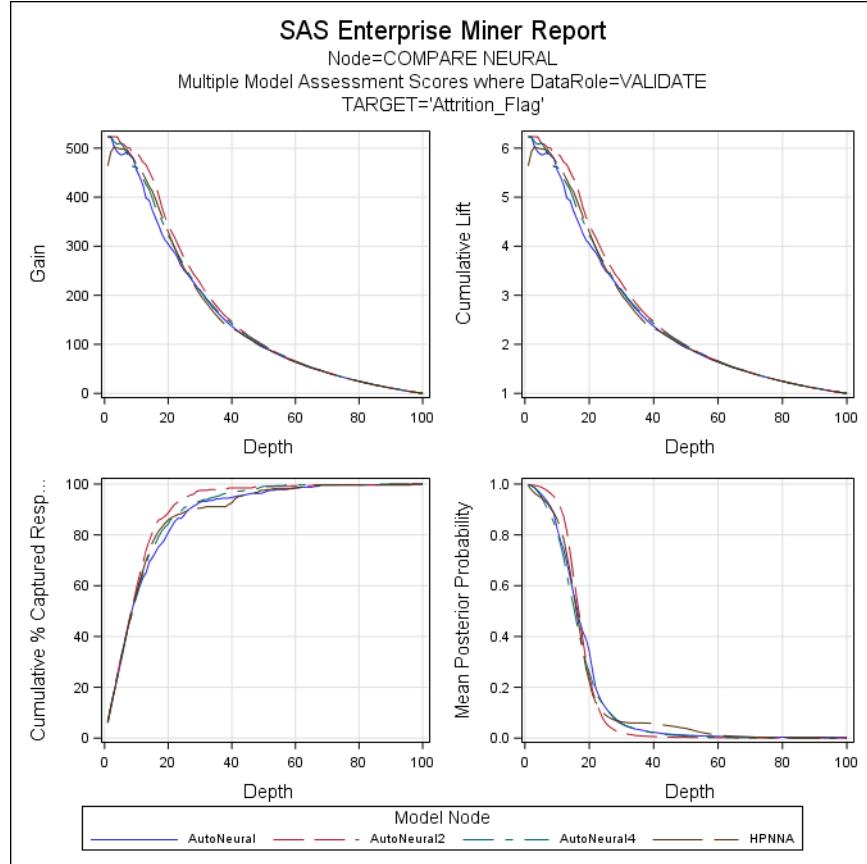




Node=COMPARE NEURAL

Multiple Model Assessment Scores where DataRole=VALIDATE

TARGET='Attrition\_Flag'

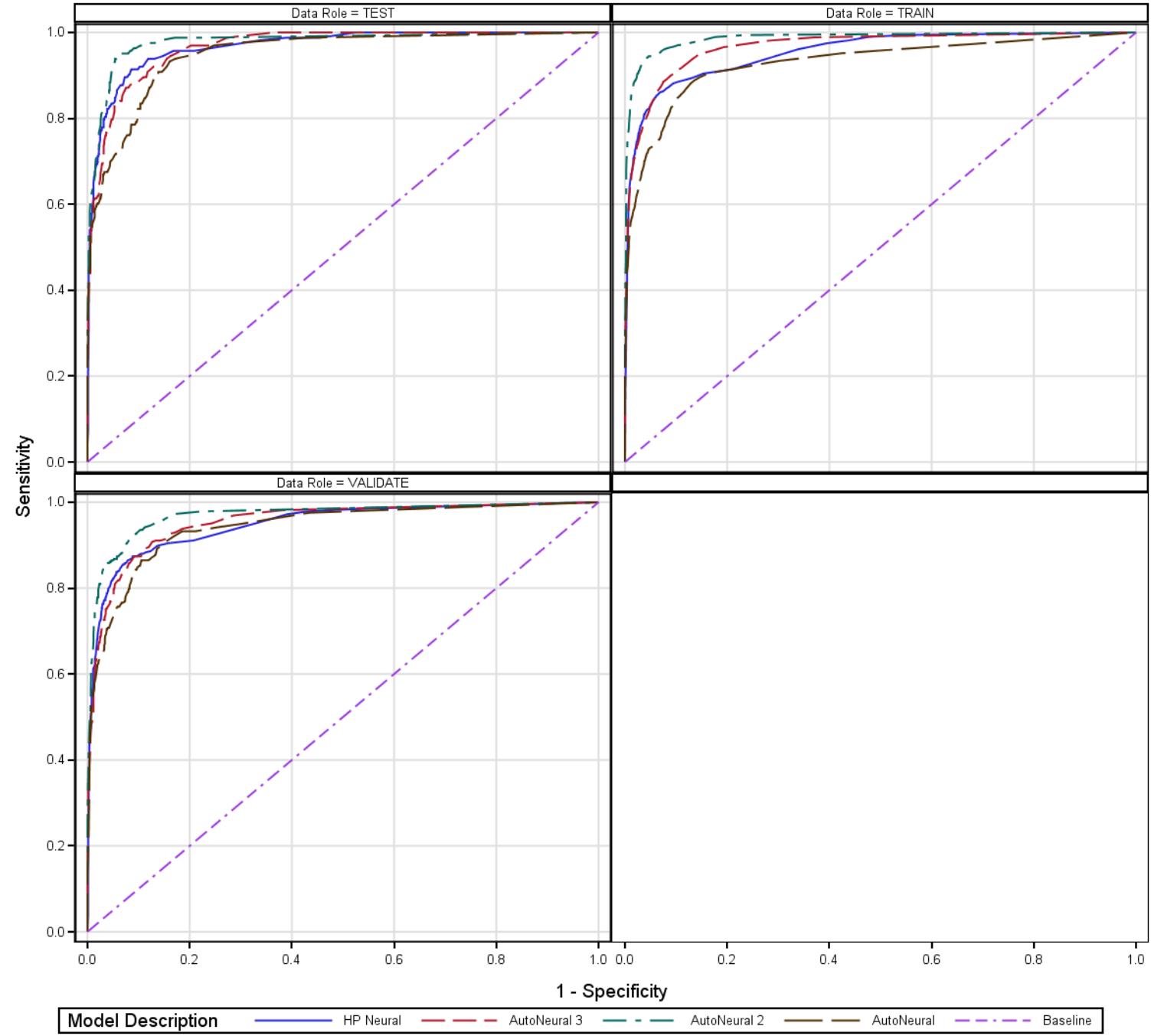


Node=COMPARE NEURAL

ROC Chart

TARGET='Attrition\_Flag' and EVENT='1'

SAS Enterprise Miner Report  
Node=COMPARE NEURAL  
ROC Chart  
TARGET='Attrition\_Flag' and EVENT='1'



## SAS Enterprise Miner Report

### Node=COMPARE LOGIT Summary

Node id = MdlComp  
 Node label = COMPARE LOGIT  
 Meta path = Ids => Varsel => Trans => Meta => Trans2 => Meta2 => Part => Reg => MdlComp  
 Notes =

### Node=COMPARE LOGIT Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	ModelCompare		NumberOfReportedLevels	1E-6		SelectionData	DEFAULT	
AssessAllTargetLevels	N		NumberofBins	100	20	SelectionDepth	10	
DecileBin	20		ProfitEpsilon	1E-6		SelectionTable	VALIDATE	TABLE
HPCriteria	DEFAULT		RecomputeAssess	N		StatisticUsed	_VMISC_	
LiftEpsilon	1E-6		RocChart	Y		TargetLabel		
ModelCriteria	Valid: Misclassification Rate		RocEpsilon	0.01		TargetName	Attrition_Flag	
ModelDescription	FULL LOGIT		RoiEpsilon	1E-6		classViyaCriteria	DEFAULT	
ModelId	Reg		ScoreDistBin	20		intervalViyaCriteria	DEFAULT	
NormalizeReportingVariables	Y		SelectionCriteria	_MISC_	DEFAULT			

### Node=COMPARE LOGIT Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag

### Node=COMPARE LOGIT 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	Reg	Reg	FULL LOGIT	Attrition_Flag		0.080537	0.058082	0.076508	0.74
	Reg2	Reg2	BACKWARD LOGIT	Attrition_Flag		0.080537	0.058082	0.076508	0.74
	Reg3	Reg3	STEPWISE LOGIT	Attrition_Flag		0.080537	0.058082	0.076508	0.74
	Reg4	Reg4	FOWARD LOGIT	Attrition_Flag		0.080537	0.058082	0.076508	0.74

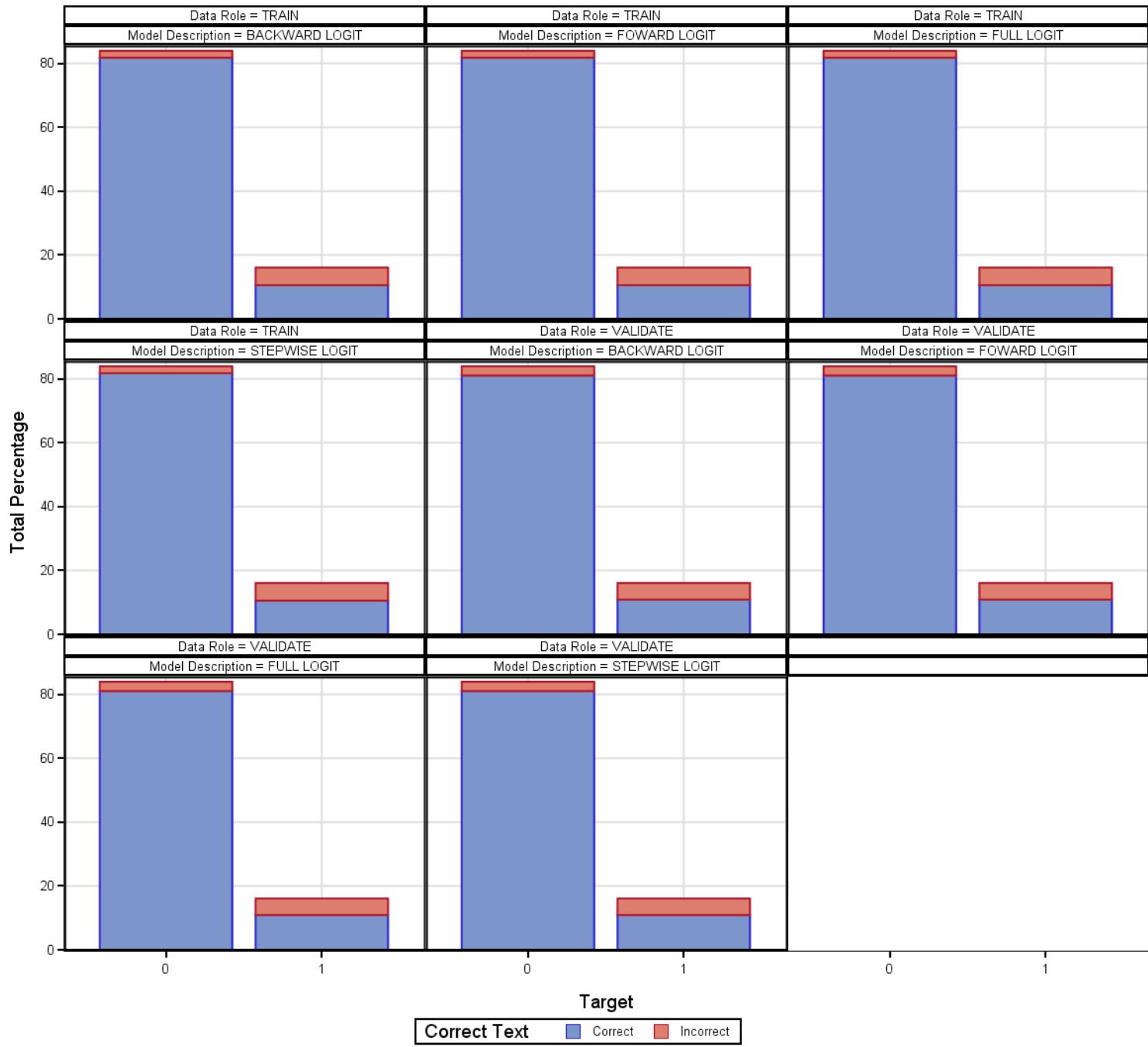
Selected Model	Predecessor Node	Model Node	Model Description	Target Variable	Target Label	Selection Criterion: Valid: Misclassification Rate	Valid: Average Squared Error	Valid: Misclassification Rate	Valid: Kolmogorov-Smirnov Statistic
Y	Reg	Reg	FULL LOGIT	Attrition_Flag		0.080537	0.058589	0.080537	0.75
	Reg2	Reg2	BACKWARD LOGIT	Attrition_Flag		0.080537	0.058589	0.080537	0.75
	Reg3	Reg3	STEPWISE LOGIT	Attrition_Flag		0.080537	0.058589	0.080537	0.75
	Reg4	Reg4	FOWARD LOGIT	Attrition_Flag		0.080537	0.058589	0.080537	0.75

## SAS Enterprise Miner Report

Node=COMPARE LOGIT

Classification Chart

TARGET='Attrition\_Flag' and \_TYPE\_='PREDICTION'



# SAS Enterprise Miner Report

Node=COMPARE LOGIT

Multiple Model Assessment Scores where DataRole=TRAIN

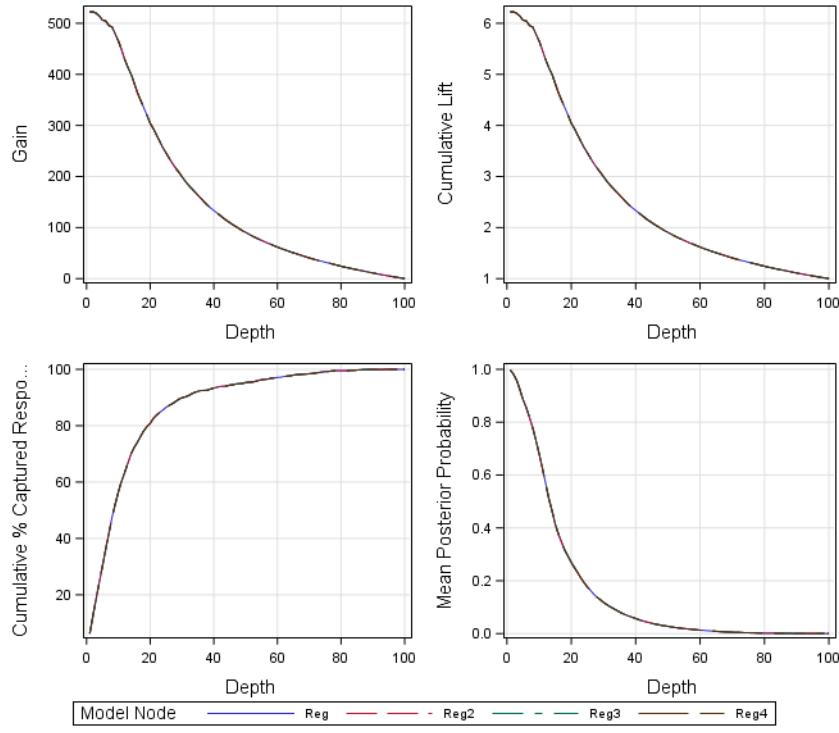
TARGET='Attrition\_Flag'

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## SAS Enterprise Miner Report

Node=COMPARE LOGIT

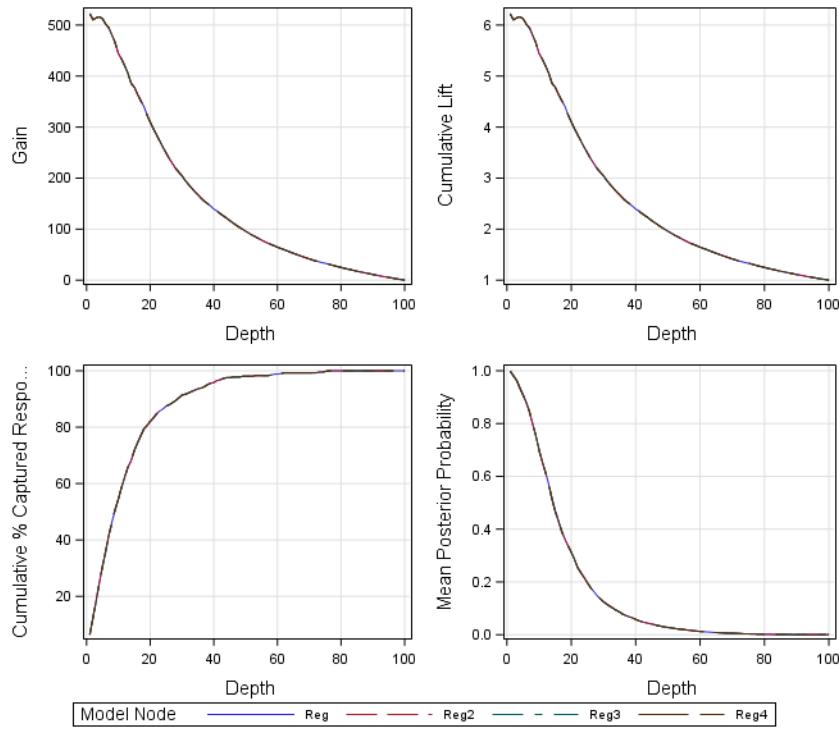
Multiple Model Assessment Scores where DataRole=TRAIN  
TARGET='Attrition\_Flag'



## SAS Enterprise Miner Report

Node=COMPARE LOGIT

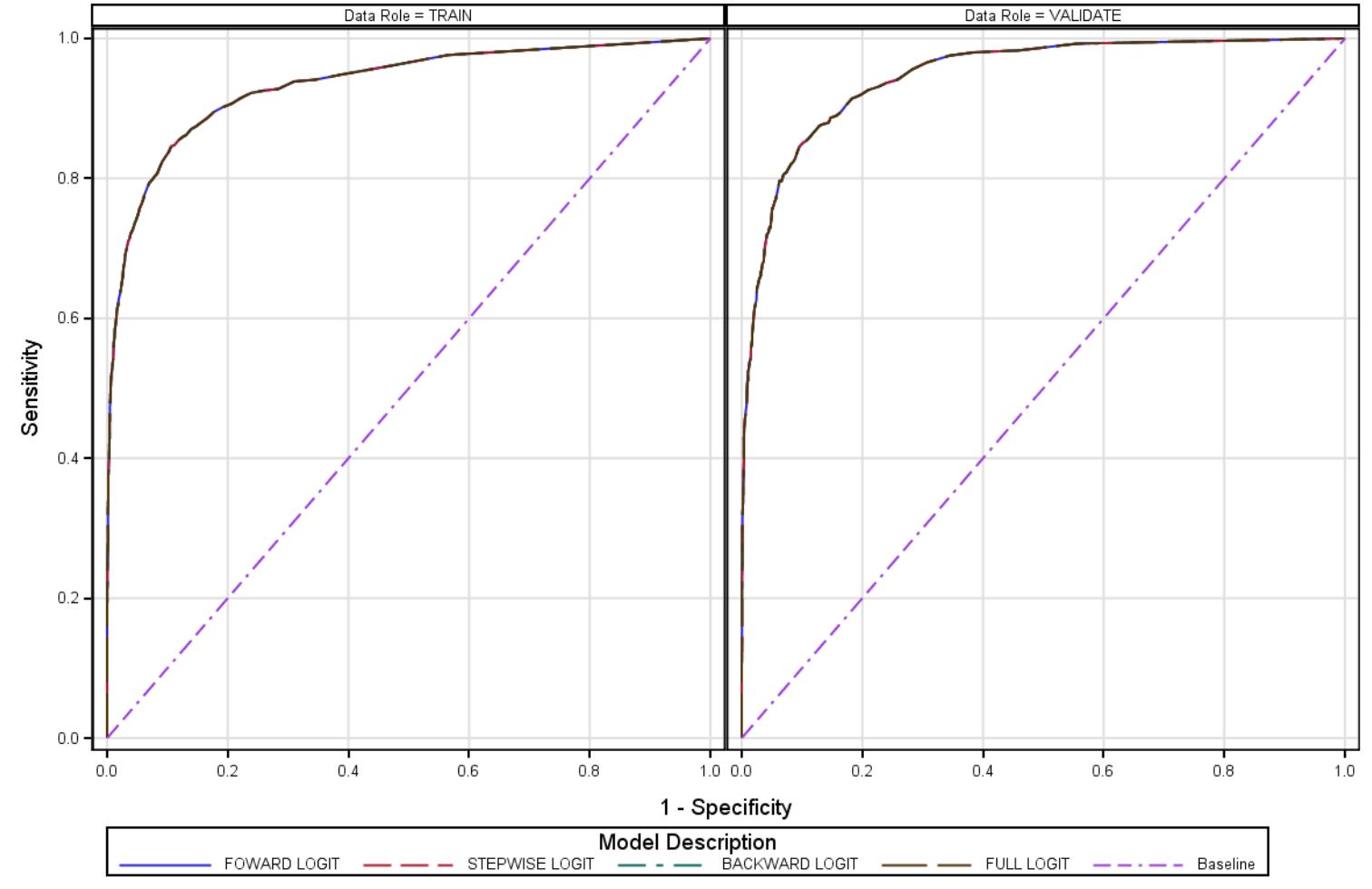
Multiple Model Assessment Scores where DataRole=VALIDATE  
TARGET='Attrition\_Flag'



## ROC Chart

TARGET='Attrition\_Flag' and EVENT='1'

SAS Enterprise Miner Report  
Node=COMPARE LOGIT  
ROC Chart  
TARGET='Attrition\_Flag' and EVENT='1'



## SAS Enterprise Miner Report

### Node=COMPARE FOREST Summary

Node id = MdlComp6  
 Node label = COMPARE FOREST  
 Meta path = Ids => Varsel => Trans => Meta => Trans2 => Meta2 => Part2 => HPDMForest3 => MdlComp6  
 Notes =

### Node=COMPARE FOREST Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	ModelCompare		NumberOfReportedLevels	1E-6		SelectionData	DEFAULT	
AssessAllTargetLevels	N		NumberofBins	100	20	SelectionDepth	10	
DecileBin	20		ProfitEpsilon	1E-6		SelectionTable	TEST	TABLE
HPCriteria	_MISC_	DEFAULT	RecomputeAssess	N		StatisticUsed	_TMISC_	
LiftEpsilon	1E-6		RocChart	Y		TargetLabel		
ModelCriteria	Test: Misclassification Rate		RocEpsilon	0.01		TargetName	Attrition_Flag	
ModelDescription	Modified Forest 1		RoiEpsilon	1E-6		classViyaCriteria	DEFAULT	
ModelId	HPDMForest3		ScoreDistBin	20		intervalViyaCriteria	DEFAULT	
NormalizeReportingVariables	Y		SelectionCriteria	_MISC_	DEFAULT			

### Node=COMPARE FOREST Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag

### Node=COMPARE FOREST Fit Statistics Table

Selected Model	Predecessor Node	Model Node	Model Description	Target Variable	Target Label	Selection Criterion: Test: Misclassification Rate	Train: Average Squared Error	Train: Misclassification Rate	Train: Kolmogorov-Smirnov Statistic
Y	HPDMForest3	HPDMForest3	Modified Forest 1	Attrition_Flag		0.058185	0.038908	0.050226	0.896
	HPDMForest	HPDMForest	Standard Forest	Attrition_Flag		0.060158	0.038595	0.048392	0.894
	HPDMForest4	HPDMForest4	Modified Forest 2	Attrition_Flag		0.060158	0.038879	0.050085	0.896
	HPDMForest2	HPDMForest2	Modified Forest 3	Attrition_Flag		0.060158	0.038798	0.049661	0.896

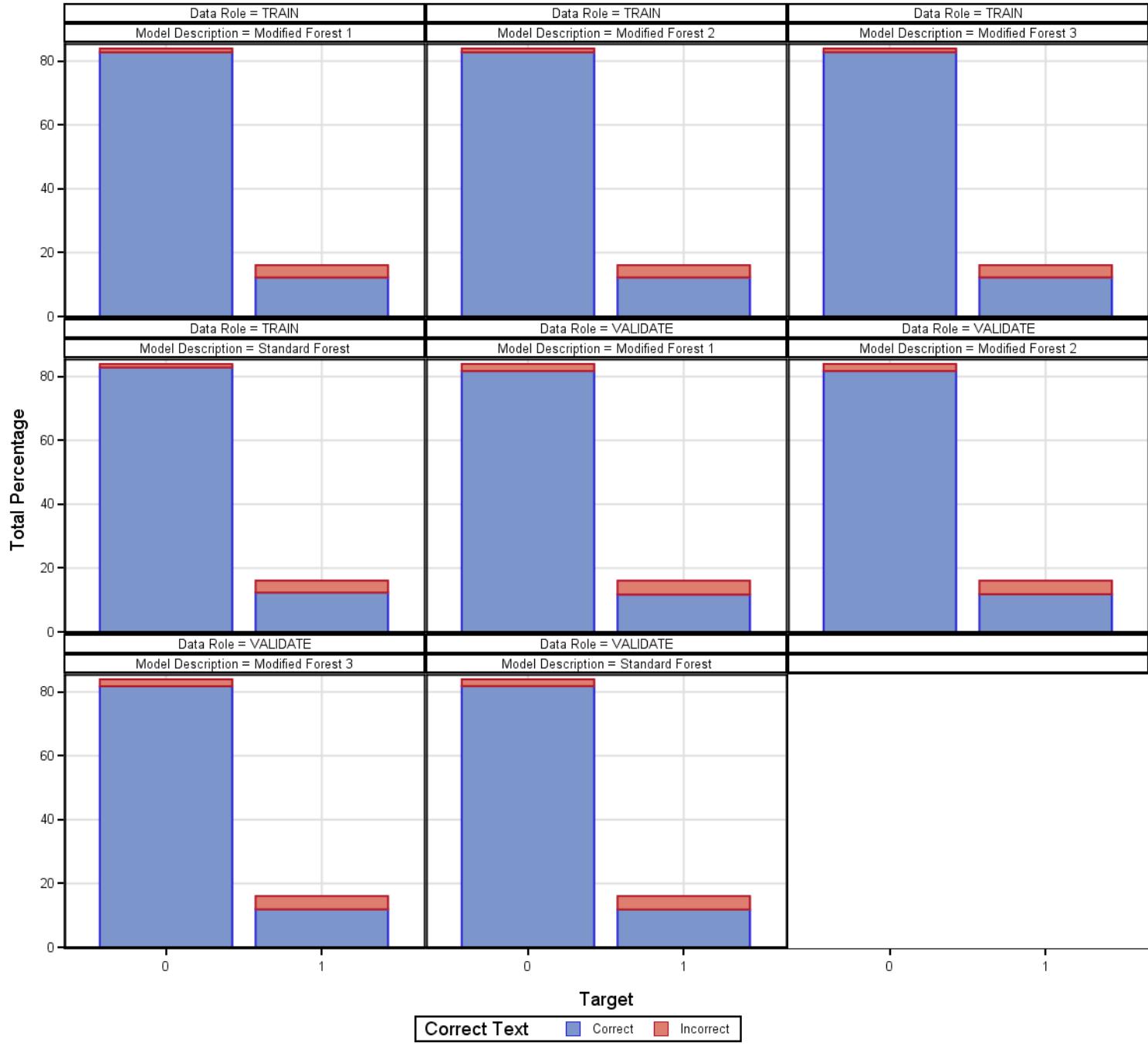
Selected Model	Predecessor Node	Model Node	Model Description	Target Variable	Target Label	Selection Criterion: Test: Misclassification Rate	Valid: Average Squared Error	Valid: Misclassification Rate	Valid: Kolmogorov-Smirnov Statistic
Y	HPDMForest3	HPDMForest3	Modified Forest 1	Attrition_Flag		0.058185	0.046729	0.065679	0.870
	HPDMForest	HPDMForest	Standard Forest	Attrition_Flag		0.060158	0.045670	0.063210	0.876
	HPDMForest4	HPDMForest4	Modified Forest 2	Attrition_Flag		0.060158	0.046217	0.064691	0.872
	HPDMForest2	HPDMForest2	Modified Forest 3	Attrition_Flag		0.060158	0.046237	0.063210	0.871

## SAS Enterprise Miner Report

Node=COMPARE FOREST

Classification Chart

TARGET='Attrition\_Flag' and \_TYPE\_='PREDICTION'

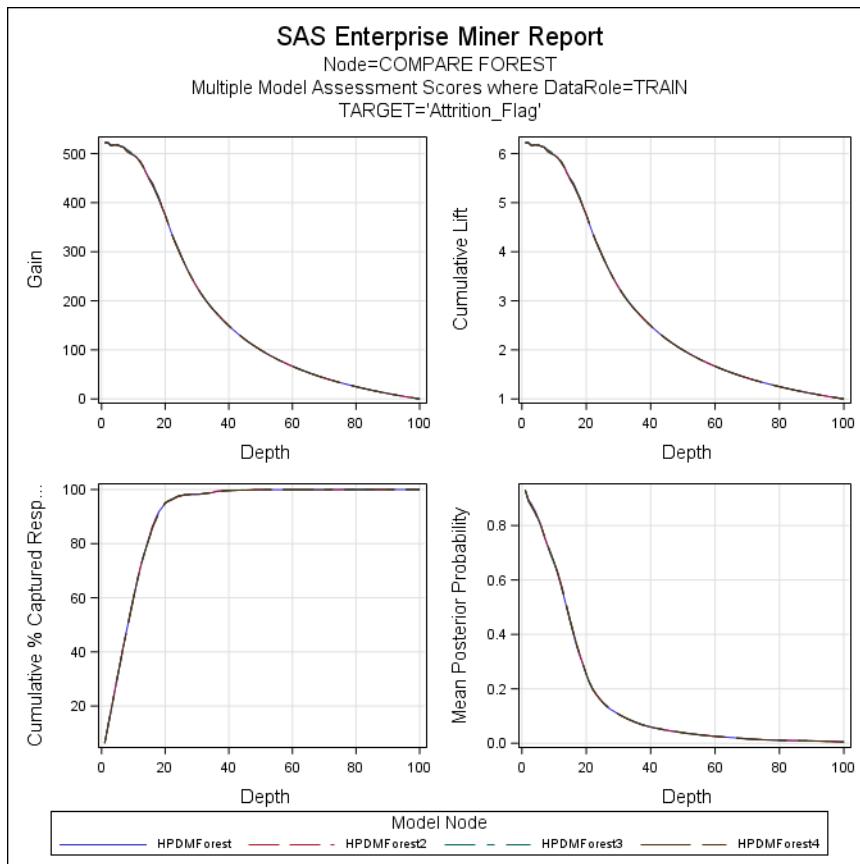
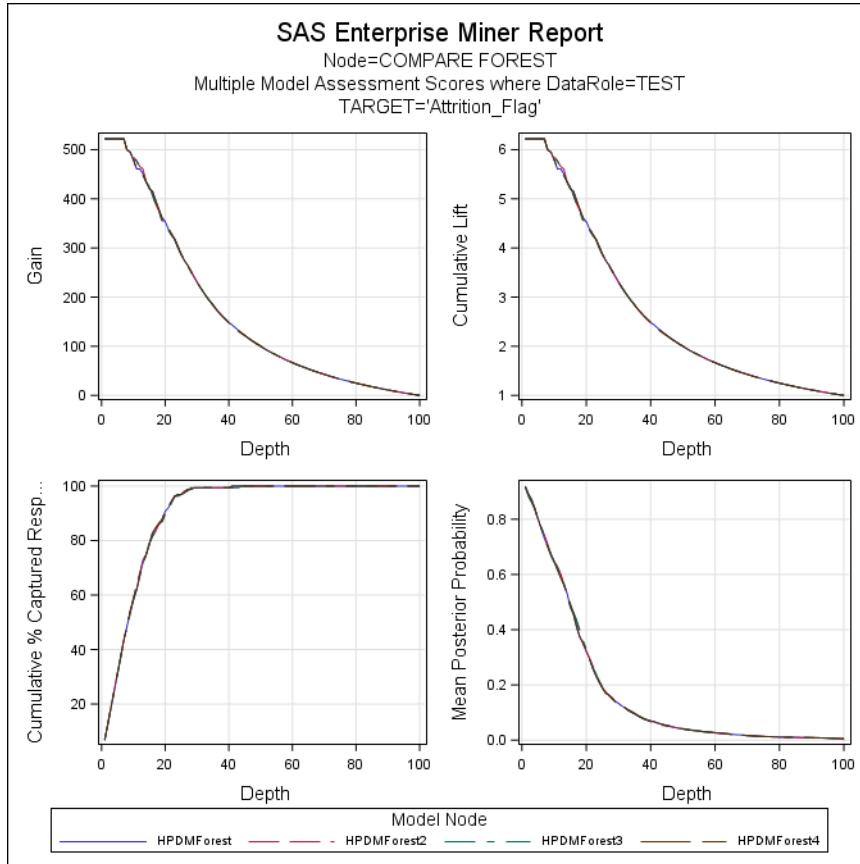


# SAS Enterprise Miner Report

Node=COMPARE FOREST

Multiple Model Assessment Scores where DataRole=TEST

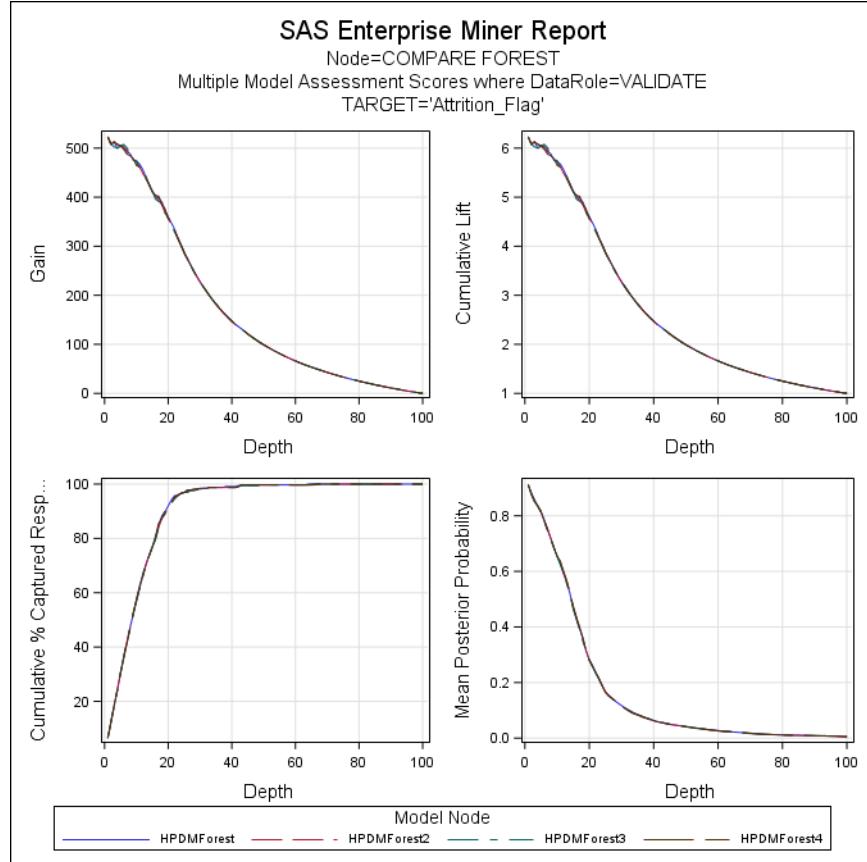
TARGET='Attrition\_Flag'

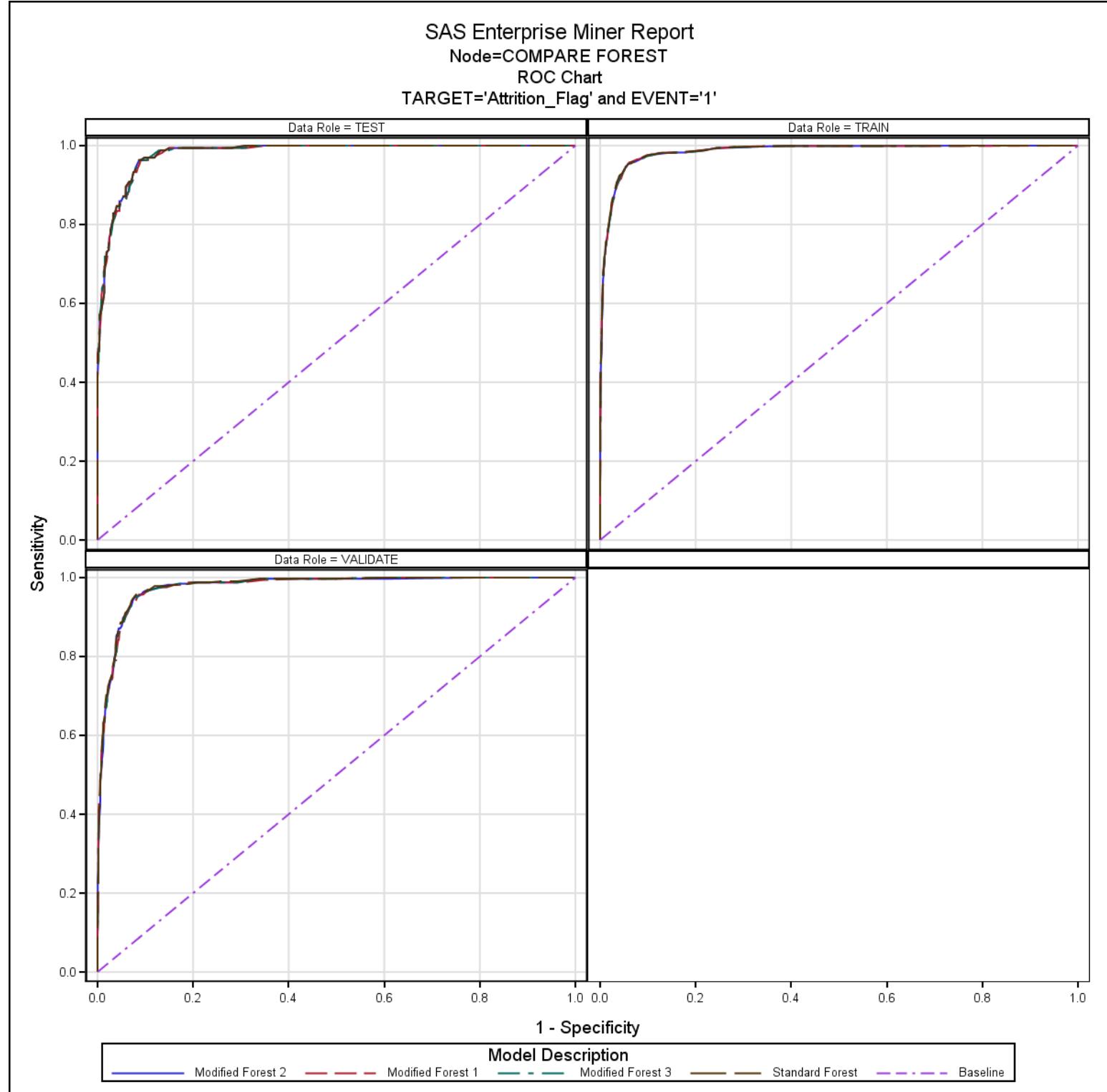


Node=COMPARE FOREST

Multiple Model Assessment Scores where DataRole=VALIDATE

TARGET='Attrition\_Flag'





## SAS Enterprise Miner Report

### Node=Ensemble Summary

Node id = Ensmbl  
 Node label = Ensemble  
 Meta path = Ids => Varsel => Trans => Meta => Trans2 => Meta2 => Part2 => Boost2 => MdlComp4 => E  
 nsmbi  
 Notes =

### Node=Ensemble Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	Ensemble		Posterior	AVERAGE		Predicted	AVERAGE	

### Node=Ensemble Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag
INPUT	INTERVAL	5	RANGE_LOG_Total_Trans_Amt RANGE_SQRT_Avg_Utilization_Ratio RANGE_SQRT_Total_Amt_Chng_Q4_Q1 RANGE_SQRT_Total_Ct_Chng_Q4_Q1 RANGE_Total_Revolving_Bal
INPUT	NOMINAL	5	G_Contacts_Count_12_mon G_Customer_Age G_Months_Inactive_12_mon G_Total_Relationship_Count G_Total_Trans_Ct

### Node=Ensemble Model Fit Statistics

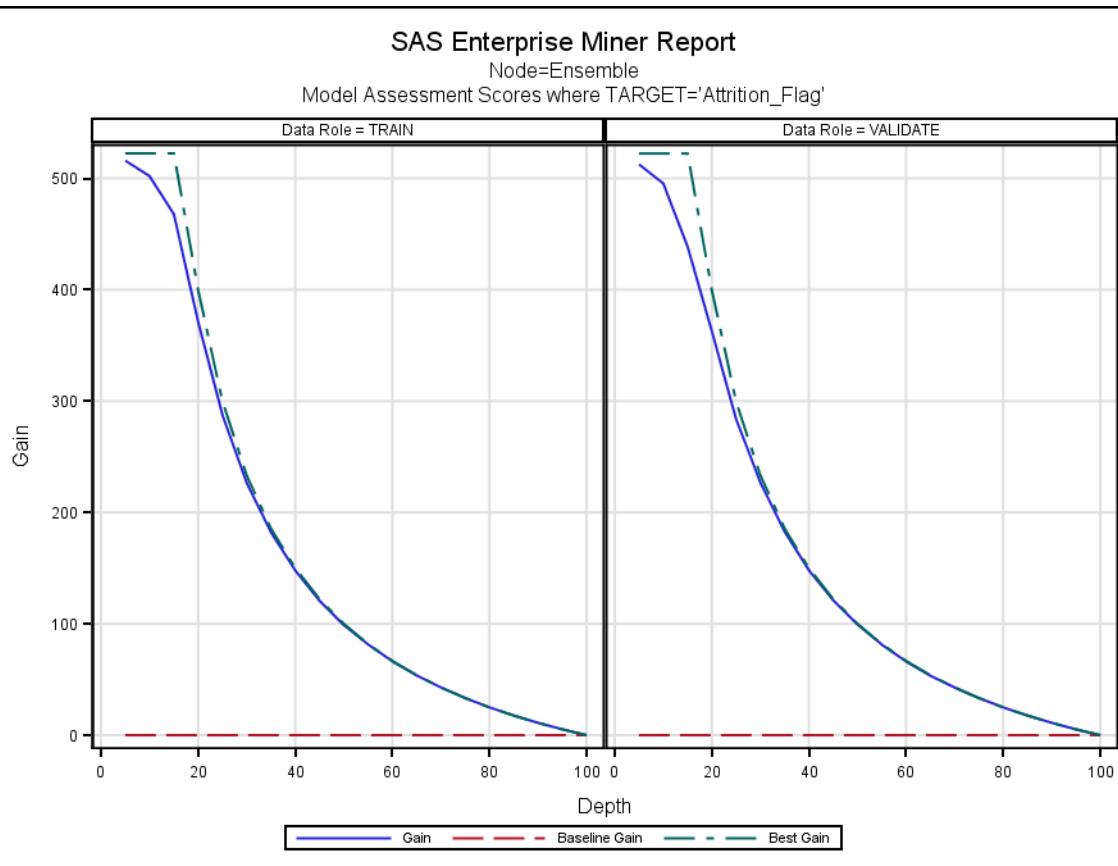
Target=Attrition\_Flag Target Label=''

Label of Statistic	Train	Validation	Test
Average Squared Error	0.04	0.04	0.04
Divisor for ASE	15188.00	5066.00	2028.00
Maximum Absolute Error	0.98	0.98	0.95
Sum of Frequencies	7594.00	2533.00	1014.00
Root Average Squared Error	0.19	0.20	0.20
Sum of Squared Errors	534.65	201.43	80.45
Frequency of Classified Cases	7594.00	2533.00	1014.00
Misclassification Rate	0.04	0.05	0.05
Number of Wrong Classifications	330.00	129.00	52.00

## SAS Enterprise Miner Report

Node=Ensemble

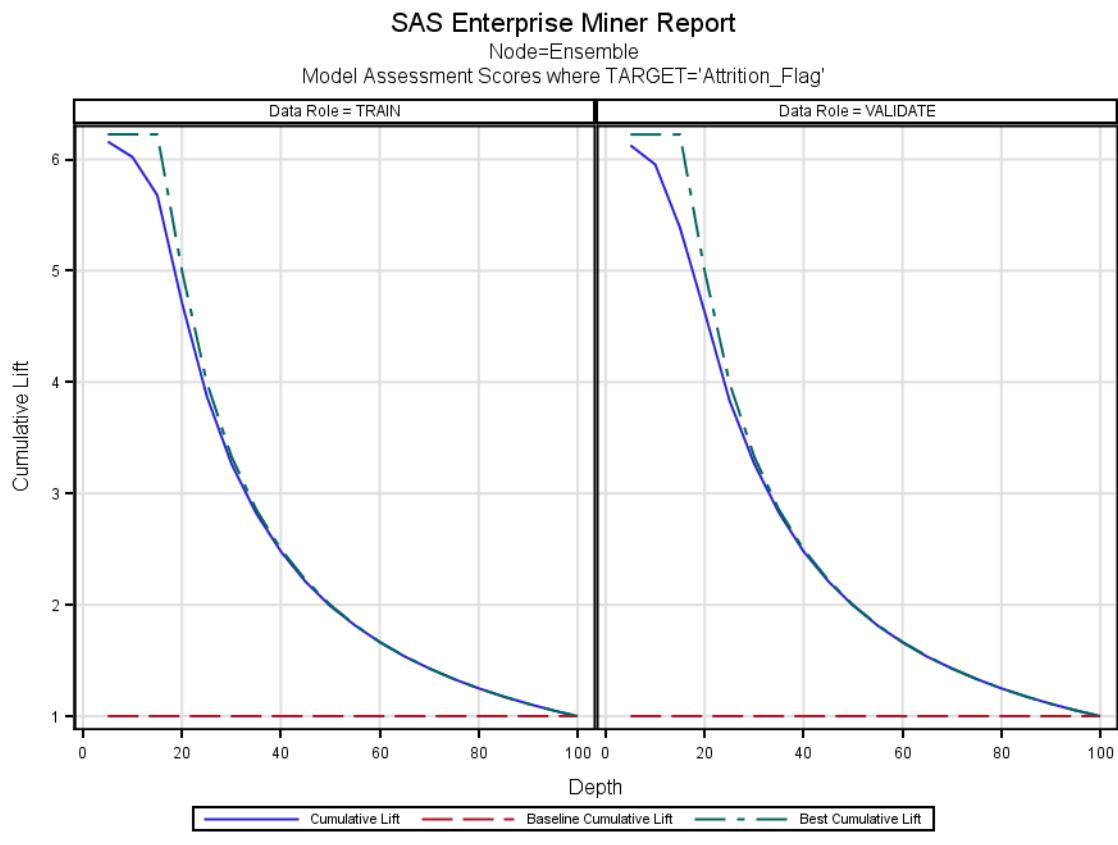
Model Assessment Scores where TARGET='Attrition\_Flag'

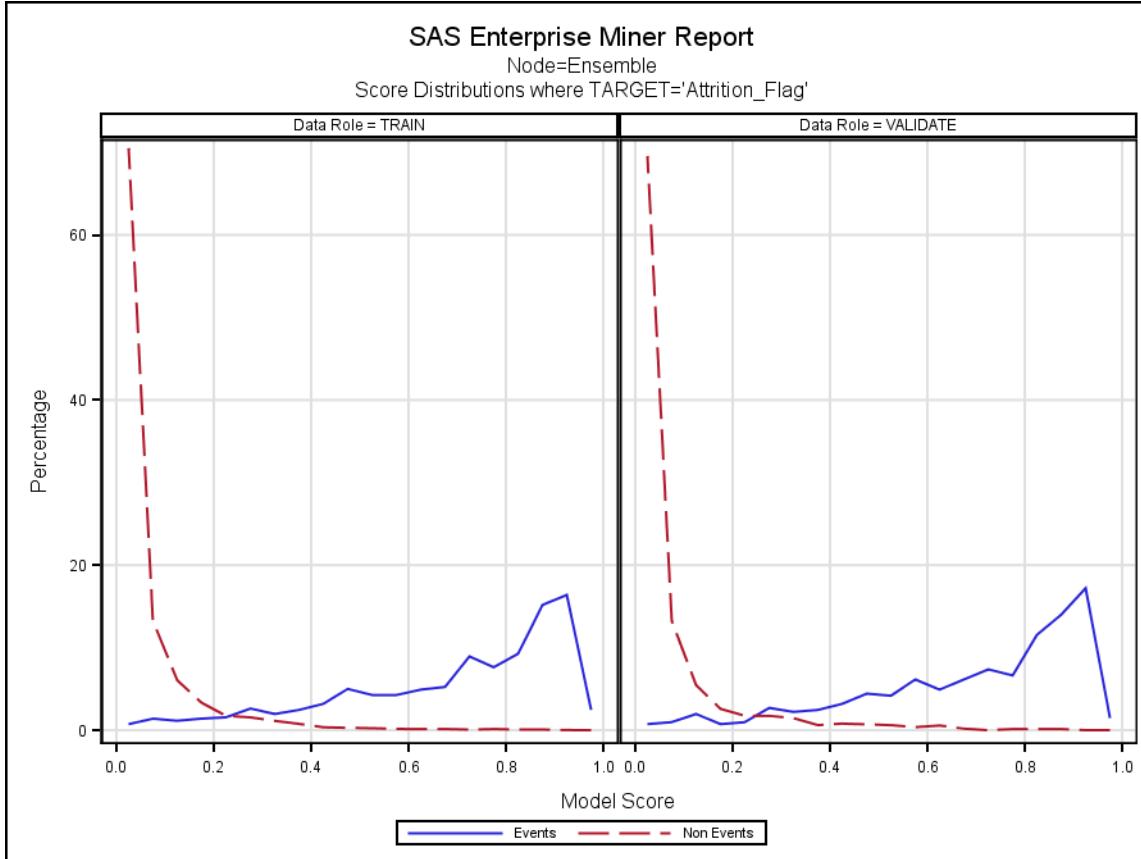
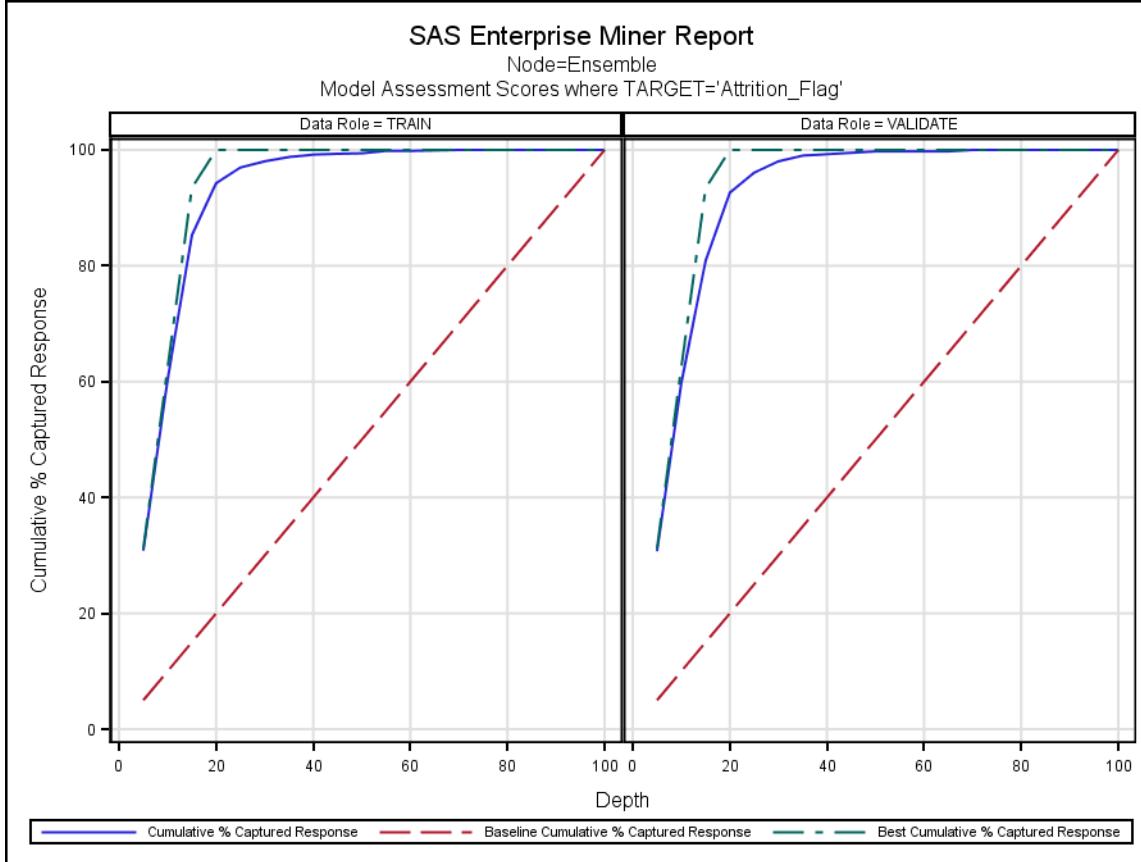


## SAS Enterprise Miner Report

Node=Ensemble

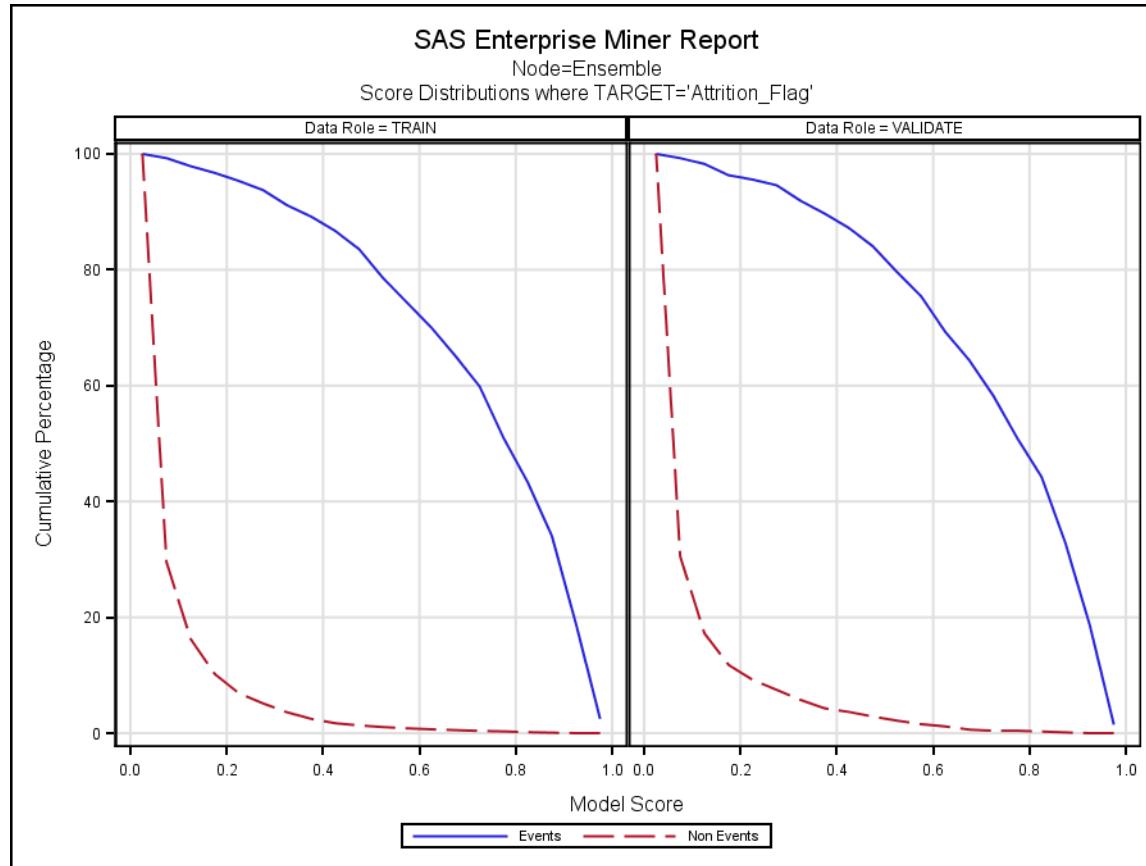
Model Assessment Scores where TARGET='Attrition\_Flag'





Node=Ensemble

## Score Distributions where TARGET='Attrition\_Flag'

**Node=Ensemble**  
**Score Distributions**

Target Variable=Attrition\_Flag 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	30	2.4590	0.0000	2.459	0.000
0.90-0.95	200	16.3934	0.0157	18.852	0.016
0.85-0.90	185	15.1639	0.0784	34.016	0.094
0.80-0.85	113	9.2623	0.0784	43.279	0.173
0.75-0.80	93	7.6230	0.1412	50.902	0.314
0.70-0.75	109	8.9344	0.0784	59.836	0.392
0.65-0.70	64	5.2459	0.1412	65.082	0.533
0.60-0.65	60	4.9180	0.1412	70.000	0.675
0.55-0.60	52	4.2623	0.1569	74.262	0.832
0.50-0.55	52	4.2623	0.2353	78.525	1.067
0.45-0.50	61	5.0000	0.2824	83.525	1.349
0.40-0.45	39	3.1967	0.3608	86.721	1.710
0.35-0.40	30	2.4590	0.7687	89.180	2.479
0.30-0.35	24	1.9672	1.1296	91.148	3.608
0.25-0.30	32	2.6230	1.5532	93.770	5.162
0.20-0.25	19	1.5574	1.7414	95.328	6.903
0.15-0.20	17	1.3934	3.3260	96.721	10.229
0.10-0.15	14	1.1475	6.0402	97.869	16.269
0.05-0.10	17	1.3934	13.2413	99.262	29.511
0.00-0.05	9	0.7377	70.4895	100.000	100.000

Target Variable=Attrition\_Flag 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	6	1.4742	0.0000	1.474	0.000
0.90-0.95	70	17.1990	0.0000	18.673	0.000
0.85-0.90	57	14.0049	0.1411	32.678	0.141
0.80-0.85	47	11.5479	0.1411	44.226	0.282
0.75-0.80	27	6.6339	0.1411	50.860	0.423
0.70-0.75	30	7.3710	0.0000	58.231	0.423
0.65-0.70	25	6.1425	0.1881	64.373	0.611
0.60-0.65	20	4.9140	0.5644	69.287	1.176
0.55-0.60	25	6.1425	0.3763	75.430	1.552
0.50-0.55	17	4.1769	0.6115	79.607	2.164
0.45-0.50	18	4.4226	0.7056	84.029	2.869
0.40-0.45	13	3.1941	0.7996	87.224	3.669
0.35-0.40	10	2.4570	0.6115	89.681	4.280
0.30-0.35	9	2.2113	1.4581	91.892	5.738
0.25-0.30	11	2.7027	1.7404	94.595	7.479
0.20-0.25	4	0.9828	1.7404	95.577	9.219
0.15-0.20	3	0.7371	2.5870	96.314	11.806
0.10-0.15	8	1.9656	5.4563	98.280	17.262
0.05-0.10	4	0.9828	13.2173	99.263	30.480
0.00-0.05	3	0.7371	69.5202	100.000	100.000

## SAS Enterprise Miner Report

### Node=Model Comparison Summary

Node id = MdlComp3  
 Node label = Model Comparison  
 Meta path = Ids => Varsel => Trans => Meta => Trans2 => Meta2 => Part2 => Tree4 => MdlComp2 => Md  
 IComp3  
 Notes =

### Node=Model Comparison Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	ModelCompare		NumberOfReportedLevels	1E-6		SelectionData	DEFAULT	
AssessAllTargetLevels	N		NumberofBins	100	20	SelectionDepth	10	
DecileBin	20		ProfitEpsilon	1E-6		SelectionTable	VALIDATE	TABLE
HPCriteria	DEFAULT		RecomputeAssess	N		StatisticUsed	_VMISC_	
LiftEpsilon	1E-6		RocChart	Y		TargetLabel		
ModelCriteria	Valid: Misclassification Rate		RocEpsilon	0.01		TargetName	Attrition_Flag	
ModelDescription	Modified Tree 3		RoiEpsilon	1E-6		classViyaCriteria	DEFAULT	
ModelId	Tree4		ScoreDistBin	20		intervalViyaCriteria	DEFAULT	
NormalizeReportingVariables	Y		SelectionCriteria	_MISC_	DEFAULT			

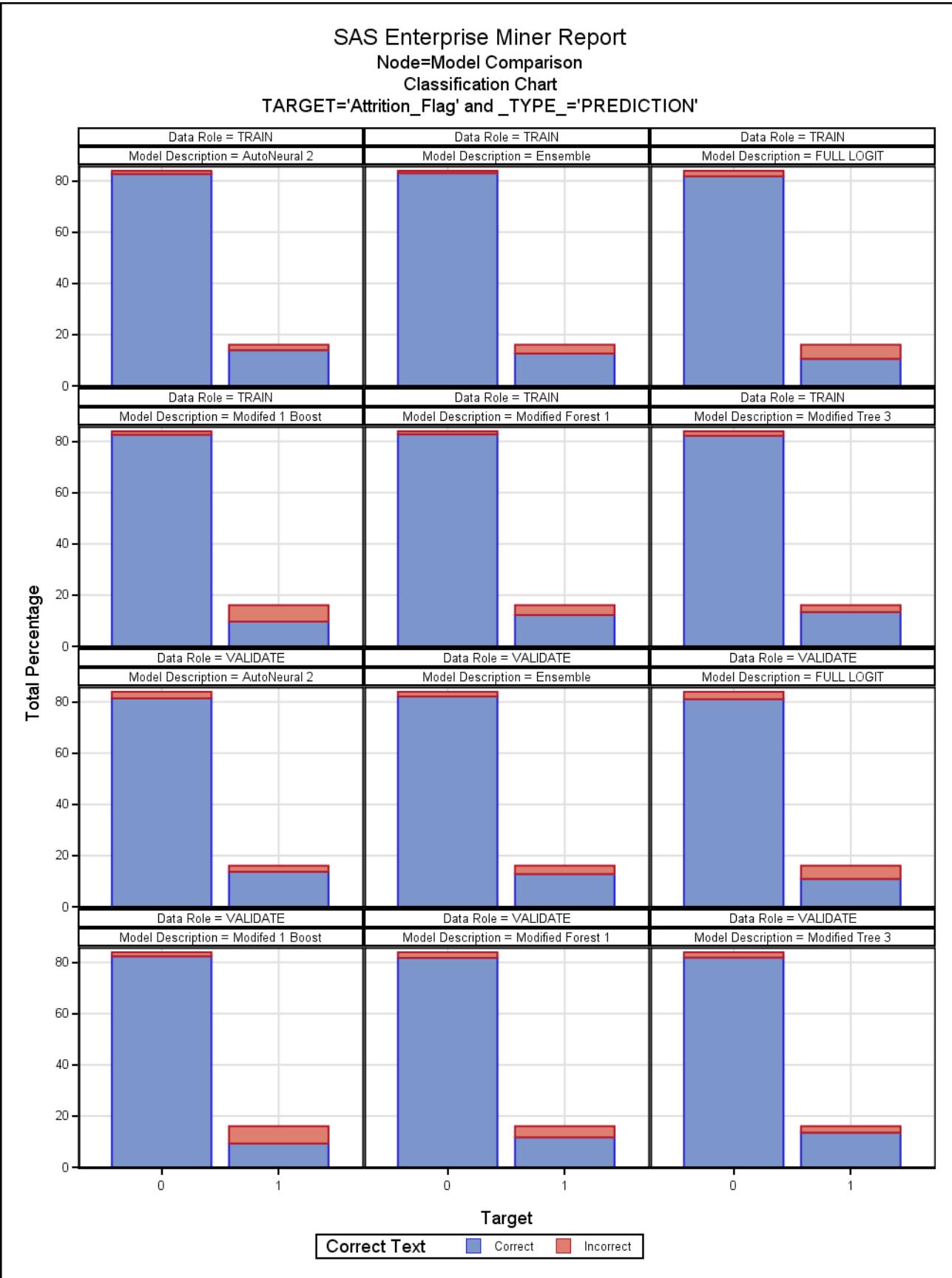
### Node=Model Comparison Variable Summary

Role	Level	Frequency Count	Name
TARGET	BINARY	1	Attrition_Flag

### 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	MdlComp2	Tree4	Modified Tree 3	Attrition_Flag		0.045926	0.037029	0.044441	0.837
	MdlComp5	AutoNeural2	AutoNeural 2	Attrition_Flag		0.049383	0.026467	0.033719	0.898
	Ensmbl	Ensmbl	Ensemble	Attrition_Flag		0.050928	0.035202	0.043455	0.886
	MdlComp6	HPDMForest3	Modified Forest 1	Attrition_Flag		0.065679	0.038908	0.050226	0.896
	MdlComp	Reg	FULL LOGIT	Attrition_Flag		0.080537	0.058082	0.076508	0.740
	MdlComp4	Boost2	Modified 1 Boost	Attrition_Flag		0.083457	0.058831	0.077596	0.772

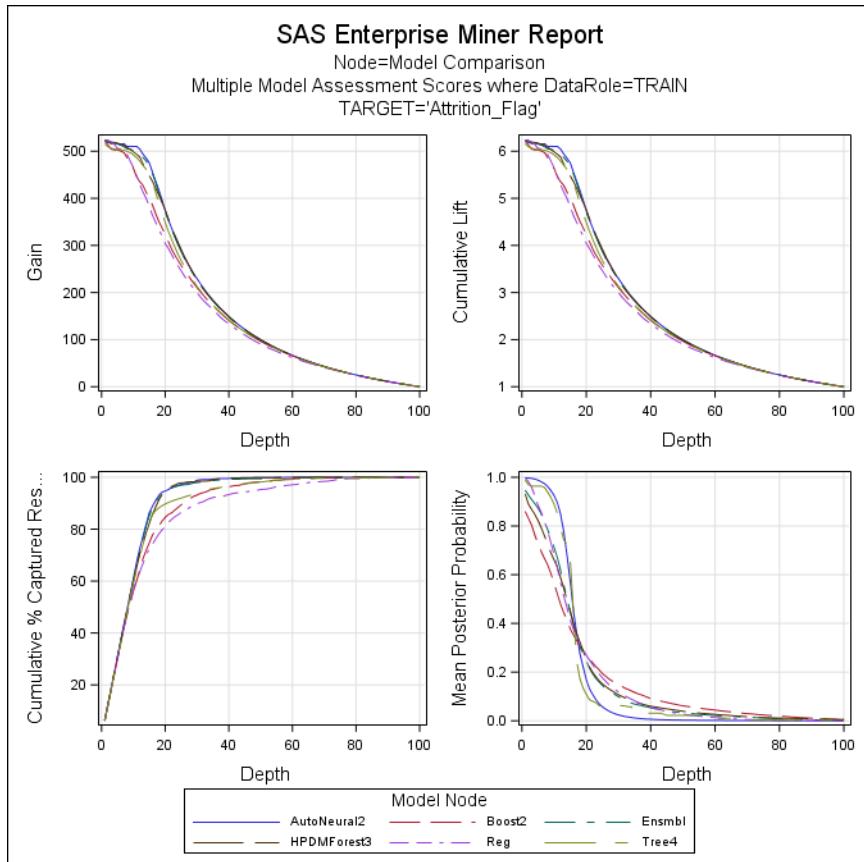
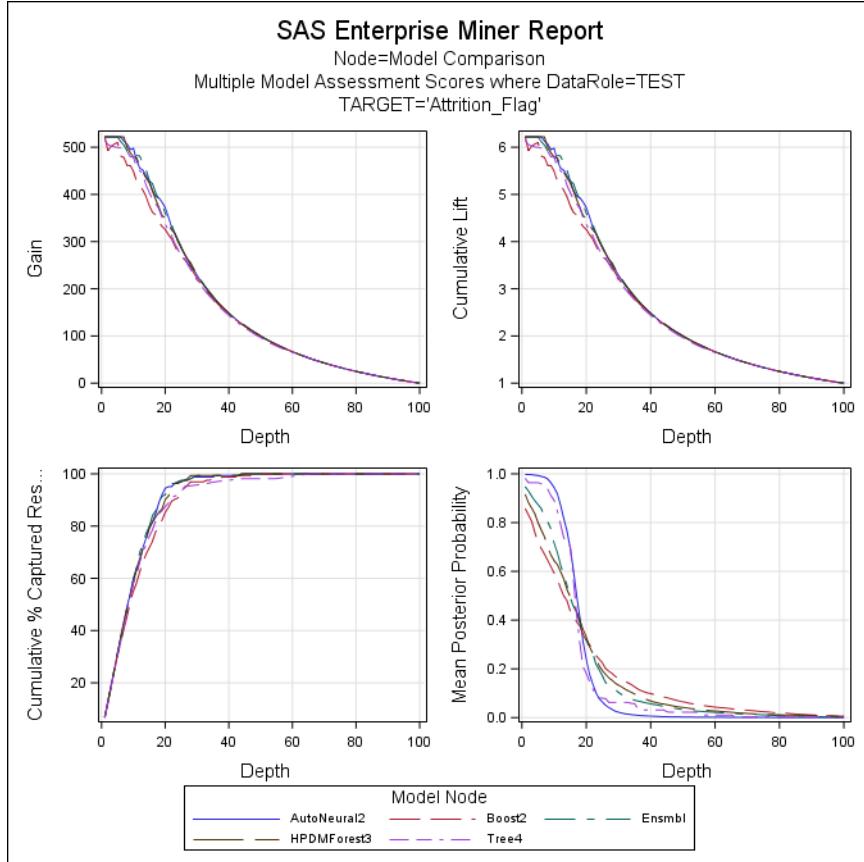
Selected Model	Predecessor Node	Model Node	Model Description	Target Variable	Target Label	Selection Criterion: Valid: Misclassification Rate	Valid: Average Squared Error	Valid: Misclassification Rate	Valid: Kolmogorov-Smirnov Statistic
Y	MdlComp2	Tree4	Modified Tree 3	Attrition_Flag		0.045926	0.039966	0.045926	0.835
	MdlComp5	AutoNeural2	AutoNeural 2	Attrition_Flag		0.049383	0.041664	0.049383	0.836
	Ensmbl	Ensmbl	Ensemble	Attrition_Flag		0.050928	0.039761	0.050928	0.873
	MdlComp6	HPDMForest3	Modified Forest 1	Attrition_Flag		0.065679	0.046729	0.065679	0.870
	MdlComp	Reg	FULL LOGIT	Attrition_Flag		0.080537	0.058589	0.080537	0.750
	MdlComp4	Boost2	Modified 1 Boost	Attrition_Flag		0.083457	0.060935	0.083457	0.793



Node=Model Comparison

Multiple Model Assessment Scores where DataRole=TEST

TARGET='Attrition\_Flag'



Node=Model Comparison

Multiple Model Assessment Scores where DataRole=VALIDATE

TARGET='Attrition\_Flag'

