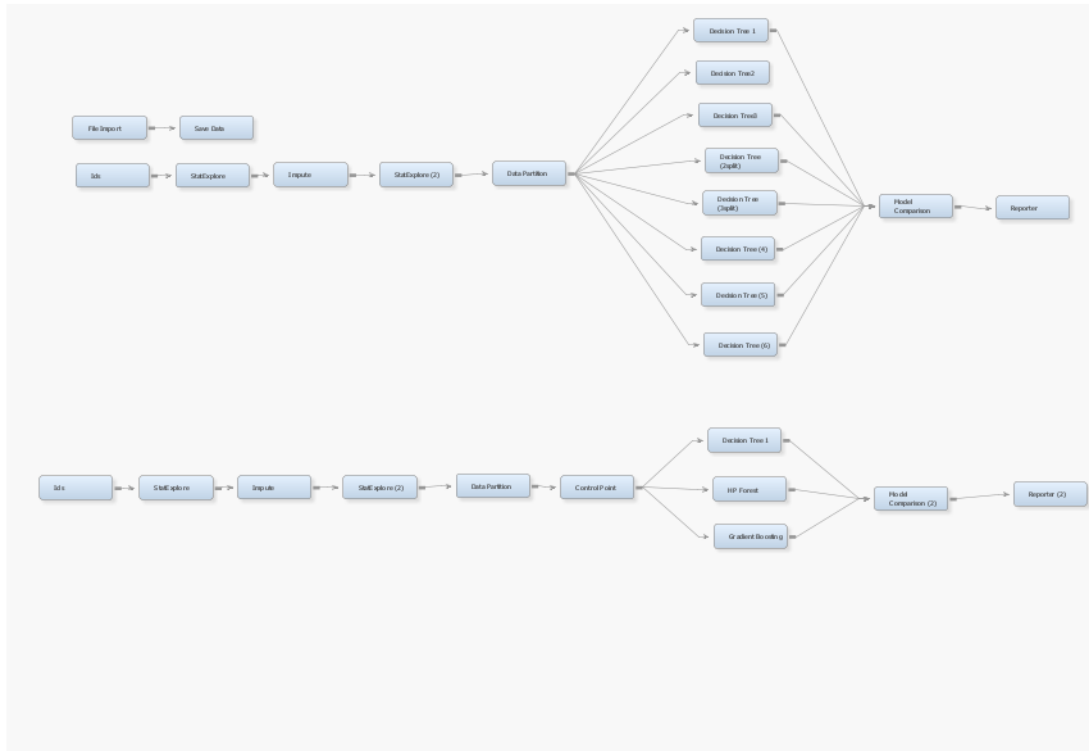# SAS Enterprise Miner Report

User   = u63466161
Date   = 07:15:53 08 January 2024
Project   = AA1
Diagram   = AA1

Start Node = Report2
Node label = Reporter (2)
Nodes   = PATH
Showall   = N

Format   = PDF
Style   = LISTING

SAS Enterprise Miner Report
Process Flow Diagram

SAS Enterprise Miner Report

Node=Ids
Summary

Node id = Ids2
Node label = Ids
Meta path = Ids2
Notes =

Node=Ids
Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	DataSource		DsCreatedBy	u63466161		NBytes	394240	.
ApplyIntervalLevelLowerLimit	Y		DsId	emsavetrain		NCols	11	.
ApplyMaxClassLevels	Y		DsModifiedBy	u63466161		NObs	2989	.
ApplyMaxPercentMissing	Y		DsModifyDate	2020186688.9		NewTable		
CMeta	WORK.M1E84V60		DsSampleName			NewVariableRole	REJECT	
ComputeStatistics	N		DsSampleSize			OutputType	VIEW	
DBPassThrough	Y		DsSampleSizeType			Role	RAW	TRAIN
Data	SEMMA.EM_SAVE_TRAIN		DsScope	LOCAL		Sample	D	
DataSelection	DATASOURCE		IdentifyEmptyColumns	Y		SampleSizeObs	10000	
DataSource	emsavetrain		IntervalLowerLimit	20		SampleSizePercent	20	
DataSourceRole	RAW		Library	SEMMA		SampleSizeType	PERCENT	
Description			MaxClassLevels	20		Scope	LOCAL	
DropMapVariables	Y		MaxPercentMissing	50		Segment		
DsCreateDate	2020186688.9		MetaAdvisor	BASIC		Table	EM_SAVE_TRAIN	

Node=Ids
Data Attributes

Attribute	Value	Attribute	Value	Attribute	Value
Data Name	EM_SAVE_TRAIN	Date Created	06 January 2024 18:41:15	Data Size	394240
Data Type	DATA	Date Modified	06 January 2024 18:41:15	Role	RAW
Data Label		Number Rows	2989	Segment	
Engine	V9	Number Columns	11	Data Library	SEMMA

Node=Ids
Variables List

Name	Label	Role	Level	Type	Length	Format	Creator
Age		INPUT	INTERVAL	N	8	BEST12.0	
Churn		TARGET	INTERVAL	N	8	BEST12.0	
CustomerID		ID	INTERVAL	N	8	BEST12.0	
FavoriteCategory		INPUT	NOMINAL	C	11	$11.	
Gender		INPUT	NOMINAL	C	6	$6.	
LastPurchaseDate		INPUT	INTERVAL	N	8	YYMMDD10.0	
Location		INPUT	NOMINAL	C	13	$13.	
MembershipLevel		INPUT	NOMINAL	C	8	$8.	
Occupation		INPUT	NOMINAL	C	11	$11.	
TotalPurchases		INPUT	INTERVAL	N	8	BEST12.0	
TotalSpent		INPUT	INTERVAL	N	8	BEST12.0	

SAS Enterprise Miner Report

**Node=StatExplore
Summary**

Node id = Stat3
Node label = StatExplore
Meta path = lds2 => Stat3
Notes =

**Node=StatExplore
Properties**

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	StatExplore		Correlation	Y		NObs	100000	1000000
BySegment	N	Y	DropRejected	Y		Pearson	Y	
ChiSquare	Y		HideVariable	Y		Spearman	N	
ChiSquareInterval	Y	N	IntervalDistribution	Y		UseScore	N	
ChiSquareIntervalNBins	5		LevelSummary	Y		UseTest	N	
ClassDistribution	Y		MaximumVars	1000		UseValidate	N	

**Node=StatExplore
Variable Summary**

Role	Level	Frequency Count	Name
INPUT	INTERVAL	4	Age LastPurchaseDate TotalPurchases TotalSpent
INPUT	NOMINAL	5	FavoriteCategory Gender Location MembershipLevel Occupation

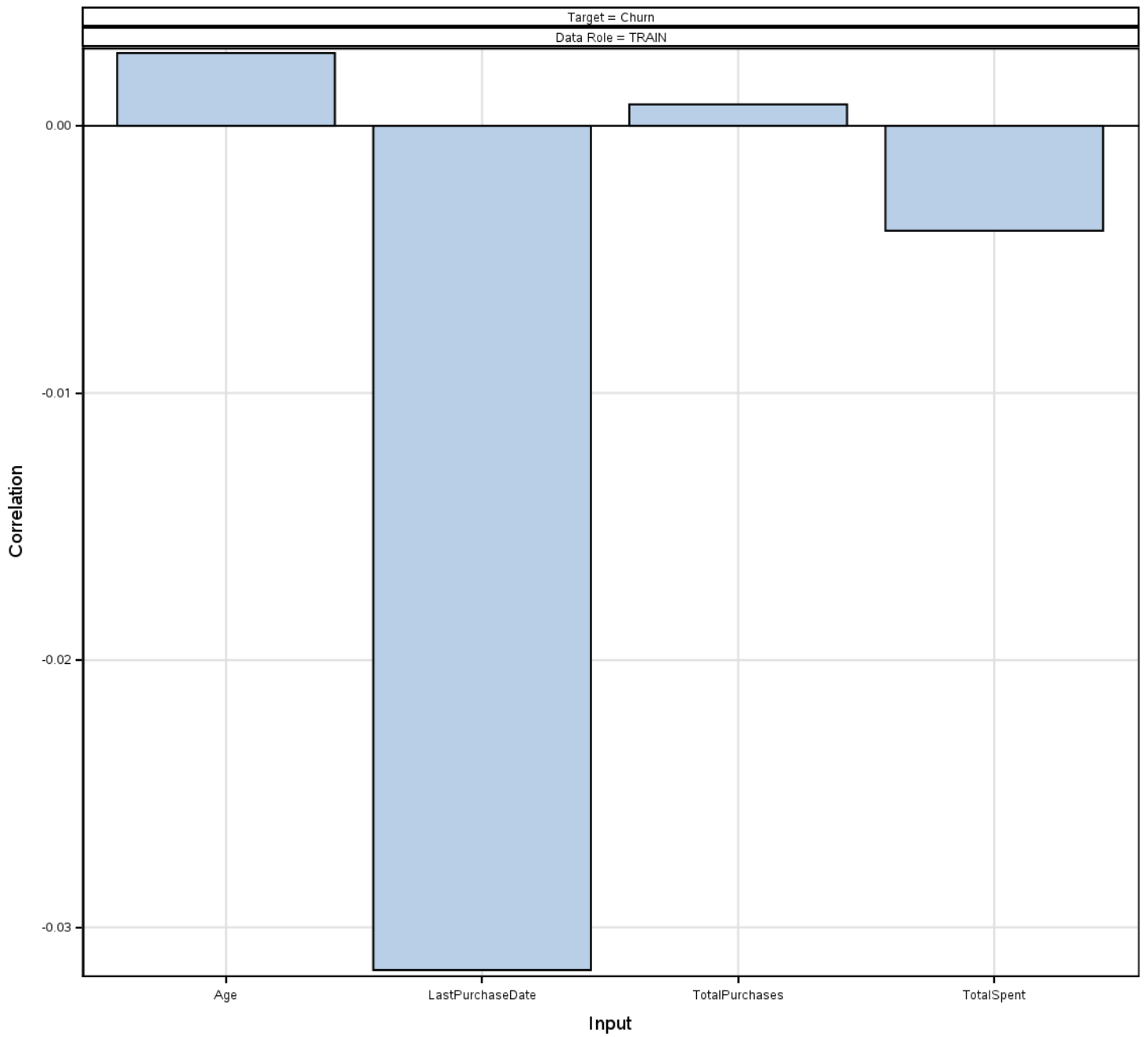| Target	Variable	Importance	Worth	Analysis Variable	Label	plot
Churn	TotalSpent	1	.001732582	1	TotalSpent	.
Churn	LastPurchaseDate	2	.001642663	1	LastPurchaseDate	.
Churn	TotalPurchases	3	.001524903	1	TotalPurchases	.
Churn	Age	4	.001379986	1	Age	.
Churn	FavoriteCategory	5	.000723734	1	FavoriteCategory	.
Churn	Location	6	.000432581	1	Location	.
Churn	Gender	7	.000364081	1	Gender	.
Churn	MembershipLevel	8	.000196550	1	MembershipLevel	.
Churn	Occupation	9	.000160322	1	Occupation	.

SAS Enterprise Miner Report
Node=StatExplore
Correlation Plot
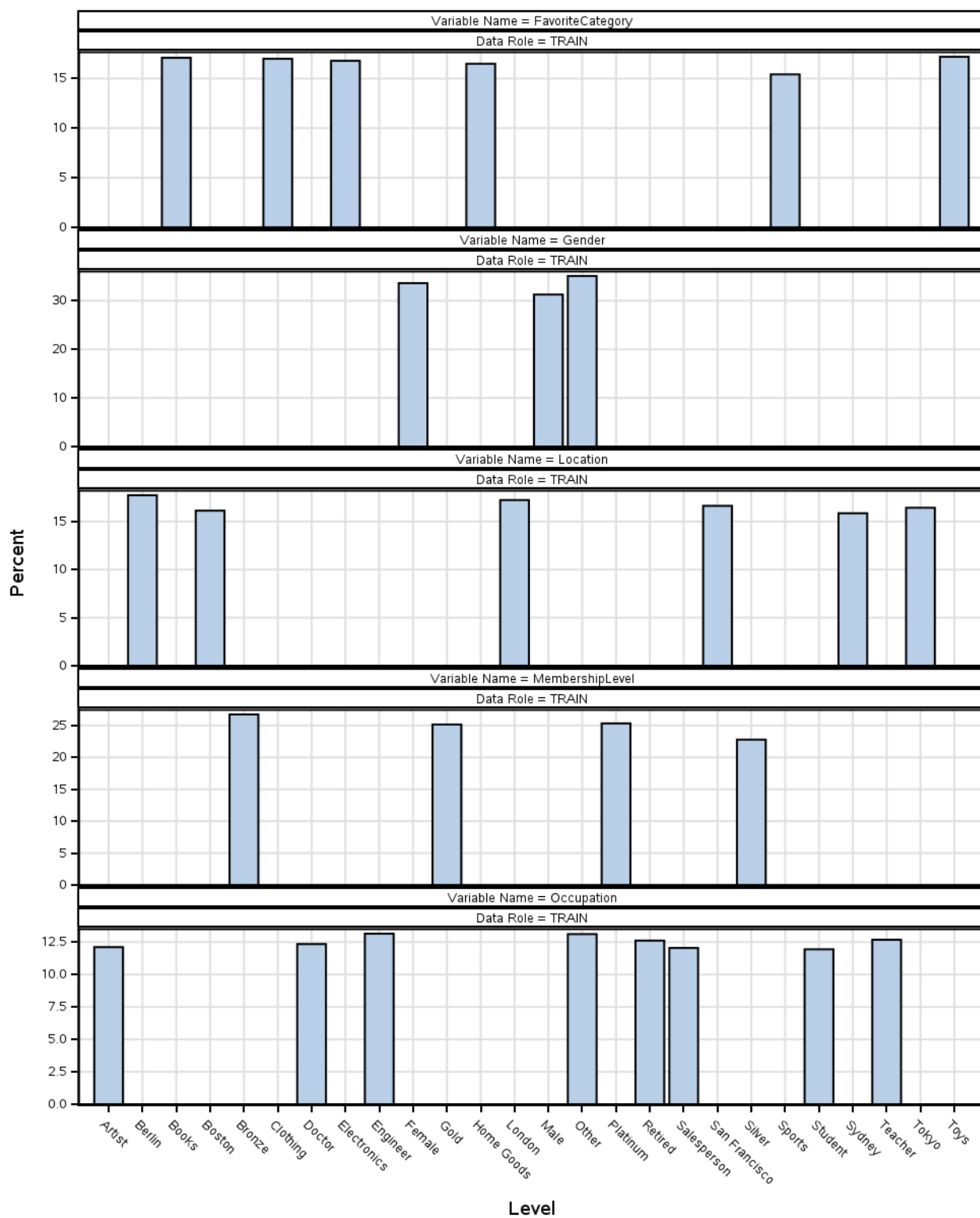## CORRTYPE='PEARSON'

| Target = Churn |
| Data Role = TRAIN |

SAS Enterprise Miner Report
Node=StatExplore
Class Variables
PLOT=1

Variable Name = FavoriteCategory, Data Role = TRAIN
Variable Name = Gender, Data Role = TRAIN
Variable Name = Location, Data Role = TRAIN
Variable Name = MembershipLevel, Data Role = TRAIN
Variable Name = Occupation, Data Role = TRAIN

SAS Enterprise Miner Report
Node=StatExplore
Interval Variables
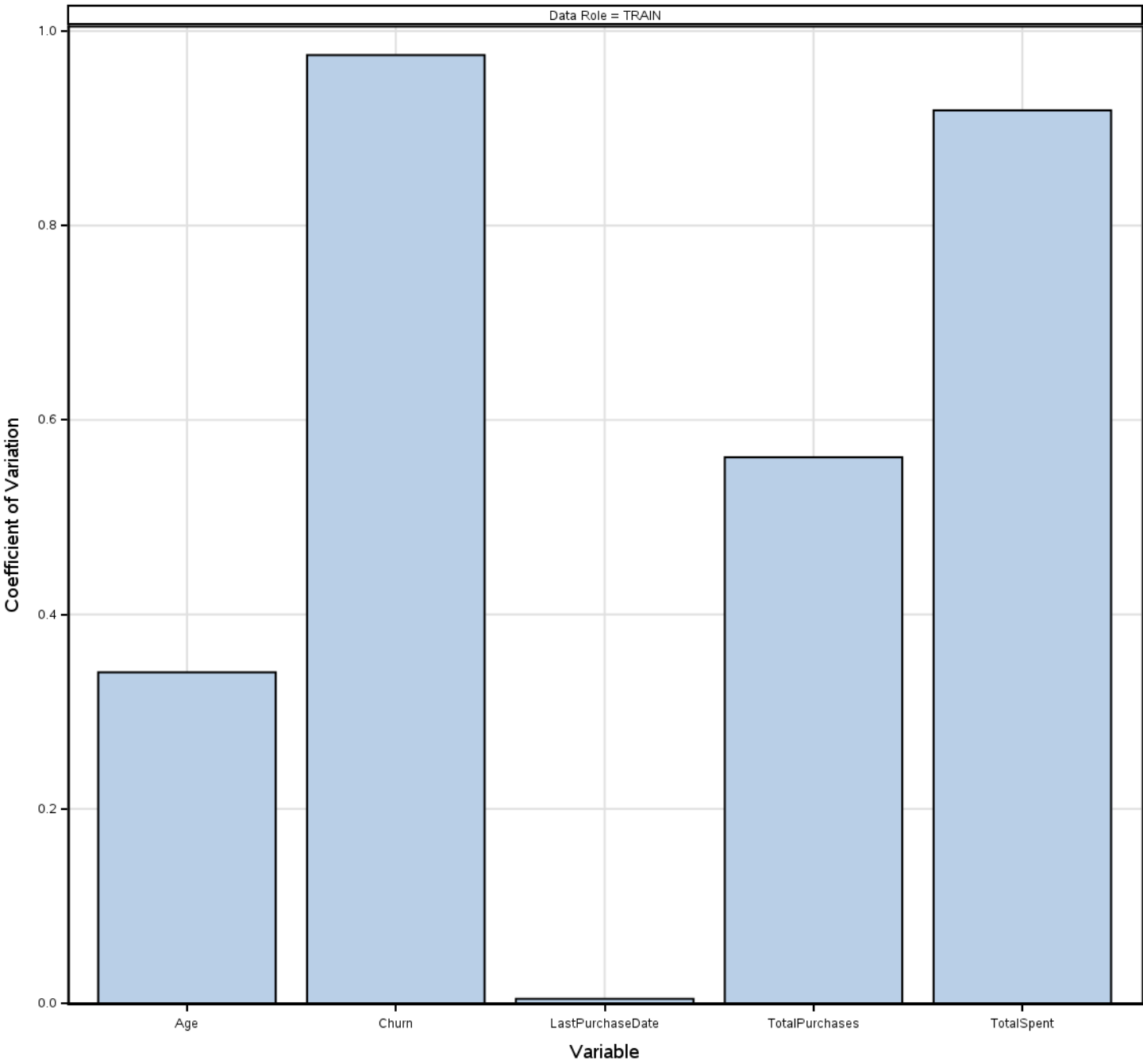
SAS Enterprise Miner Report

Node=Impute
Summary

Node id = Impt2
Node label = Impute
Meta path = Ids2 => Stat3 => Impt2
Notes =

Node=Impute
Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	Impute		IndicatorRole	INPUT	REJECTED	MinCatSize	5	
ABWTuning	9		IndicatorSource	IMPUTED		Normalize	Y	
AHUBERTuning	1.5		LeafSize	5		Nrules	5	
AWAVETuning	6.2831853072		MaxPctMissing	50		Nsurrs	2	
DefaultChar			Maxbranch	2		RandomSeed	12345	
DefaultNum	.		Maxdepth	6		ReplaceVariable	N	
DistributionMissing	N		MethodClass	COUNT		SpacingProportion	90	
HideVariable	Y		MethodInterval	MEAN		Splitsize	.	
ImputeNoMissing	N		MethodTargetClass	NONE		ValidateTestMissing	N	
Indicator	UNIQUE	NONE	MethodTargetInterval	NONE				

Node=Impute
Variable Summary

Role	Level	Frequency Count	Name
INPUT	INTERVAL	4	Age LastPurchaseDate TotalPurchases TotalSpent
INPUT	NOMINAL	5	FavoriteCategory Gender Location MembershipLevel Occupation

Node=Impute
Imputation Summary

Variable Name	Impute Method	Imputed Variable	Indicator Variable	Impute Value	Role	Measurement Level	Label	Number of Missing for TRAIN
Age	MEAN	IMP_Age	M_Age	43.3811	INPUT	INTERVAL		8
TotalPurchases	MEAN	IMP_TotalPurchases	M_TotalPurchases	50.1017	INPUT	INTERVAL		9

SAS Enterprise Miner Report

Node=StatExplore (2)
Summary

Node id = Stat4
Node label = StatExplore (2)
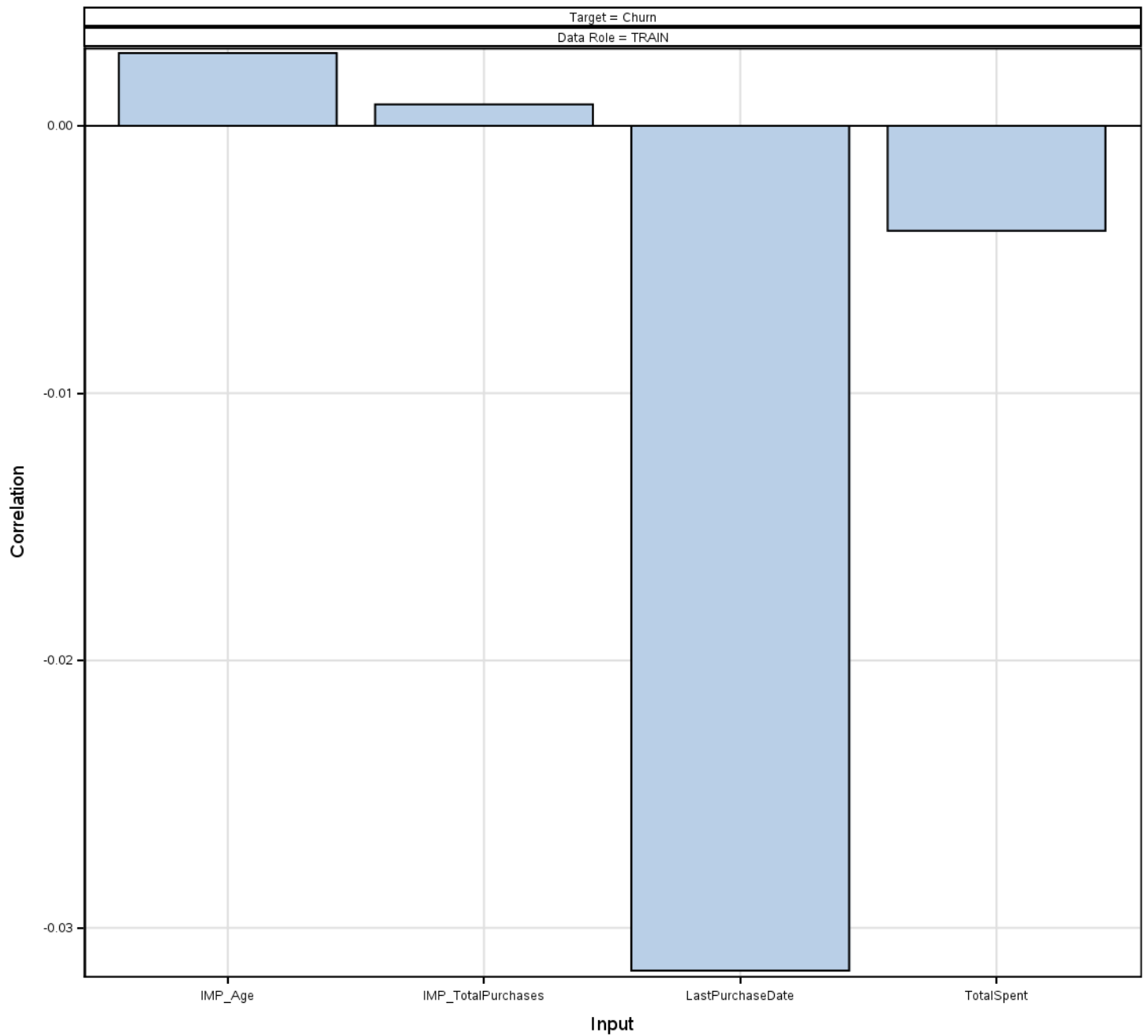Meta path = Ids2 => Stat3 => Impt2 => Stat4
Notes =

Node=StatExplore (2)
Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	StatExplore		Correlation	Y		NObs	100000	1000000
BySegment	N	Y	DropRejected	Y		Pearson	Y	
ChiSquare	Y		HideVariable	Y		Spearman	N	
ChiSquareInterval	N		IntervalDistribution	Y		UseScore	N	
ChiSquareIntervalNBins	5		LevelSummary	Y		UseTest	N	
ClassDistribution	Y		MaximumVars	1000		UseValidate	N	

Node=StatExplore (2)
Variable Summary

Role	Level	Frequency Count	Name
INPUT	BINARY	2	M_Age M_TotalPurchases
INPUT	INTERVAL	4	IMP_Age IMP_TotalPurchases LastPurchaseDate TotalSpent
INPUT	NOMINAL	5	FavoriteCategory Gender Location MembershipLevel Occupation

Target	Variable	Importance	Worth	Analysis Variable	Label	plot
Churn	TotalSpent	1	.001732582	1	TotalSpent	.
Churn	LastPurchaseDate	2	.001642663	1	LastPurchaseDate	.
Churn	IMP_TotalPurchases	3	.001513789	1	Imputed TotalPurchases	.
Churn	IMP_Age	4	.001255145	1	Imputed Age	.
Churn	FavoriteCategory	5	.000723734	1	FavoriteCategory	.
Churn	Location	6	.000432581	1	Location	.
Churn	Gender	7	.000364081	1	Gender	.
Churn	MembershipLevel	8	.000196550	1	MembershipLevel	.
Churn	M_Age	9	.000184986	1	Imputation Indicator for Age	.
Churn	Occupation	10	.000160322	1	Occupation	.
Churn	M_TotalPurchases	11	.000014007	1	Imputation Indicator for TotalPurchases	.

SAS Enterprise Miner Report
Node=StatExplore (2)
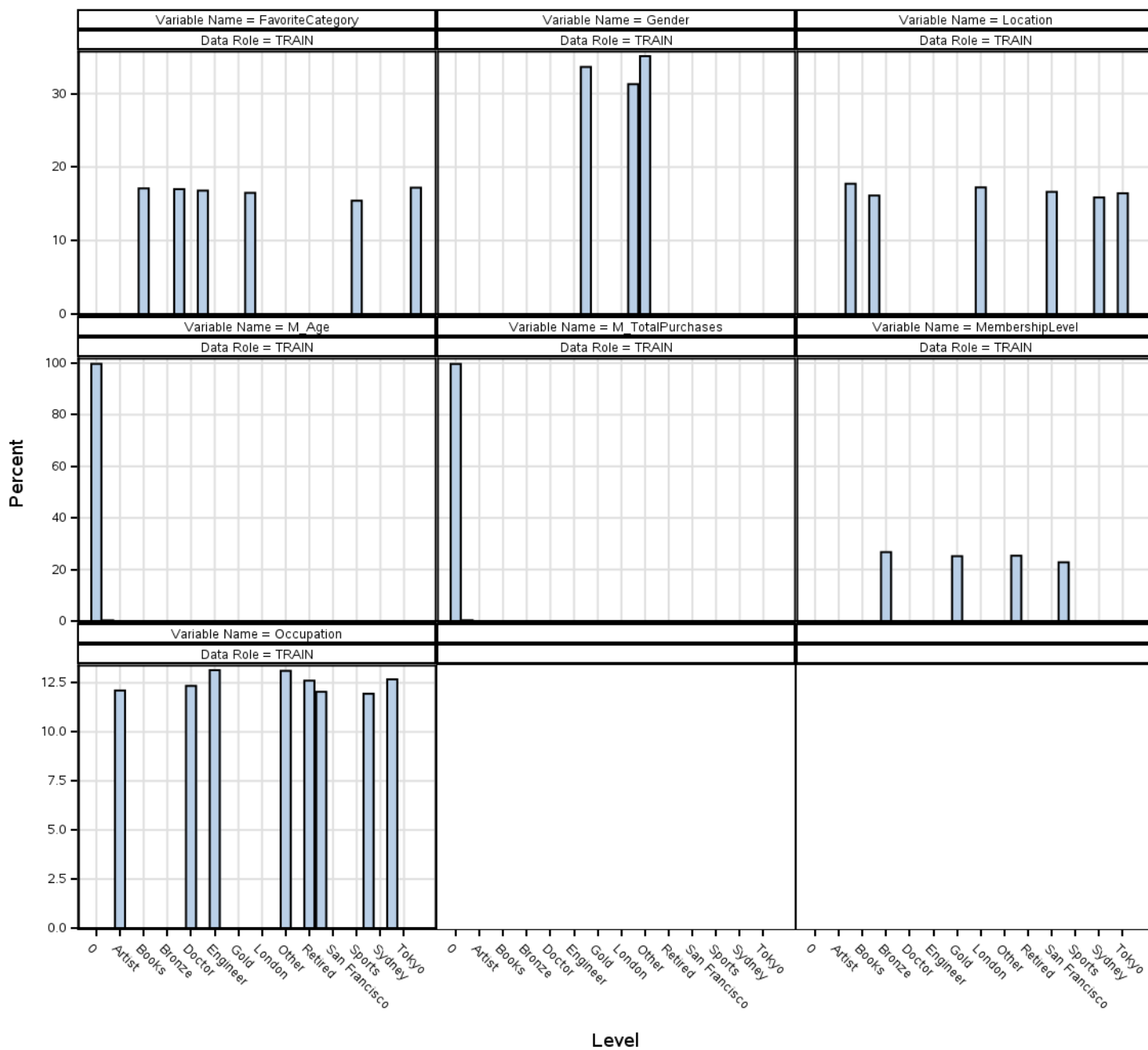## Correlation Plot
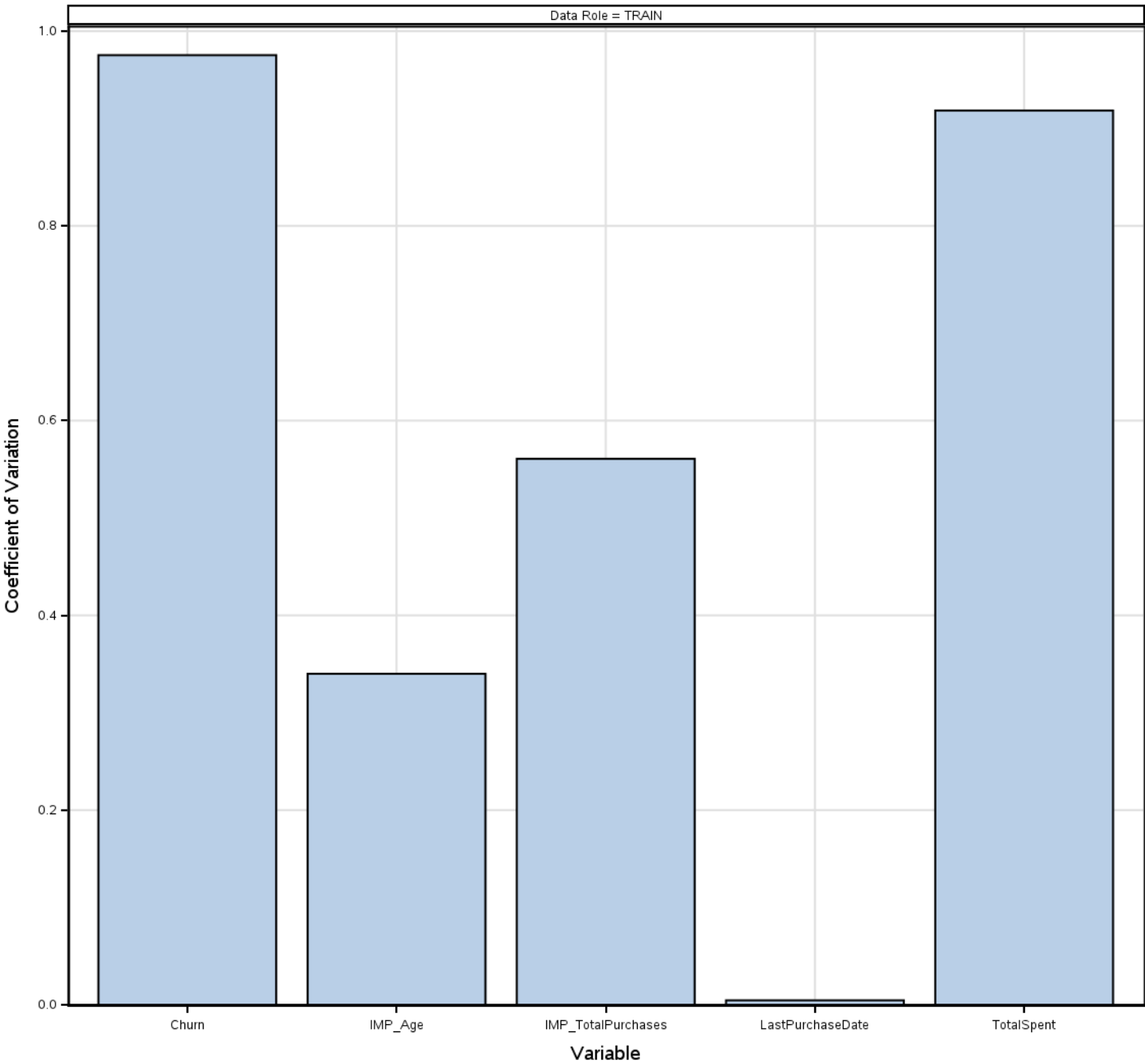## CORRTYPE='PEARSON'

SAS Enterprise Miner Report
Node=StatExplore (2)
Class Variables
PLOT=1

SAS Enterprise Miner Report
Node=StatExplore (2)
Interval Variables

SAS Enterprise Miner Report

**Node=Data Partition
Summary**

Node id = Part2
Node label = Data Partition
Meta path = Ids2 => Stat3 => Impt2 => Stat4 => Part2
Notes =

**Node=Data Partition
Properties**

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	Partition		Method	DEFAULT		TestPct	0	30
ClassDistribution	Y		OutputType	DATA		TrainPct	70	40
IntervalDistribution	Y		RandomSeed	12345		ValidatePct	30	

**Node=Data Partition
Variable Summary**

Role	Level	Frequency Count	Name
TARGET	INTERVAL	1	Churn
INPUT	BINARY	2	M_Age M_TotalPurchases
INPUT	INTERVAL	4	IMP_Age IMP_TotalPurchases LastPurchaseDate TotalSpent
INPUT	NOMINAL	5	FavoriteCategory Gender Location MembershipLevel Occupation
ID	INTERVAL	1	CustomerID

SAS Enterprise Miner Report

Node=Decision Tree 1
Summary

Node id = Tree9
Node label = Decision Tree 1
Meta path = Ids2 => Stat3 => Impt2 => Stat4 => Part2 => Tree9
Notes =

Node=Decision 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	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		ShowNodeId	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=Decision Tree 1
Variable Summary

Role	Level	Frequency Count	Name
TARGET	INTERVAL	1	Churn
INPUT	BINARY	2	M_Age M_TotalPurchases
INPUT	INTERVAL	4	IMP_Age IMP_TotalPurchases LastPurchaseDate TotalSpent
INPUT	NOMINAL	5	FavoriteCategory Gender Location MembershipLevel Occupation
ID	INTERVAL	2	CustomerID _dataobs_

Node=Decision Tree 1
Model Fit Statistics

Target=Churn Target Label=' '

Label of Statistic	Train	Validation	Test
Sum of Frequencies	2092.00	897.000	.
Maximum Absolute Error	0.52	0.516	.
Sum of Squared Errors	522.45	224.373	.
Average Squared Error	0.25	0.250	.
Root Average Squared Error	0.50	0.500	.

Target=Churn Target Label=' '

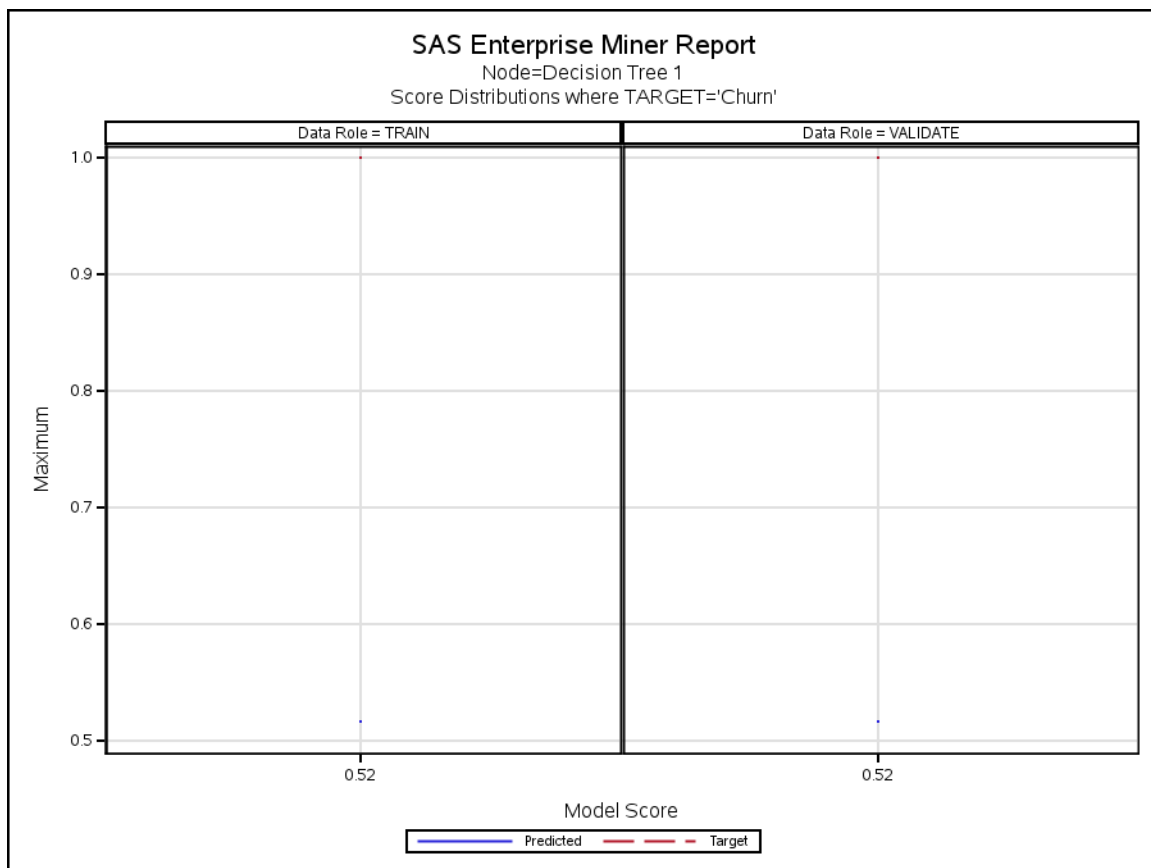| Label of Statistic	Train	Validation	Test
Divisor for ASE	2092.00	897.000	.
Total Degrees of Freedom	2092.00	.	.

SAS Enterprise Miner Report
Node=Decision Tree 1
Tree Diagram

SAS Enterprise Miner Report
Node=Decision Tree 1
Treemap
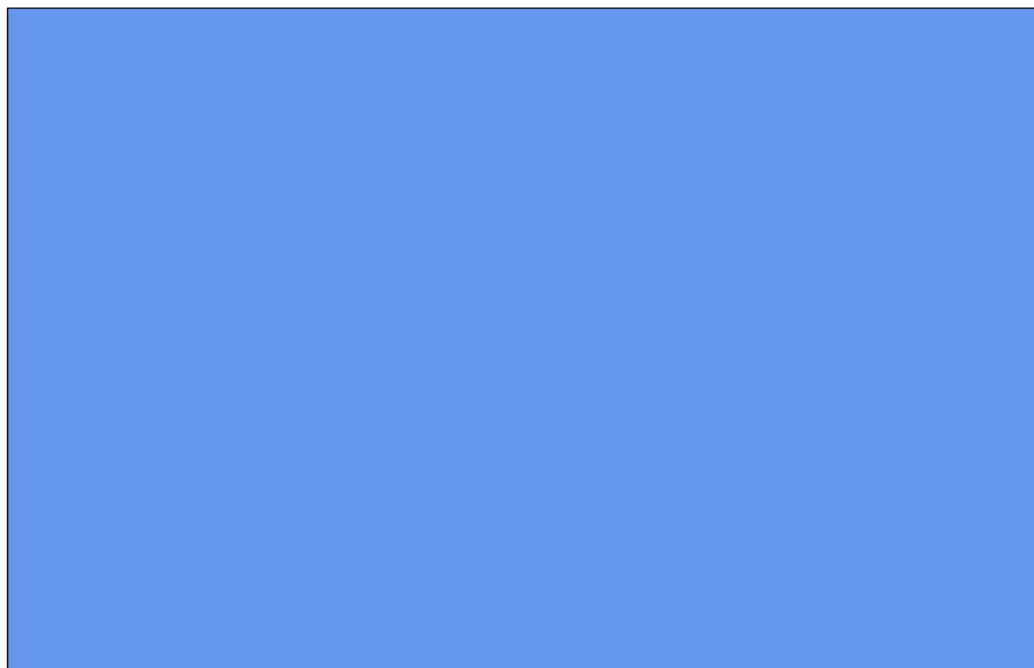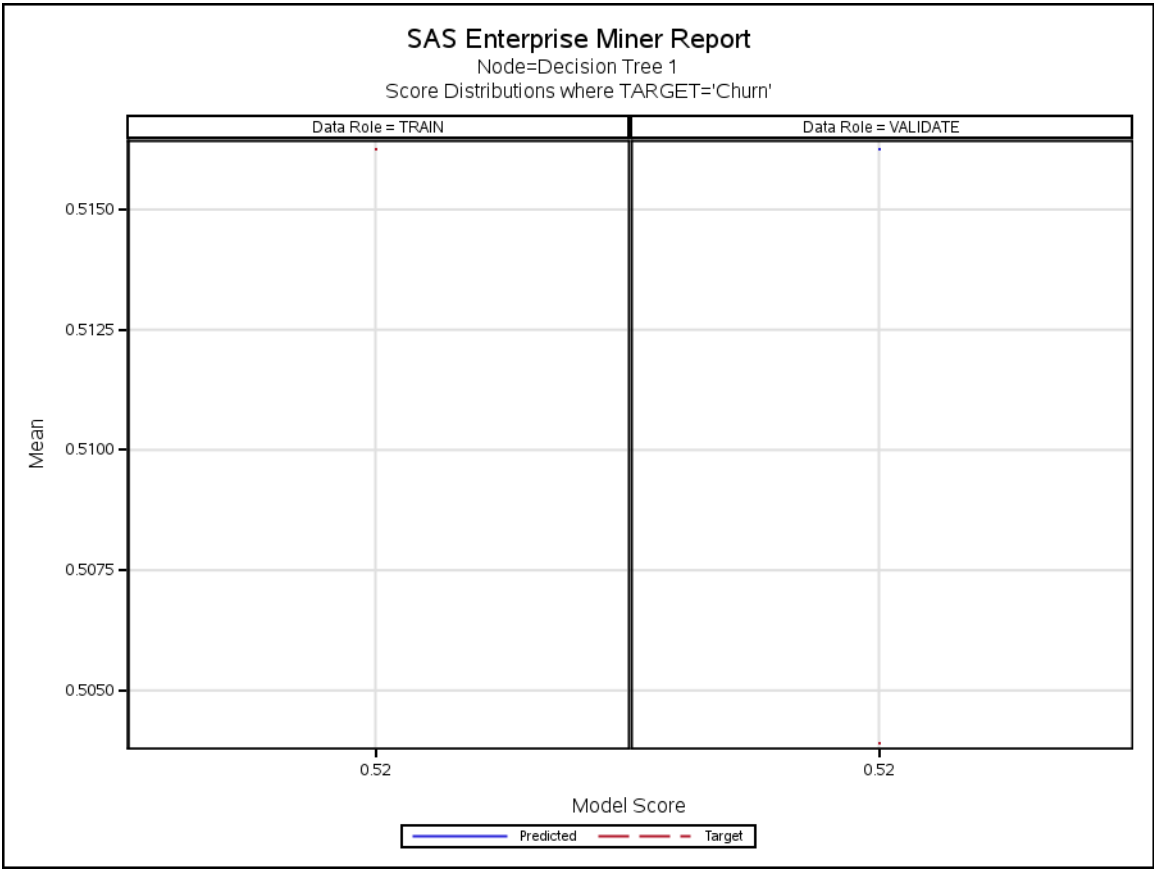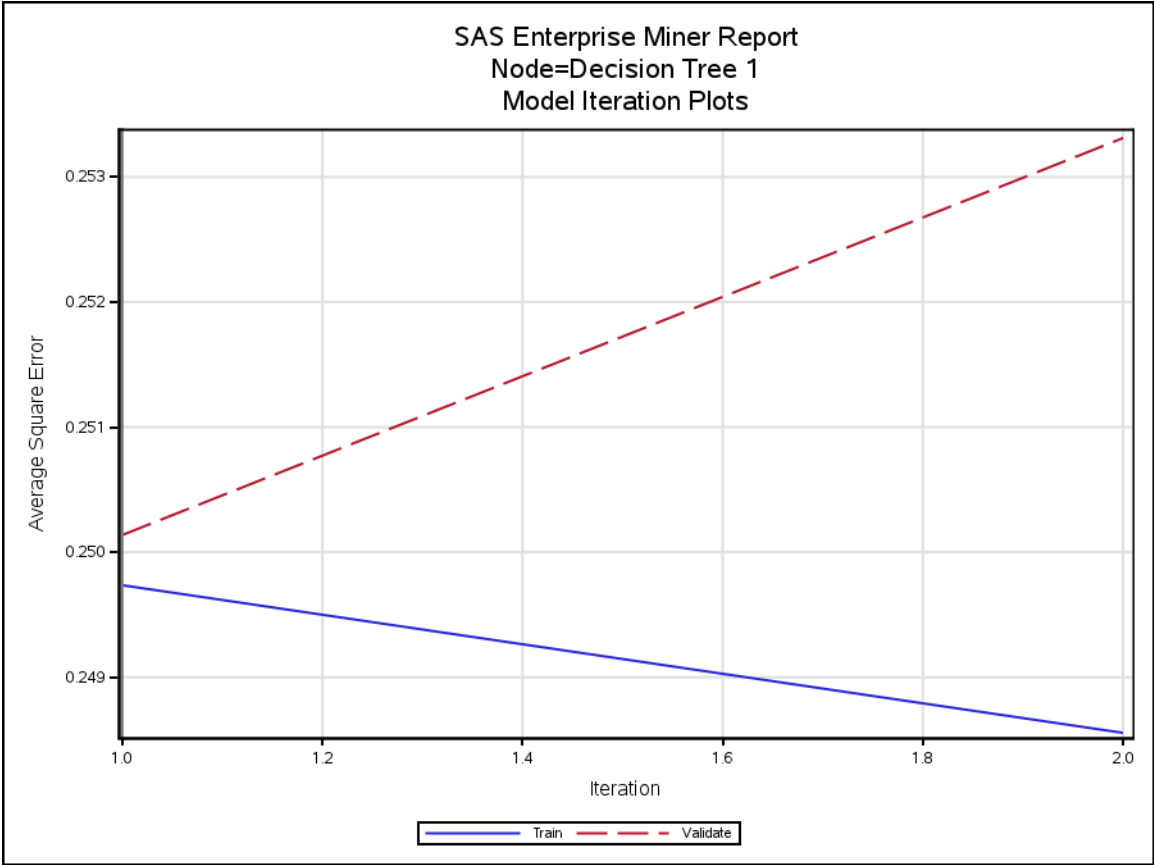
SAS Enterprise Miner Report
Node=Decision Tree 1
Model Iteration Plots

SAS Enterprise Miner Report
Node=Decision Tree 1
Score Distributions where TARGET='Churn'

SAS Enterprise Miner Report
Node=Decision Tree 1
Score Distributions where TARGET='Churn'

Node=Decision Tree 1
Score Distributions

Target Variable=Churn Data Role=TRAIN

Range for Predicted	Mean Predicted	Max Predicted	Min Predicted	Mean Target	Max Target	Min Target
0.516 - 0.516	0.51625	0.51625	0.51625	0.51625	1	0

Target Variable=Churn Data Role=VALIDATE

Range for Predicted	Mean Predicted	Max Predicted	Min Predicted	Mean Target	Max Target	Min Target
0.516 - 0.516	0.51625	0.51625	0.51625	0.50390	1	0

SAS Enterprise Miner Report

Node=HP Forest
Summary

Node id = HPDMForest
Node label = HP Forest
Meta path = Ids2 => Stat3 => Impt2 => Stat4 => Part2 => HPDMForest
Notes =

Node=HP Forest
Properties

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

Node=HP Forest
Variable Summary

| Role	Level	Frequency Count	Name
TARGET	INTERVAL	1	Churn
INPUT	BINARY	2	M_Age M_TotalPurchases
INPUT	INTERVAL	4	IMP_Age IMP_TotalPurchases LastPurchaseDate TotalSpent
INPUT	NOMINAL	5	FavoriteCategory Gender Location MembershipLevel Occupation
ID	INTERVAL	2	CustomerID _dataobs_

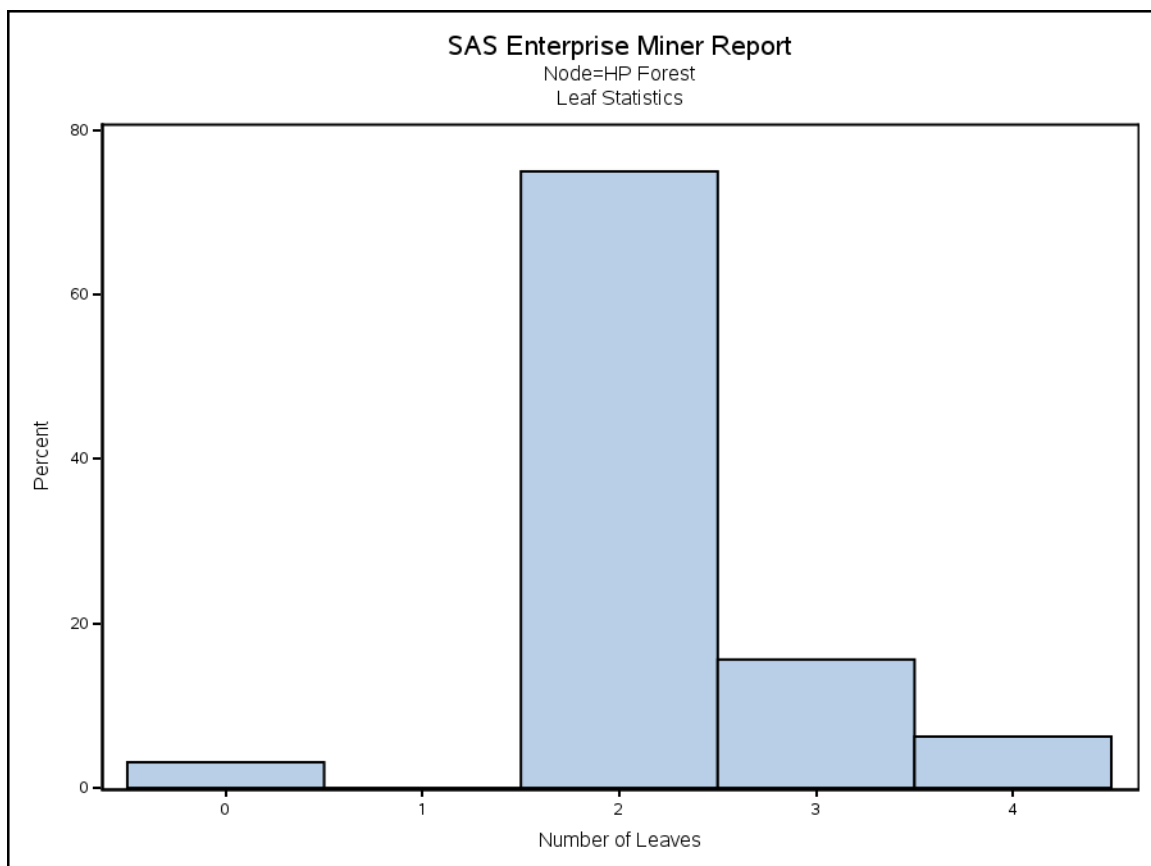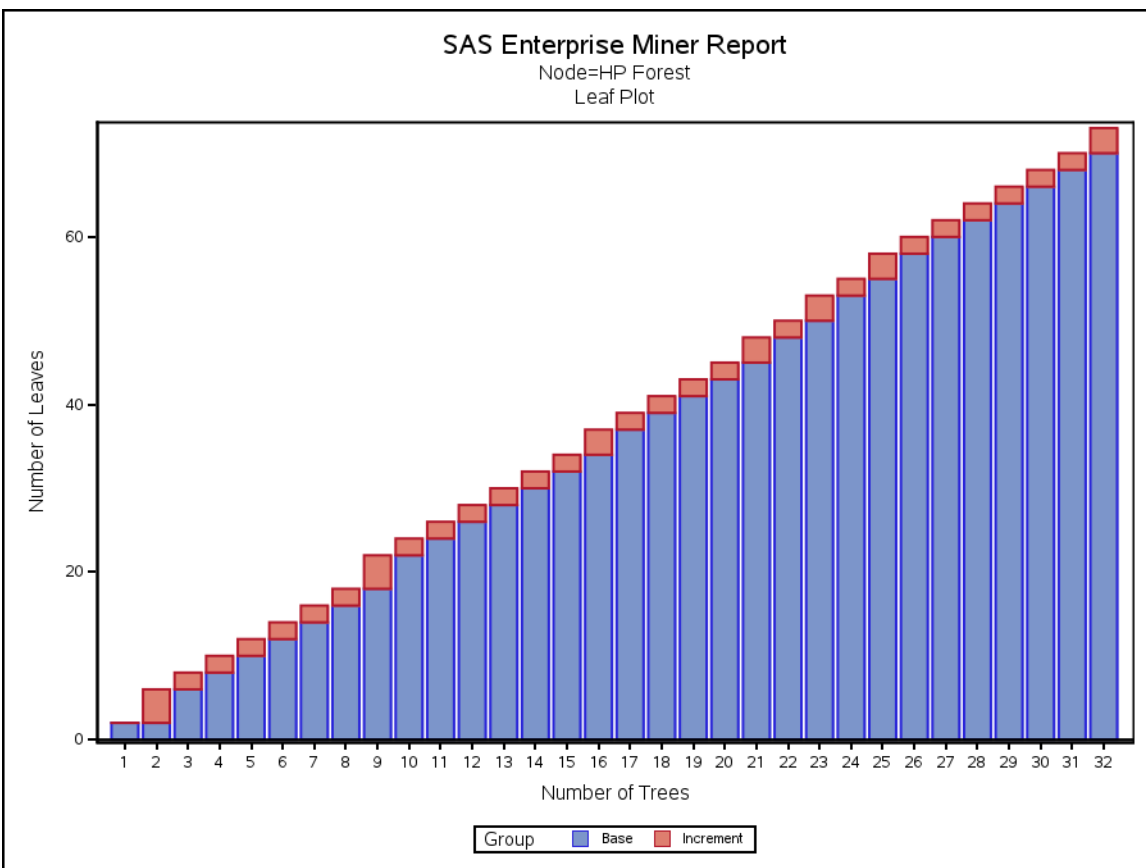## Node=HP Forest
Model Fit Statistics

Target=Churn Target Label=' '

Label of Statistic	Train	Validation	Test
Average Squared Error	0.25	0.251	.
Divisor for ASE	2092.00	897.000	.
Maximum Absolute Error	0.55	0.562	.
Sum of Frequencies	2092.00	897.000	.
Root Average Squared Error	0.50	0.501	.
Sum of Squared Errors	517.81	225.073	.

Node=HP Forest
Iteration History

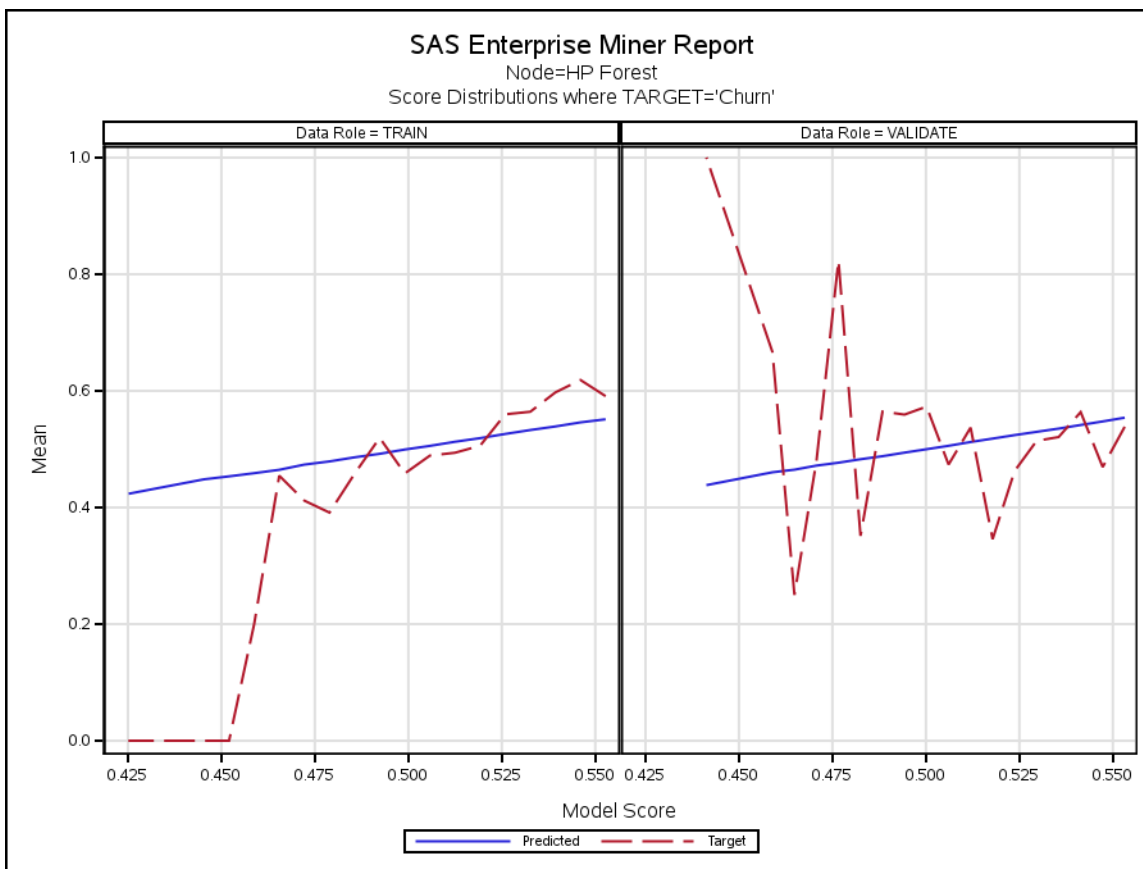| Number of Trees	Number of Leaves	Average Square Error (Train)	Average Square Error (Out of Bag)	Average Square Error (Validate)
1	2	0.24946	0.25067	0.25034
2	6	0.24856	0.25287	0.25115
3	8	0.24860	0.25403	0.25112
4	10	0.24816	0.25339	0.25147
5	12	0.24830	0.25312	0.25134

Number of Trees	Number of Leaves	Average Square Error (Train)	Average Square Error (Out of Bag)	Average Square Error (Validate)
6	14	0.24828	0.25230	0.25111
7	16	0.24829	0.25172	0.25089
8	18	0.24816	0.25167	0.25093
9	22	0.24766	0.25157	0.25142
10	24	0.24773	0.25116	0.25118
11	26	0.24773	0.25143	0.25097
12	28	0.24773	0.25128	0.25102
13	30	0.24777	0.25122	0.25087
14	32	0.24771	0.25106	0.25097
15	34	0.24777	0.25109	0.25088
16	37	0.24762	0.25091	0.25101
17	39	0.24761	0.25078	0.25108
18	41	0.24760	0.25063	0.25123
19	43	0.24763	0.25066	0.25110
20	45	0.24766	0.25065	0.25114
21	48	0.24757	0.25060	0.25096
22	50	0.24762	0.25057	0.25088
23	53	0.24758	0.25055	0.25083
24	55	0.24762	0.25055	0.25079
25	58	0.24752	0.25042	0.25080
26	60	0.24753	0.25040	0.25085
27	62	0.24752	0.25029	0.25096
28	64	0.24753	0.25028	0.25100
29	66	0.24753	0.25021	0.25110
30	68	0.24755	0.25023	0.25103
31	70	0.24756	0.25026	0.25097
32	73	0.24752	0.25028	0.25092

SAS Enterprise Miner Report
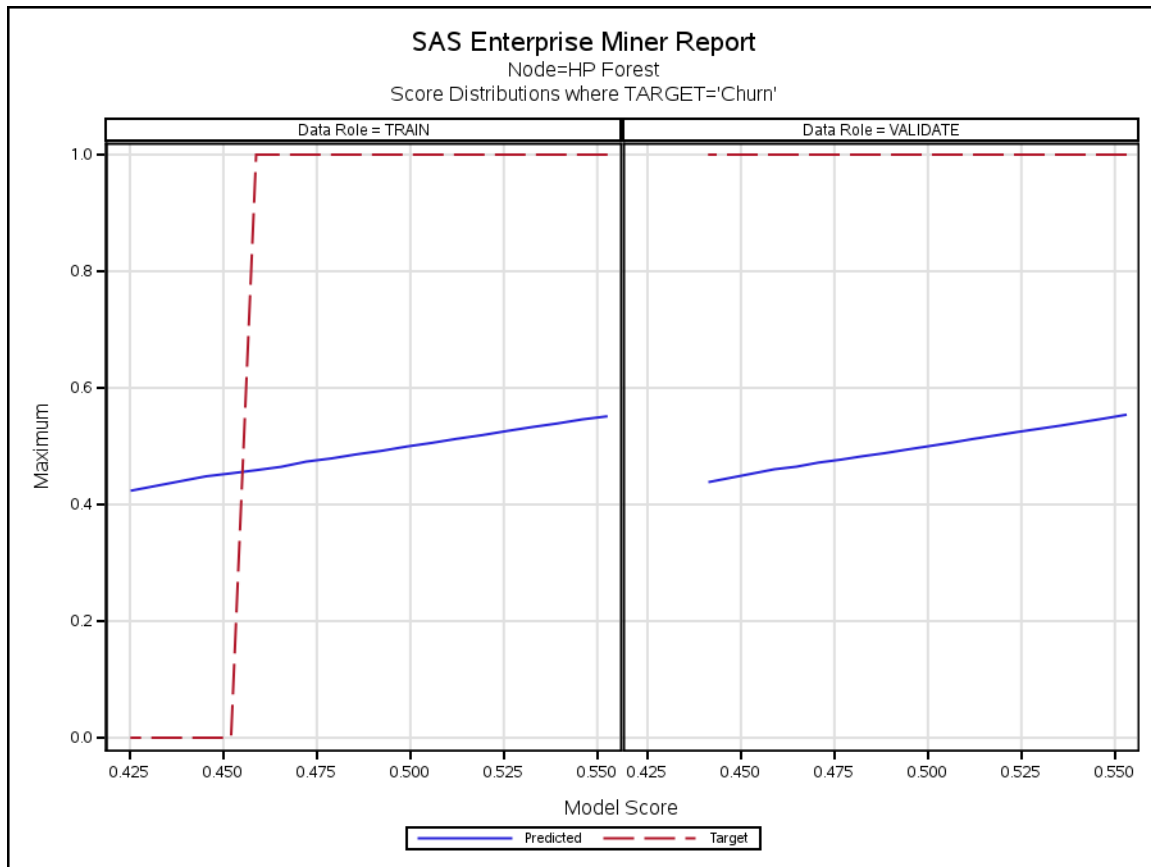Node=HP Forest
Iteration Plot
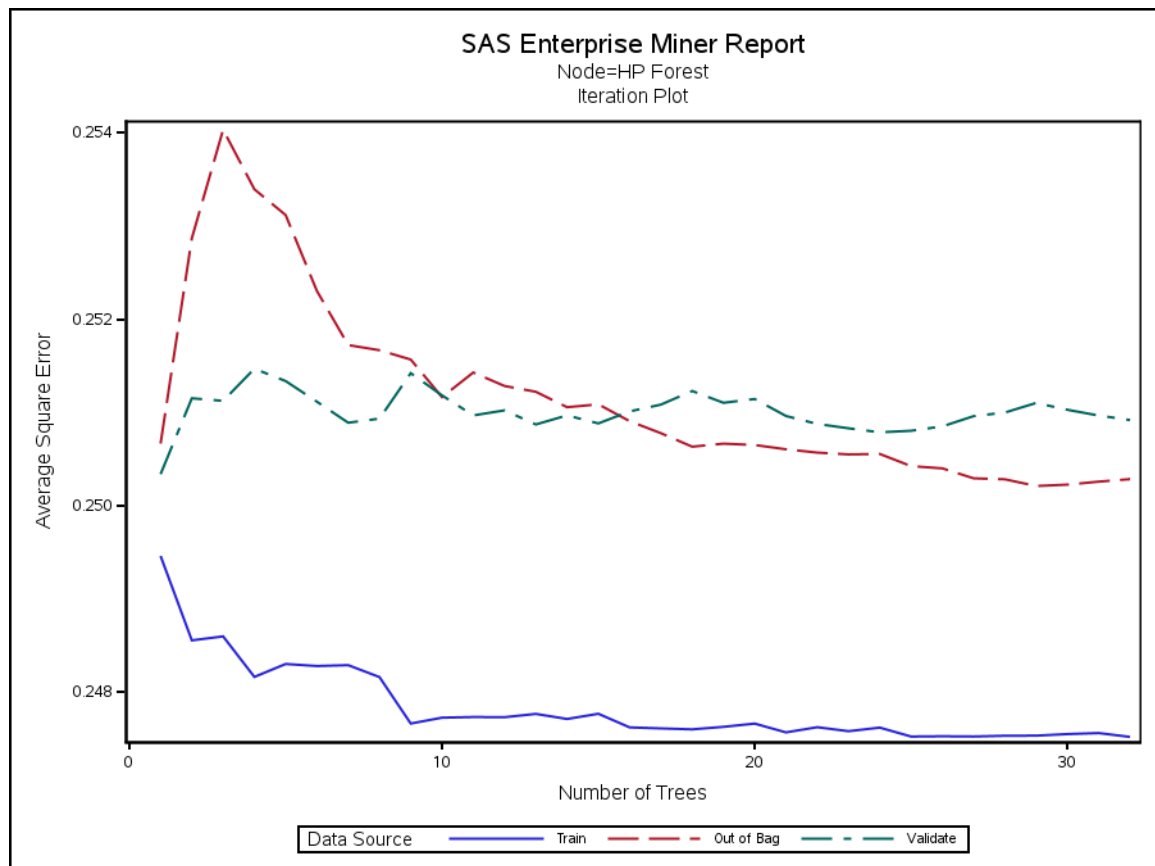
Node=HP Forest
Variable Importance

Variable Name	Number of Splitting Rules	Train: Mean Square Error	Train: Absolute Error	OOB: Mean Square Error	OOB: Absolute Error	Valid: Mean Square Error	Valid: Absolute Error	Label
Location	15	0.000987	0.001974	-0.00061	0.000376	-0.00183	-0.000842	
FavoriteCategory	10	0.000640	0.001280	-0.00087	-0.000230	-0.00024	0.000427	
Gender	5	0.000224	0.000448	-0.00026	-0.000041846	-0.00007	0.000163	
MembershipLevel	4	0.000230	0.000460	-0.00042	-0.000188	-0.00026	-0.000034869	
M_Age	3	0.000098	0.000195	-0.00008	-0.000047531	-0.00005	0.000001492	Imputation Indicator for Age
TotalSpent	2	0.000081	0.000162	-0.00024	-0.000137	-0.00020	-0.000108	
IMP_TotalPurchases	1	0.000029	0.000058975	-0.00007	-0.000038426	-0.00002	0.000013446	Imputed TotalPurchases
LastPurchaseDate	1	0.000050	0.000099894	0.00001	0.000049239	-0.00001	0.000028808	
IMP_Age	0	0.000000	0	0.00000	0	0.00000	0	Imputed Age
M_TotalPurchases	0	0.000000	0	0.00000	0	0.00000	0	Imputation Indicator for TotalPurchases
Occupation	0	0.000000	0	0.00000	0	0.00000	0	

SAS Enterprise Miner Report
Node=HP Forest
Score Distributions where TARGET='Churn'

SAS Enterprise Miner Report
Node=HP Forest
Score Distributions where TARGET='Churn'

Node=HP Forest
Score Distributions

Target Variable=Churn Data Role=TRAIN

Range for Predicted	Mean Predicted	Max Predicted	Min Predicted	Mean Target	Max Target	Min Target
0.549 - 0.556	0.55128	0.55611	0.54958	0.59091	1	0
0.543 - 0.549	0.54597	0.54930	0.54285	0.61864	1	0
0.536 - 0.543	0.53898	0.54261	0.53606	0.59740	1	0
0.529 - 0.536	0.53285	0.53586	0.52929	0.56420	1	0
0.523 - 0.529	0.52612	0.52920	0.52260	0.55981	1	0
0.516 - 0.523	0.51893	0.52230	0.51596	0.50588	1	0
0.509 - 0.516	0.51273	0.51563	0.50919	0.49390	1	0
0.502 - 0.509	0.50567	0.50889	0.50266	0.48901	1	0
0.496 - 0.502	0.49941	0.50238	0.49596	0.45833	1	0
0.489 - 0.496	0.49205	0.49544	0.48901	0.51948	1	0
0.482 - 0.489	0.48605	0.48897	0.48231	0.45783	1	0
0.476 - 0.482	0.47903	0.48221	0.47597	0.39130	1	0
0.469 - 0.476	0.47357	0.47551	0.46888	0.41176	1	0
0.462 - 0.469	0.46465	0.46791	0.46222	0.45455	1	0
0.455 - 0.462	0.45885	0.46104	0.45584	0.20000	1	0
0.449 - 0.455	0.45341	0.45438	0.45245	0.00000	0	0
0.442 - 0.449	0.44832	0.44832	0.44832	0.00000	0	0
0.422 - 0.429	0.42361	0.42537	0.42184	0.00000	0	0

Target Variable=Churn Data Role=VALIDATE

Range for Predicted	Mean Predicted	Max Predicted	Min Predicted	Mean Target	Max Target	Min Target
0.550 - 0.556	0.55405	0.55611	0.55076	0.53846	1	0
0.544 - 0.550	0.54758	0.55013	0.54453	0.46939	1	0
0.538 - 0.544	0.54149	0.54424	0.53869	0.56364	1	0
0.533 - 0.538	0.53531	0.53834	0.53272	0.52083	1	0
0.527 - 0.533	0.52975	0.53254	0.52679	0.51429	1	0
0.521 - 0.527	0.52415	0.52601	0.52129	0.46269	1	0

Target Variable=Churn Data Role=VALIDATE

Range for Predicted	Mean Predicted	Max Predicted	Min Predicted	Mean Target	Max Target	Min Target
0.515 - 0.521	0.51817	0.52077	0.51512	0.34568	1	0
0.509 - 0.515	0.51228	0.51486	0.50919	0.53704	1	0
0.503 - 0.509	0.50581	0.50889	0.50325	0.47368	1	0
0.497 - 0.503	0.49994	0.50266	0.49736	0.57303	1	0
0.491 - 0.497	0.49411	0.49710	0.49170	0.55932	1	0
0.485 - 0.491	0.48797	0.49104	0.48553	0.56452	1	0
0.480 - 0.485	0.48277	0.48531	0.47959	0.35135	1	0
0.474 - 0.480	0.47683	0.47886	0.47404	0.82353	1	0
0.468 - 0.474	0.47186	0.47352	0.46791	0.48000	1	0
0.462 - 0.468	0.46487	0.46686	0.46336	0.25000	1	0
0.456 - 0.462	0.46040	0.46104	0.45912	0.66667	1	0
0.438 - 0.444	0.43834	0.43834	0.43834	1.00000	1	1

Target Variable=Churn Data Role=VALIDATE

Range for Predicted	Mean Predicted	Max Predicted	Min Predicted	Mean Target	Max Target	Min Target

SAS Enterprise Miner Report

**Node=Gradient Boosting
Summary**

Node id = Boost
Node label = Gradient Boosting
Meta path = Ids2 => Stat3 => Impt2 => Stat4 => Part2 => Boost
Notes =

**Node=Gradient Boosting
Properties**

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	Boost		MaxBranch	2		Performance	DISK	
AssessMeasure	PROFIT		MaxDepth	2		Precision	0	
CategoricalBins	30		Measure	PROFIT		ReUseVar	1	
CreateHStat	N		MinCatSize	5		Seed	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	0.001		ObsImportance	N		VarSelection	Y	

**Node=Gradient Boosting
Variable Summary**

Role	Level	Frequency Count	Name
TARGET	INTERVAL	1	Churn
INPUT	BINARY	2	M_Age M_TotalPurchases
INPUT	INTERVAL	4	IMP_Age IMP_TotalPurchases LastPurchaseDate TotalSpent
INPUT	NOMINAL	5	FavoriteCategory Gender Location MembershipLevel Occupation
ID	INTERVAL	2	CustomerID _dataobs_

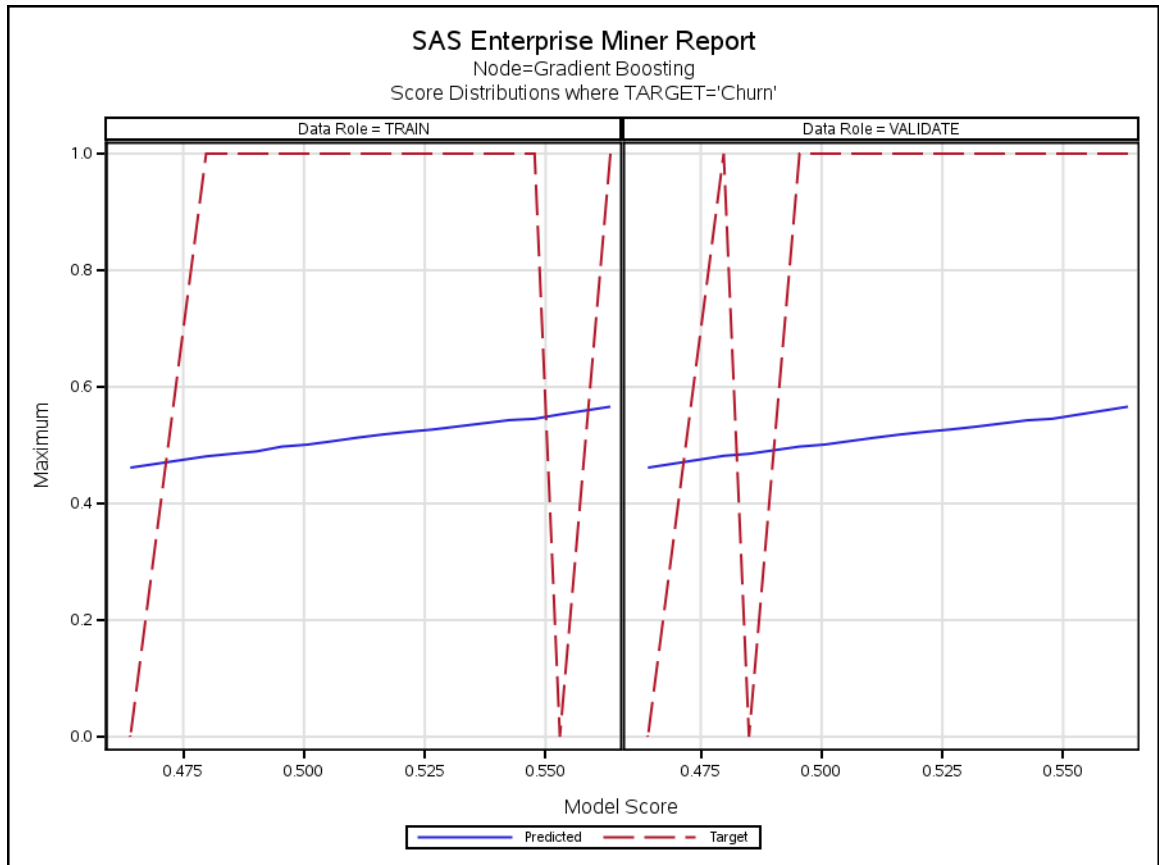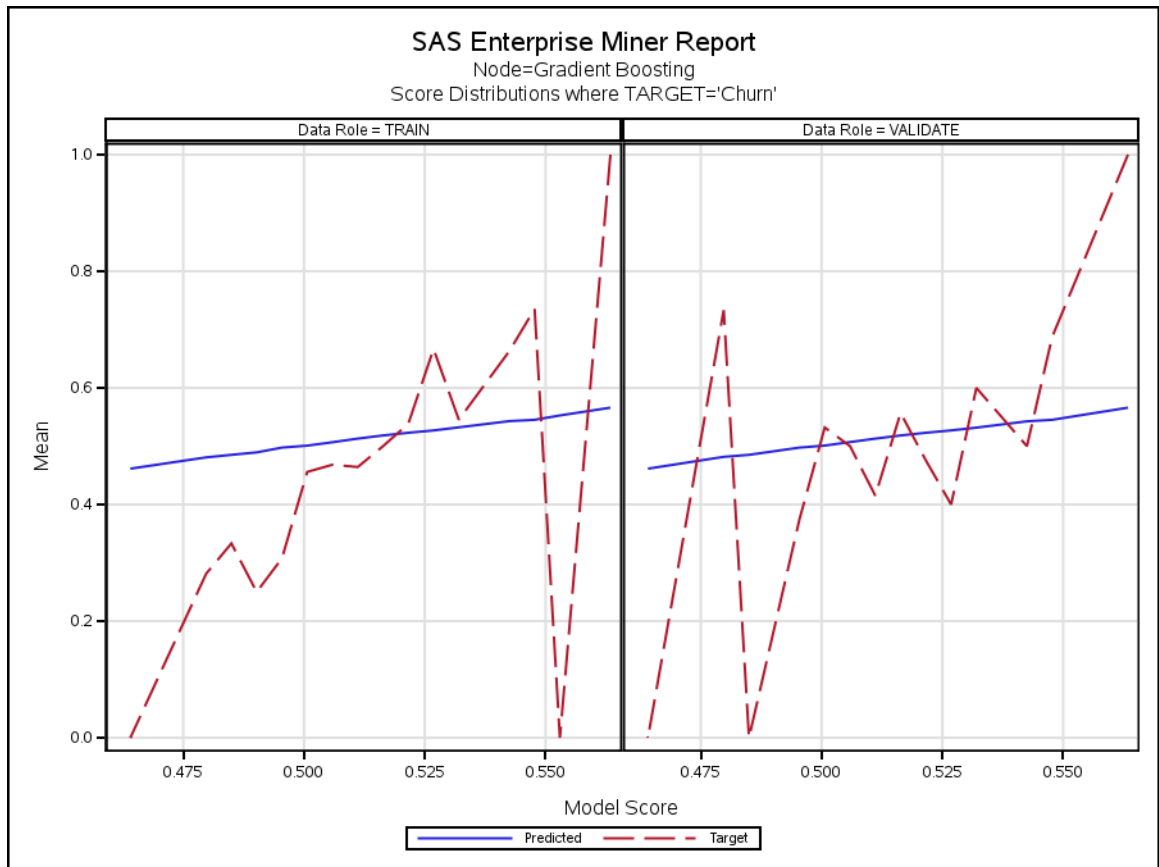**Node=Gradient Boosting
Model Fit Statistics**

Target=Churn Target Label=' '

Label of Statistic	Train	Validation	Test
Sum of Frequencies	2092.00	897.000	.
Sum of Case Weights Times Freq	2092.00	897.000	.
Maximum Absolute Error	0.55	0.545	.
Sum of Squared Errors	519.53	224.628	.
Average Squared Error	0.25	0.250	.
Root Average Squared Error	0.50	0.500	.
Divisor for ASE	2092.00	897.000	.
Total Degrees of Freedom	2092.00	.	.

SAS Enterprise Miner Report
Node=Gradient Boosting
Subseries Plot
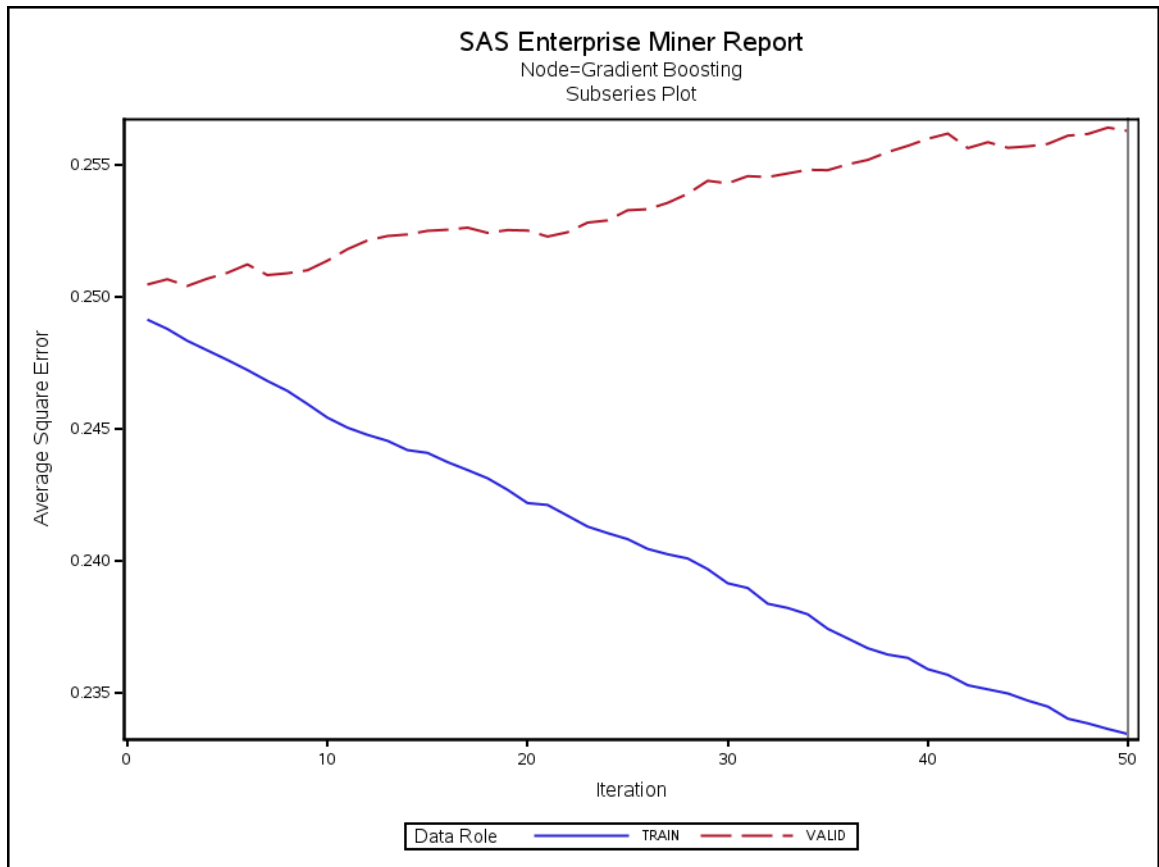
Node=Gradient Boosting
Variable Importance

Variable Name	Label	Number of Splitting Rules	Importance	Validation Importance	Ratio of Validation to Training Importance
LastPurchaseDate		4	1.00000	1	1
Location		2	0.78996	0	0
IMP_TotalPurchases	Imputed TotalPurchases	2	0.78942	0	0
MembershipLevel		1	0.48509	0	0
M_TotalPurchases	Imputation Indicator for TotalPurchases	0	0.00000	0	.
IMP_Age	Imputed Age	0	0.00000	0	.
M_Age	Imputation Indicator for Age	0	0.00000	0	.
FavoriteCategory		0	0.00000	0	.
TotalSpent		0	0.00000	0	.
Gender		0	0.00000	0	.
Occupation		0	0.00000	0	.

SAS Enterprise Miner Report
Node=Gradient Boosting
Score Distributions where TARGET='Churn'

SAS Enterprise Miner Report
Node=Gradient Boosting
Score Distributions where TARGET='Churn'

Node=Gradient Boosting
Score Distributions

Target Variable=Churn Data Role=TRAIN

Range for Predicted	Mean Predicted	Max Predicted	Min Predicted	Mean Target	Max Target	Min Target
0.561 - 0.566	0.56603	0.56603	0.56603	1.00000	1	1
0.550 - 0.556	0.55271	0.55271	0.55271	0.00000	0	0
0.545 - 0.550	0.54524	0.54524	0.54524	0.73529	1	0
0.540 - 0.545	0.54298	0.54423	0.54019	0.66304	1	0
0.529 - 0.535	0.53235	0.53390	0.53004	0.54545	1	0
0.524 - 0.529	0.52700	0.52778	0.52677	0.66667	1	0
0.519 - 0.524	0.52305	0.52344	0.52150	0.53838	1	0
0.514 - 0.519	0.51838	0.51839	0.51446	0.50000	1	0
0.509 - 0.514	0.51301	0.51311	0.50940	0.46429	1	0
0.503 - 0.509	0.50678	0.50818	0.50598	0.46825	1	0
0.498 - 0.503	0.50094	0.50264	0.49970	0.45581	1	0
0.493 - 0.498	0.49759	0.49759	0.49759	0.30769	1	0
0.488 - 0.493	0.48937	0.48937	0.48937	0.25000	1	0
0.482 - 0.488	0.48518	0.48518	0.48518	0.33333	1	0
0.477 - 0.482	0.48081	0.48224	0.47890	0.28125	1	0
0.461 - 0.467	0.46144	0.46144	0.46144	0.00000	0	0

Target Variable=Churn Data Role=VALIDATE

Range for Predicted	Mean Predicted	Max Predicted	Min Predicted	Mean Target	Max Target	Min Target
0.561 - 0.566	0.56603	0.56603	0.56603	1.00000	1	1
0.545 - 0.550	0.54524	0.54524	0.54524	0.68750	1	0
0.540 - 0.545	0.54263	0.54423	0.54019	0.50000	1	0
0.529 - 0.535	0.53181	0.53390	0.53004	0.60000	1	0
0.524 - 0.529	0.52705	0.52778	0.52686	0.40000	1	0
0.519 - 0.524	0.52303	0.52344	0.52150	0.47564	1	0
0.514 - 0.519	0.51839	0.51839	0.51839	0.55696	1	0
0.509 - 0.514	0.51297	0.51311	0.50940	0.41509	1	0
0.503 - 0.509	0.50707	0.50818	0.50598	0.50000	1	0
0.498 - 0.503	0.50105	0.50264	0.49970	0.53211	1	0
0.493 - 0.498	0.49759	0.49759	0.49759	0.37500	1	0
0.482 - 0.488	0.48518	0.48518	0.48518	0.00000	0	0
0.477 - 0.482	0.48174	0.48224	0.47890	0.73333	1	0
0.461 - 0.467	0.46144	0.46144	0.46144	0.00000	0	0

SAS Enterprise Miner Report

Node=Model Comparison (2)
Summary

Node id = MdlComp2
Node label = Model Comparison (2)
Meta path = Ids2 => Stat3 => Impt2 => Stat4 => Part2 => Tree9 => MdlComp2
Notes =

Node=Model Comparison (2)
Properties

Property	Value	Default	Property	Value	Default	Property	Value	Default
Component	ModelCompare		NumberOfReportedLevels	1E-6		SelectionData	DEFAULT	
AssessAllTargetLevels	N		NumberofBins	20		SelectionDepth	10	
DecileBin	20		ProfitEpsilon	1E-6		SelectionTable	TRAIN	TABLE
HPCriteria	DEFAULT		RecomputeAssess	N		StatisticUsed	_VASE_	
LiftEpsilon	1E-6		RocChart	Y		TargetLabel		
ModelCriteria	Valid: Average Squared Error		RocEpsilon	0.01		TargetName	Churn	
ModelDescription	Decision Tree 1		RoiEpsilon	1E-6		classViyaCriteria	DEFAULT	
ModelId	Tree9		ScoreDistBin	20		intervalViyaCriteria	DEFAULT	
NormalizeReportingVariables	Y		SelectionCriteria	DEFAULT				

Node=Model Comparison (2)
Variable Summary

Role	Level	Frequency Count	Name
TARGET	INTERVAL	1	Churn

Node=Model Comparison (2)
Fit Statistics Table

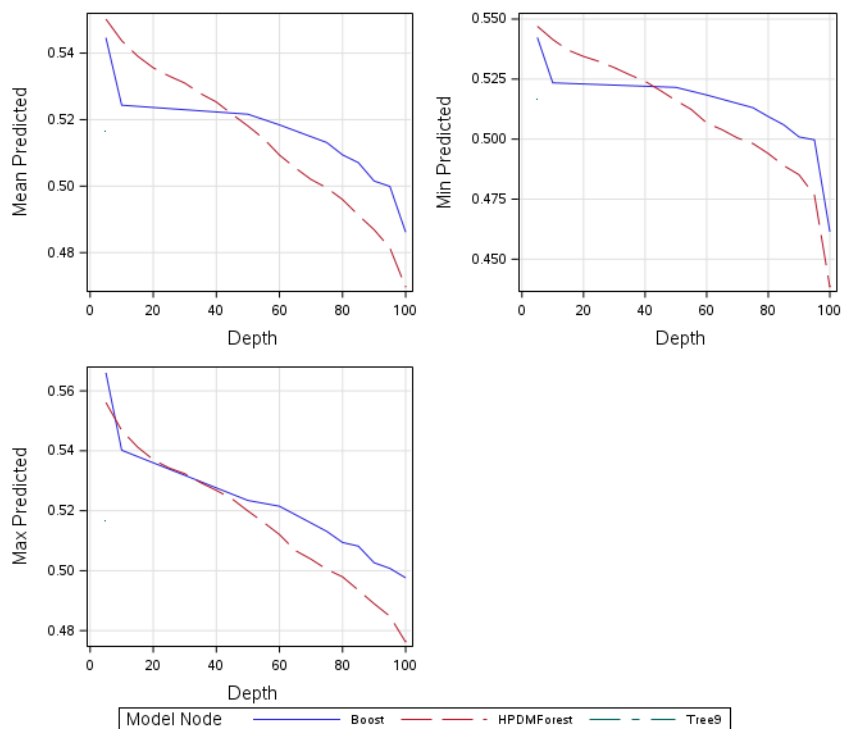| Selected Model	Predecessor Node	Model Node	Model Description	Target Variable	Target Label	Selection Criterion: Valid: Average Squared Error	Train: Average Squared Error
Y	Tree9	Tree9	Decision Tree 1	Churn		0.25014	0.24974
	Boost	Boost	Gradient Boosting	Churn		0.25042	0.24834
	HPDMForest	HPDMForest	HP Forest	Churn		0.25092	0.24752

SAS Enterprise Miner Report
Node=Model Comparison (2)
Multiple Model Assessment Scores where DataRole=TRAIN
TARGET='Churn'
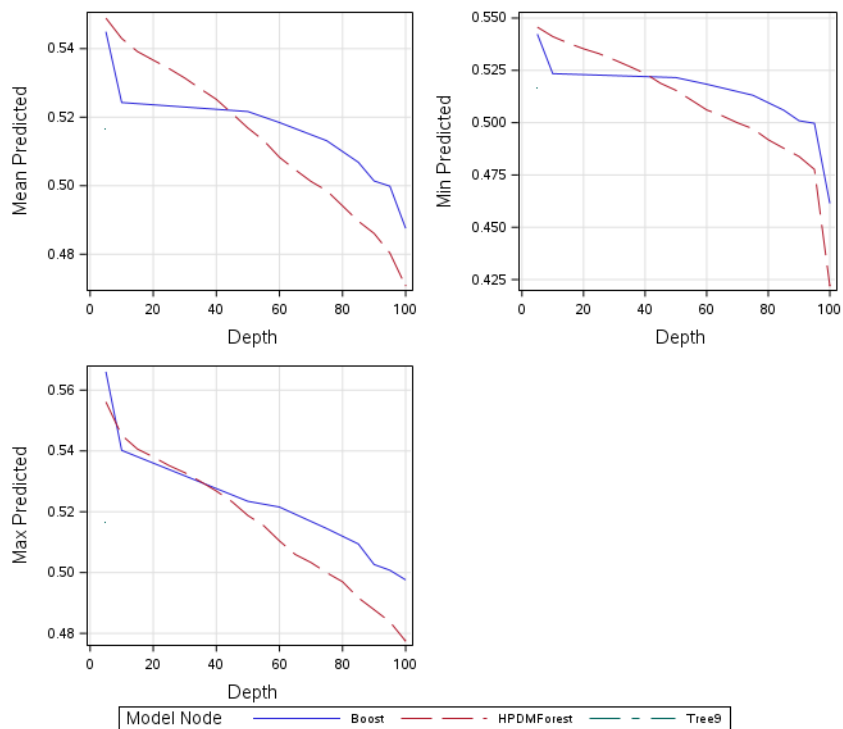
SAS Enterprise Miner Report
Node=Model Comparison (2)
Multiple Model Assessment Scores where DataRole=VALIDATE
TARGET='Churn'

End of Report