

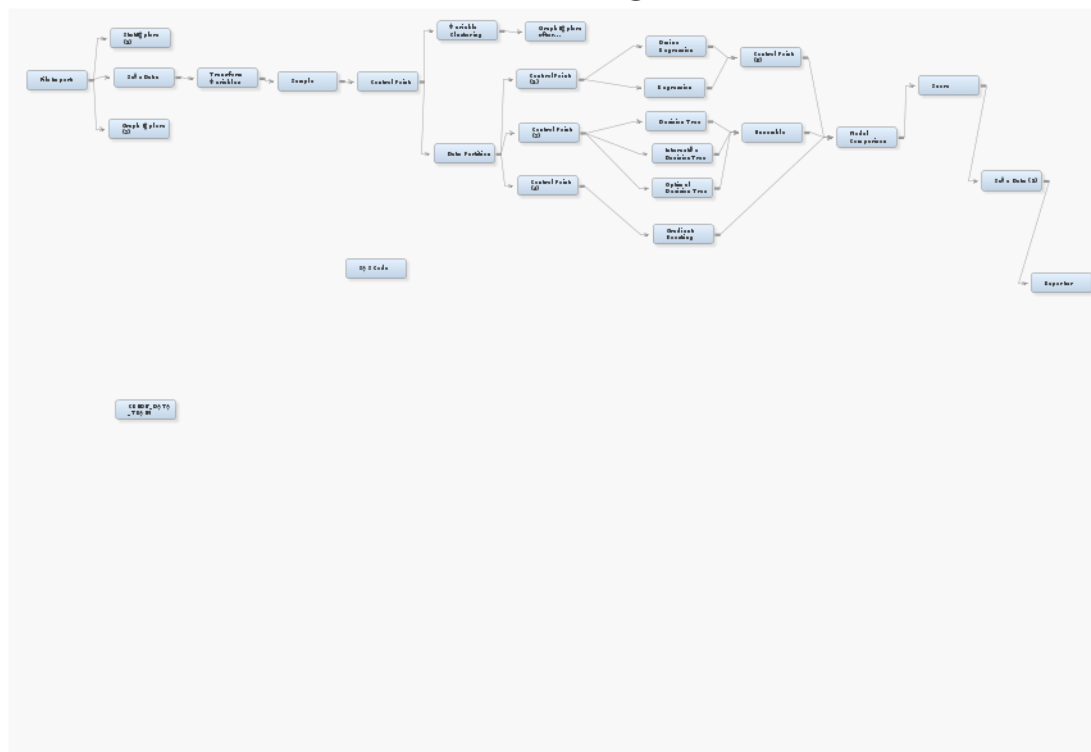
SAS Enterprise Miner Report

User = u63387163
 Date = 03:27:52 August 02
 Project = European Credit Card
 Diagram = European Credit

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=File Import
Summary

Node id = FIMPORT
Node label = File Import
Meta path = FIMPORT
Notes =

Node=File Import
Properties

| Property | Value | Default | Property | Value | Default | Property | Value | Default |
|-----------------|-------------|---------|------------|---|---------|-----------|------------|---------|
| Component | FileImport | | GuessRows | 500 | | NameRow | Y | |
| AccessTable | NoTableName | | IFilename | C:\Users\Owner\OneDrive\Desktop\CSU GLOBAL\European Credit Card.csv | | Password | NoPassword | |
| AdvancedAdvisor | N | | ImportType | Local | LOCAL | Role | TRAIN | |
| Delimiter | , | | MaxCols | 10000 | | SkipRows | 0 | |
| FileType | csv | XLS | MaxRows | 1000000 | | Summarize | N | |

Node=File Import
Data Attributes

| Attribute | Value | Attribute | Value | Attribute | Value |
|------------|--------------|----------------|--------------------|--------------|----------|
| Data Name | FIMPORT_DATA | Date Created | 22Jul2024:19:14:18 | Data Size | 70779904 |
| Data Type | DATA | Date Modified | 22Jul2024:19:14:18 | Role | TRAIN |
| Data Label | | Number Rows | 284807 | Segment | |
| Engine | V9 | Number Columns | 31 | Data Library | EMWS1 |

Node=File Import
Variables List

| Name | Label | Role | Level | Type | Length | Format | Creator |
|--------|-------|--------|----------|------|--------|----------|---------|
| Amount | | INPUT | INTERVAL | N | 8 | BEST12.0 | |
| Class | | TARGET | BINARY | N | 8 | BEST12.0 | |
| Time | | INPUT | INTERVAL | N | 8 | BEST12.0 | |
| V1 | | INPUT | INTERVAL | N | 8 | BEST12.0 | |
| V10 | | INPUT | INTERVAL | N | 8 | BEST12.0 | |
| V11 | | INPUT | INTERVAL | N | 8 | BEST12.0 | |
| V12 | | INPUT | INTERVAL | N | 8 | BEST12.0 | |
| V13 | | INPUT | INTERVAL | N | 8 | BEST12.0 | |
| V14 | | INPUT | INTERVAL | N | 8 | BEST12.0 | |
| V15 | | INPUT | INTERVAL | N | 8 | BEST12.0 | |
| V16 | | INPUT | INTERVAL | N | 8 | BEST12.0 | |
| V17 | | INPUT | INTERVAL | N | 8 | BEST12.0 | |
| V18 | | INPUT | INTERVAL | N | 8 | BEST12.0 | |
| V19 | | INPUT | INTERVAL | N | 8 | BEST12.0 | |
| V2 | | INPUT | INTERVAL | N | 8 | BEST12.0 | |
| V20 | | INPUT | INTERVAL | N | 8 | BEST12.0 | |
| V21 | | INPUT | INTERVAL | N | 8 | BEST12.0 | |
| V22 | | INPUT | INTERVAL | N | 8 | BEST12.0 | |
| V23 | | INPUT | INTERVAL | N | 8 | BEST12.0 | |
| V24 | | INPUT | INTERVAL | N | 8 | BEST12.0 | |

| Name | Label | Role | Level | Type | Length | Format | Creator |
|------|-------|-------|----------|------|--------|----------|---------|
| V25 | | INPUT | INTERVAL | N | 8 | BEST12.0 | |
| V26 | | INPUT | INTERVAL | N | 8 | BEST12.0 | |
| V27 | | INPUT | INTERVAL | N | 8 | BEST12.0 | |
| V28 | | INPUT | INTERVAL | N | 8 | BEST12.0 | |
| V3 | | INPUT | INTERVAL | N | 8 | BEST12.0 | |
| V4 | | INPUT | INTERVAL | N | 8 | BEST12.0 | |
| V5 | | INPUT | INTERVAL | N | 8 | BEST12.0 | |
| V6 | | INPUT | INTERVAL | N | 8 | BEST12.0 | |
| V7 | | INPUT | INTERVAL | N | 8 | BEST12.0 | |
| V8 | | INPUT | INTERVAL | N | 8 | BEST12.0 | |
| V9 | | INPUT | INTERVAL | N | 8 | BEST12.0 | |

Node=File Import
Created Variables List

SAS Enterprise Miner Report

Node=Save Data
Summary

Node id = EMSave
Node label = Save Data
Meta path = FIMPORT => EMSave
Notes =

Node=Save Data
Properties

| Property | Value | Default | Property | Value | Default | Property | Value | Default |
|-------------------|----------|---------|----------|---------------------------|---------|-------------|----------|----------|
| Component | EMSave | | Name | European Credit Card_Data | | Train | Y | |
| AllObs | Y | | OutObs | 1000 | | Transaction | Y | |
| AllRoles | Y | | Replace | Y | | Type | SAS7BDAT | SAS7DBAT |
| DirectorySelector | | | Score | Y | | Validate | Y | |
| Lib | EUROPEAN | | Test | Y | | | | |

Node=Save Data
Variable Summary

| Role | Level | Frequency Count | Name |
|-------|----------|-----------------|--|
| INPUT | INTERVAL | 30 | Amount Time V1 V10 V11 V12 V13 V14 V15 V16 V17 V18 V19 V2 V20 V21 V22 V23 V24 V25 V26 V27 V28 V3 V4 V5 V6 V7 V8 V9 |

Node=Save Data
Data

| Data Library | Output Location | Total Observations | Saved Observations | Number of Variables |
|--------------|---------------------------------|--------------------|--------------------|---------------------|
| EUROPEAN | /saswork/em_save_TRAIN.sas7bdat | 284807 | MAX | 31 |

SAS Enterprise Miner Report

Node=Transform Variables
Summary

Node id = Trans
Node label = Transform Variables
Meta path = FIMPORT => EMSave => 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 | NONE | | HideVariable | Y | | RejectVariable | Y | |
| DefaultTargetMethod | NONE | | MaxOptimalBins | 4 | | SummaryStatistics | Y | |
| EmRandomSeed | 12345 | | MinOffset | Y | | SummaryVariables | TRANSFORMED | |
| EmSampleMethod | FIRSTN | | MissingAsLevel | N | | UseMetaTransform | Y | |

Node=Transform Variables
Variable Summary

| Role | Level | Frequency Count | Name |
|--------|----------|--------------------|--|
| TARGET | BINARY | 1 | Class |
| INPUT | INTERVAL | 30 | Amount Time V1 V10 V11 V12 V13 V14 V15 V16 V17 V18 V19 V2 V20 V21 V22 V23 V24 V25 V26 V27 V28 V3 V4 V5 V6 V7 V8 V9 |

Node=Transform Variables
Transformations Statistics

| Source | Method | Variable Name | Formula | Number of Levels | Non Missing | Missing | Minimum | Maximum | Mean | Standard Deviation | Skewness | Kurtosis | Label |
|--------|----------|------------------|-----------------|------------------------|----------------|---------|---------|----------|---------|-----------------------|----------|----------|--------------------|
| Input | Original | Amount | | . | 284807 | 0 | 0 | 25691.16 | 88.3496 | 250.120 | 16.9777 | 845.093 | |
| Output | Computed | LOG_Amount | log(Amount + 1) | . | 284807 | 0 | 0 | 10.15 | 3.1522 | 1.657 | 0.1627 | -0.640 | Transformed Amount |

SAS Enterprise Miner Report

Node=Sample
Summary

Node id = Smpl
Node label = Sample
Meta path = FIMIMPORT => EMSSave => Trans => Smpl
Notes =

Node=Sample
Properties

| Property | Value | Default | Property | Value | Default | Property | Value | Default |
|-------------------|--------|---------|-----------------------|----------|---------|-------------------|---------|--------------|
| Component | Sample | | IgnoreSmallStrata | N | | OutputType | DATA | |
| AdjustFreq | N | | IntervalDistribution | Y | | Pvalue | 0.01 | |
| Alpha | 0.01 | | LevelProportion | 100 | | RandomSeed | 12345 | |
| ClassDistribution | Y | | LevelSampleProportion | 50 | | SizeObs | . | |
| ClusterMethod | RANDOM | | LevelSelection | EVENT | | SizePercent | 10 | |
| FreqCount | N | | Method | STRATIFY | DEFAULT | SizeType | PERCENT | |
| FreqMiss | N | | MinStrataSize | 5 | | StratifyCriterion | EQUAL | PROPORTIONAL |

Node=Sample
Variable Summary

| Role | Level | Frequency Count | Name |
|--------|----------|--------------------|--|
| TARGET | BINARY | 1 | Class |
| INPUT | INTERVAL | 30 | LOG_Amount Time V1 V10 V11 V12 V13 V14 V15 V16 V17 V18 V19 V2 V20 V21 V22 V23 V24 V25 V26 V27 V28 V3 V4 V5 V6 V7 V8 V9 |

SAS Enterprise Miner Report

Node=Data Partition Summary

Node id = Part
 Node label = Data Partition
 Meta path = FIMPORT => EMSSave => Trans => Smpl => Part
 Notes =

Node=Data Partition Properties

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

Node=Data Partition Variable Summary

| Role | Level | Frequency Count | Name |
|--------|----------|--------------------|--|
| TARGET | BINARY | 1 | Class |
| INPUT | INTERVAL | 30 | LOG_Amount Time V1 V10 V11 V12 V13 V14 V15 V16 V17 V18 V19 V2 V20 V21 V22 V23 V24 V25 V26 V27 V28 V3 V4 V5 V6 V7 V8 V9 |
| ID | INTERVAL | 1 | _dataobs_ |

SAS Enterprise Miner Report

Node=Regression
Summary

Node id = Reg
Node label = Regression
Meta path = FIMPORT => EMSSave => Trans => Smpl => Part => Reg
Notes =

Node=Regression
Properties

| Property | Value | Default | Property | Value | Default | Property | Value | Default |
|------------------|--------------|--------------|-----------------------|-----------|---------|--------------------|-------|---------|
| Component | Regression | | Force | 0 | | PolynomialDegree | 2 | |
| AbsConValue | -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 | VMISC | 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=Regression
Variable Summary

| Role | Level | Frequency Count | Name |
|--------|----------|-----------------|--|
| TARGET | BINARY | 1 | Class |
| INPUT | INTERVAL | 30 | LOG_Amount Time V1 V10 V11 V12 V13 V14 V15 V16 V17 V18 V19 V2 V20 V21 V22 V23 V24 V25 V26 V27 V28 V3 V4 V5 V6 V7 V8 V9 |

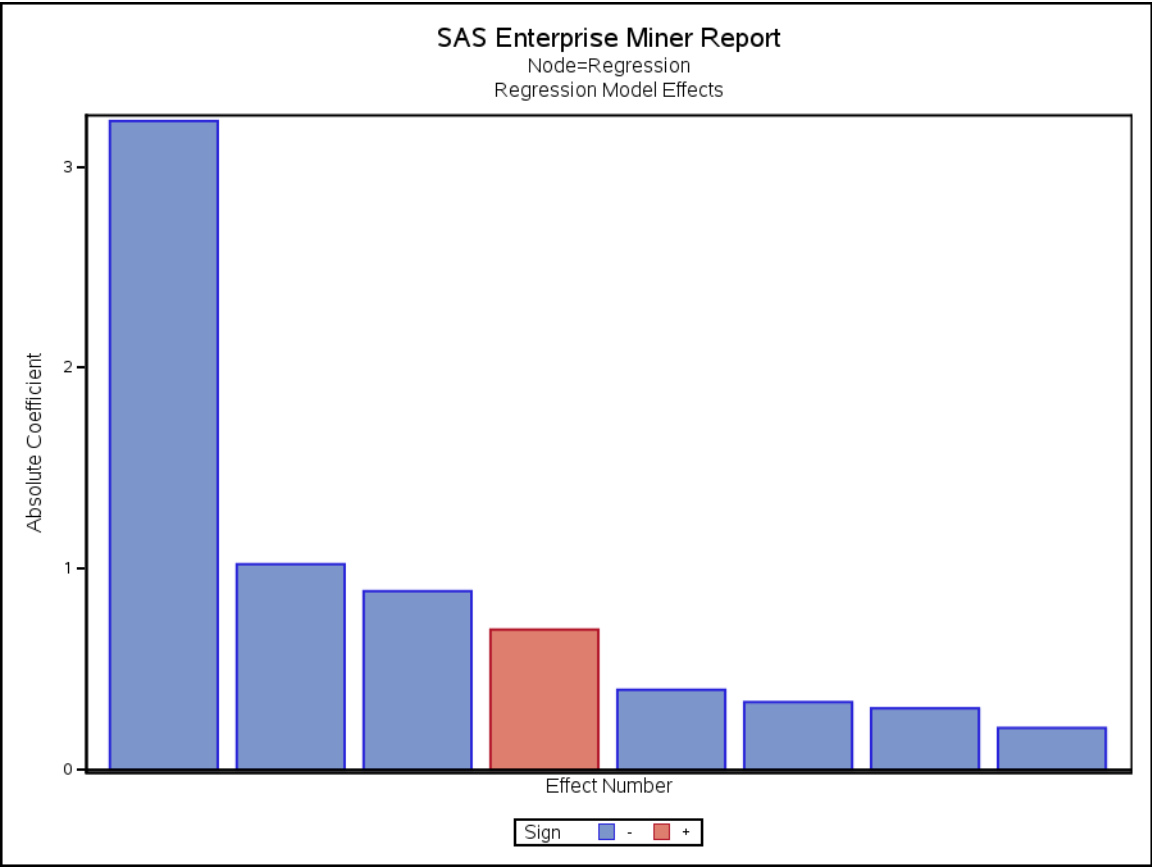
Node=Regression
Model Fit Statistics

Target=Class Target Label='1'

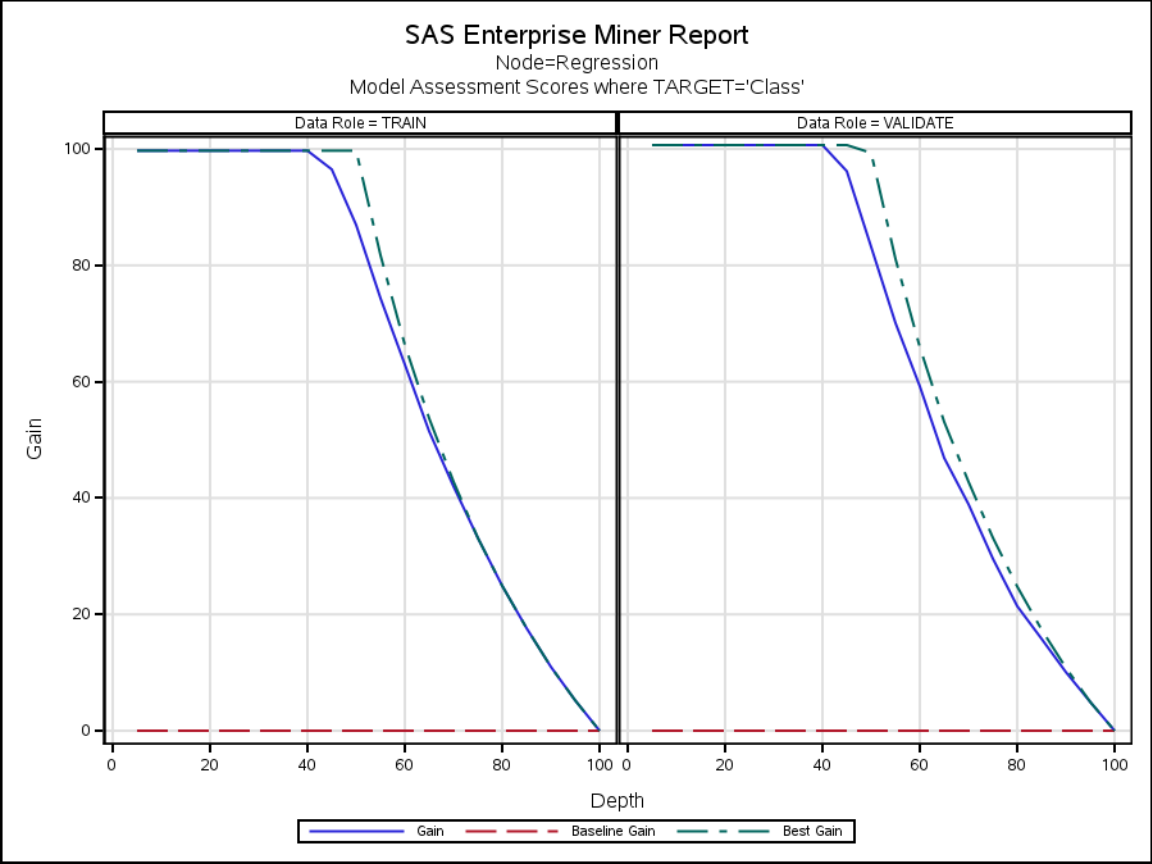
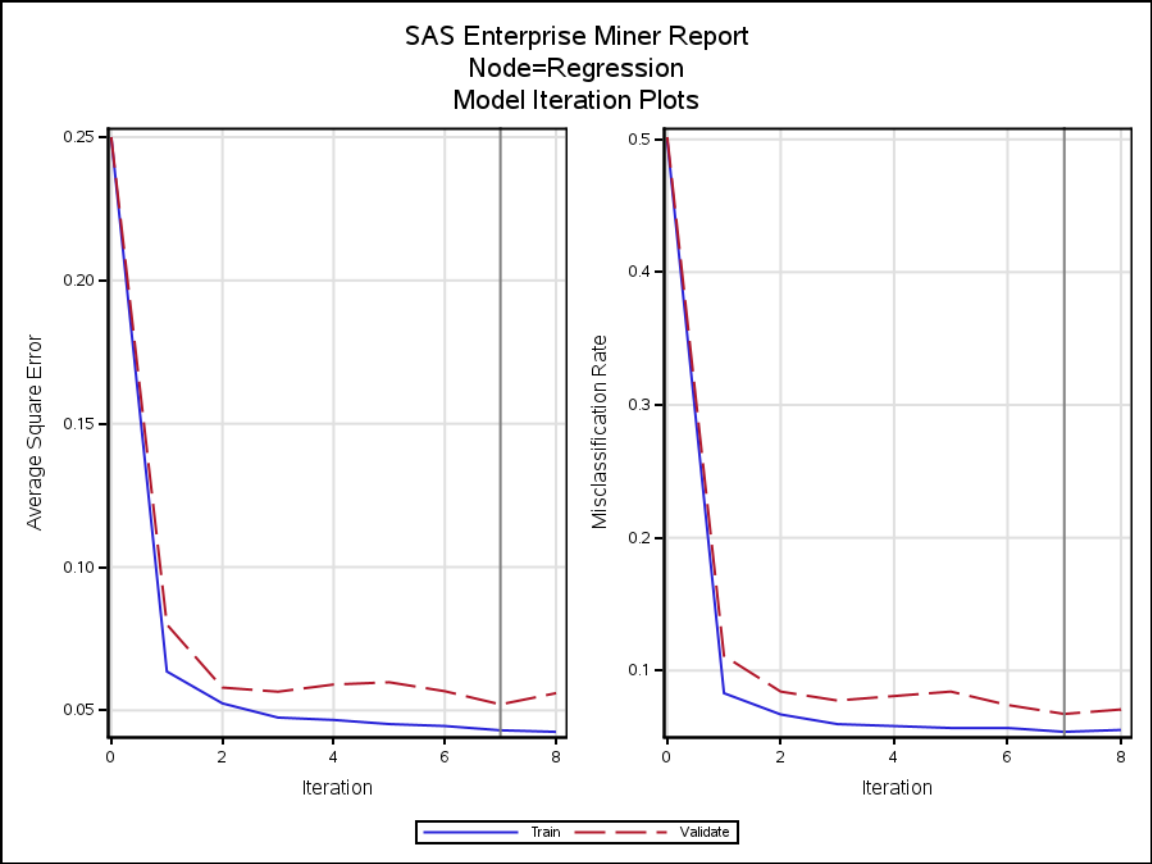
| Label of Statistic | Train | Validation | Test |
|--------------------------------|---------|------------|------|
| Akaike's Information Criterion | 215.50 | . | . |
| Average Squared Error | 0.04 | 0.052 | . |
| Average Error Function | 0.15 | 0.189 | . |
| Degrees of Freedom for Error | 679.00 | . | . |
| Model Degrees of Freedom | 8.00 | . | . |
| Total Degrees of Freedom | 687.00 | . | . |
| Divisor for ASE | 1374.00 | 594.000 | . |

Target=Class Target Label=''

| Label of Statistic | Train | Validation | Test |
|--------------------------------|---------|------------|------|
| Error Function | 199.50 | 112.048 | . |
| Final Prediction Error | 0.04 | . | . |
| Maximum Absolute Error | 0.97 | 0.992 | . |
| Mean Square Error | 0.04 | 0.052 | . |
| Sum of Frequencies | 687.00 | 297.000 | . |
| Number of Estimate Weights | 8.00 | . | . |
| Root Average Sum of Squares | 0.21 | 0.228 | . |
| Root Final Prediction Error | 0.21 | . | . |
| Root Mean Squared Error | 0.21 | 0.228 | . |
| Schwarz's Bayesian Criterion | 251.76 | . | . |
| Sum of Squared Errors | 59.16 | 30.941 | . |
| Sum of Case Weights Times Freq | 1374.00 | 594.000 | . |
| Misclassification Rate | 0.05 | 0.067 | . |

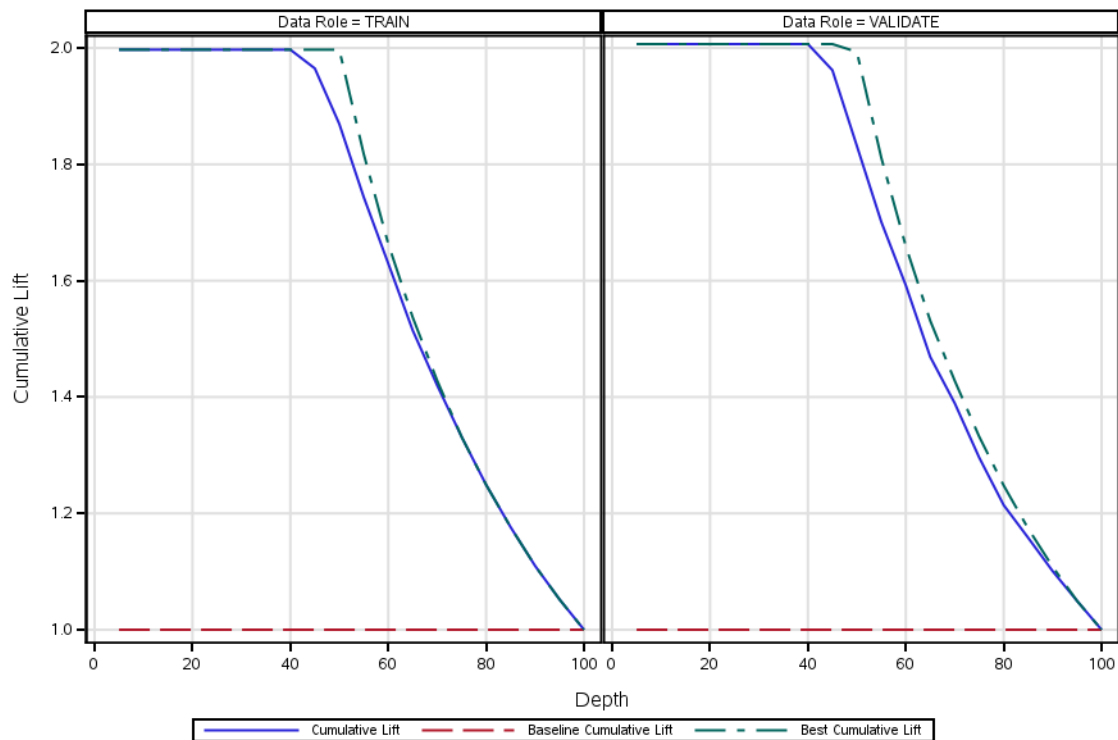


| Effect Number | Variable | Level | Coefficient | T-value | P Value | Effect Number | Variable | Level | Coefficient | T-value | P Value |
|---------------|-----------|-------|-------------|----------|------------|---------------|----------|-------|-------------|----------|----------|
| 1 | Intercept | 1 | -3.22719 | -11.1971 | 4.2114E-29 | 5 | V13 | | -0.39762 | -2.16555 | 0.030345 |
| 2 | V14 | | -1.02252 | -6.2633 | 3.7684E-10 | 6 | V23 | | -0.33642 | -2.20671 | 0.027334 |
| 3 | V12 | | -0.88845 | -4.9483 | .000000749 | 7 | V2 | | -0.30544 | -2.73386 | 0.006260 |
| 4 | V4 | | 0.69721 | 5.5896 | .000000023 | 8 | V8 | | -0.20796 | -2.47158 | 0.013452 |



Node=Regression

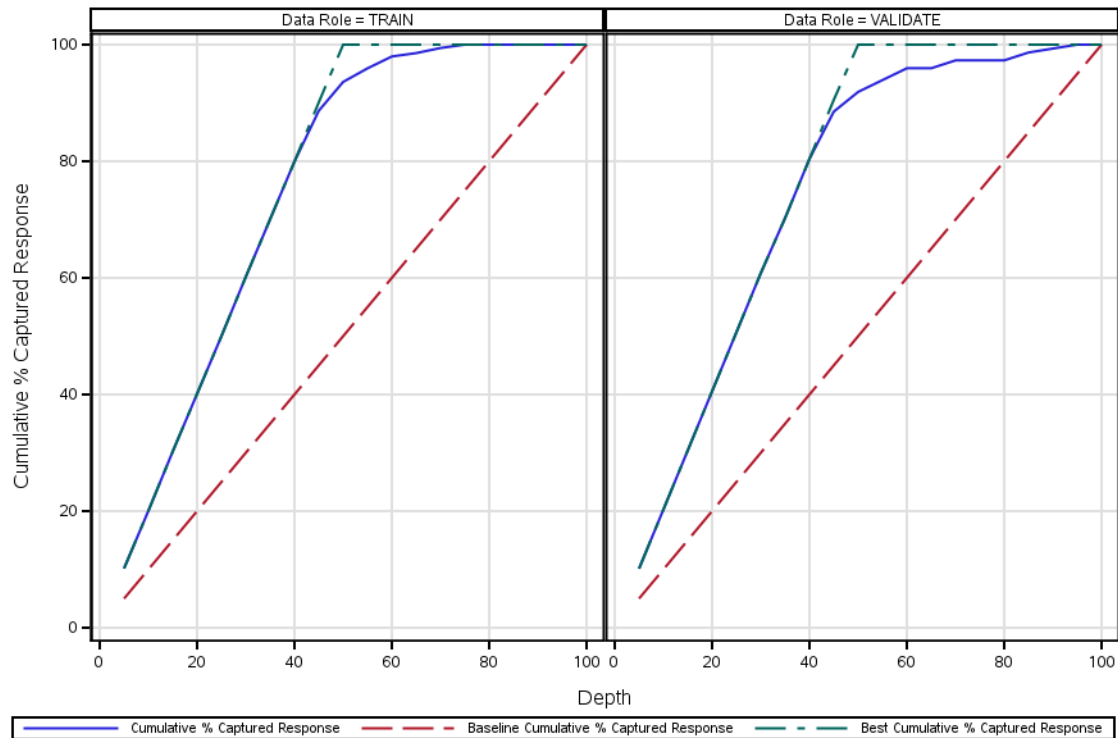
Model Assessment Scores where TARGET='Class'

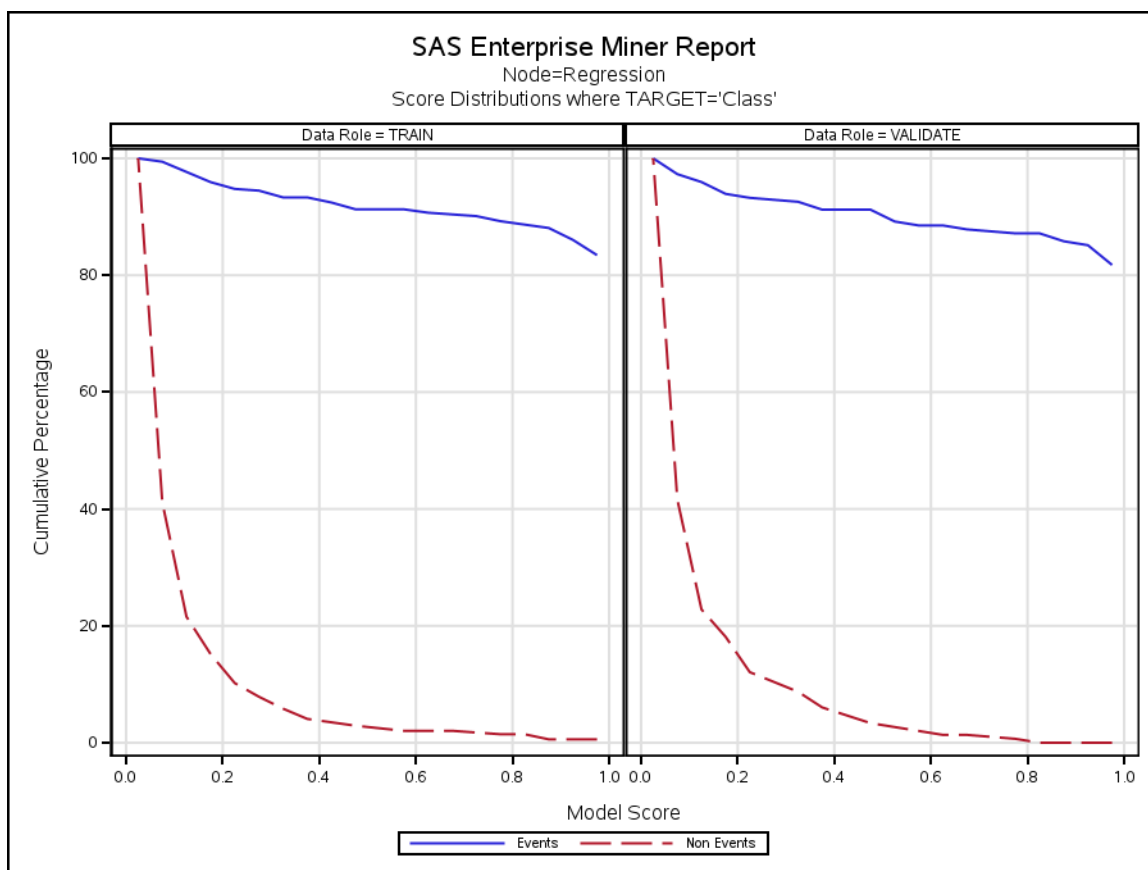
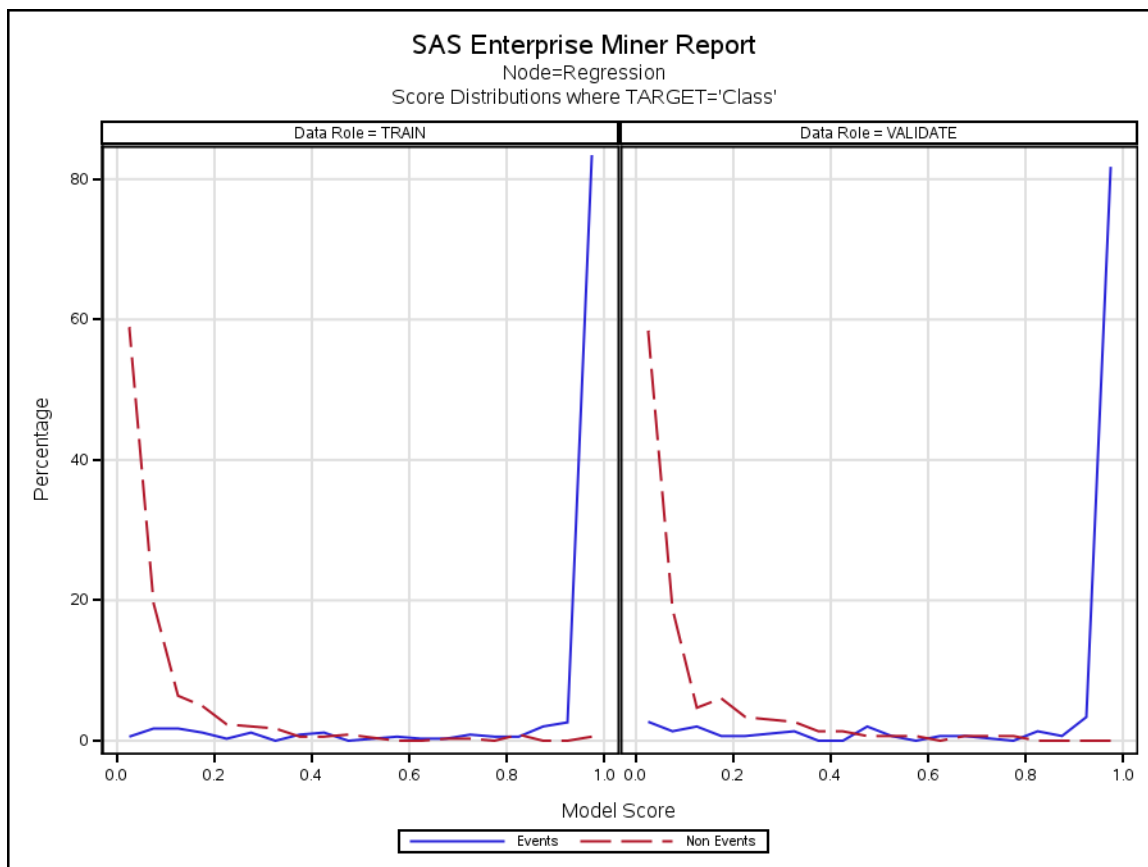


SAS Enterprise Miner Report

Node=Regression

Model Assessment Scores where TARGET='Class'





Node=Regression
Score Distributions

Target Variable=Class 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 | 287 | 83.4302 | 0.5831 | 83.430 | 0.583 |
| 0.90-0.95 | 9 | 2.6163 | 0.0000 | 86.047 | 0.583 |
| 0.85-0.90 | 7 | 2.0349 | 0.0000 | 88.081 | 0.583 |
| 0.80-0.85 | 2 | 0.5814 | 0.8746 | 88.663 | 1.458 |
| 0.75-0.80 | 2 | 0.5814 | 0.0000 | 89.244 | 1.458 |
| 0.70-0.75 | 3 | 0.8721 | 0.2915 | 90.116 | 1.749 |
| 0.65-0.70 | 1 | 0.2907 | 0.2915 | 90.407 | 2.041 |
| 0.60-0.65 | 1 | 0.2907 | 0.0000 | 90.698 | 2.041 |
| 0.55-0.60 | 2 | 0.5814 | 0.0000 | 91.279 | 2.041 |
| 0.45-0.50 | 0 | 0.0000 | 0.8746 | 91.279 | 2.915 |
| 0.40-0.45 | 4 | 1.1628 | 0.5831 | 92.442 | 3.499 |
| 0.35-0.40 | 3 | 0.8721 | 0.5831 | 93.314 | 4.082 |
| 0.30-0.35 | 0 | 0.0000 | 1.7493 | 93.314 | 5.831 |
| 0.25-0.30 | 4 | 1.1628 | 2.0408 | 94.477 | 7.872 |
| 0.20-0.25 | 1 | 0.2907 | 2.3324 | 94.767 | 10.204 |
| 0.15-0.20 | 4 | 1.1628 | 4.9563 | 95.930 | 15.160 |
| 0.10-0.15 | 6 | 1.7442 | 6.4140 | 97.674 | 21.574 |
| 0.05-0.10 | 6 | 1.7442 | 19.5335 | 99.419 | 41.108 |
| 0.00-0.05 | 2 | 0.5814 | 58.8921 | 100.000 | 100.000 |

Target Variable=Class 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 | 121 | 81.7568 | 0.0000 | 81.757 | 0.000 |
| 0.90-0.95 | 5 | 3.3784 | 0.0000 | 85.135 | 0.000 |
| 0.85-0.90 | 1 | 0.6757 | 0.0000 | 85.811 | 0.000 |
| 0.80-0.85 | 2 | 1.3514 | 0.0000 | 87.162 | 0.000 |
| 0.75-0.80 | 0 | 0.0000 | 0.6711 | 87.162 | 0.671 |
| 0.65-0.70 | 1 | 0.6757 | 0.6711 | 87.838 | 1.342 |
| 0.60-0.65 | 1 | 0.6757 | 0.0000 | 88.514 | 1.342 |
| 0.55-0.60 | 0 | 0.0000 | 0.6711 | 88.514 | 2.013 |
| 0.50-0.55 | 1 | 0.6757 | 0.6711 | 89.189 | 2.685 |
| 0.45-0.50 | 3 | 2.0270 | 0.6711 | 91.216 | 3.356 |
| 0.40-0.45 | 0 | 0.0000 | 1.3423 | 91.216 | 4.698 |
| 0.35-0.40 | 0 | 0.0000 | 1.3423 | 91.216 | 6.040 |
| 0.30-0.35 | 2 | 1.3514 | 2.6846 | 92.568 | 8.725 |
| 0.20-0.25 | 1 | 0.6757 | 3.3557 | 93.243 | 12.081 |
| 0.15-0.20 | 1 | 0.6757 | 6.0403 | 93.919 | 18.121 |
| 0.10-0.15 | 3 | 2.0270 | 4.6980 | 95.946 | 22.819 |
| 0.05-0.10 | 2 | 1.3514 | 18.7919 | 97.297 | 41.611 |
| 0.00-0.05 | 4 | 2.7027 | 58.3893 | 100.000 | 100.000 |

SAS Enterprise Miner Report

Node=Dmine Regression Summary

Node id = DmineReg
 Node label = Dmine Regression
 Meta path = FIMPORT => EMSave => Trans => Smpl => Part => DmineReg
 Notes =

Node=Dmine Regression Properties

| Property | Value | Default | Property | Value | Default | Property | Value | Default |
|--------------|--------------|---------|----------------|---------|---------|---------------|--------|---------|
| Component | DmineReg | | MinR2 | 0.005 | | StatusMonitor | N | |
| Cutoff | 0.5 | | PrintOption | DEFAULT | | StopR2 | 0.0005 | |
| FastRegLabel | FastRegLABEL | | SASSPDS | Y | | UseAov16 | N | Y |
| MaxRows | 3000 | | ScoreVarSuffix | | | UseGroups | Y | |

Node=Dmine Regression Variable Summary

| Role | Level | Frequency Count | Name |
|--------|----------|-----------------|--|
| TARGET | BINARY | 1 | Class |
| INPUT | INTERVAL | 30 | LOG_Amount Time V1 V10 V11 V12 V13 V14 V15 V16 V17 V18 V19 V2 V20 V21 V22 V23 V24 V25 V26 V27 V28 V3 V4 V5 V6 V7 V8 V9 |

Node=Dmine Regression Model Fit Statistics

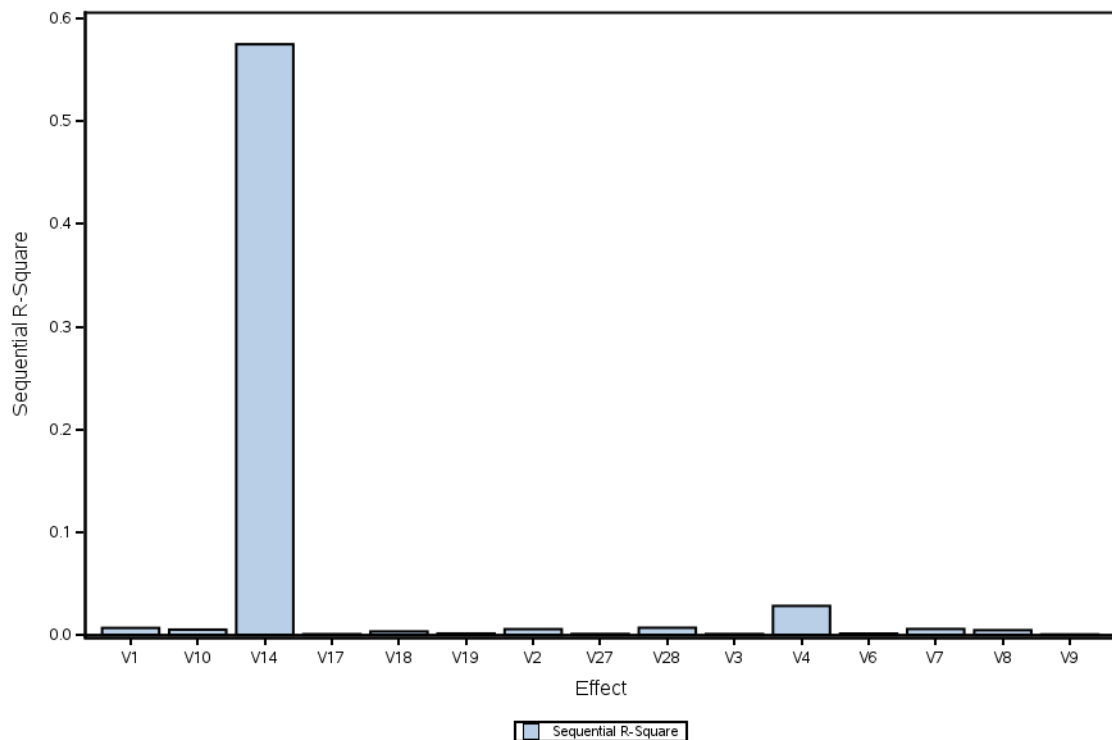
Target=Class Target Label="1"

| Label of Statistic | Train | Validation | Test |
|---------------------------------|---------|------------|------|
| Average Squared Error | 0.05 | 0.066 | . |
| Divisor for ASE | 1374.00 | 594.000 | . |
| Maximum Absolute Error | 1.00 | 1.000 | . |
| Sum of Frequencies | 687.00 | 297.000 | . |
| Root Average Squared Error | 0.23 | 0.258 | . |
| Sum of Squared Errors | 71.95 | 39.496 | . |
| Frequency of Classified Cases | 687.00 | 297.000 | . |
| Misclassification Rate | 0.07 | 0.077 | . |
| Number of Wrong Classifications | 47.00 | 23.000 | . |

SAS Enterprise Miner Report

Node=Dmine Regression

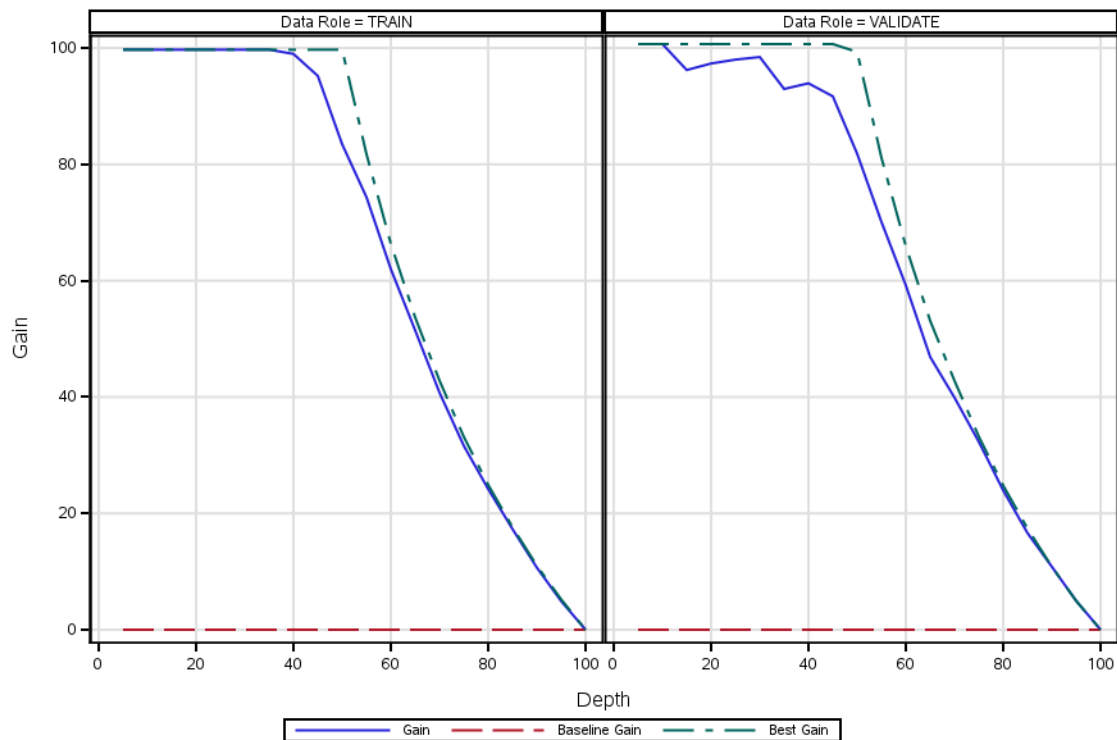
Effects in the Model

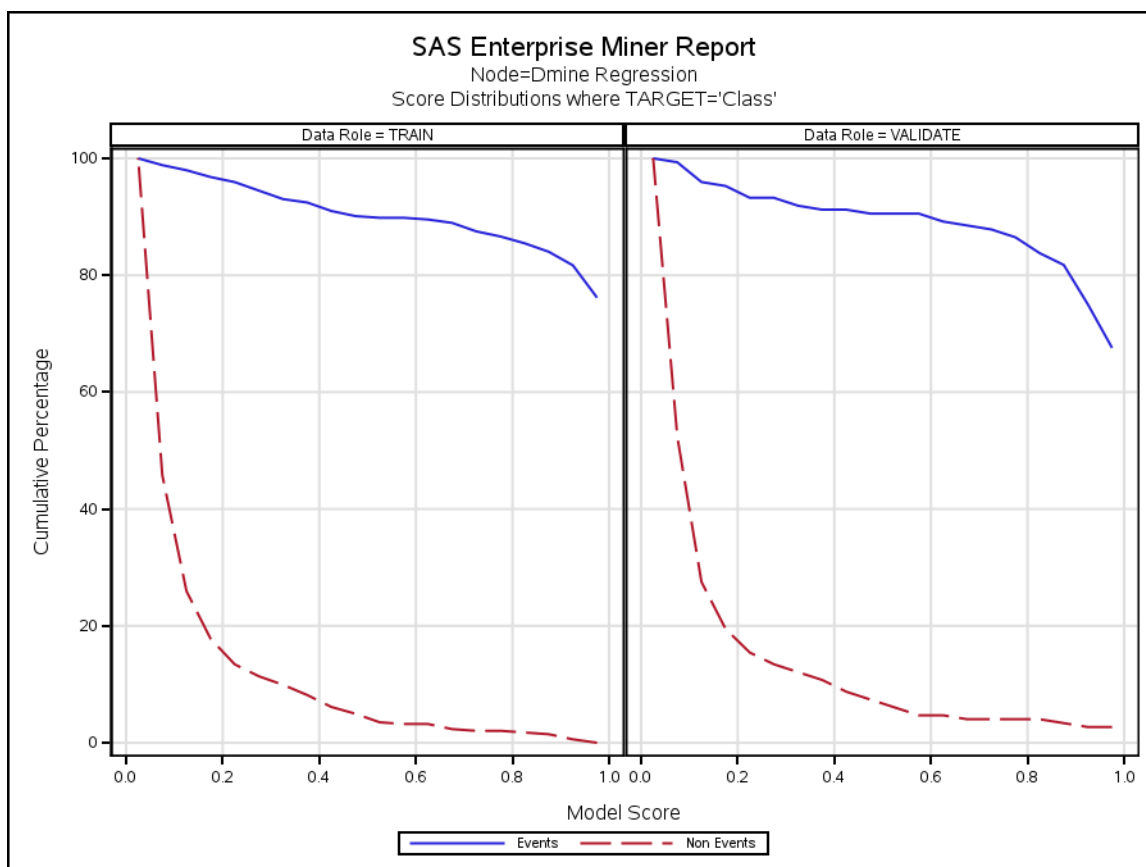
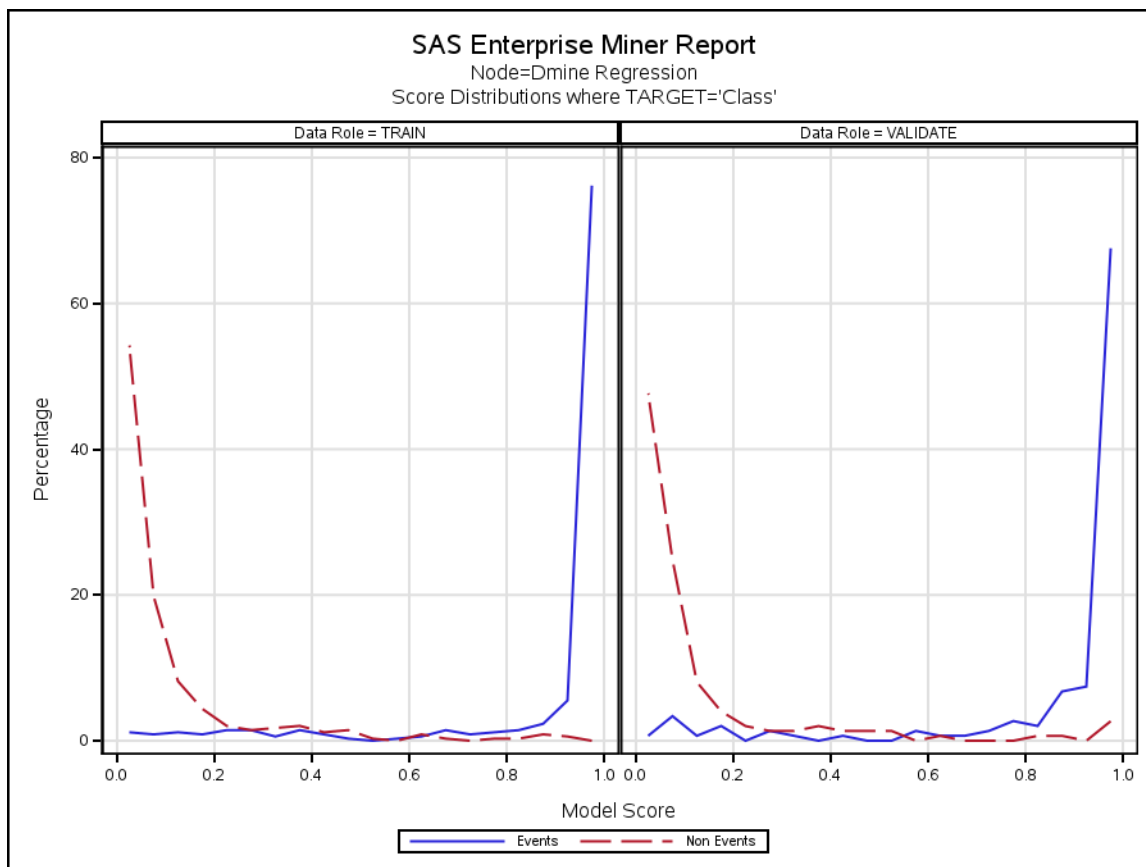


SAS Enterprise Miner Report

Node=Dmine Regression

Model Assessment Scores where TARGET='Class'





Node=Dmine Regression
Score Distributions

Target Variable=Class 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 | 262 | 76.1628 | 0.0000 | 76.163 | 0.000 |
| 0.90-0.95 | 19 | 5.5233 | 0.5831 | 81.686 | 0.583 |
| 0.85-0.90 | 8 | 2.3256 | 0.8746 | 84.012 | 1.458 |
| 0.80-0.85 | 5 | 1.4535 | 0.2915 | 85.465 | 1.749 |
| 0.75-0.80 | 4 | 1.1628 | 0.2915 | 86.628 | 2.041 |
| 0.70-0.75 | 3 | 0.8721 | 0.0000 | 87.500 | 2.041 |
| 0.65-0.70 | 5 | 1.4535 | 0.2915 | 88.953 | 2.332 |
| 0.60-0.65 | 2 | 0.5814 | 0.8746 | 89.535 | 3.207 |
| 0.55-0.60 | 1 | 0.2907 | 0.0000 | 89.826 | 3.207 |
| 0.50-0.55 | 0 | 0.0000 | 0.2915 | 89.826 | 3.499 |
| 0.45-0.50 | 1 | 0.2907 | 1.4577 | 90.116 | 4.956 |
| 0.40-0.45 | 3 | 0.8721 | 1.1662 | 90.988 | 6.122 |
| 0.35-0.40 | 5 | 1.4535 | 2.0408 | 92.442 | 8.163 |
| 0.30-0.35 | 2 | 0.5814 | 1.7493 | 93.023 | 9.913 |
| 0.25-0.30 | 5 | 1.4535 | 1.4577 | 94.477 | 11.370 |
| 0.20-0.25 | 5 | 1.4535 | 2.0408 | 95.930 | 13.411 |
| 0.15-0.20 | 3 | 0.8721 | 4.3732 | 96.802 | 17.784 |
| 0.10-0.15 | 4 | 1.1628 | 8.1633 | 97.965 | 25.948 |
| 0.05-0.10 | 3 | 0.8721 | 19.8251 | 98.837 | 45.773 |
| 0.00-0.05 | 4 | 1.1628 | 54.2274 | 100.000 | 100.000 |

Target Variable=Class 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 | 100 | 67.5676 | 2.6846 | 67.568 | 2.685 |
| 0.90-0.95 | 11 | 7.4324 | 0.0000 | 75.000 | 2.685 |
| 0.85-0.90 | 10 | 6.7568 | 0.6711 | 81.757 | 3.356 |
| 0.80-0.85 | 3 | 2.0270 | 0.6711 | 83.784 | 4.027 |
| 0.75-0.80 | 4 | 2.7027 | 0.0000 | 86.486 | 4.027 |
| 0.70-0.75 | 2 | 1.3514 | 0.0000 | 87.838 | 4.027 |
| 0.65-0.70 | 1 | 0.6757 | 0.0000 | 88.514 | 4.027 |
| 0.60-0.65 | 1 | 0.6757 | 0.6711 | 89.189 | 4.698 |
| 0.55-0.60 | 2 | 1.3514 | 0.0000 | 90.541 | 4.698 |
| 0.50-0.55 | 0 | 0.0000 | 1.3423 | 90.541 | 6.040 |
| 0.45-0.50 | 0 | 0.0000 | 1.3423 | 90.541 | 7.383 |
| 0.40-0.45 | 1 | 0.6757 | 1.3423 | 91.216 | 8.725 |
| 0.35-0.40 | 0 | 0.0000 | 2.0134 | 91.216 | 10.738 |
| 0.30-0.35 | 1 | 0.6757 | 1.3423 | 91.892 | 12.081 |
| 0.25-0.30 | 2 | 1.3514 | 1.3423 | 93.243 | 13.423 |
| 0.20-0.25 | 0 | 0.0000 | 2.0134 | 93.243 | 15.436 |
| 0.15-0.20 | 3 | 2.0270 | 4.0268 | 95.270 | 19.463 |
| 0.10-0.15 | 1 | 0.6757 | 8.0537 | 95.946 | 27.517 |
| 0.05-0.10 | 5 | 3.3784 | 24.8322 | 99.324 | 52.349 |
| 0.00-0.05 | 1 | 0.6757 | 47.6510 | 100.000 | 100.000 |

SAS Enterprise Miner Report

Node=Decision Tree Summary

Node id = Tree
Node label = Decision Tree
Meta path = FIMPORT => EMSave => Trans => Smpl => Part => Tree
Notes =

Node=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 | ASE | 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 | 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=Decision Tree Variable Summary

| Role | Level | Frequency Count | Name |
|--------|----------|--------------------|--|
| TARGET | BINARY | 1 | Class |
| INPUT | INTERVAL | 30 | LOG_Amount Time V1 V10 V11 V12 V13 V14 V15 V16 V17 V18 V19 V2 V20 V21 V22 V23 V24 V25 V26 V27 V28 V3 V4 V5 V6 V7 V8 V9 |

Node=Decision Tree Model Fit Statistics

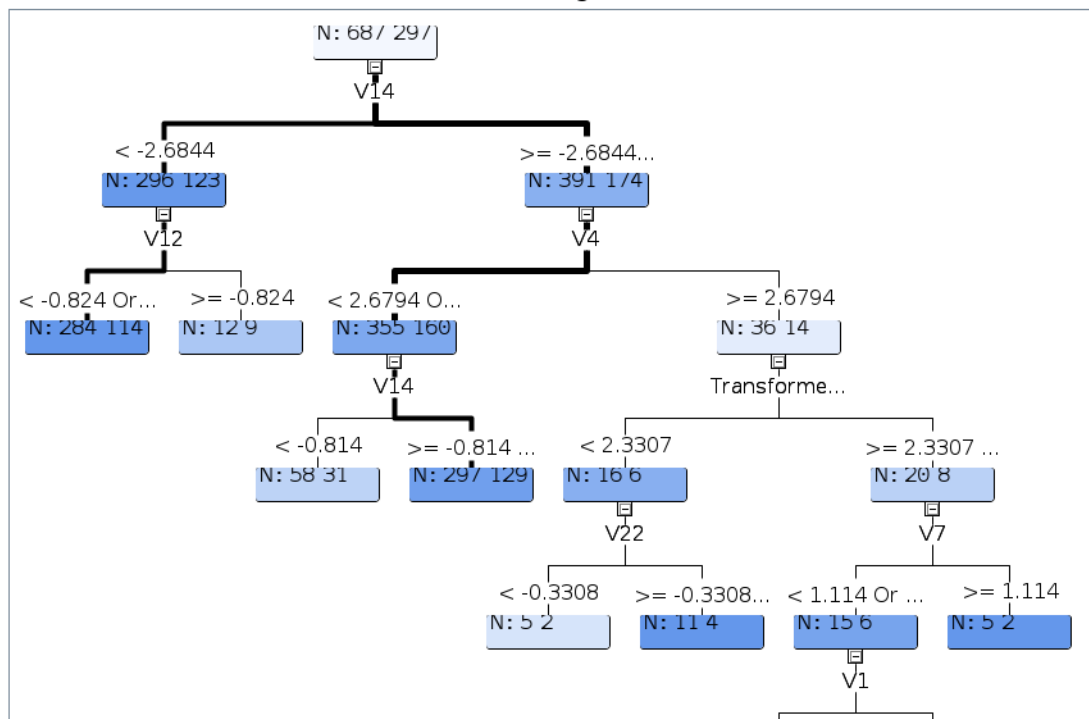
Target=Class Target Label='1'

| Label of Statistic | Train | Validation | Test |
|------------------------|--------|------------|------|
| Sum of Frequencies | 687.00 | 297.000 | . |
| Misclassification Rate | 0.05 | 0.098 | . |
| Maximum Absolute Error | 0.96 | 1.000 | . |
| Sum of Squared Errors | 58.19 | 43.905 | . |

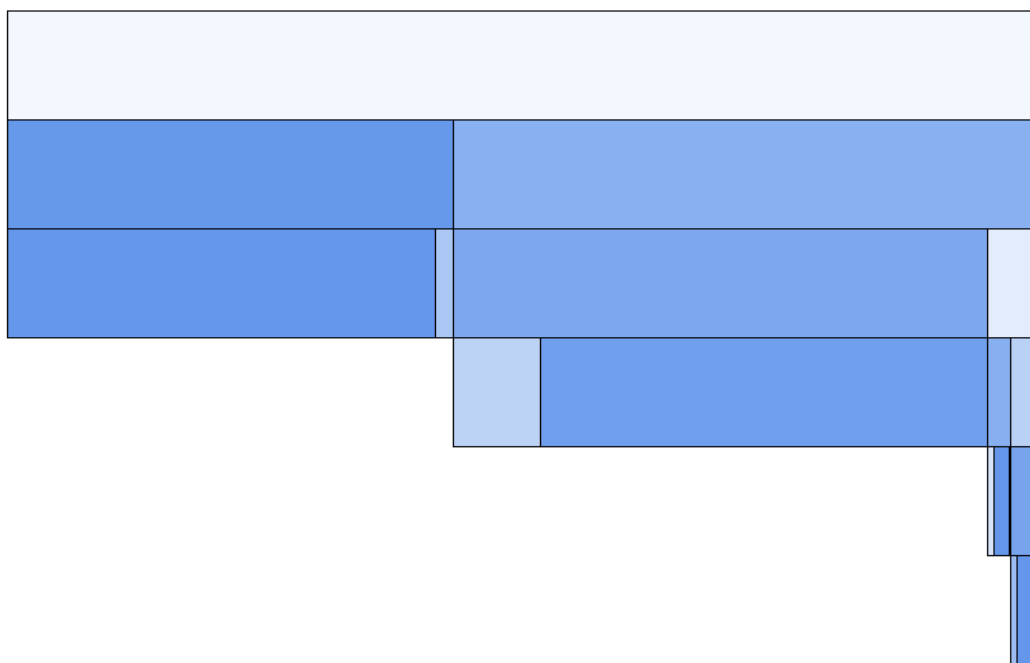
Target=Class Target Label=

| Label of Statistic | Train | Validation | Test |
|----------------------------|---------|------------|------|
| Average Squared Error | 0.04 | 0.074 | . |
| Root Average Squared Error | 0.21 | 0.272 | . |
| Divisor for ASE | 1374.00 | 594.000 | . |
| Total Degrees of Freedom | 687.00 | . | . |

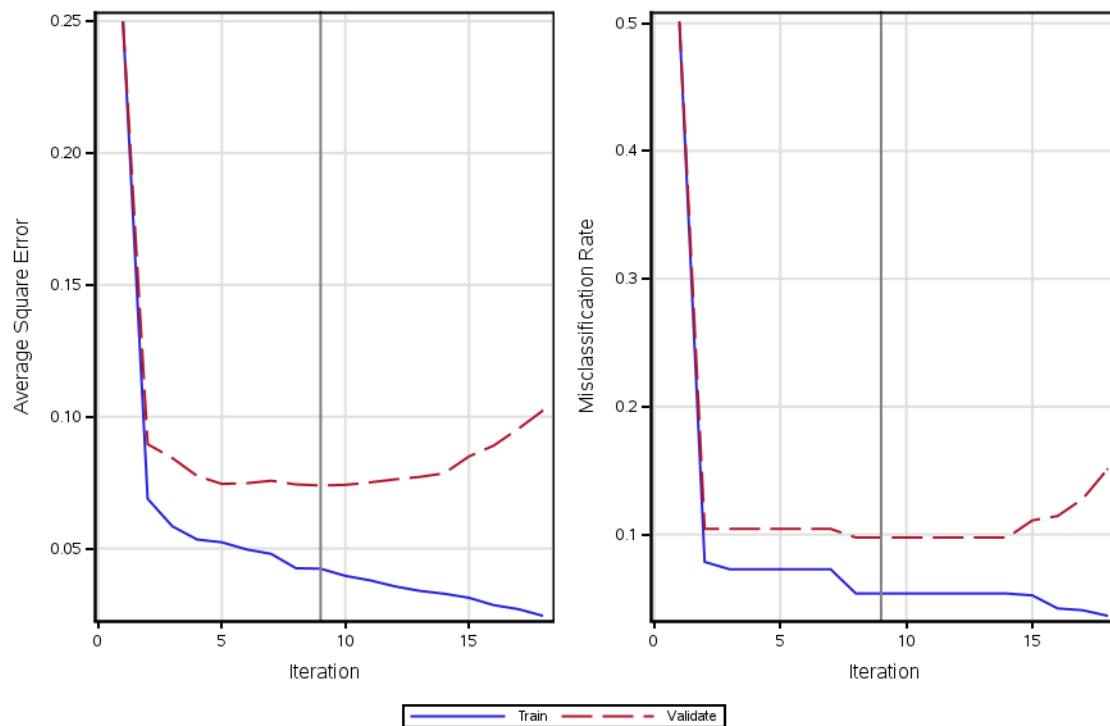
SAS Enterprise Miner Report
Node=Decision Tree
Tree Diagram



SAS Enterprise Miner Report
Node=Decision Tree
Treemap



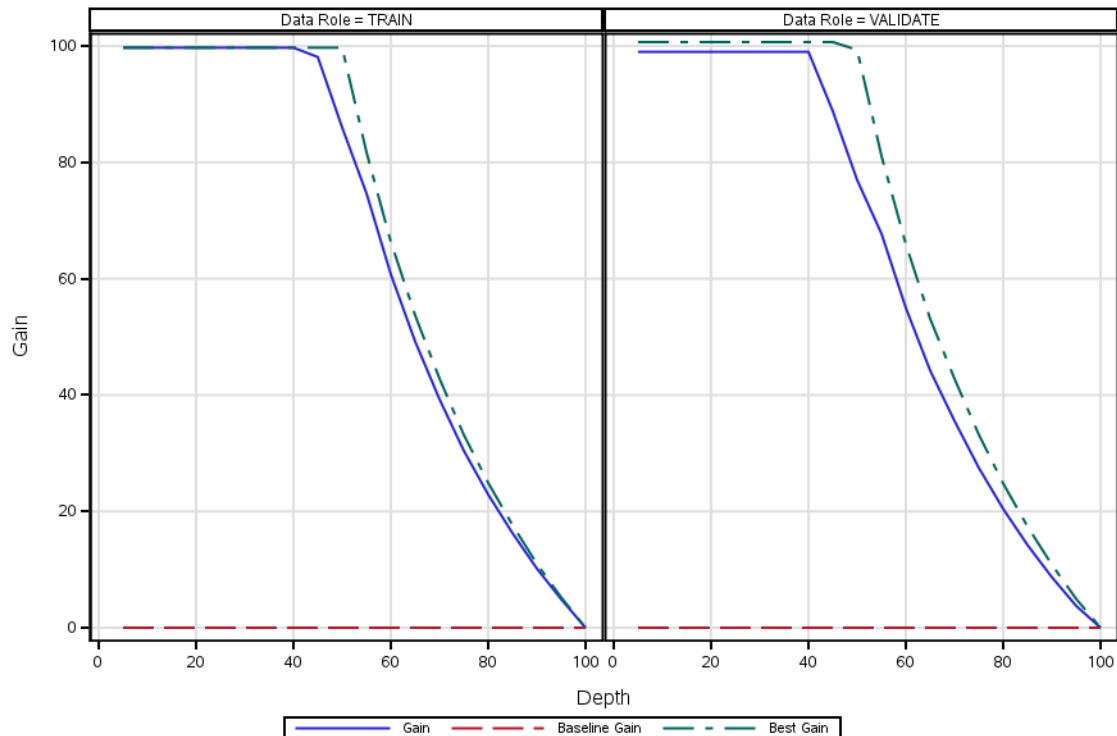
SAS Enterprise Miner Report
Node=Decision Tree
Model Iteration Plots



SAS Enterprise Miner Report

Node=Decision Tree

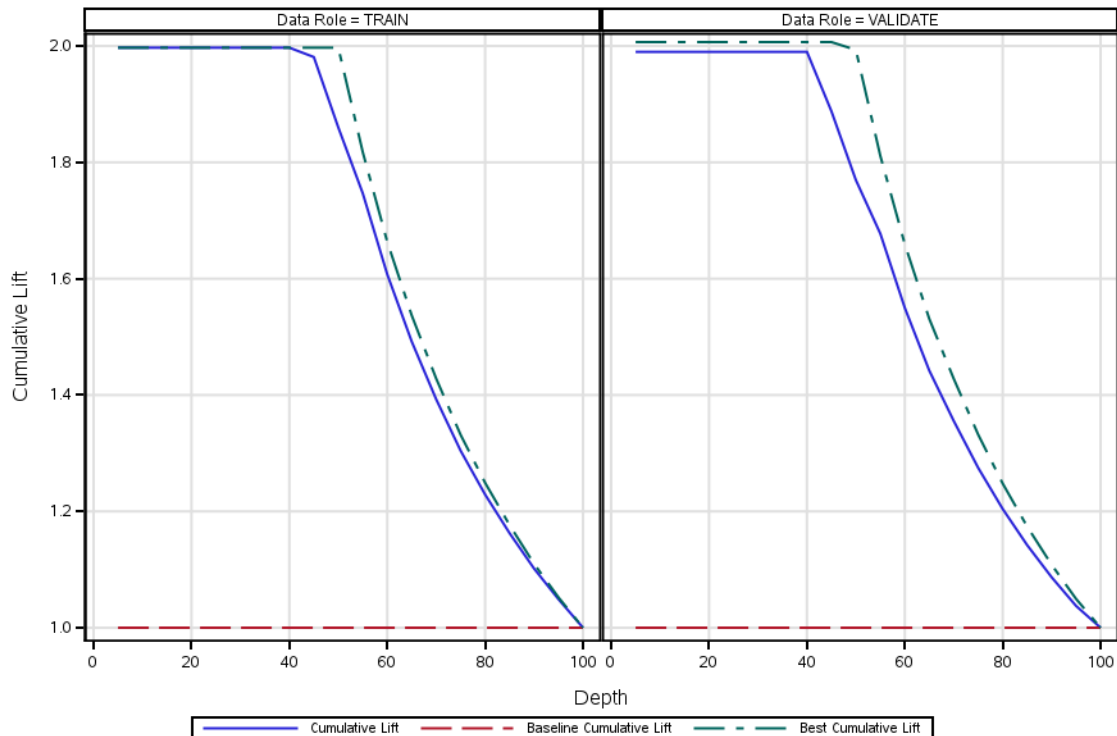
Model Assessment Scores where TARGET='Class'



SAS Enterprise Miner Report

Node=Decision Tree

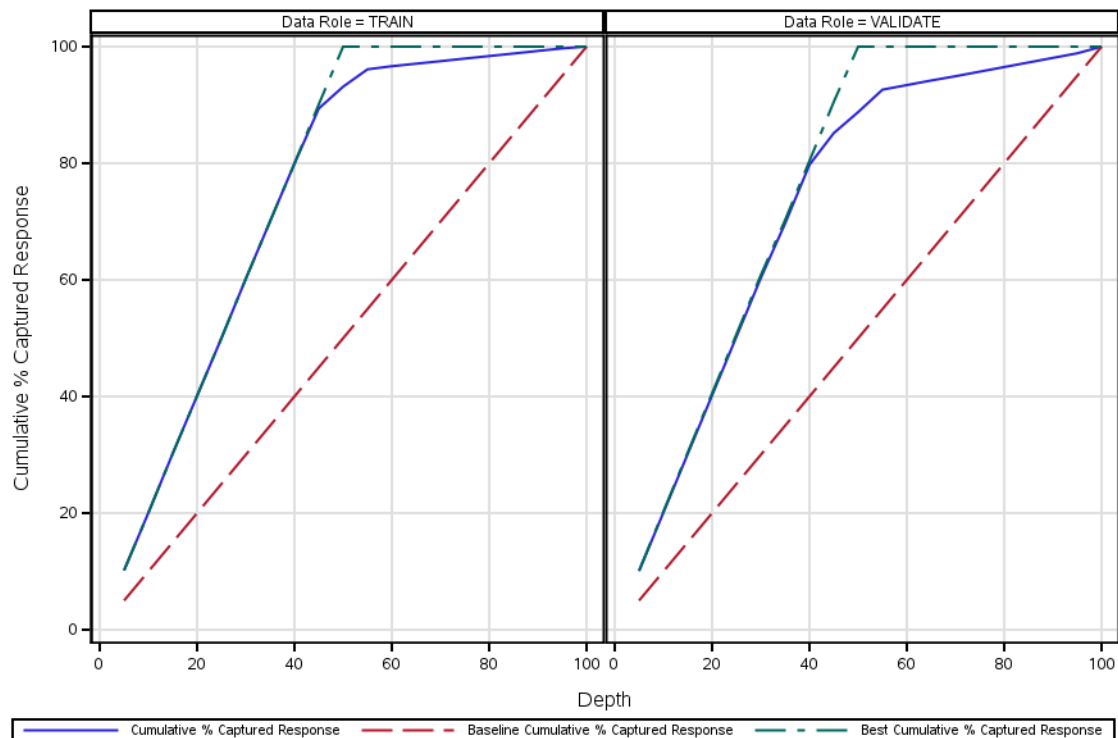
Model Assessment Scores where TARGET='Class'



SAS Enterprise Miner Report

Node=Decision Tree

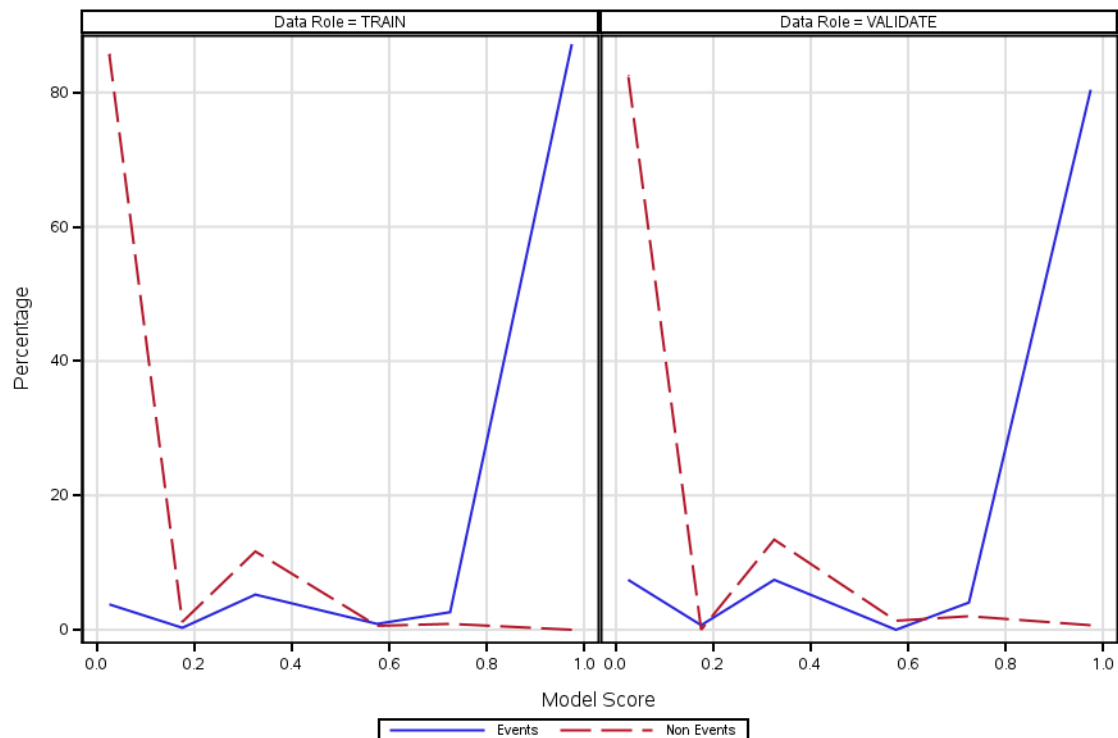
Model Assessment Scores where TARGET='Class'

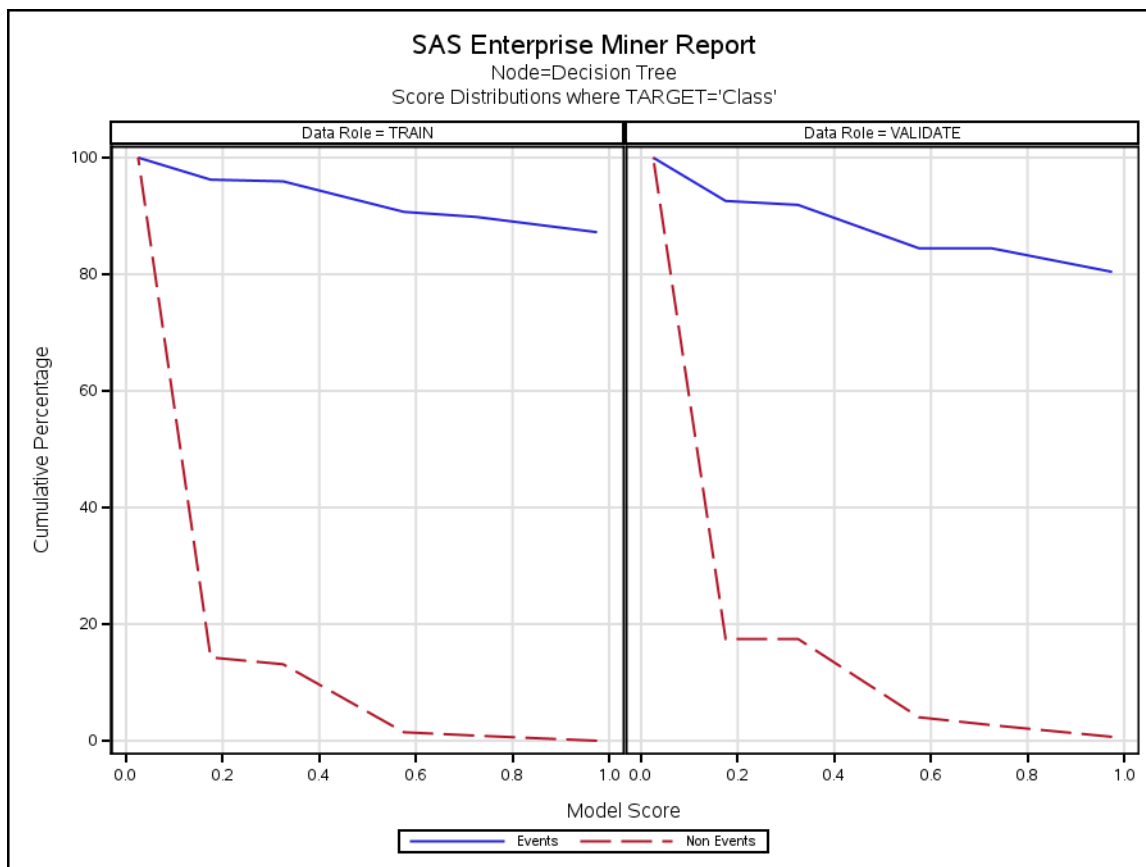


SAS Enterprise Miner Report

Node=Decision Tree

Score Distributions where TARGET='Class'





Node=Decision Tree Score Distributions

Target Variable=Class 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 | 300 | 87.2093 | 0.0000 | 87.209 | 0.000 |
| 0.70-0.75 | 9 | 2.6163 | 0.8746 | 89.826 | 0.875 |
| 0.55-0.60 | 3 | 0.8721 | 0.5831 | 90.698 | 1.458 |
| 0.30-0.35 | 18 | 5.2326 | 11.6618 | 95.930 | 13.120 |
| 0.15-0.20 | 1 | 0.2907 | 1.1662 | 96.221 | 14.286 |
| 0.00-0.05 | 13 | 3.7791 | 85.7143 | 100.000 | 100.000 |

Target Variable=Class 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 | 119 | 80.4054 | 0.6711 | 80.405 | 0.671 |
| 0.70-0.75 | 6 | 4.0541 | 2.0134 | 84.459 | 2.685 |
| 0.55-0.60 | 0 | 0.0000 | 1.3423 | 84.459 | 4.027 |
| 0.30-0.35 | 11 | 7.4324 | 13.4228 | 91.892 | 17.450 |
| 0.15-0.20 | 1 | 0.6757 | 0.0000 | 92.568 | 17.450 |
| 0.00-0.05 | 11 | 7.4324 | 82.5503 | 100.000 | 100.000 |

SAS Enterprise Miner Report

Node=Interactive Decision Tree Summary

Node id = Tree2
 Node label = Interactive Decision Tree
 Meta path = FIMPORT => EMSave => Trans => Smpl => Part => Tree2
 Notes =

Node=Interactive 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 | PROFIT/LOSS | | LeafSize | 5 | | ProfitLoss | NONE | |
| AssessPercentage | 0.25 | | Leafid | Y | | RASE | N | |
| CV | N | | Maxbranch | 2 | | SampleMethod | RANDOM | |
| CVNlter | 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=Interactive Decision Tree Variable Summary

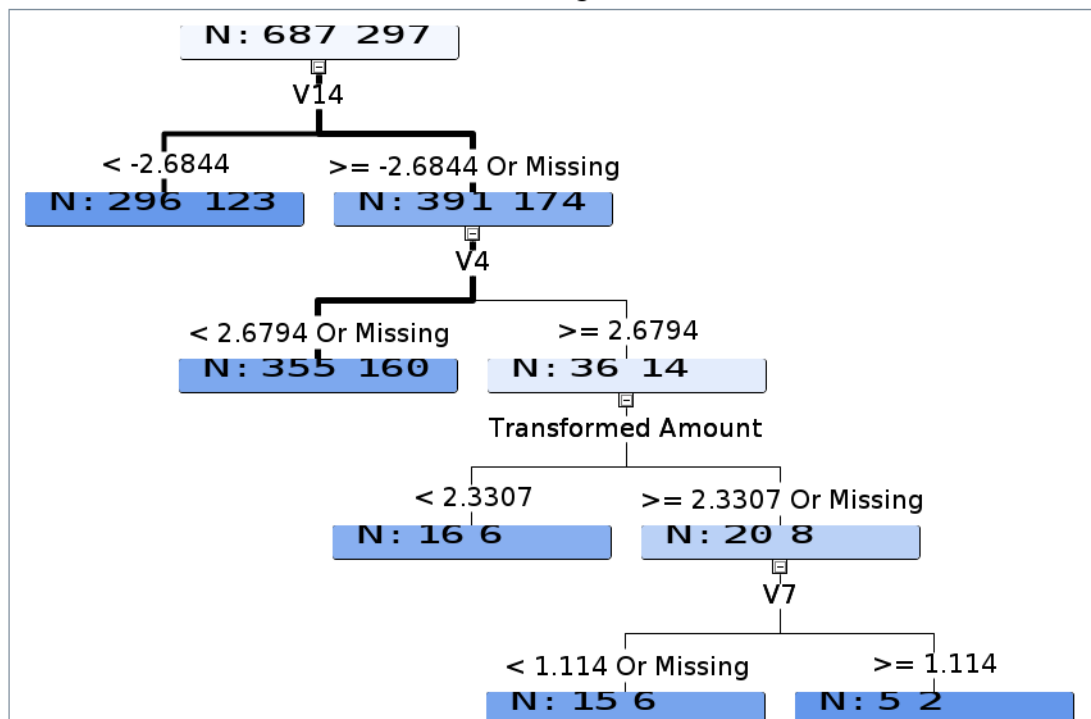
| Role | Level | Frequency Count | Name |
|--------|----------|--------------------|--|
| TARGET | BINARY | 1 | Class |
| INPUT | INTERVAL | 30 | LOG_Amount Time V1 V10 V11 V12 V13 V14 V15 V16 V17 V18 V19 V2 V20 V21 V22 V23 V24 V25 V26 V27 V28 V3 V4 V5 V6 V7 V8 V9 |
| ID | INTERVAL | 1 | _dataobs_ |

Node=Interactive Decision Tree Model Fit Statistics

Target=Class Target Label=

| Label of Statistic | Train | Validation | Test |
|----------------------------|---------|------------|------|
| Sum of Frequencies | 687.00 | 297.000 | . |
| Misclassification Rate | 0.05 | 0.098 | . |
| Maximum Absolute Error | 0.99 | 0.990 | . |
| Sum of Squared Errors | 67.89 | 51.216 | . |
| Average Squared Error | 0.05 | 0.086 | . |
| Root Average Squared Error | 0.22 | 0.294 | . |
| Divisor for ASE | 1374.00 | 594.000 | . |
| Total Degrees of Freedom | 687.00 | . | . |

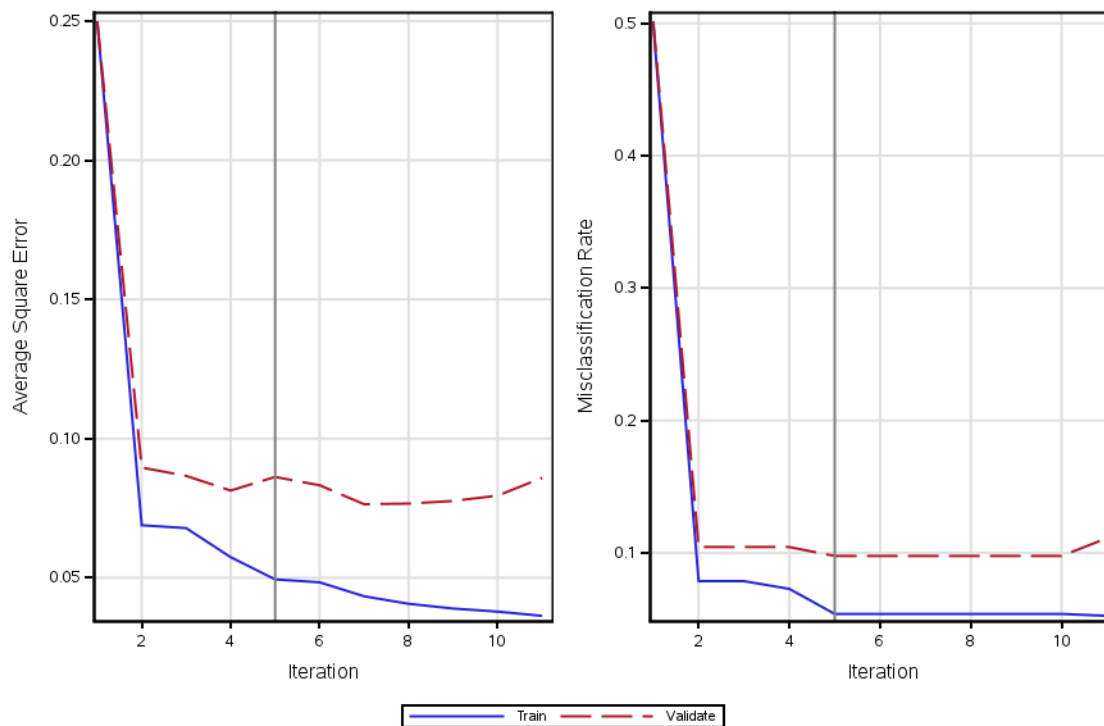
SAS Enterprise Miner Report
Node=Interactive Decision Tree
Tree Diagram



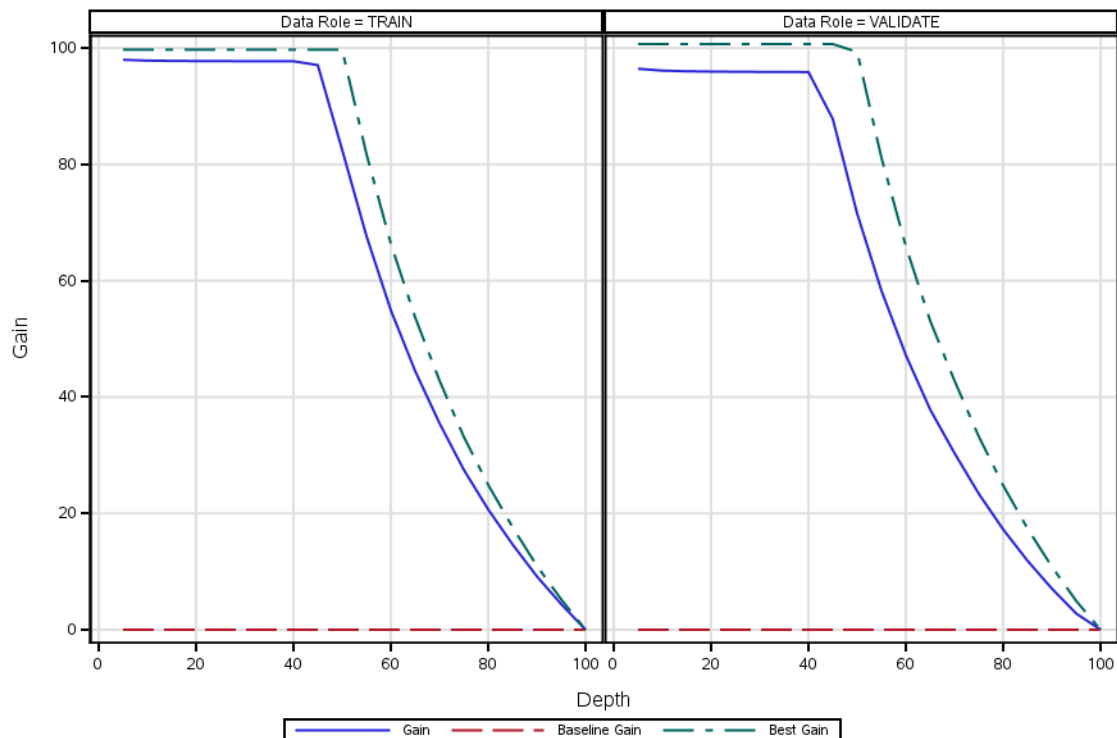
SAS Enterprise Miner Report
Node=Interactive Decision Tree
Treemap



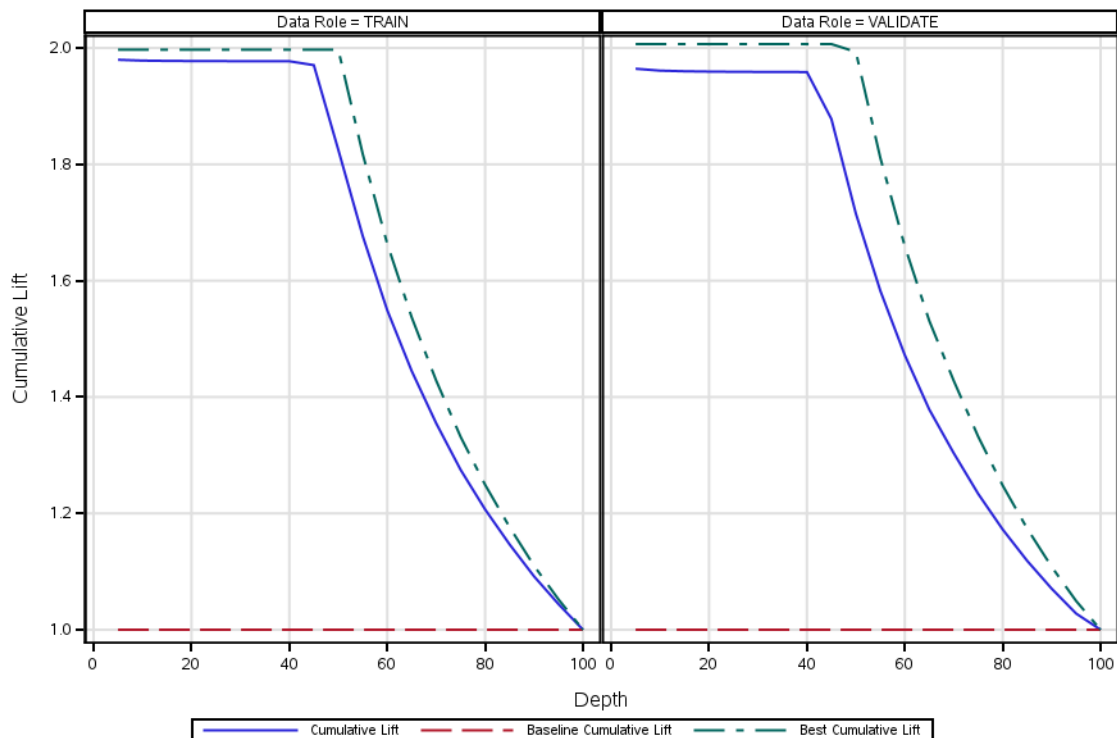
SAS Enterprise Miner Report
Node=Interactive Decision Tree
Model Iteration Plots



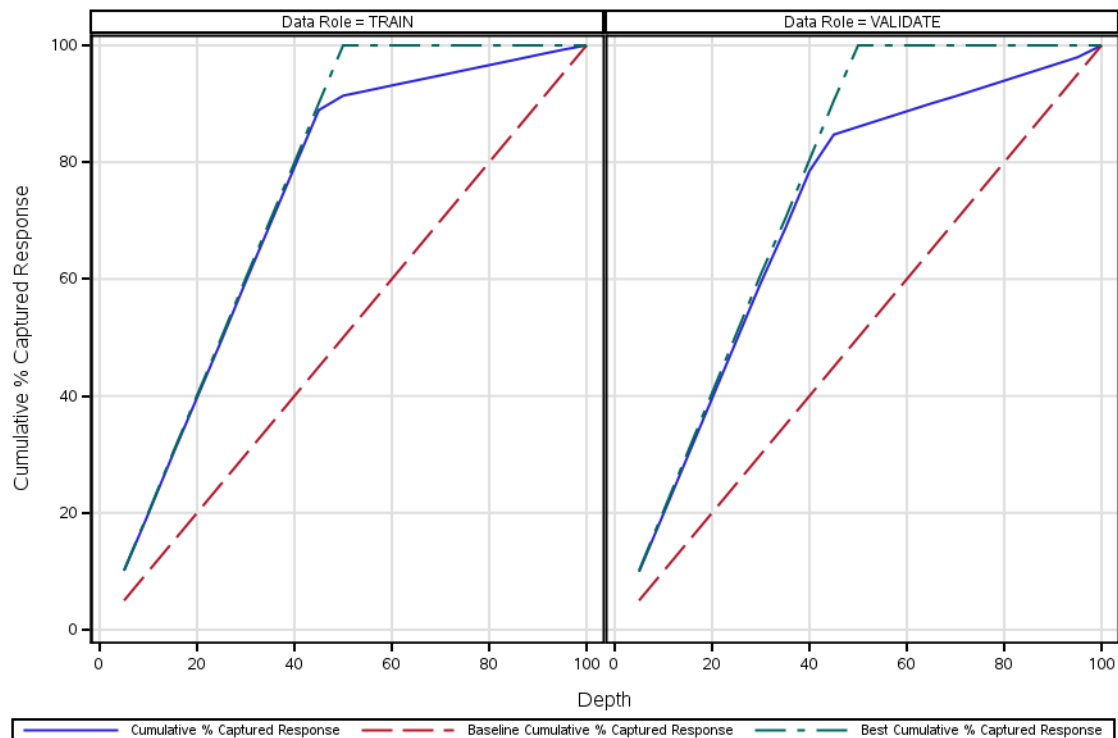
SAS Enterprise Miner Report
Node=Interactive Decision Tree
Model Assessment Scores where TARGET='Class'



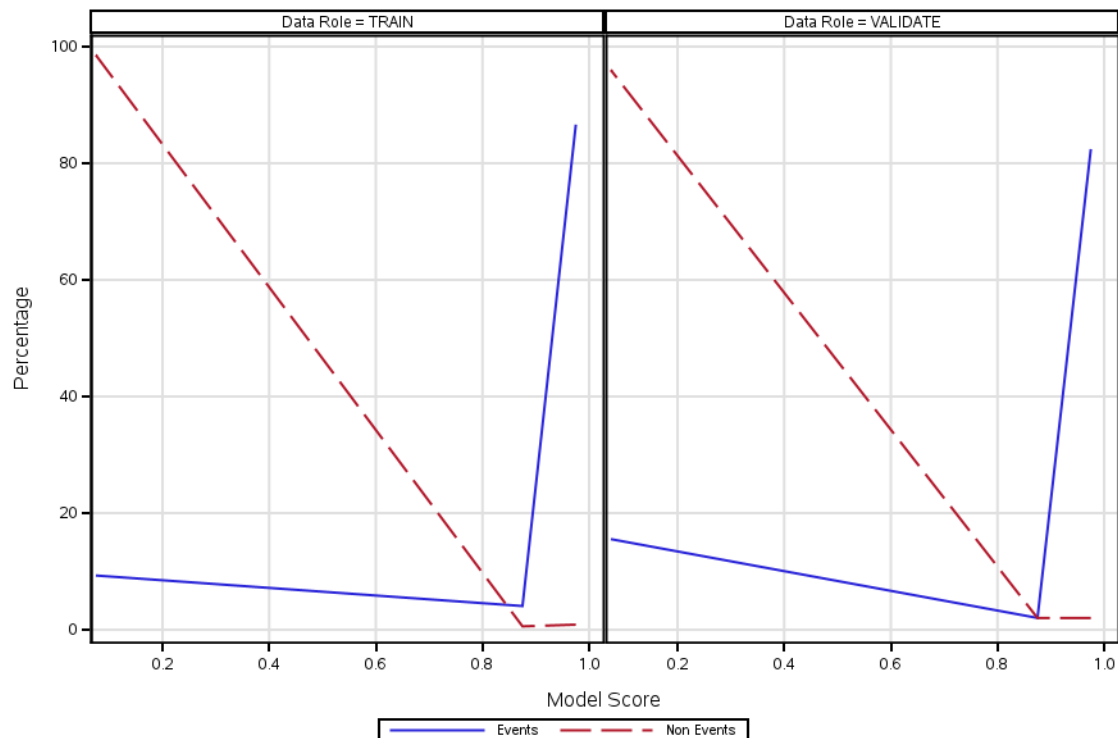
SAS Enterprise Miner Report
Node=Interactive Decision Tree
Model Assessment Scores where TARGET='Class'



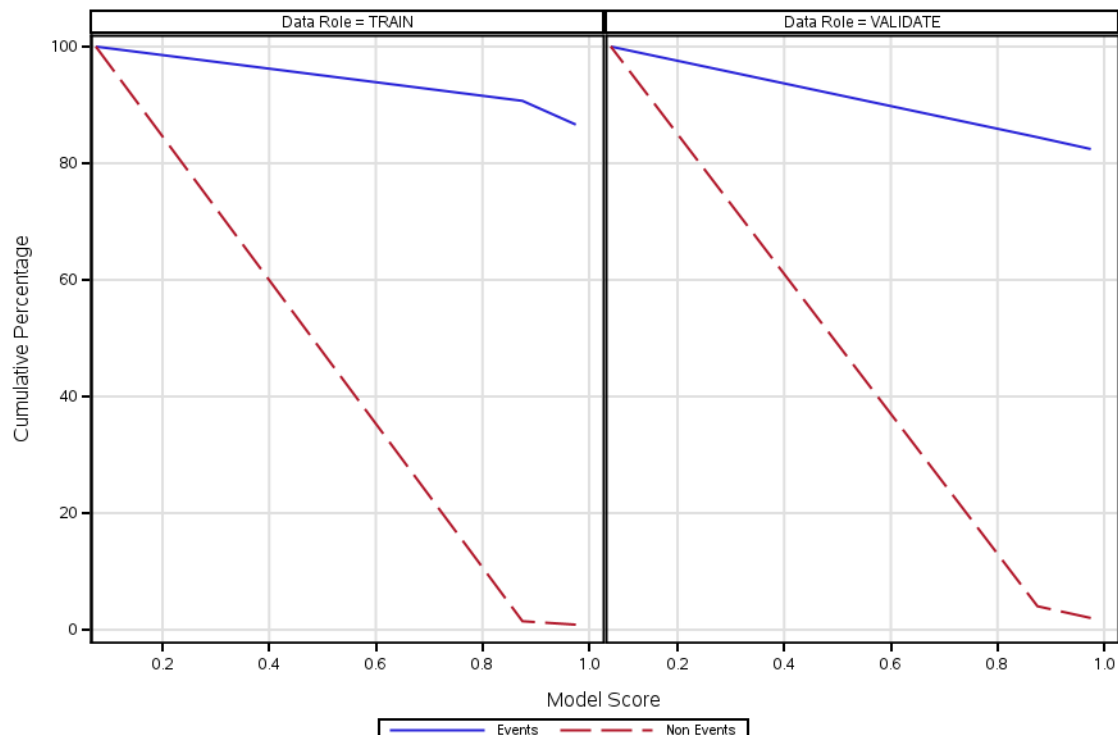
SAS Enterprise Miner Report
 Node=Interactive Decision Tree
 Model Assessment Scores where TARGET='Class'



SAS Enterprise Miner Report
 Node=Interactive Decision Tree
 Score Distributions where TARGET='Class'



SAS Enterprise Miner Report
Node=Interactive Decision Tree
Score Distributions where TARGET='Class'



Node=Interactive Decision Tree
Score Distributions

Target Variable=Class 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 | 298 | 86.6279 | 0.8746 | 86.628 | 0.875 |
| 0.85-0.90 | 14 | 4.0698 | 0.5831 | 90.698 | 1.458 |
| 0.05-0.10 | 32 | 9.3023 | 98.5423 | 100.000 | 100.000 |

Target Variable=Class 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 | 122 | 82.4324 | 2.0134 | 82.432 | 2.013 |
| 0.85-0.90 | 3 | 2.0270 | 2.0134 | 84.459 | 4.027 |
| 0.05-0.10 | 23 | 15.5405 | 95.9732 | 100.000 | 100.000 |

SAS Enterprise Miner Report

Node=Optimal Decision Tree Summary

Node id = Tree3
 Node label = Optimal Decision Tree
 Meta path = FIMPORT => EMSave => Trans => Smpl => Part => Tree3
 Notes =

Node=Optimal 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 | PROFIT/LOSS | | LeafSize | 5 | | ProfitLoss | NONE | |
| AssessPercentage | 0.25 | | Leafid | Y | | RASE | N | |
| CV | N | | Maxbranch | 2 | | SampleMethod | RANDOM | |
| CVNlter | 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=Optimal Decision Tree Variable Summary

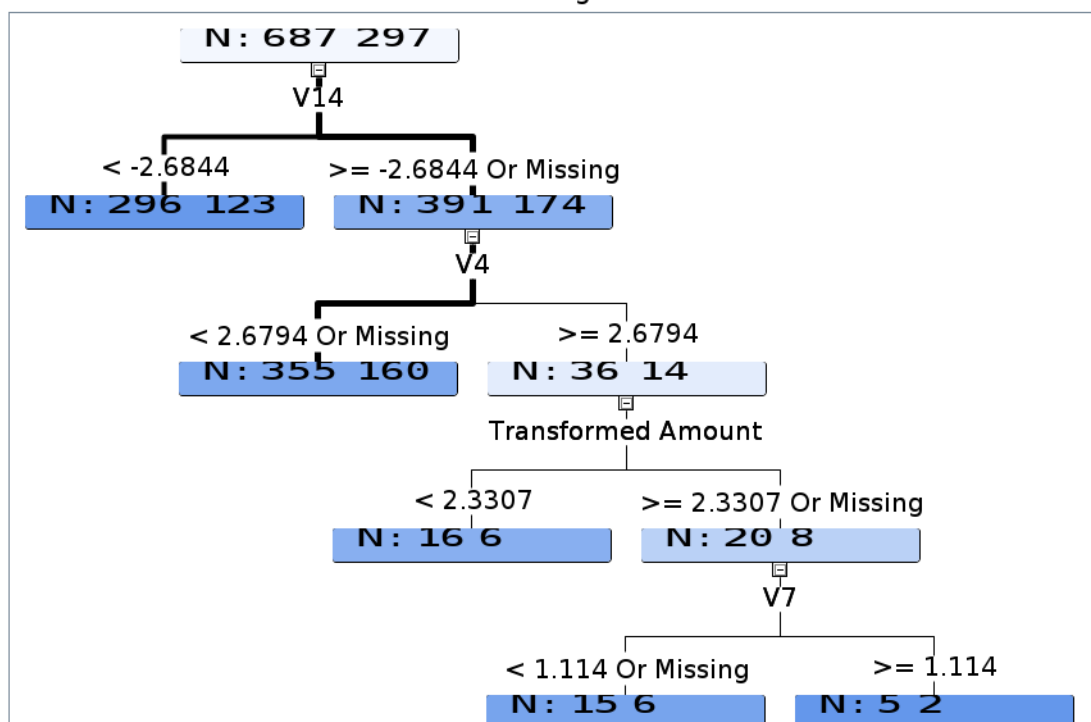
| Role | Level | Frequency Count | Name |
|--------|----------|--------------------|--|
| TARGET | BINARY | 1 | Class |
| INPUT | INTERVAL | 30 | LOG_Amount Time V1 V10 V11 V12 V13 V14 V15 V16 V17 V18 V19 V2 V20 V21 V22 V23 V24 V25 V26 V27 V28 V3 V4 V5 V6 V7 V8 V9 |
| ID | INTERVAL | 1 | _dataobs_ |

Node=Optimal Decision Tree Model Fit Statistics

Target=Class Target Label=

| Label of Statistic | Train | Validation | Test |
|----------------------------|---------|------------|------|
| Sum of Frequencies | 687.00 | 297.000 | . |
| Misclassification Rate | 0.05 | 0.098 | . |
| Maximum Absolute Error | 0.99 | 0.990 | . |
| Sum of Squared Errors | 67.89 | 51.216 | . |
| Average Squared Error | 0.05 | 0.086 | . |
| Root Average Squared Error | 0.22 | 0.294 | . |
| Divisor for ASE | 1374.00 | 594.000 | . |
| Total Degrees of Freedom | 687.00 | . | . |

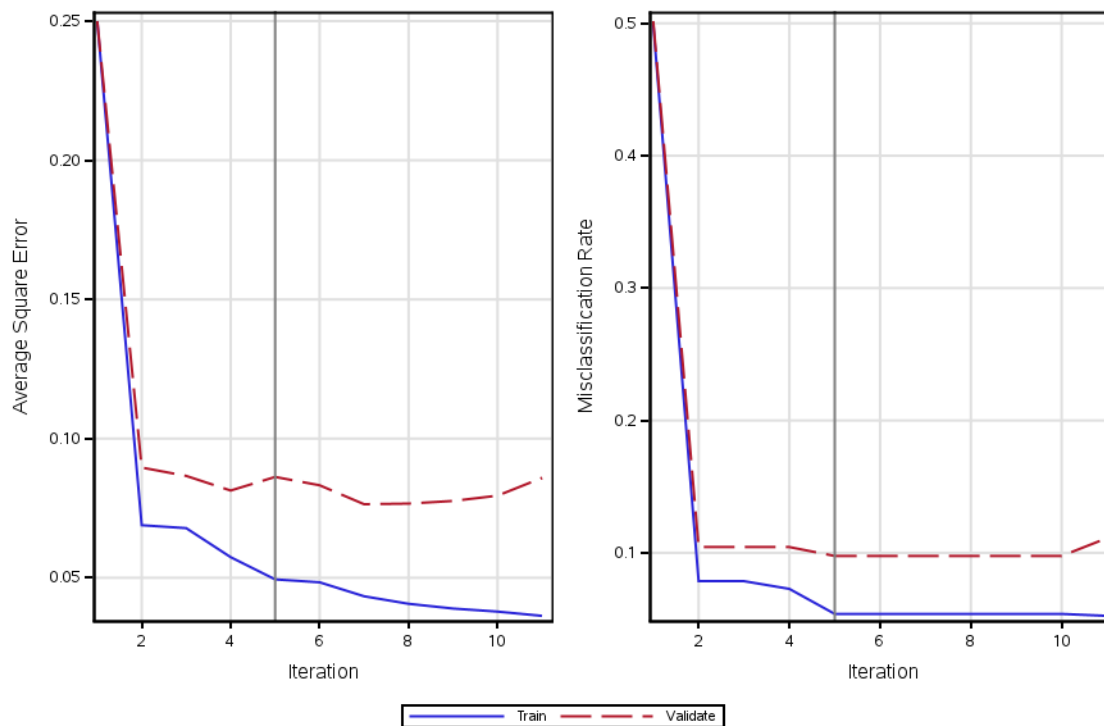
SAS Enterprise Miner Report
Node=Optimal Decision Tree
Tree Diagram



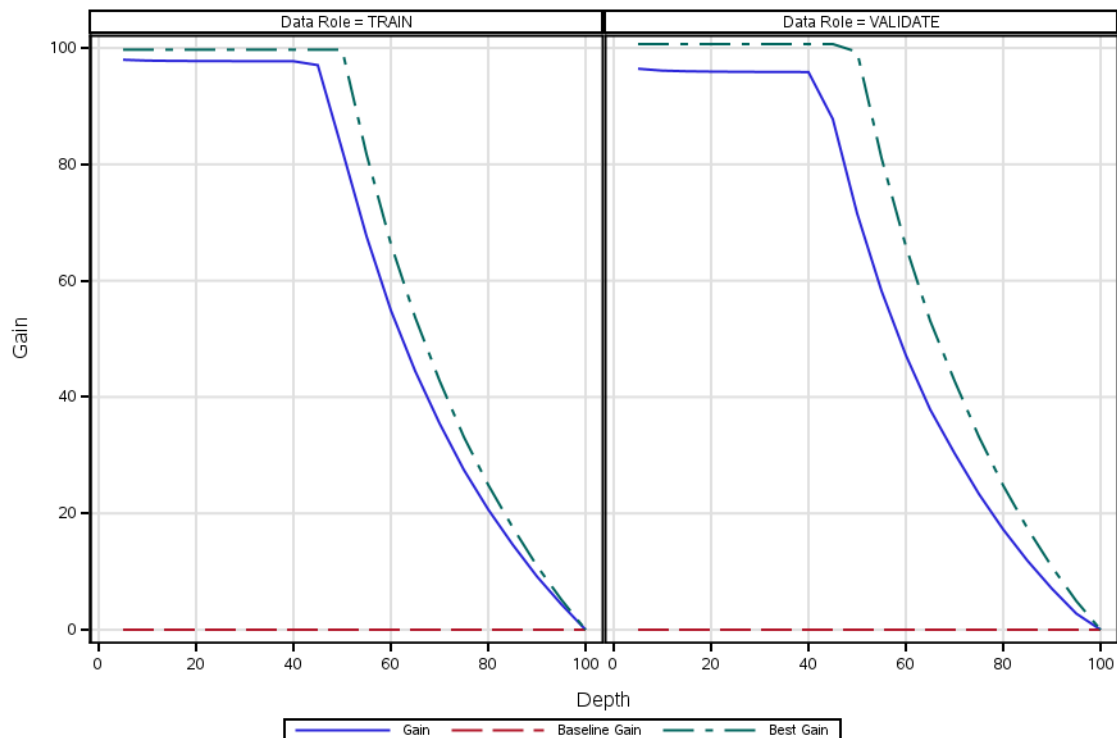
SAS Enterprise Miner Report
Node=Optimal Decision Tree
Treemap



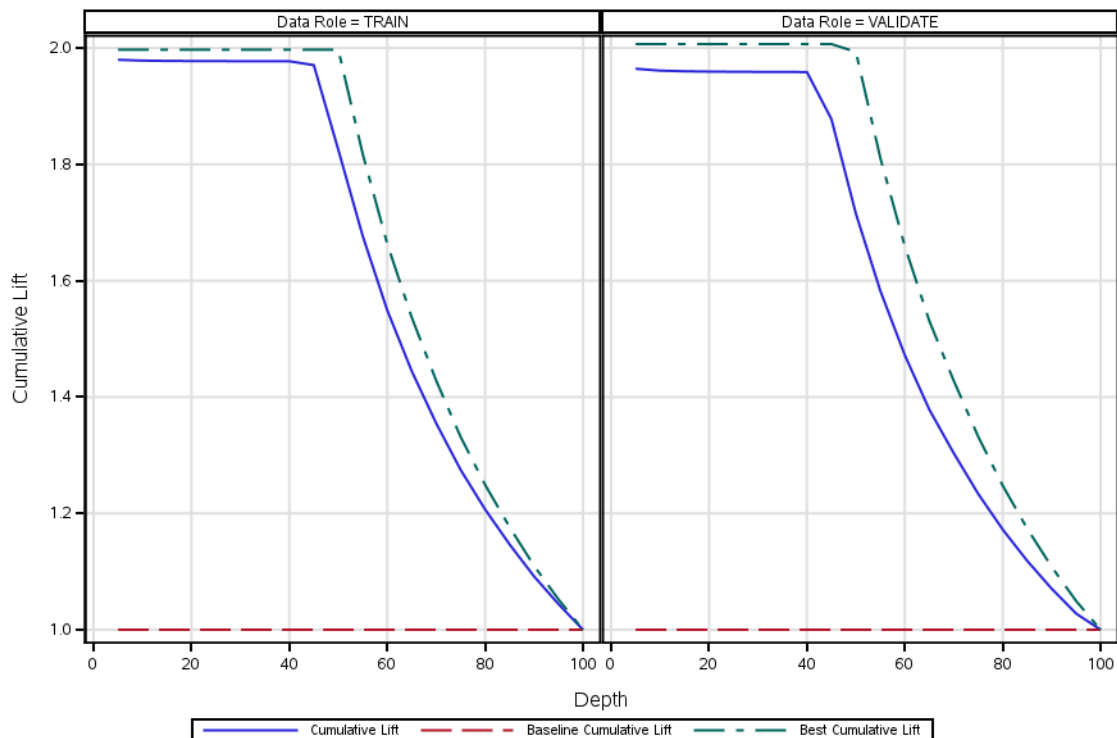
SAS Enterprise Miner Report
Node=Optimal Decision Tree
Model Iteration Plots



SAS Enterprise Miner Report
Node=Optimal Decision Tree
Model Assessment Scores where TARGET='Class'

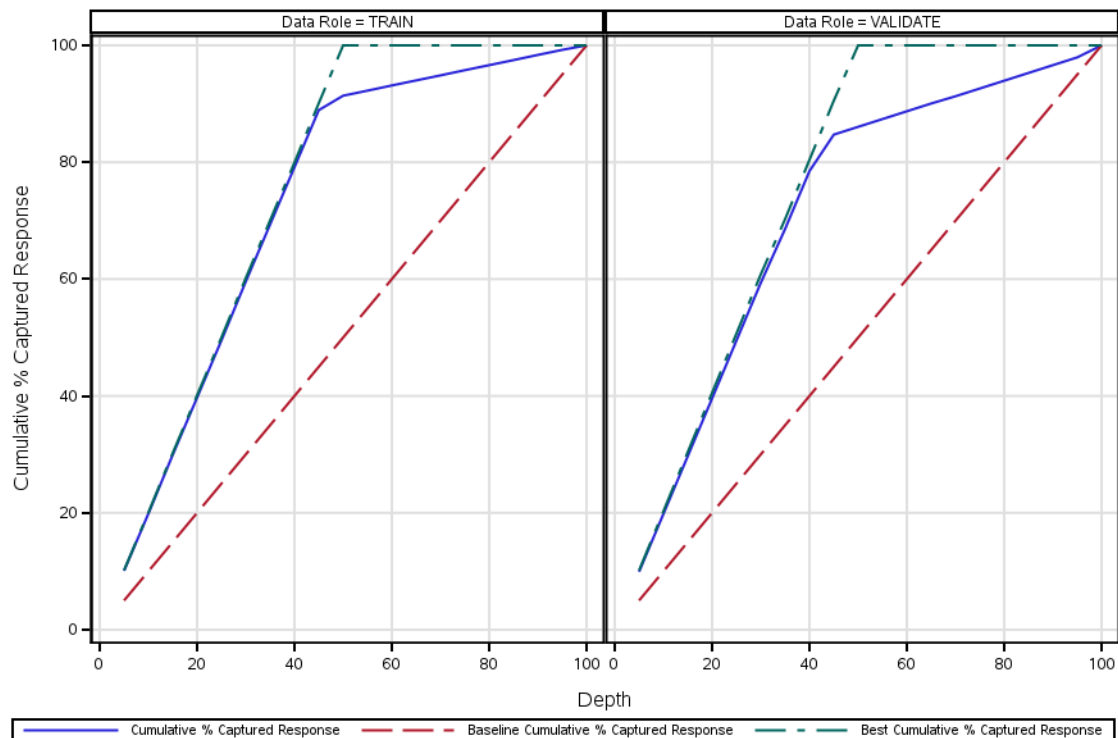


SAS Enterprise Miner Report
Node=Optimal Decision Tree
Model Assessment Scores where TARGET='Class'



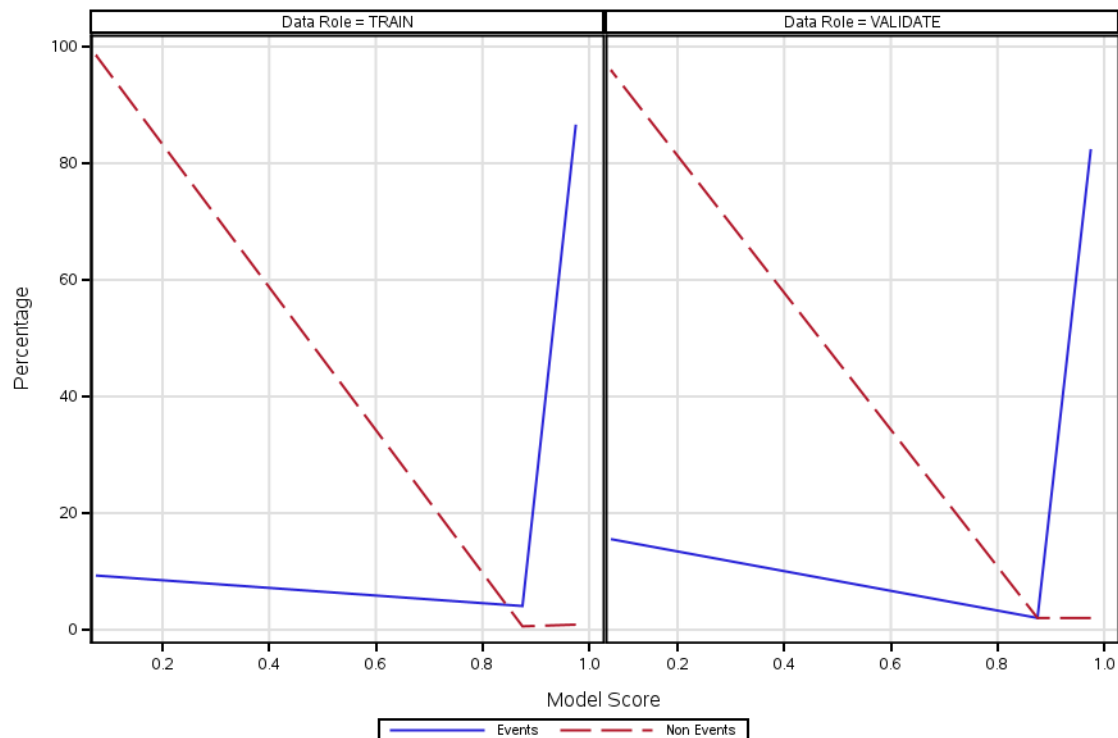
SAS Enterprise Miner Report

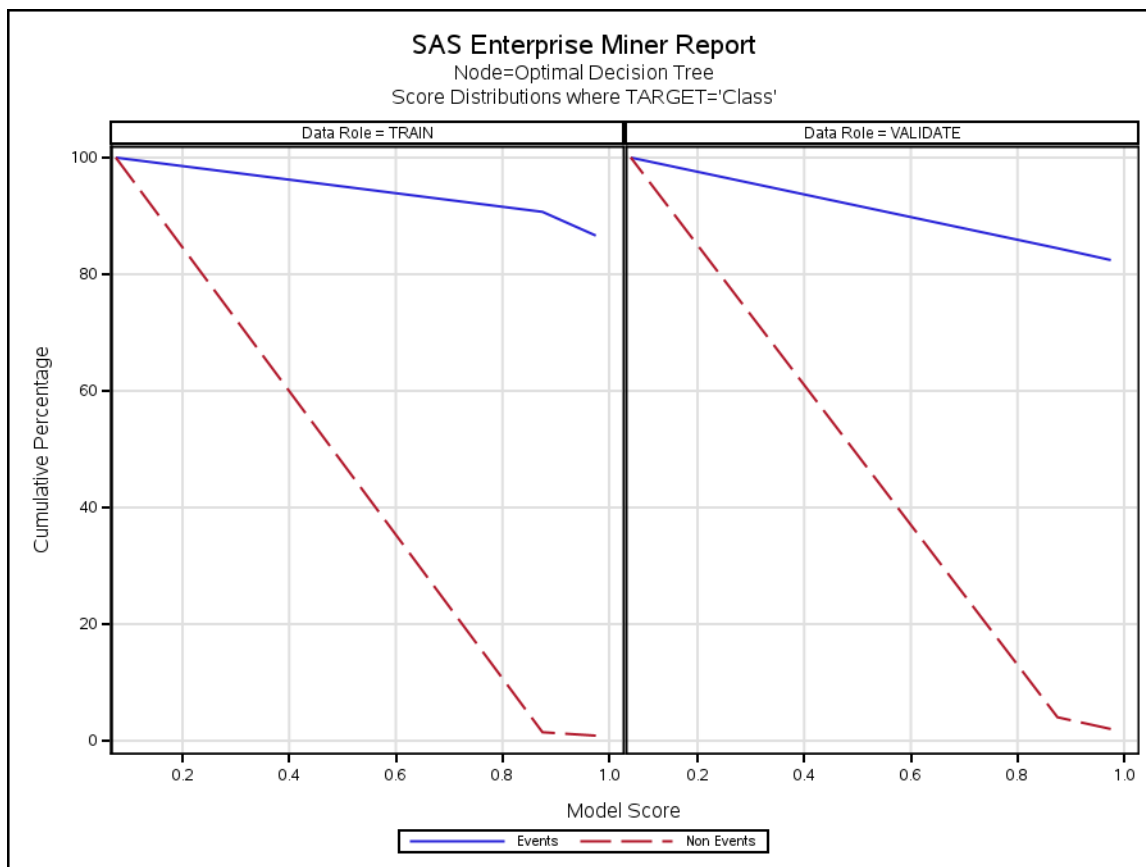
Node=Optimal Decision Tree
Model Assessment Scores where TARGET='Class'



SAS Enterprise Miner Report

Node=Optimal Decision Tree
Score Distributions where TARGET='Class'





Node=Optimal Decision Tree Score Distributions

Target Variable=Class 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 | 298 | 86.6279 | 0.8746 | 86.628 | 0.875 |
| 0.85-0.90 | 14 | 4.0698 | 0.5831 | 90.698 | 1.458 |
| 0.05-0.10 | 32 | 9.3023 | 98.5423 | 100.000 | 100.000 |

Target Variable=Class 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 | 122 | 82.4324 | 2.0134 | 82.432 | 2.013 |
| 0.85-0.90 | 3 | 2.0270 | 2.0134 | 84.459 | 4.027 |
| 0.05-0.10 | 23 | 15.5405 | 95.9732 | 100.000 | 100.000 |

SAS Enterprise Miner Report

Node=Ensemble Summary

Node id = Ensmbl
 Node label = Ensemble
 Meta path = FIMPORT => EMSave => Trans => Smpl => Part => Tree => Ensmbl
 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 | Class |
| INPUT | INTERVAL | 6 | LOG_Amount V12 V14 V22 V4 V7 |

Node=Ensemble Model Fit Statistics

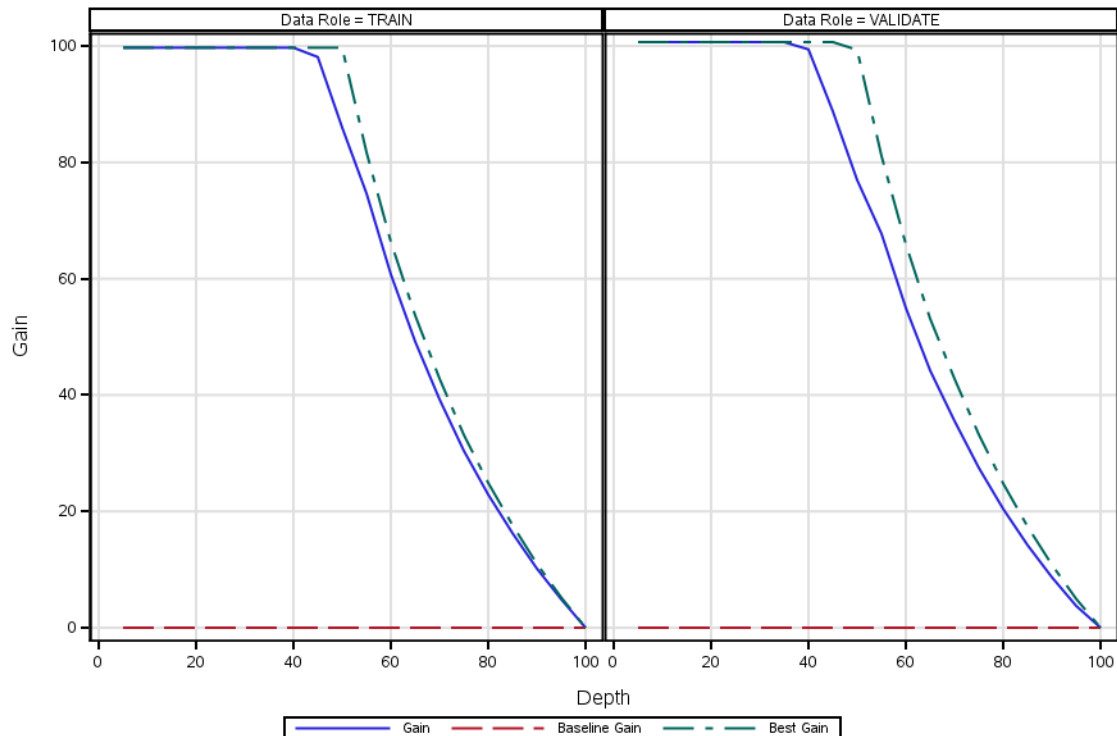
Target=Class Target Label="1"

| Label of Statistic | Train | Validation | Test |
|---------------------------------|---------|------------|------|
| Average Squared Error | 0.05 | 0.080 | . |
| Divisor for ASE | 1374.00 | 594.000 | . |
| Maximum Absolute Error | 0.93 | 0.956 | . |
| Sum of Frequencies | 687.00 | 297.000 | . |
| Root Average Squared Error | 0.21 | 0.283 | . |
| Sum of Squared Errors | 62.50 | 47.637 | . |
| Frequency of Classified Cases | 687.00 | 297.000 | . |
| Misclassification Rate | 0.05 | 0.098 | . |
| Number of Wrong Classifications | 37.00 | 29.000 | . |

SAS Enterprise Miner Report

Node=Ensemble

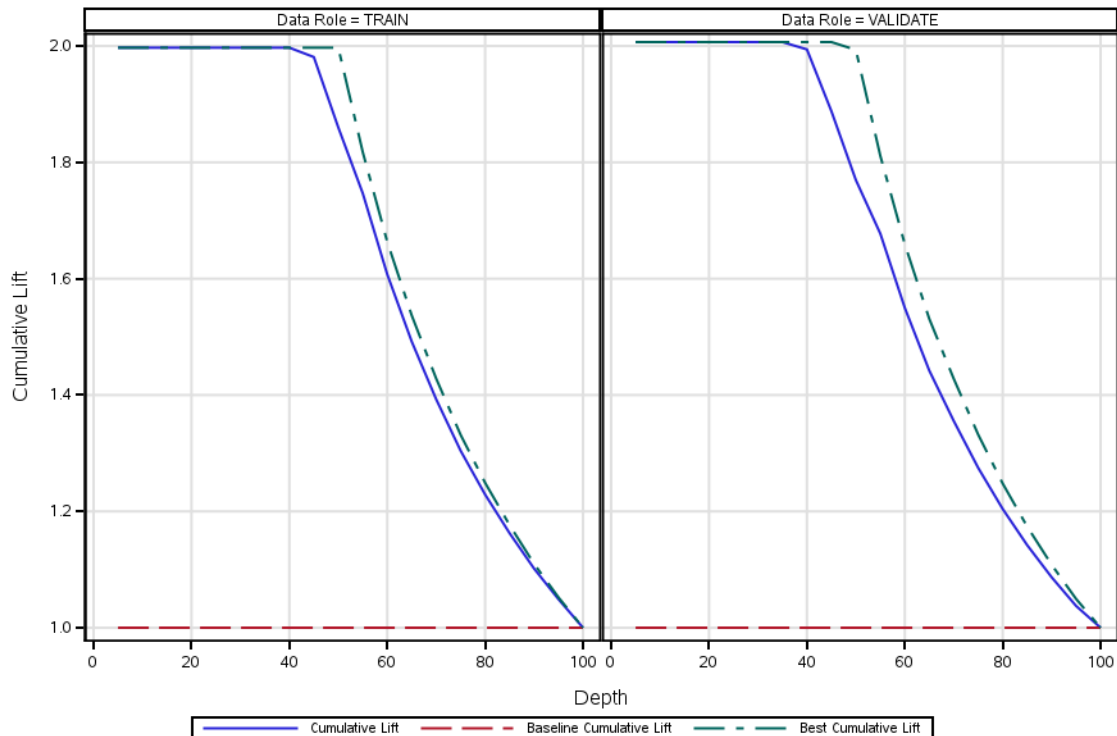
Model Assessment Scores where TARGET='Class'



SAS Enterprise Miner Report

Node=Ensemble

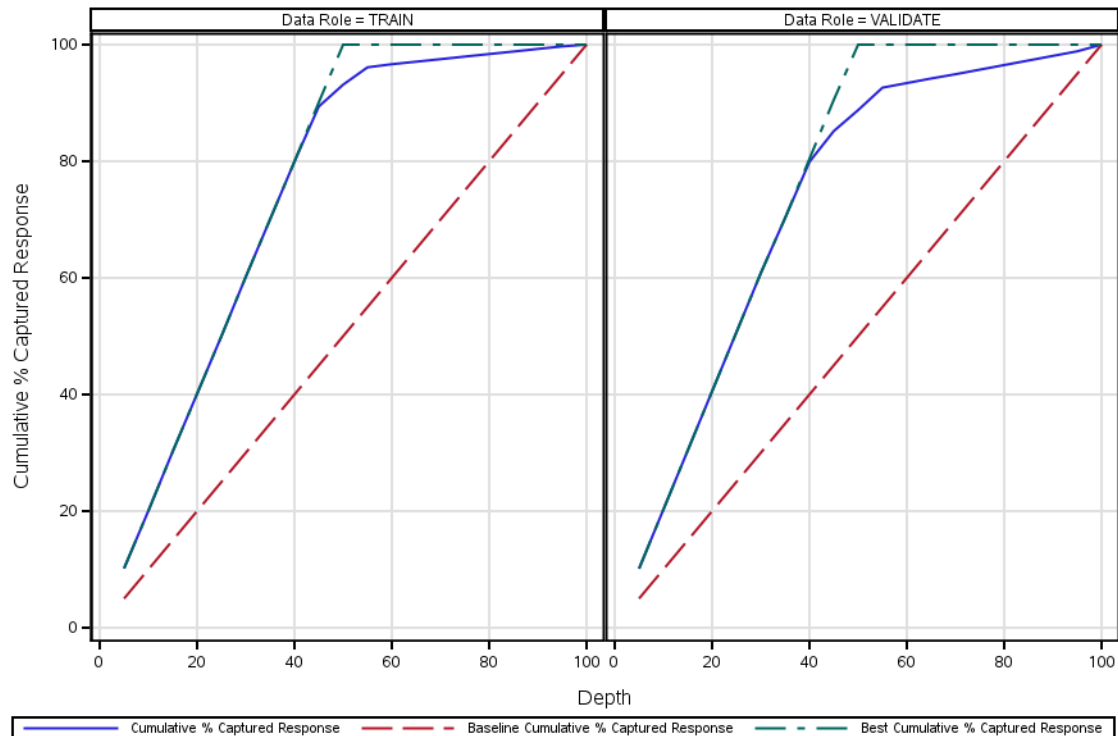
Model Assessment Scores where TARGET='Class'



SAS Enterprise Miner Report

Node=Ensemble

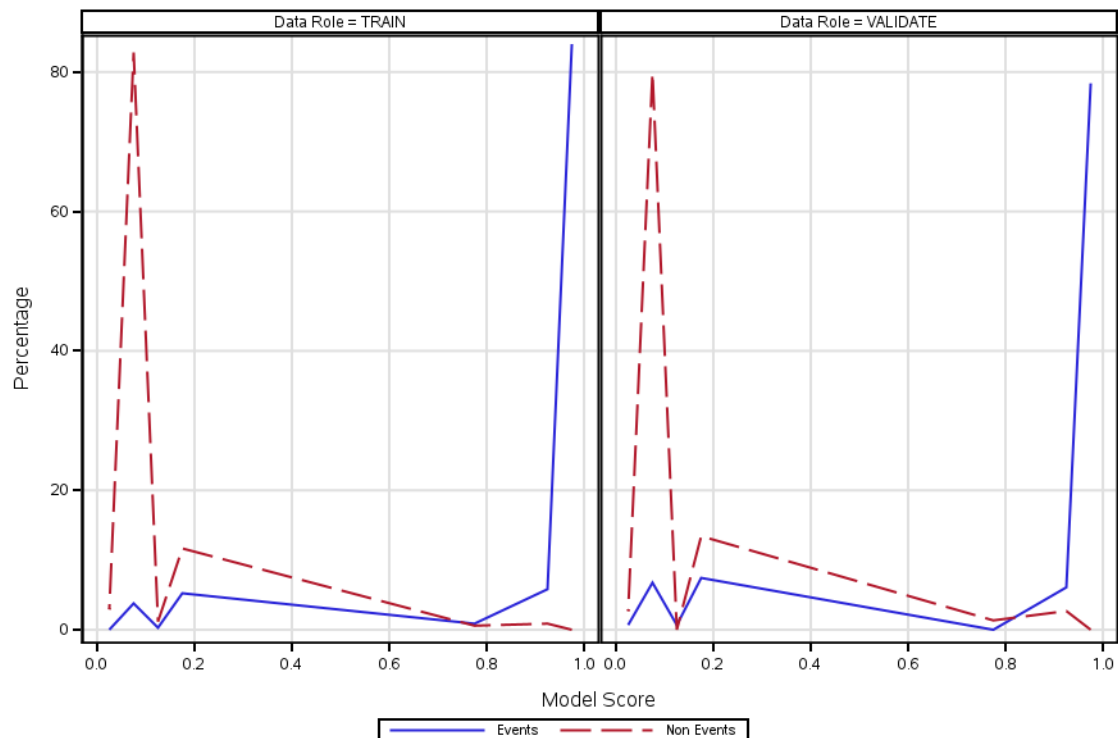
Model Assessment Scores where TARGET='Class'

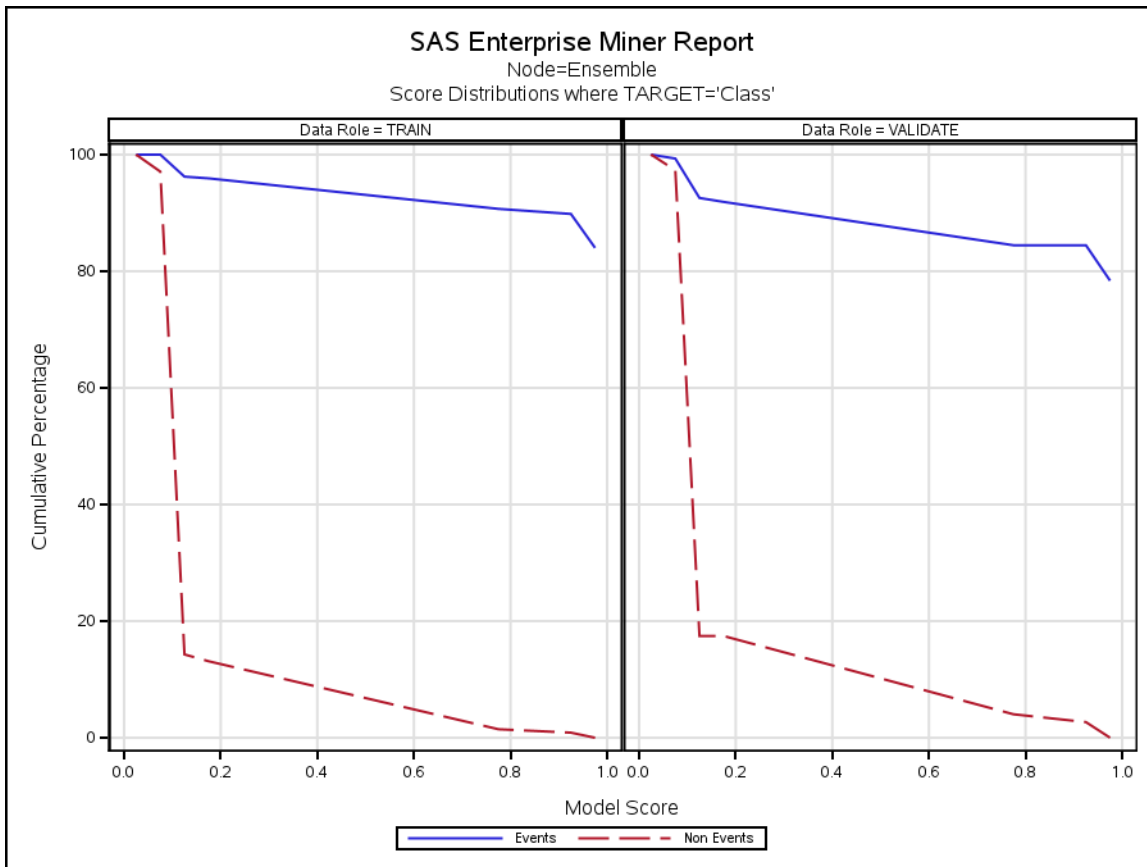


SAS Enterprise Miner Report

Node=Ensemble

Score Distributions where TARGET='Class'





Node=Ensemble Score Distributions

Target Variable=Class 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 | 289 | 84.0116 | 0.0000 | 84.012 | 0.000 |
| 0.90-0.95 | 20 | 5.8140 | 0.8746 | 89.826 | 0.875 |
| 0.75-0.80 | 3 | 0.8721 | 0.5831 | 90.698 | 1.458 |
| 0.15-0.20 | 18 | 5.2326 | 11.6618 | 95.930 | 13.120 |
| 0.10-0.15 | 1 | 0.2907 | 1.1662 | 96.221 | 14.286 |
| 0.05-0.10 | 13 | 3.7791 | 82.7988 | 100.000 | 97.085 |
| 0.00-0.05 | 0 | 0.0000 | 2.9155 | 100.000 | 100.000 |

Target Variable=Class 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 | 116 | 78.3784 | 0.0000 | 78.378 | 0.000 |
| 0.90-0.95 | 9 | 6.0811 | 2.6846 | 84.459 | 2.685 |
| 0.75-0.80 | 0 | 0.0000 | 1.3423 | 84.459 | 4.027 |
| 0.15-0.20 | 11 | 7.4324 | 13.4228 | 91.892 | 17.450 |
| 0.10-0.15 | 1 | 0.6757 | 0.0000 | 92.568 | 17.450 |
| 0.05-0.10 | 10 | 6.7568 | 79.8658 | 99.324 | 97.315 |
| 0.00-0.05 | 1 | 0.6757 | 2.6846 | 100.000 | 100.000 |

SAS Enterprise Miner Report

Node=Gradient Boosting Summary

Node id = Boost
 Node label = Gradient Boosting
 Meta path = FIMPORT => EMSave => Trans => Smpl => Part => Boost
 Notes =

Node=Gradient Boosting Properties

| Property | Value | Default | Property | Value | Default | Property | Value | Default |
|-----------------|-------|---------|---------------|-------------|---------|-----------------|-------|---------|
| Component | Boost | | MaxBranch | 2 | | Performance | DISK | |
| AssessMeasure | ASE | 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 | BINARY | 1 | Class |
| INPUT | INTERVAL | 30 | LOG_Amount Time V1 V10 V11 V12 V13 V14 V15 V16 V17 V18 V19 V2 V20 V21 V22 V23 V24 V25 V26 V27 V28 V3 V4 V5 V6 V7 V8 V9 |
| ID | INTERVAL | 1 | _dataobs_ |

Node=Gradient Boosting Model Fit Statistics

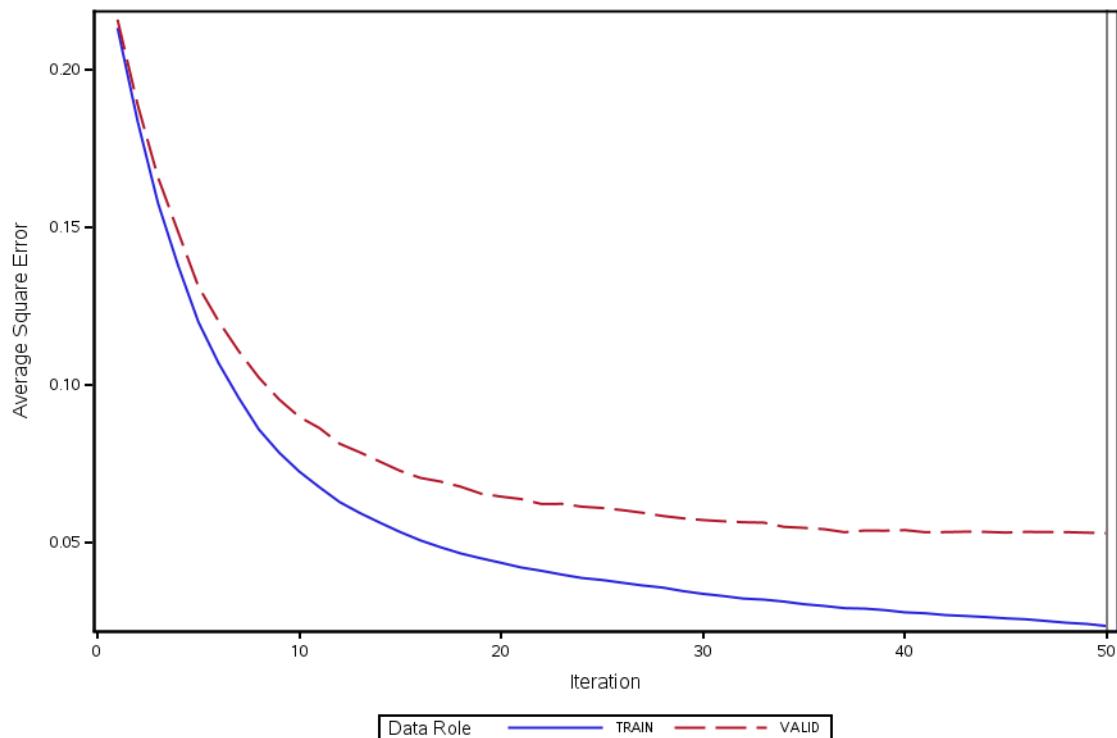
Target=Class Target Label='1'

| Label of Statistic | Train | Validation | Test |
|--------------------------------|---------|------------|------|
| Sum of Frequencies | 687.00 | 297.000 | . |
| Sum of Case Weights Times Freq | 1374.00 | 594.000 | . |
| Misclassification Rate | 0.03 | 0.067 | . |
| Maximum Absolute Error | 0.85 | 0.970 | . |
| Sum of Squared Errors | 32.60 | 31.562 | . |
| Average Squared Error | 0.02 | 0.053 | . |
| Root Average Squared Error | 0.15 | 0.231 | . |
| Divisor for ASE | 1374.00 | 594.000 | . |
| Total Degrees of Freedom | 687.00 | . | . |

SAS Enterprise Miner Report

Node=Gradient Boosting

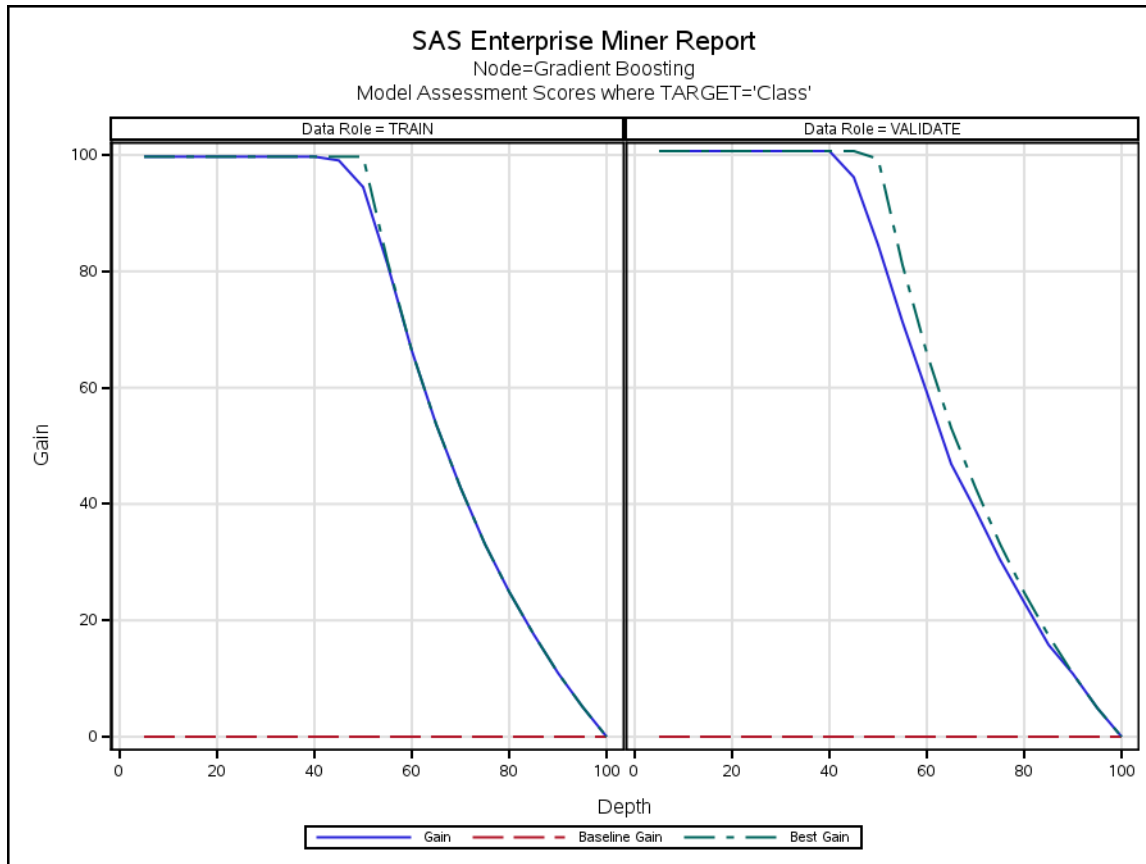
Subseries Plot



Node=Gradient Boosting Variable Importance

| Variable Name | Label | Number of Splitting Rules | Importance | Validation Importance | Ratio of Validation to Training Importance |
|---------------|--------------------|---------------------------|------------|-----------------------|--|
| V14 | | 33 | 1.00000 | 1.00000 | 1.00000 |
| V4 | | 20 | 0.44236 | 0.50840 | 1.14927 |
| V12 | | 19 | 0.35083 | 0.29167 | 0.83138 |
| V3 | | 9 | 0.22321 | 0.04510 | 0.20204 |
| V21 | | 11 | 0.19717 | 0.02886 | 0.14637 |
| V11 | | 10 | 0.16976 | 0.09686 | 0.57057 |
| V8 | | 2 | 0.13492 | 0.09218 | 0.68323 |
| V7 | | 9 | 0.13268 | 0.06464 | 0.48719 |
| V10 | | 6 | 0.12711 | 0.05139 | 0.40429 |
| LOG_Amount | Transformed Amount | 4 | 0.12186 | 0.05977 | 0.49046 |
| V17 | | 8 | 0.12027 | 0.01851 | 0.15392 |
| V23 | | 5 | 0.10073 | 0.06475 | 0.64281 |
| V20 | | 2 | 0.08849 | 0.01433 | 0.16194 |
| V16 | | 2 | 0.06644 | 0.00000 | 0.00000 |
| V22 | | 2 | 0.06612 | 0.00000 | 0.00000 |
| V19 | | 2 | 0.05354 | 0.00000 | 0.00000 |
| V18 | | 1 | 0.04667 | 0.00000 | 0.00000 |
| V15 | | 1 | 0.04644 | 0.00000 | 0.00000 |
| V1 | | 1 | 0.03839 | 0.05924 | 1.54330 |
| V13 | | 1 | 0.03663 | 0.00000 | 0.00000 |
| V26 | | 1 | 0.03039 | 0.00000 | 0.00000 |
| V2 | | 0 | 0.00000 | 0.00000 | . |
| Time | | 0 | 0.00000 | 0.00000 | . |

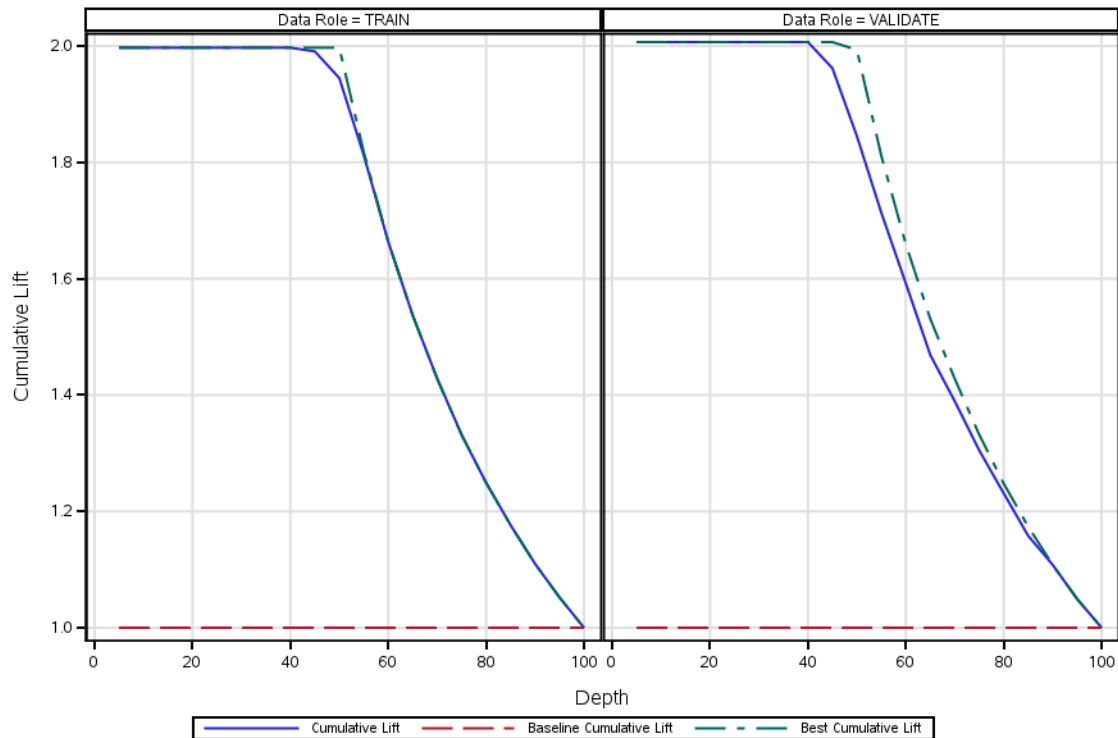
| Variable Name | Label | Number of Splitting Rules | Importance | Validation Importance | Ratio of Validation to Training Importance |
|---------------|-------|---------------------------|------------|-----------------------|--|
| V27 | | 0 | 0.00000 | 0.00000 | . |
| V28 | | 0 | 0.00000 | 0.00000 | . |
| V25 | | 0 | 0.00000 | 0.00000 | . |
| V24 | | 0 | 0.00000 | 0.00000 | . |
| V5 | | 0 | 0.00000 | 0.00000 | . |
| V6 | | 0 | 0.00000 | 0.00000 | . |
| V9 | | 0 | 0.00000 | 0.00000 | . |



SAS Enterprise Miner Report

Node=Gradient Boosting

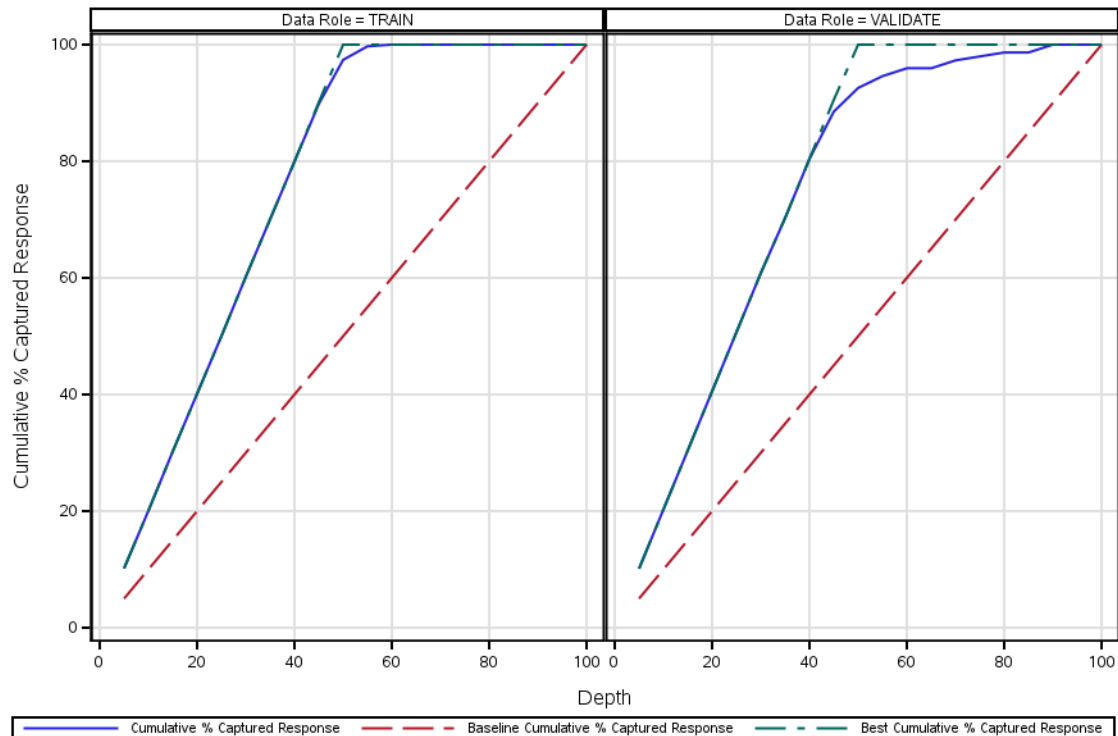
Model Assessment Scores where TARGET='Class'

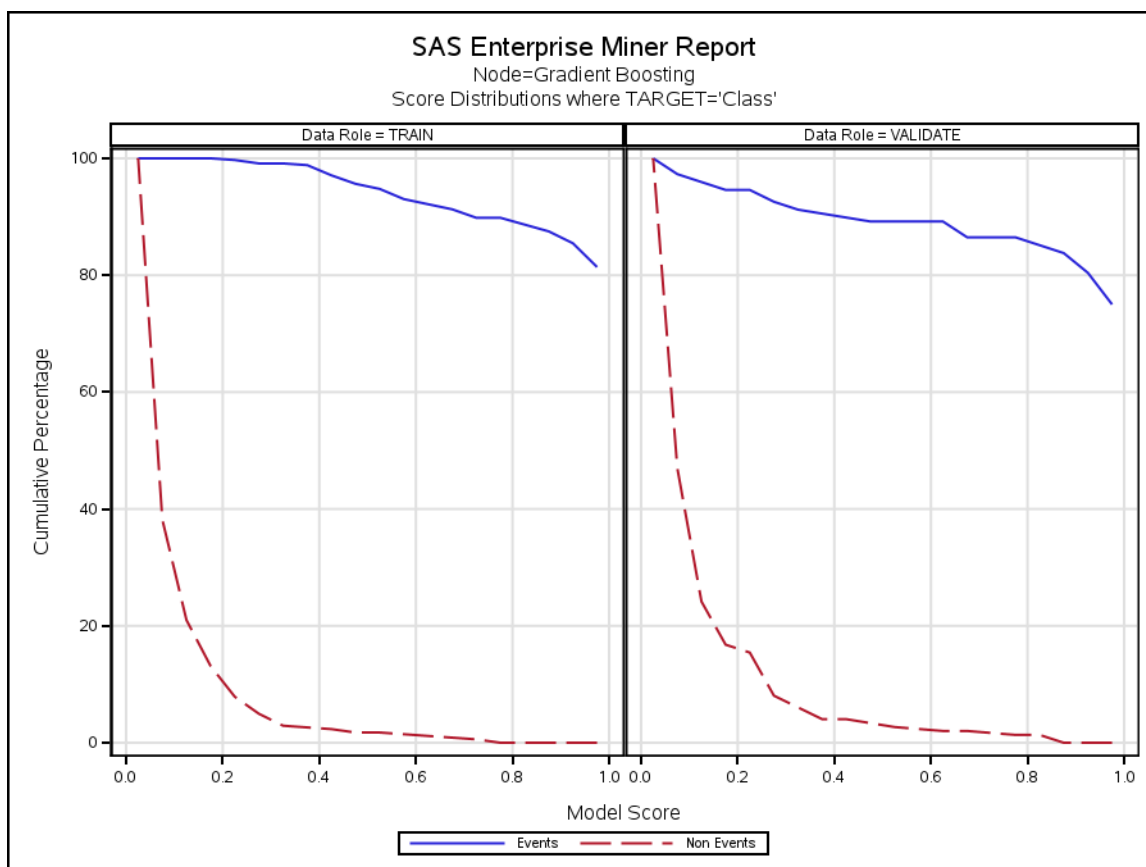
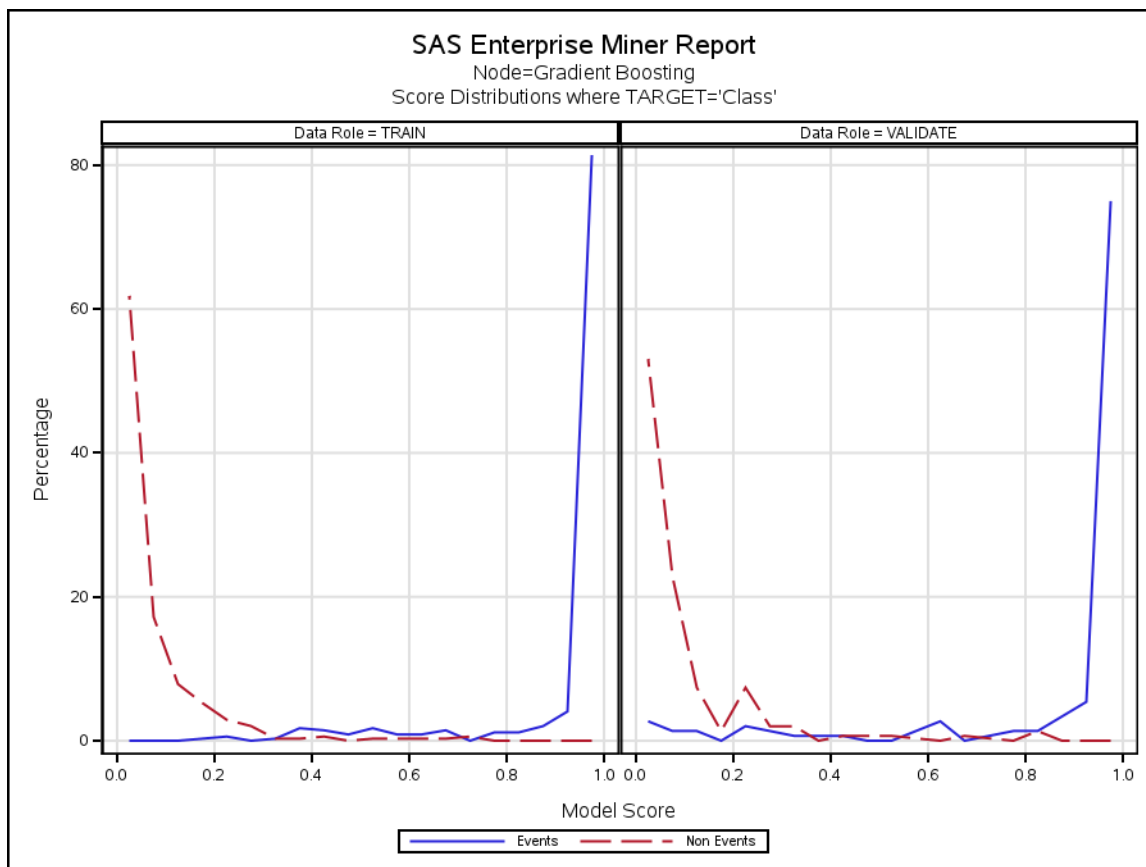


SAS Enterprise Miner Report

Node=Gradient Boosting

Model Assessment Scores where TARGET='Class'





Node=Gradient Boosting
Score Distributions

Target Variable=Class 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 | 280 | 81.3953 | 0.0000 | 81.395 | 0.000 |
| 0.90-0.95 | 14 | 4.0698 | 0.0000 | 85.465 | 0.000 |
| 0.85-0.90 | 7 | 2.0349 | 0.0000 | 87.500 | 0.000 |
| 0.80-0.85 | 4 | 1.1628 | 0.0000 | 88.663 | 0.000 |
| 0.75-0.80 | 4 | 1.1628 | 0.0000 | 89.826 | 0.000 |
| 0.70-0.75 | 0 | 0.0000 | 0.5831 | 89.826 | 0.583 |
| 0.65-0.70 | 5 | 1.4535 | 0.2915 | 91.279 | 0.875 |
| 0.60-0.65 | 3 | 0.8721 | 0.2915 | 92.151 | 1.166 |
| 0.55-0.60 | 3 | 0.8721 | 0.2915 | 93.023 | 1.458 |
| 0.50-0.55 | 6 | 1.7442 | 0.2915 | 94.767 | 1.749 |
| 0.45-0.50 | 3 | 0.8721 | 0.0000 | 95.640 | 1.749 |
| 0.40-0.45 | 5 | 1.4535 | 0.5831 | 97.093 | 2.332 |
| 0.35-0.40 | 6 | 1.7442 | 0.2915 | 98.837 | 2.624 |
| 0.30-0.35 | 1 | 0.2907 | 0.2915 | 99.128 | 2.915 |
| 0.25-0.30 | 0 | 0.0000 | 2.0408 | 99.128 | 4.956 |
| 0.20-0.25 | 2 | 0.5814 | 2.9155 | 99.709 | 7.872 |
| 0.15-0.20 | 1 | 0.2907 | 5.2478 | 100.000 | 13.120 |
| 0.10-0.15 | 0 | 0.0000 | 7.8717 | 100.000 | 20.991 |
| 0.05-0.10 | 0 | 0.0000 | 17.2012 | 100.000 | 38.192 |
| 0.00-0.05 | 0 | 0.0000 | 61.8076 | 100.000 | 100.000 |

Target Variable=Class 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 | 111 | 75.0000 | 0.0000 | 75.000 | 0.000 |
| 0.90-0.95 | 8 | 5.4054 | 0.0000 | 80.405 | 0.000 |
| 0.85-0.90 | 5 | 3.3784 | 0.0000 | 83.784 | 0.000 |
| 0.80-0.85 | 2 | 1.3514 | 1.3423 | 85.135 | 1.342 |
| 0.75-0.80 | 2 | 1.3514 | 0.0000 | 86.486 | 1.342 |
| 0.65-0.70 | 0 | 0.0000 | 0.6711 | 86.486 | 2.013 |
| 0.60-0.65 | 4 | 2.7027 | 0.0000 | 89.189 | 2.013 |
| 0.50-0.55 | 0 | 0.0000 | 0.6711 | 89.189 | 2.685 |
| 0.45-0.50 | 0 | 0.0000 | 0.6711 | 89.189 | 3.356 |
| 0.40-0.45 | 1 | 0.6757 | 0.6711 | 89.865 | 4.027 |
| 0.35-0.40 | 1 | 0.6757 | 0.0000 | 90.541 | 4.027 |
| 0.30-0.35 | 1 | 0.6757 | 2.0134 | 91.216 | 6.040 |
| 0.25-0.30 | 2 | 1.3514 | 2.0134 | 92.568 | 8.054 |
| 0.20-0.25 | 3 | 2.0270 | 7.3826 | 94.595 | 15.436 |
| 0.15-0.20 | 0 | 0.0000 | 1.3423 | 94.595 | 16.779 |
| 0.10-0.15 | 2 | 1.3514 | 7.3826 | 95.946 | 24.161 |
| 0.05-0.10 | 2 | 1.3514 | 22.8188 | 97.297 | 46.980 |
| 0.00-0.05 | 4 | 2.7027 | 53.0201 | 100.000 | 100.000 |

SAS Enterprise Miner Report

Node=Model Comparison Summary

Node id = MdlComp
 Node label = Model Comparison
 Meta path = FIMPORT => EMSave => Trans => Smpl => Part => Reg => MdlComp
 Notes =

Node=Model Comparison 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 | _VMISC_ | |
| LiftEpsilon | 1E-6 | | RocChart | Y | | TargetLabel | | |
| ModelCriteria | Valid: Misclassification Rate | | RocEpsilon | 0.01 | | TargetName | Class | |
| ModelDescription | Regression | | RoiEpsilon | 1E-6 | | classViyaCriteria | DEFAULT | |
| ModelId | Reg | | ScoreDistBin | 20 | | intervalViyaCriteria | DEFAULT | |
| NormalizeReportingVariables | Y | | SelectionCriteria | DEFAULT | | | | |

Node=Model Comparison Variable Summary

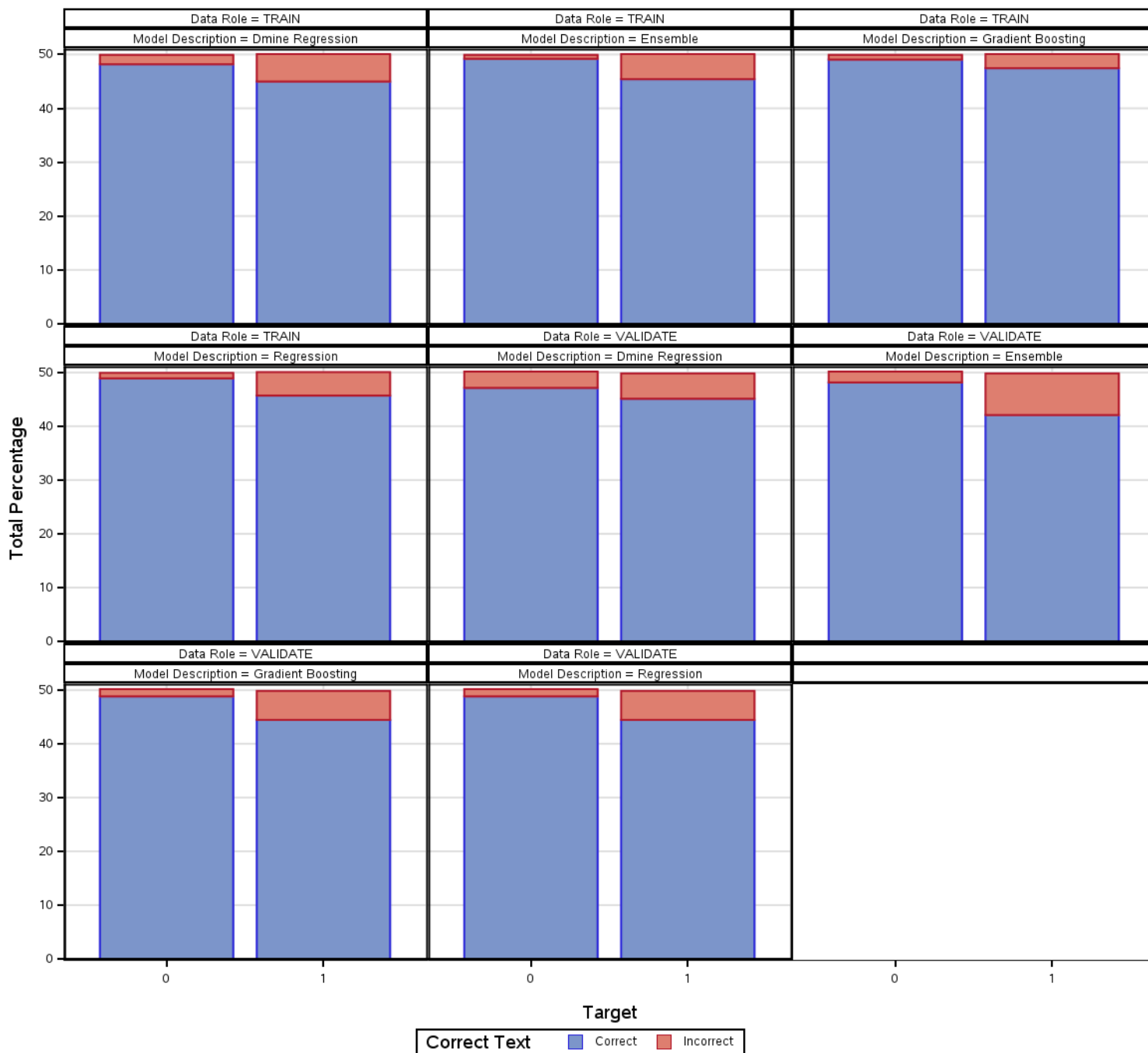
| Role | Level | Frequency Count | Name |
|--------|--------|--------------------|-------|
| TARGET | BINARY | 1 | Class |

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 | Reg | Reg | Regression | Class | | 0.067340 | 0.043060 | 0.053857 | 0.892 |
| | Boost | Boost | Gradient Boosting | Class | | 0.067340 | 0.023723 | 0.034934 | 0.965 |
| | DmineReg | DmineReg | Dmine Regression | Class | | 0.077441 | 0.052364 | 0.068413 | 0.869 |
| | Ensmbl | Ensmbl | Ensemble | Class | | 0.097643 | 0.045489 | 0.053857 | 0.892 |

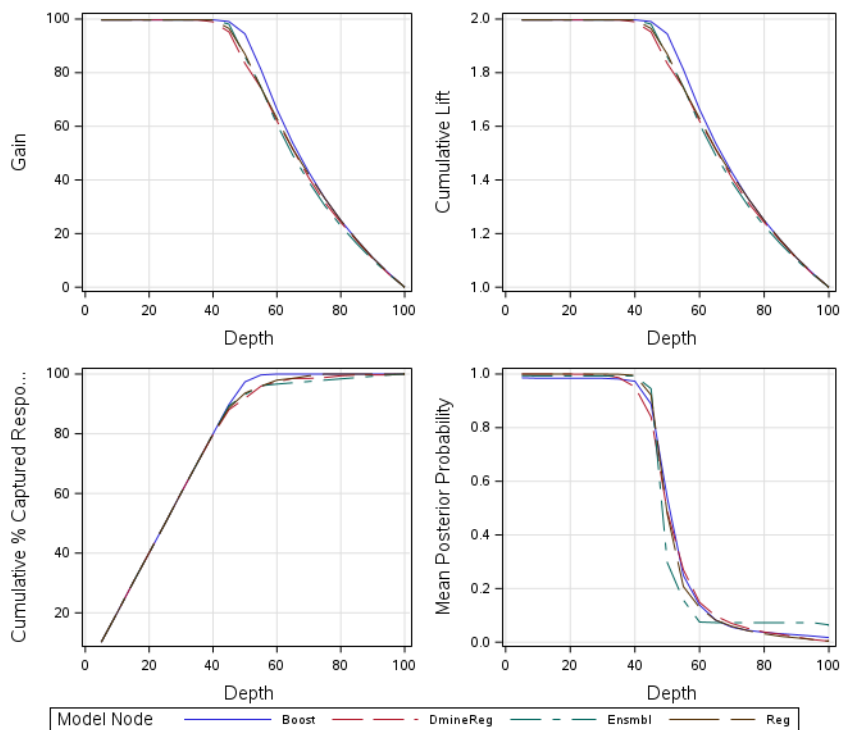
| Selected Model | Predecessor Node | Model Node | Model Description | Target Variable | Target Label | Selection Criterion: Valid: Misclassification Rate | Valid: Average Squared Error | Valid: Misclassification Rate | Valid: Kolmogorov-Smirnov Statistic |
|-------------------|---------------------|---------------|-------------------|--------------------|-----------------|---|---------------------------------------|-------------------------------------|---|
| Y | Reg | Reg | Regression | Class | | 0.067340 | 0.052089 | 0.067340 | 0.879 |
| | Boost | Boost | Gradient Boosting | Class | | 0.067340 | 0.053135 | 0.067340 | 0.872 |
| | DmineReg | DmineReg | Dmine Regression | Class | | 0.077441 | 0.066491 | 0.077441 | 0.858 |
| | Ensmbl | Ensmbl | Ensemble | Class | | 0.097643 | 0.080197 | 0.097643 | 0.818 |

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



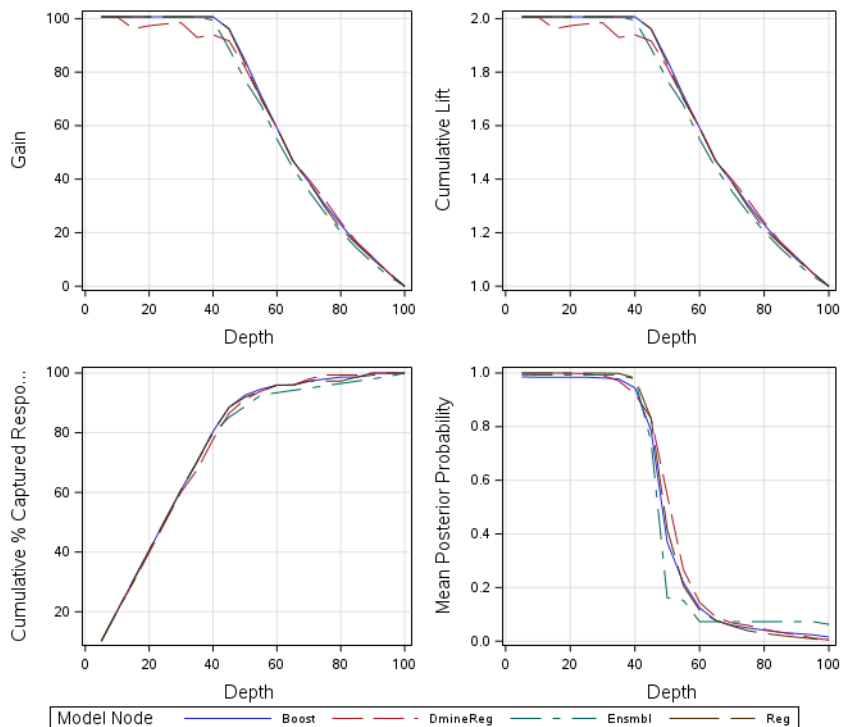
SAS Enterprise Miner Report

Node=Model Comparison
Multiple Model Assessment Scores where DataRole=TRAIN
TARGET='Class'

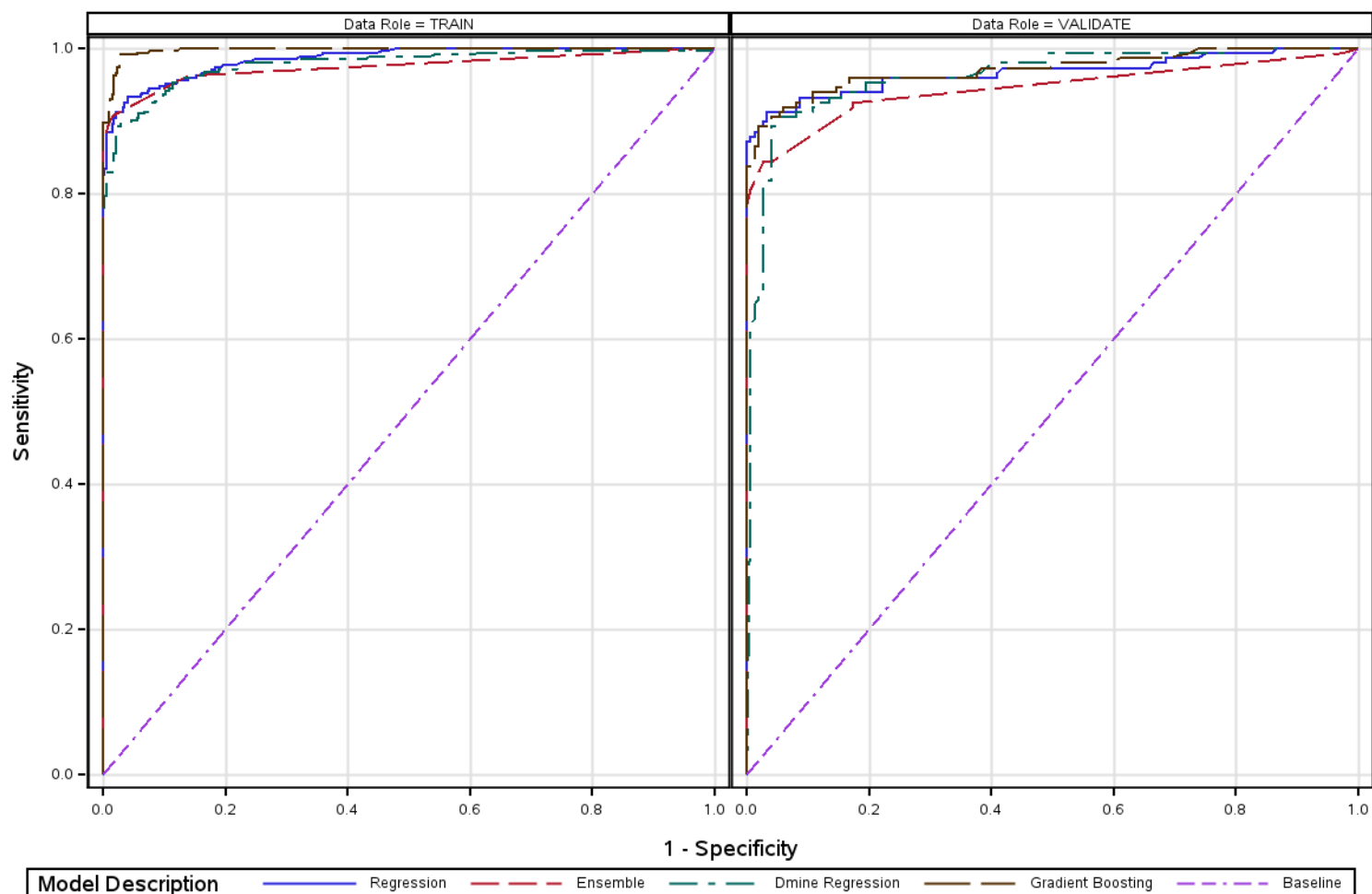


SAS Enterprise Miner Report

Node=Model Comparison
Multiple Model Assessment Scores where DataRole=VALIDATE
TARGET='Class'



SAS Enterprise Miner Report
Node=Model Comparison
ROC Chart
TARGET='Class' and EVENT='1'



SAS Enterprise Miner Report

Node=Score Summary

Node id = Score
 Node label = Score
 Meta path = FIMPORT => EMSave => Trans => Smpl => Part => Reg => MdlComp => Score
 Notes =

Node=Score Properties

| Property | Value | Default | Property | Value | Default | Property | Value | Default |
|--------------------|-------|---------|---------------|-------|---------|----------------|---------|---------|
| Component | Score | | HideInput | Y | | JScore | N | |
| CScore | N | | HideOther | Y | | OptimizedCode | Y | |
| FixedOutputNames | Y | | HidePredict | Y | | OutputType | VIEW | |
| GraphReports | Y | | HideRejected | Y | | PackageName | DEFAULT | |
| HideAssess | Y | | HideResidual | Y | | PreferenceName | | |
| HideClassification | Y | | HideTarget | Y | | ScoreTest | N | |
| HideFreq | Y | | HideVariables | N | | ScoreValidate | N | |

Node=Score Variable Summary

| Role | Level | Frequency Count | Name |
|---------|---------|--------------------|---------|
| TARGET | BINARY | 1 | Class |
| SEGMENT | NOMINAL | 1 | b_Class |

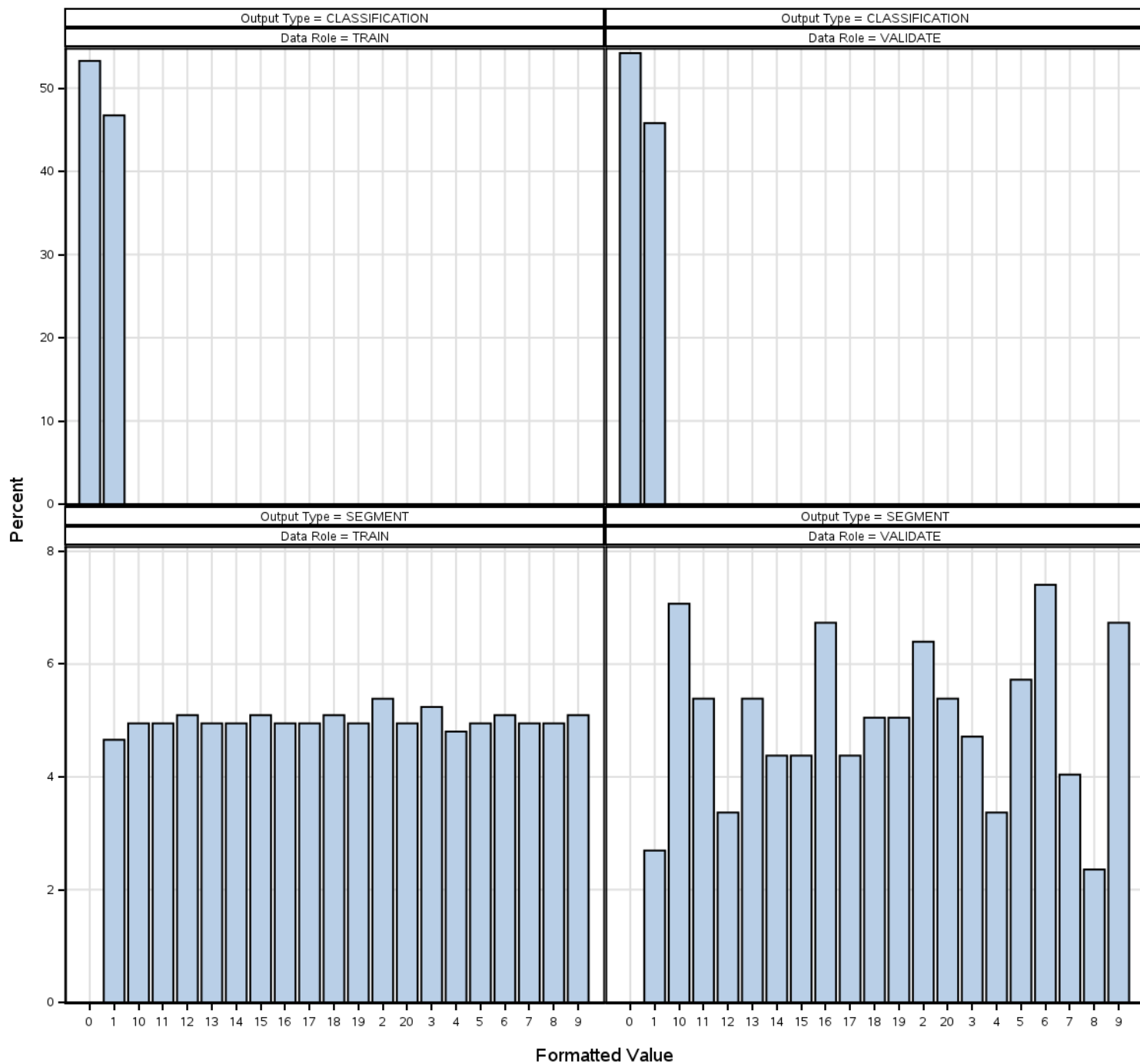
Node=Score Output Variables

| Variable Name | Creator | Variable Label | Function | Type |
|---------------------|---------|----------------------------------|----------------|------|
| EM_CLASSIFICATION | Score | Prediction for Class | CLASSIFICATION | C |
| EM_EVENTPROBABILITY | Score | Probability for level 1 of Class | PREDICT | N |
| EM_PROBABILITY | Score | Probability of Classification | PREDICT | N |
| EM_SEGMENT | Score | Segment | TRANSFORM | N |
| I_Class | Reg | Into: Class | CLASSIFICATION | C |
| P_Class0 | Reg | Predicted: Class=0 | PREDICT | N |
| P_Class1 | Reg | Predicted: Class=1 | PREDICT | N |
| U_Class | Reg | Unnormalized Into: Class | CLASSIFICATION | N |
| _WARN_ | Reg | Warnings | ASSESS | C |
| b_Class | MdlComp | | TRANSFORM | N |

SAS Enterprise Miner Report

Node=Score

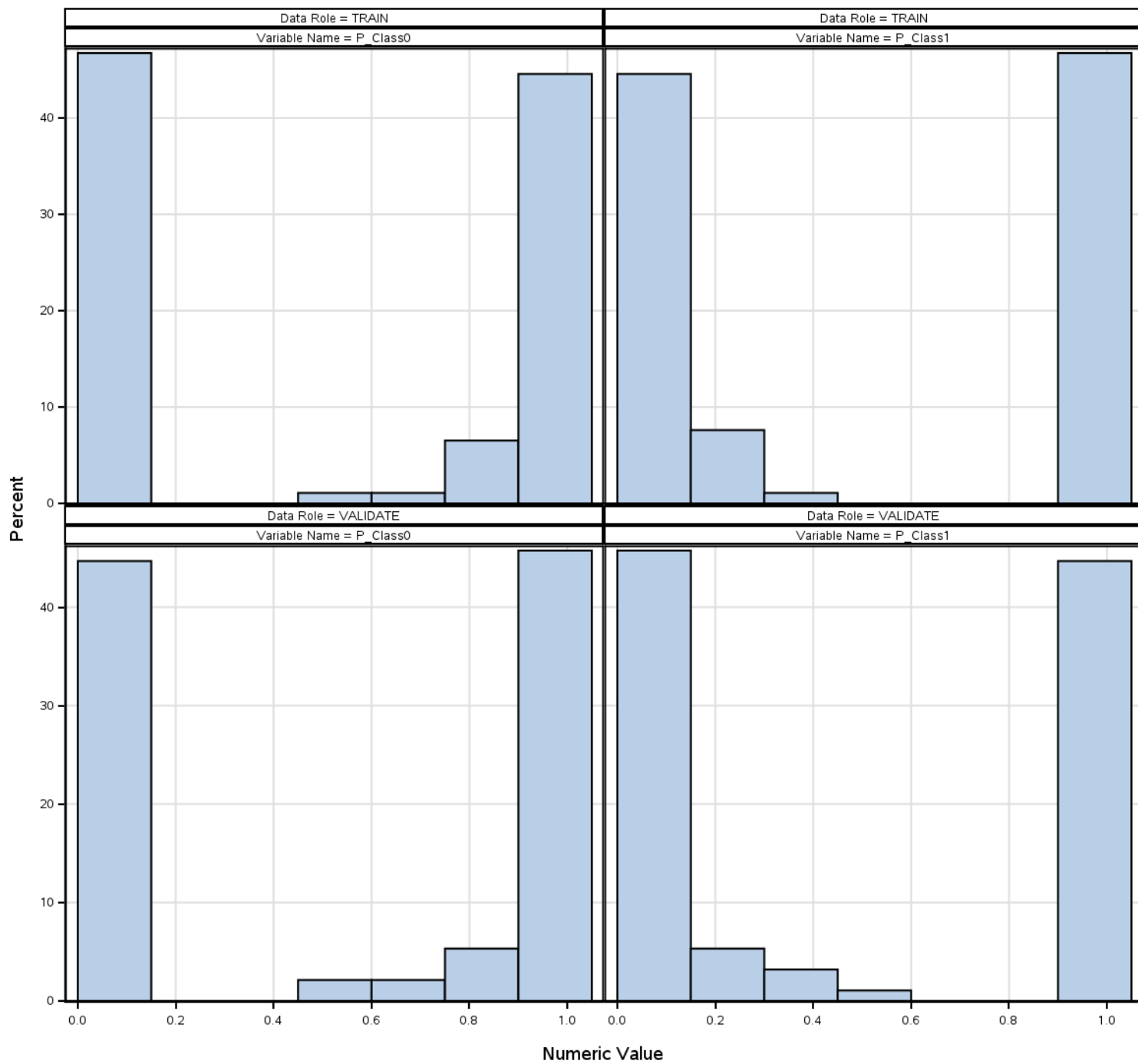
Bar Chart



SAS Enterprise Miner Report

Node=Score

Histogram



SAS Enterprise Miner Report

Node=Save Data (2) Summary

Node id = EMSave2

Node label = Save Data (2)

Meta path = FIMPORT => EMSave => Trans => Smpl => Part => Reg => MdlComp => Score => EMSave2

Notes =

Node=Save Data (2) Properties

| Property | Value | Default | Property | Value | Default | Property | Value | Default |
|-------------------|----------|---------|----------|-------|---------|-------------|----------|----------|
| Component | EMSave | | Name | | | Train | Y | |
| AllObs | Y | | OutObs | 1000 | | Transaction | Y | |
| AllRoles | Y | | Replace | Y | | Type | SAS7BDAT | SAS7DBAT |
| DirectorySelector | | | Score | Y | | Validate | Y | |
| Lib | EUROPEAN | | Test | Y | | | | |

Node=Save Data (2) Variable Summary

| Role | Level | Frequency Count | Name |
|-------|----------|--------------------|--------------------------|
| INPUT | INTERVAL | 7 | V12 V13 V14 V2 V23 V4 V8 |

Node=Save Data (2) Data

| Data Library | Output Location | Total Observations | Saved Observations | Number of Variables |
|-----------------|------------------------------------|-----------------------|-----------------------|---------------------------|
| EUROPEAN | /saswork/em_save_TRAIN.sas7bdat | 687 | MAX | 20 |
| EUROPEAN | /saswork/em_save_VALIDATE.sas7bdat | 297 | MAX | 20 |

End of Report