Handling Missing Values in SAS

SAS 9 and SAS Viya

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Agenda

What are missing values

General Definition

SAS Definition

Why do missing values happen

Reasons

Options

How to manage missing values in SAS

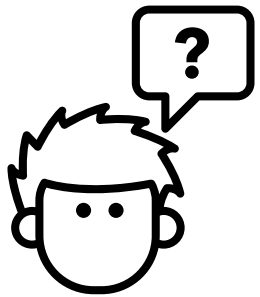
Programming

Products

What is Missing Data?

Definition

In statistics, missing data, or missing values, occur when no data value is stored for the variable in an observation. Missing data are a common occurrence and can have a significant effect on the conclusions that can be drawn from the data. - Wikipedia



What is Missing Data?

SAS

Missing Value

- is a value that indicates that no data value is stored for the variable in the current observation. There are three kinds of missing values:
- numeric
- character
- special numeric

By default, SAS prints a missing numeric value as a single period (.) and a missing character value as a blank space. See Creating Special Missing Values for more information about special numeric missing values.

Why is the data missing?

Missing Completely At Random (MCAR)

The probability of missingness doesn't depend on anything.

Missing At Random (MAR)

The probability of missingness does not depend on the unobserved value of the missing variable, but it can depend on any of the other variables in your dataset

Not Missing at Random (NMAR)

The probability of missingness depends on the unobserved value of the missing variable itself

When should you be concerned?

Reporting

- May draw inaccurate conclusions or inference about the data

Predictive Modeling

- Bias in the estimation of parameters
- Significant effect on the conclusions

What should you do about missing values?

Remove observation(s)

Replace with Constant or Zero

Replace with mean or mode

Replace using an imputation method

Functions

Useful Functions

Character

MISSING(*expression*)

- Returns a number that indicates whether the argument contains a missing value.
  - missing_flag = missing(gender);

CMISS(*argument-1 <, argument-2,...>*)

- Counts the number of missing arguments.
  - char_miss = cmiss(BP_Status, Chol_Status, Smoking_Status, Weight_Status);

COALESCEC(*expression*[, ...*expression*])

- Returns the first non-null or nonmissing value from a list of character arguments.
  - charvar = coalescec(charvar, "***NOT ANSWERED***");

Function Documentation

Useful Functions

Numeric

MISSING(*expression*)

- Returns a number that indicates whether the argument contains a missing value.
  - missing_flag = missing(income);

NMISS(*argument-1 <,... argument-n>*)

- Returns the number of missing numeric values.
  - num_miss = nmiss(AgeAtDeath, AgeAtStart, AgeCHDdiag);

COALESCE(*argument-1<..., argument-n>*)

- Returns the first nonmissing value from a list of numeric arguments.
  - numvar = coalesce(numvar, 1000);

Useful Functions

Numeric

Both return zero for missing values

- y=sum(x,0);
- y=coalesce(x,0);

In SQL use the mean or coalesce function

- case when missing(var1) then mean(var1) else var1 end as var1
- coalesce(var1, mean(var1)) as var1

Procedures

Remove observations

WHERE

In data steps, proc SQL, and procedures

IF

In data steps

CASE

proc SQL

Replace Value(s)

PROC STDIZE

Replacing Missing Values

PROC STDIZE

- Replace all numeric missing values with zero

```
PROC STDIZE data=table1 out=table2 reponly missing=0;
run;
```

- Replace all numeric missing values with the mean

```
PROC STDIZE data=table1 out=table2 reponly method=mean;
var _numeric_;
run;
```

reponly – only replace; do not standardize

missing – can be any constant

method – includes MEDIAN, SUM and others for doing standardization activities

PROC STDIZE Documentation

PROC STANDARD

Replacing Missing Values

PROC STANDARD

- Replace all numeric missing values with mean

```
PROC STANDARD data=table 1 out=table2 replace;
run;
```

PROC STANDARD Documentation

Use Imputation Method

PROC HPIMPUTE

Replacing Missing Values

PROC HPIMPUTE

```
proc hpimpute data=sampsio.hmeq out=out1;
    input mortdue value clage debtinc;
    impute mortdue / value = 70000;
    impute value / method = mean;
    impute clage / method = random;
    impute debtinc / method = pmedian;
run;
```

Imputation Results

Variable	Imputation Indicator	Imputed Variable	N Missing	Type of Imputation	Imputation Value (Seed)
MORTDUE	M_MORTDUE	IM_MORTDUE	518	Given value	70000
VALUE	M_VALUE	IM_VALUE	112	Mean	101776
CLAGE	M_CLAGE	IM_CLAGE	308	Random	5.00000
DEBTINC	M_DEBTINC	IM_DEBTINC	1267	Pseudo Median	34.81696

MEAN, RANDOM, PMEDIAN or Constant Value

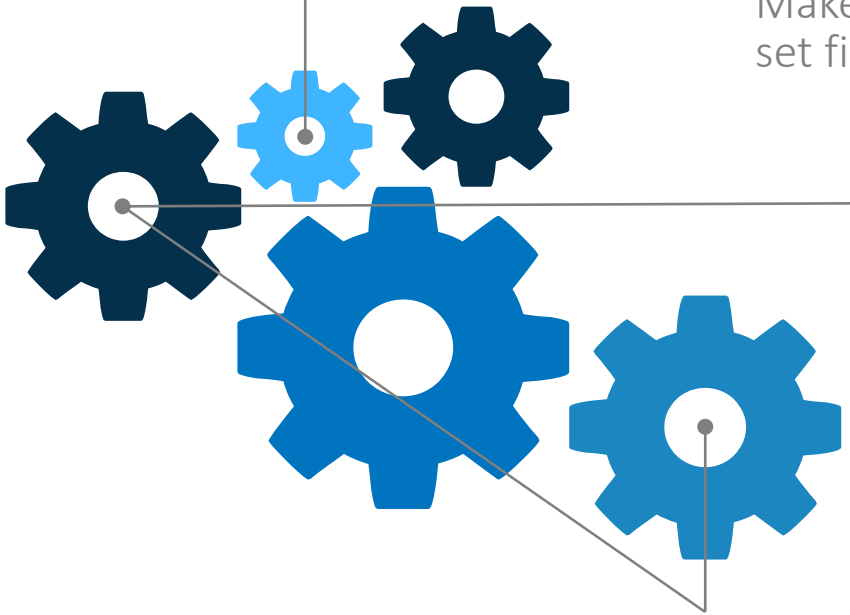
HPIMPUTE Procedure Documentation

Multiple Imputation

PROC MI & PROC MIANALYZE

Multiple Imputation In 3 Steps

Using PROC MI & PROC MIANALYZE



1. *Imputation*

Make *M*=5 to >25* copies of incomplete data set filling in with conditionally random values

2. *Analysis*

Of each data set separately

3. *Pooling*

- *Point estimates.* Average across *M* analyses
- *Standard errors*. Combine variances

PROC MI Documentation

Multiple Imputation

Step 1 Proc MI Example: Imputation

Oxygen	RunTime	RunPulse
44.609	11.37	178
54.297	8.65	156
49.874	9.22	.
.	11.95	176
39.442	13.08	174
50.541	.	.
44.754	11.12	176
51.855	10.33	166
40.836	10.95	168
46.774	10.25	.
39.407	12.63	174
45.441	9.63	164

```
PROC MI data=mi_example out=outmi
        seed=1234;
        var Oxygen RunTime RunPulse;
run;
```

Multiple Imputation

Step 1: Imputation → Step 2: Analysis → Step 3: Pooling

Oxygen	RunTime	RunPulse
44.609	11.37	178
54.297	8.65	156
49.874	9.22	.
.	11.95	176
39.442	13.08	174
50.541	.	.
44.754	11.12	176
51.855	10.33	166
40.836	10.95	168
46.774	10.25	.
39.407	12.63	174
45.441	9.63	164

```
PROC MI data=mi_example out=outmi
        seed=1234;
        var Oxygen RunTime RunPulse;
run;
```

Multiple Imputation

Step 1 Results: Imputation

Oxygen	RunTime	RunPulse
44.609	11.37	178
54.297	8.65	156
49.874	9.22	.
.	11.95	176
39.442	13.08	174
50.541	.	.
44.754	11.12	176
51.855	10.33	166
40.836	10.95	168
46.774	10.25	.
39.407	12.63	174
45.441	9.63	164

Multiple imputed datasets created

Oxygen	RunTime	RunPulse
44.609	11.37	178
54.297	8.65	156
49.874	9.22	169.856
48.987	11.95	176
39.442	13.08	174
50.541	10.932	178.697
44.754	11.12	176
51.855	10.33	166
40.836	10.95	168
46.774	10.25	157.241
39.407	12.63	174
45.441	9.63	164

Oxygen	RunTime	RunPulse
44.609	11.37	178
54.297	8.65	156
49.874	9.22	173.309
50.095	11.95	176
39.442	13.08	174
50.541	11.769	158.932
44.754	11.12	176
51.855	10.33	166
40.836	10.95	168
46.774	10.25	161.803
39.407	12.63	174
45.441	9.63	164

Multiple Imputation

Step 1: Imputation → Step 2: Analysis → Step 3: Pooling

```
PROC REG data=outmi outest=outreg covout noprint;
        model Oxygen = RunTime RunPulse;
        by _Imputation_;
run;
```

Other model options: Reg, Logistic, Genmod, Mixed, GLM

Multiple Imputation

Step 2 Results: Parameter Estimates & Covariance Matrices

```
PROC PRINT data=outreg (obs=8);
        var _Imputation_ _Type_ _Name_ Intercept  RunTime  RunPulse;
run;
```

Obs	_Imputation_	_TYPE_	_NAME_	Intercept	RunTime	RunPulse
1	1	PARMS		82.9694	-2.44422	-0.06121
2	1	COV	Intercept	65.1698	0.26463	-0.39518
3	1	COV	RunTime	0.2646	0.14005	-0.0101
4	1	COV	RunPulse	-0.3952	-0.0101	0.00293
5	2	PARMS		85.1831	-3.0485	-0.03452
6	2	COV	Intercept	85.3406	-0.44671	-0.46786
7	2	COV	RunTime	-0.4467	0.13629	-0.00581
8	2	COV	RunPulse	-0.4679	-0.00581	0.00308

Multiple Imputation


```
PROC MIANALYZE data=outreg;
        modeleffects Intercept RunTime RunPulse;
run;
```

Replaces **var**

Notice the dependent variable is not included here

Multiple Imputation Parameter Estimates

Parameter	Estimate	Std Error	95% Confidence Limits		DF	Minimum	Maximum	Pr > |t|
Intercept	92.696519	12.780914	65.35758	120.0355	14.412	82.969385	101.288118	<.0001
RunTime	-2.915452	0.48346	-3.90873	-1.9222	26.264	-3.146336	-2.444217	<.0001
RunPulse	-0.086795	0.070425	-0.23209	0.0585	24.163	-0.13547	-0.034519	0.2296

PROC MIANALYZE Documentation

PROC SURVEYIMPUTE

PROC SURVEYIMPUTE

Brand new in SAS/Stat 14.1

Impute missing values – PROC SURVEYIMPUTE

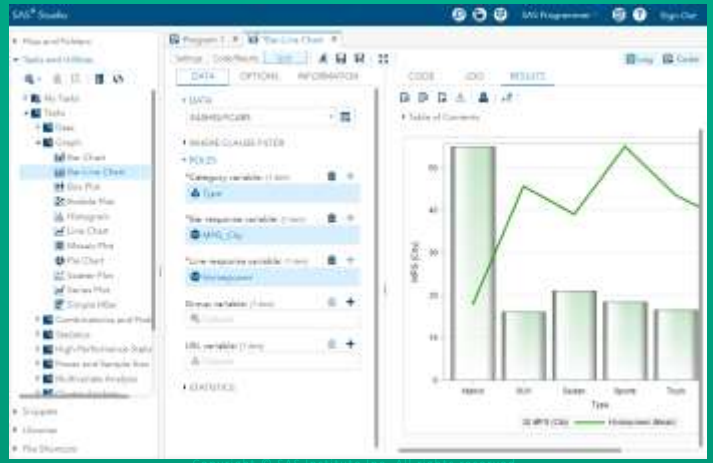
The SURVEYIMPUTE procedure imputes missing values of an item in a sample survey by replacing them with observed values from the same item. Imputation methods include single and multiple hot-deck Imputation, Approximate Bayesian bootstrap (ABB) imputation, Fractional hotdeck imputation (FHDI), and fully efficient fractional imputation (FEFI)

```
/* Joint imputation for Department and Response*/
proc surveyimpute data=SIS_Survey_Sub method=fefi varmethod=jackknife;
  class Department Response;
  var Department Response;
  strata State NewUser;
  cluster School;
  weight SamplingWeight;
  output out=SIS_Survey_Imputed outjkcoefs=SIS_JKCoefs;
run;
```

PROC SURVEYIMPUTE Documentation

Products

SAS Studio



Replacing Missing Values

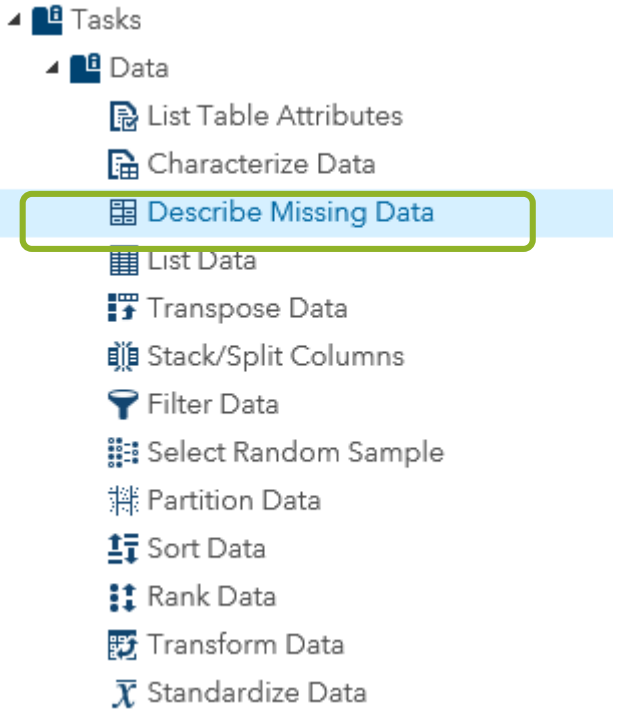
SAS Studio

3 Ways

1. Task – Data → Describe Missing Data
2. Task – Data → Standardize Data
   - Omit row
   - Replace Value
3. SAS Code
   - PROC STDIZE - documentation
   - PROC STANDARD - documentation
   - PROC HPIMPUTE - documentation
   - SAS/STAT PROC MI - documentation

Describe Missing Data Task

Frequencies



Missing Data Frequencies
Legend: ., A, B, etc = Missing

Default or seriously delinquent		
BAD	Frequency	Percent
Non-missing	5960	100.00

Amount of current loan request		
LOAN	Frequency	Percent
Non-missing	5960	100.00

Amount due on existing mortgage		
MORTDUE	Frequency	Percent
.	518	8.69
Non-missing	5442	91.31

Home improvement or Debt Consolidation		
REASON	Frequency	Percent
	252	4.23
Non-missing	5708	95.77

Prof/Exec/Office/Self/Other		
JOB	Frequency	Percent
	279	4.68
Non-missing	5681	95.32

Years on current job		
YOJ	Frequency	Percent
.	515	8.64
Non-missing	5445	91.36

Describe Missing Data Task

Missing Data Pattern

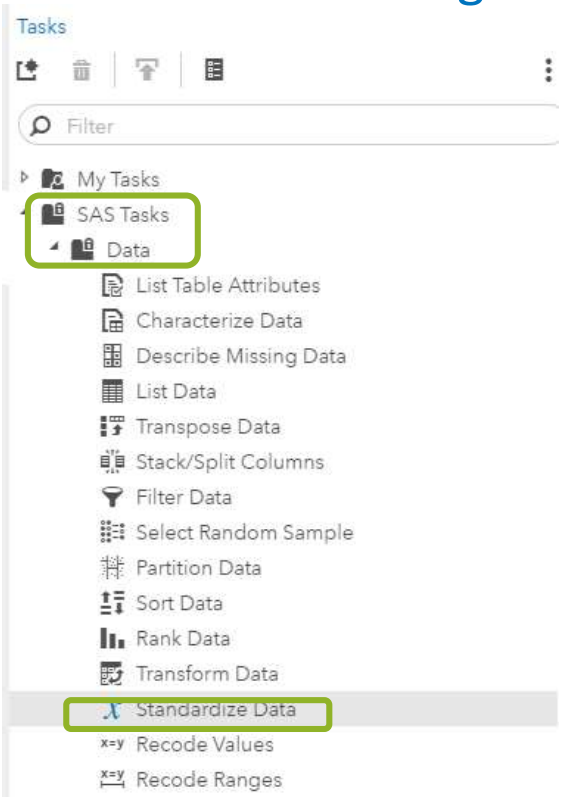
Missing Data Patterns across Variables

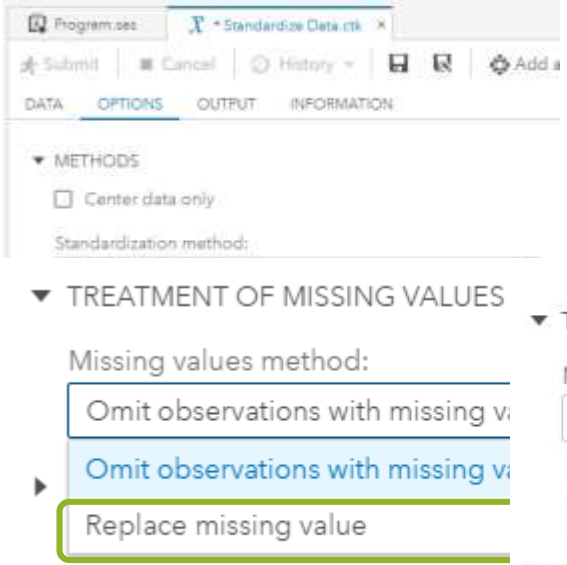
Legend: ., A, B, etc = Missing

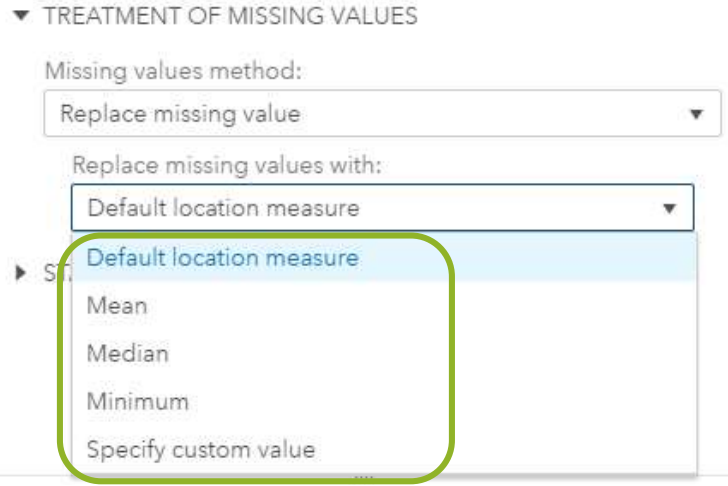
Default or seriously delinquent	Amount of current loan request	Amount due on existing mortgage	Value of current property	Home improvement or Debt Consolidation	Prof/Exec/Office/Self/Other	Years on current job	No. of major derogatory reports	No. of deliquent credit lines	Age of oldest credit line in months	No. of recent credit inquiries	No. of trade credit lines	Debt to income ratio	Frequency	Percent
Non-missing	Non-missing	.	.			.	.	.	.	.	.	.	2	0.0336
Non-missing	Non-missing	.	.			.	.	.	.	.	.	Non-missing	6	0.1007
Non-missing	Non-missing	.	.			Non-missing	Non-missing	Non-missing	.	Non-missing	Non-missing	.	1	0.0168
Non-missing	Non-missing	.	.		Non-missing	Non-missing	Non-missing	Non-missing	Non-missing	Non-missing	Non-missing	.	1	0.0168
Non-missing	Non-missing	.	.	Non-missing		Non-missing	Non-missing	Non-missing	Non-missing	Non-missing	Non-missing	.	2	0.0336
Non-missing	Non-missing	.	.	Non-missing		Non-missing	Non-missing	Non-missing	Non-missing	Non-missing	Non-missing	Non-missing	1	0.0168
Non-missing	Non-missing	.	.	Non-missing	Non-missing	.	.	.	.	.	.	.	2	0.0336
Non-missing	Non-missing	.	.	Non-missing	Non-missing	Non-missing	.	.	.	.	.	.	2	0.0336

Standardize Data Task

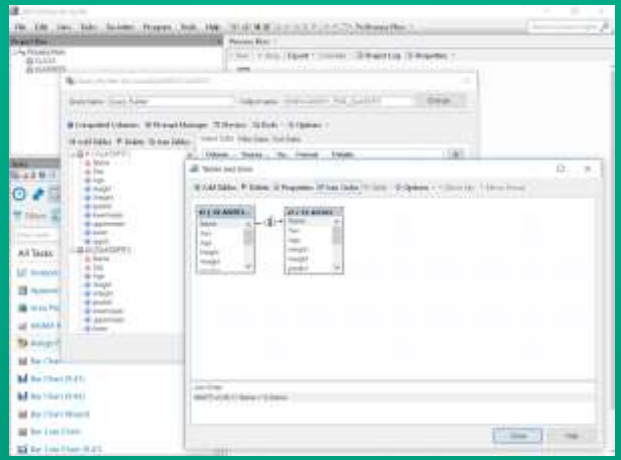
Select Missing Values Method & How to replace missing values







SAS Enterprise Guide



Replacing Missing Values

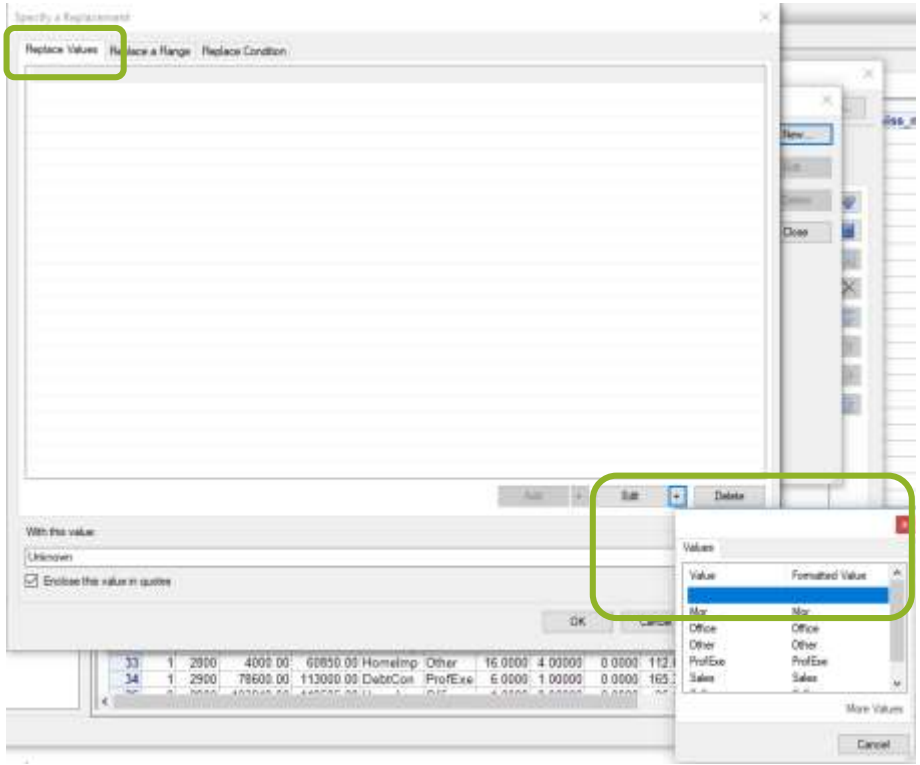
SAS Enterprise Guide

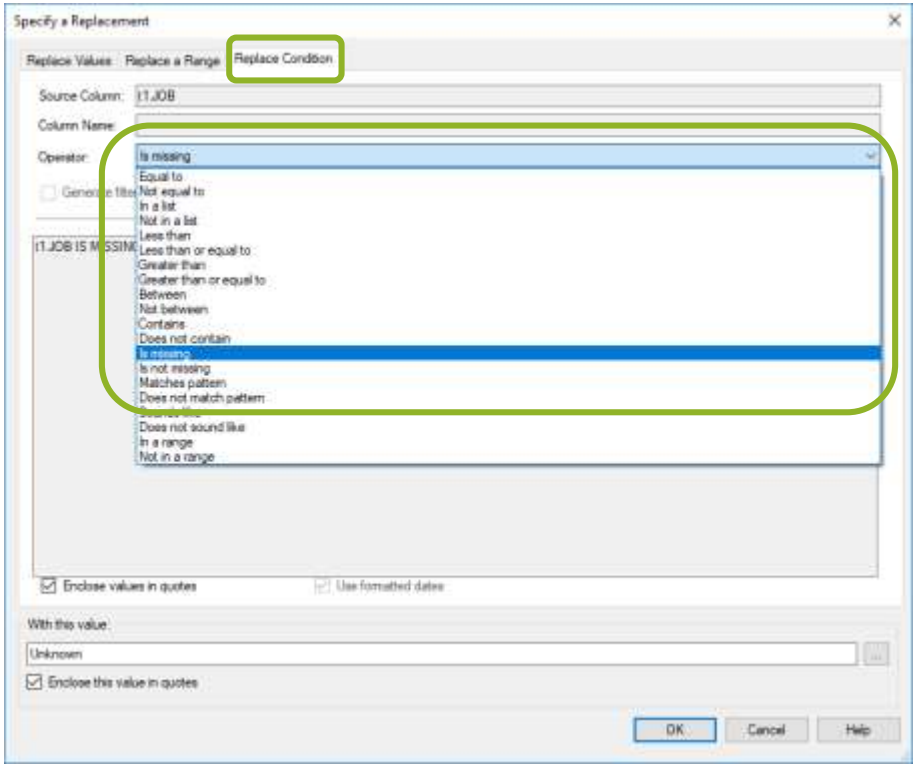
3 Ways

1. Task - Query Builder using Computed Column –> Replace Values *(numeric & character)*
2. Task – Data → Standardize Data *(numeric only - replaces with mean)*
3. SAS Code
   - PROC STDIZE - documentation
   - PROC STANDARD - documentation
   - PROC HPIMPUTE - documentation
   - SAS/STAT PROC MI - documentation

Query Builder Task

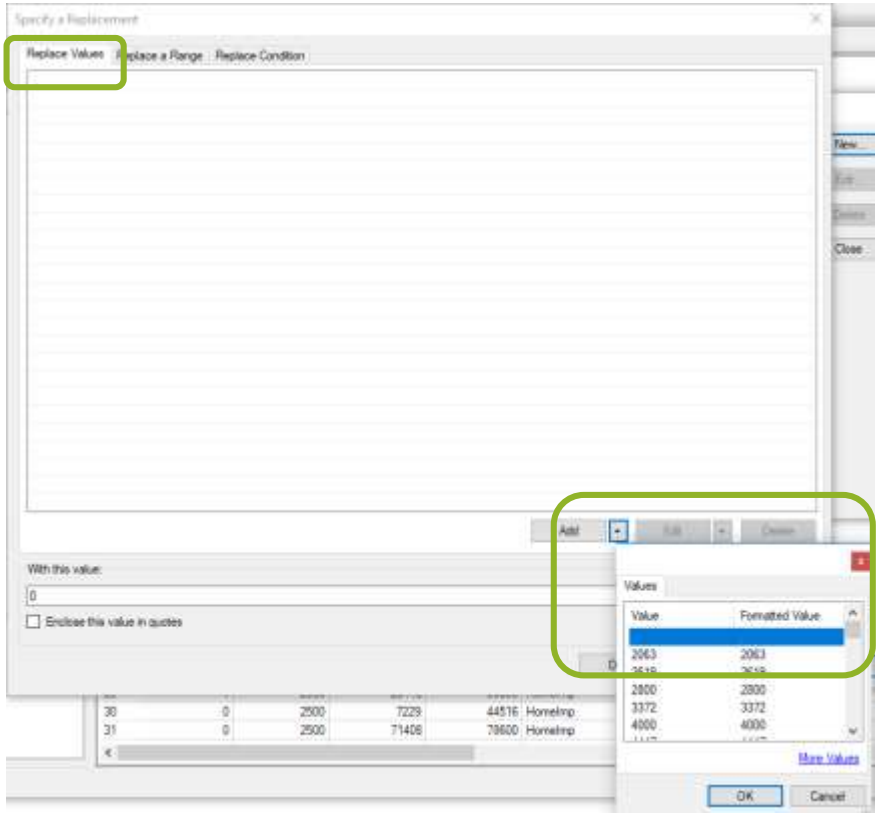
Replace Value or Replace Condition for Character Variable

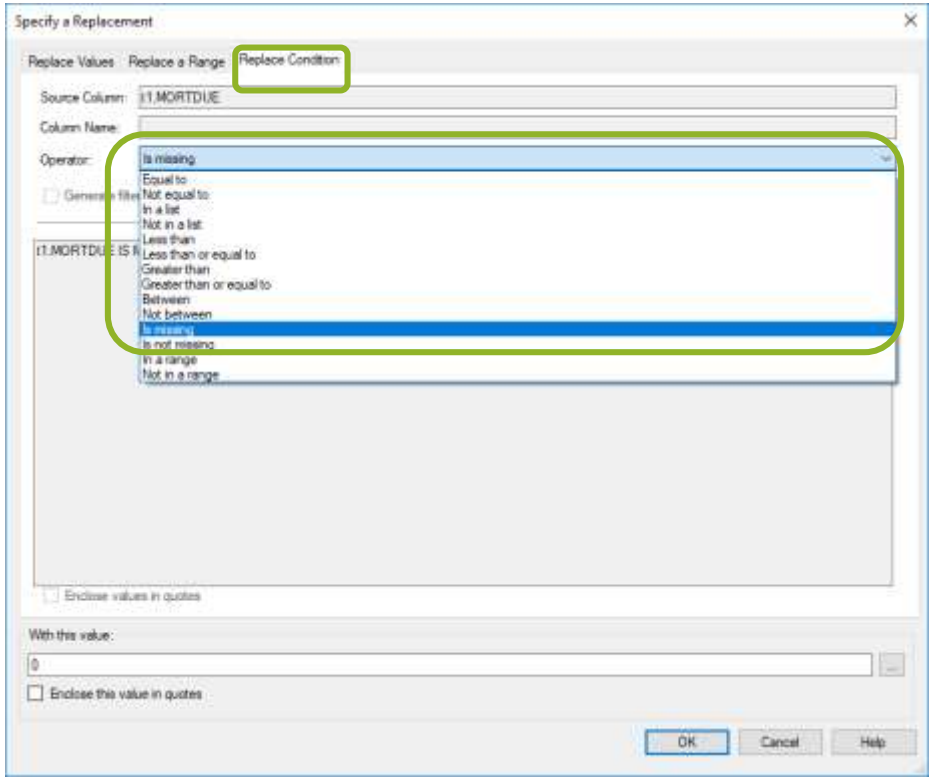




Query Builder Task

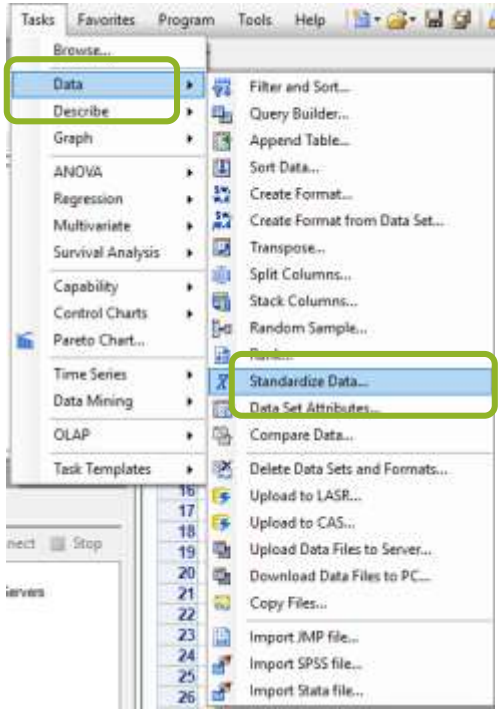
Replace Value or Replace Condition for Numeric Variable

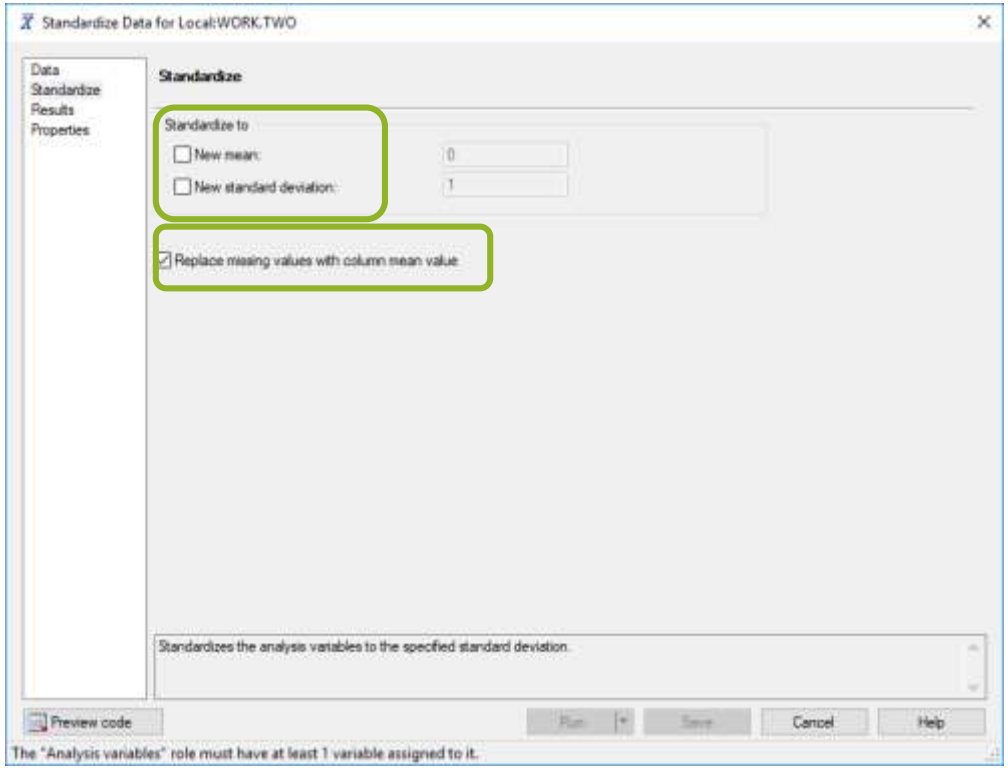




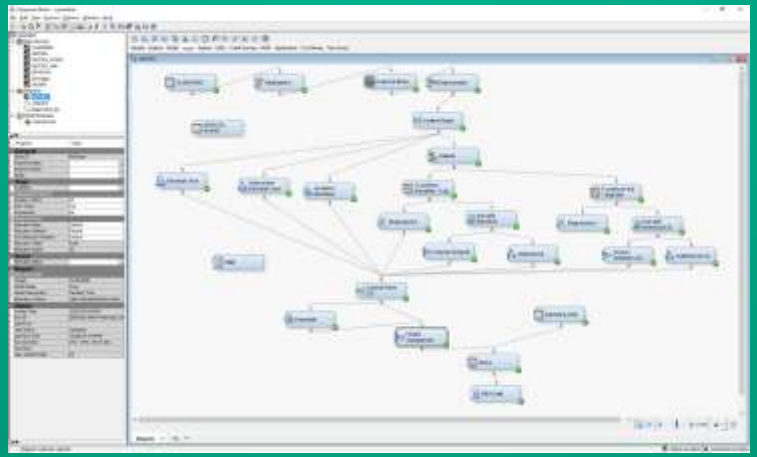
Standardize Data Task

Uncheck New Mean & New Standard Deviation





SAS Enterprise Miner



Replacing Missing Values

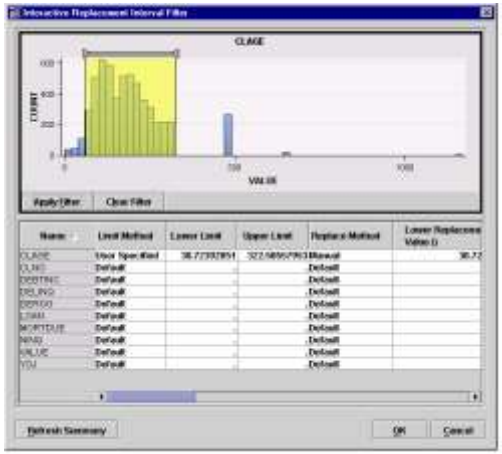
SAS Enterprise Miner

3 Ways

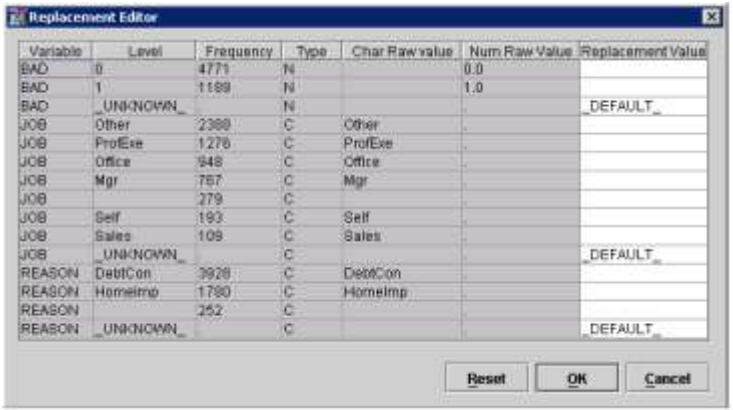
1. Replacement Node
   - Missing values with constants
2. Impute Node
   - **Class variables** – count, default constant value, distribution, tree, tree surrogate
   - **Target variables** – count, default constant value, distribution
   - **Interval variables** – mean, median, midrange, distribution, tree, tree surrogate, mid-minimum spacing, Tukey's Biweight, Huber, Andrew's Wave, default constant
3. SAS Code Node
   - PROC STDIZE - documentation
   - PROC STANDARD - documentation
   - PROC HPIMPUTE - documentation
   - SAS/STAT PROC MI - documentation

Replacing Missing Values

Replacement Node



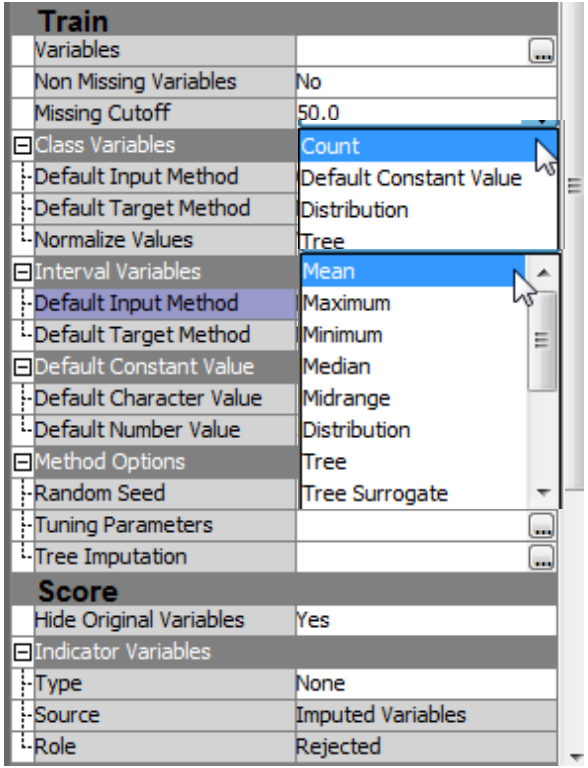
- Used to interactively specify replacement values for class and interval levels
  - Trim outliers
  - Replace Missing
- Use to generate score code to process unknown levels when scoring



Replacing Missing Values

Impute Node

- Used to replace missing values
- Many modeling techniques will drop rows of data that have any missing values
- Creates imputation indicator variables



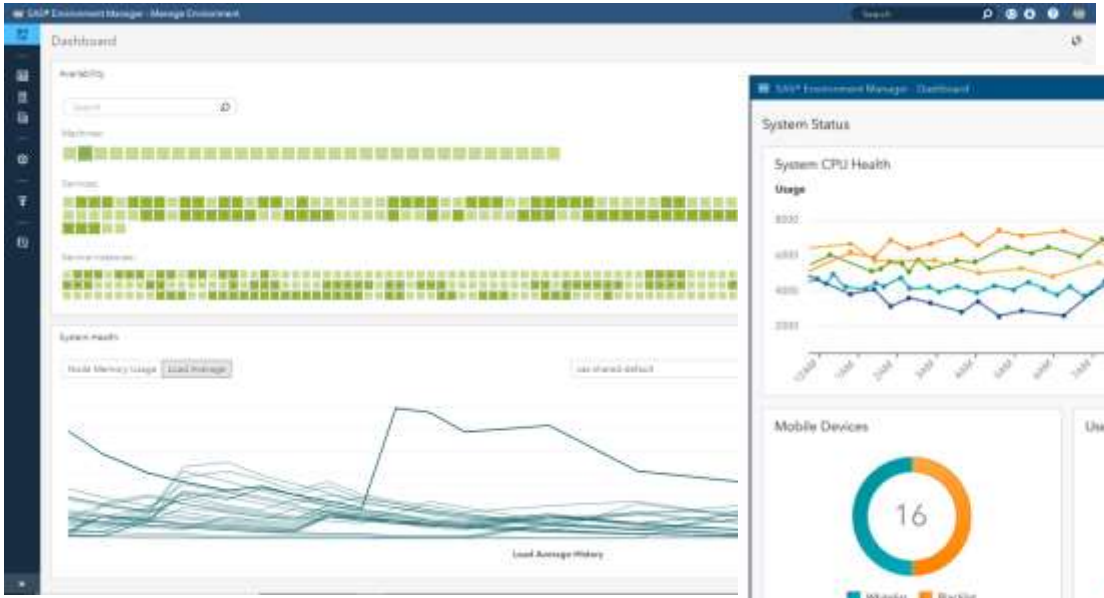
- Class Variables
- Interval Variables

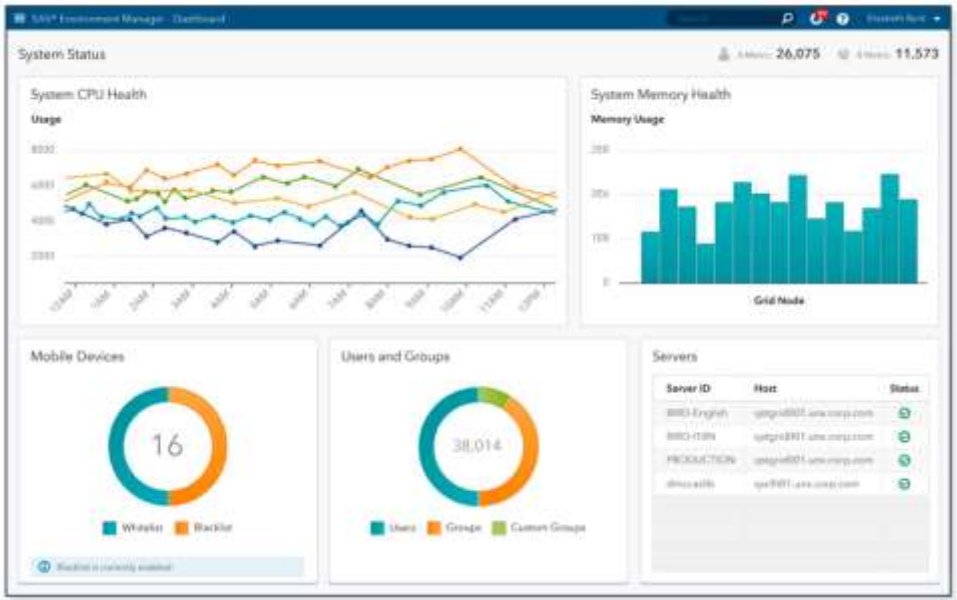
SAS Viya

Visual Statistics, Visual Data Mining and Machine Learning

What is SAS Viya?

SAS Viya is a cloud-enabled, in-memory analytics engine that provides quick, accurate and reliable analytical insights.





SAS Viya Products

- SAS Viya is an underlying foundation for additional products that will take advantage of a cloud-enabled, open platform. Most offerings include both a coding interface as well a visual interface.
  - SAS Visual Analytics
  - SAS Visual Statistics
  - SAS Visual Data Mining and Machine Learning
  - SAS Visual Forecasting
  - SAS Visual Text Mining
  - SAS Optimization
  - SAS Econometrics
  - SAS Visual Investigator

SAS Viya

MULTIPLE INTERFACES, SINGLE CODE BASE

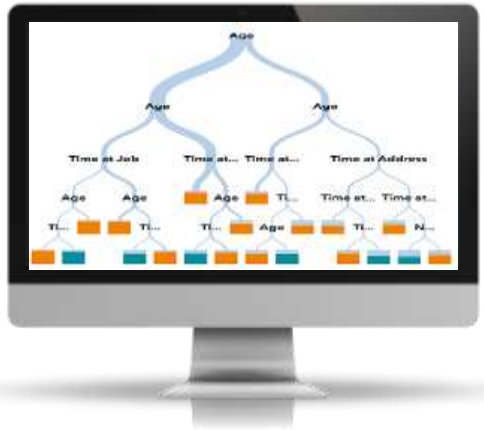
Visual Interfaces

Programming Interfaces

python sas Java R

API Interfaces

REST API



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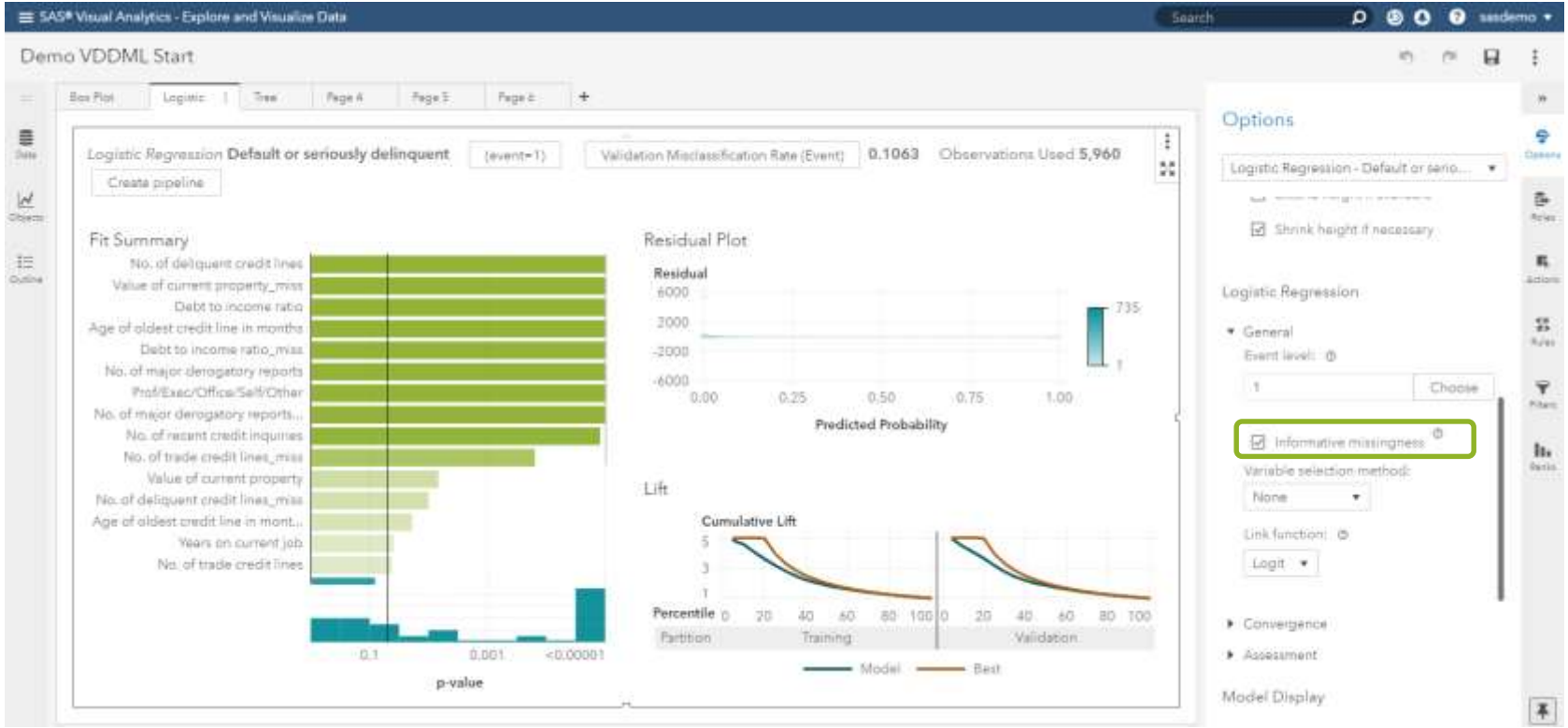
Visual Interfaces

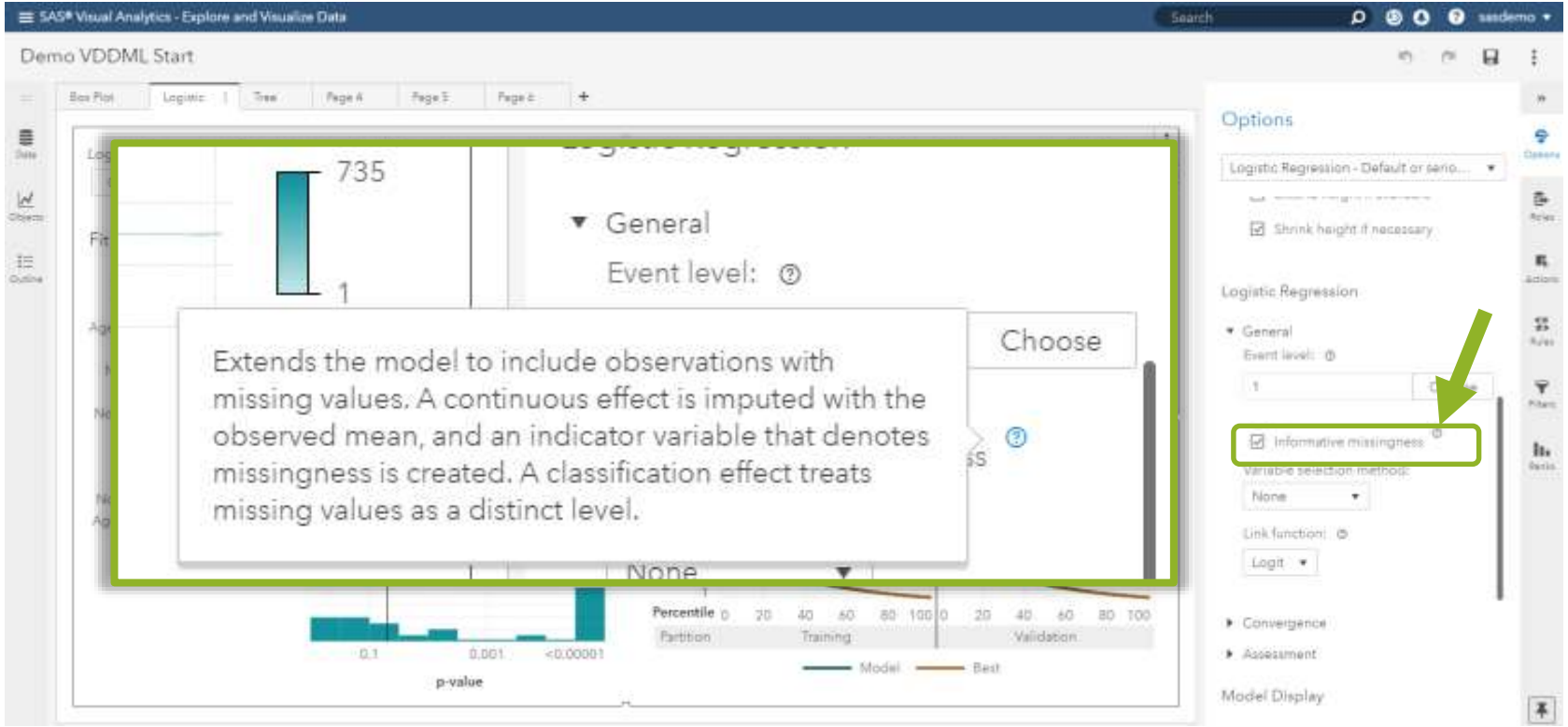
Visual Interfaces

Explore and Visualize Data



Visual Interfaces

Explore and Visualize Data

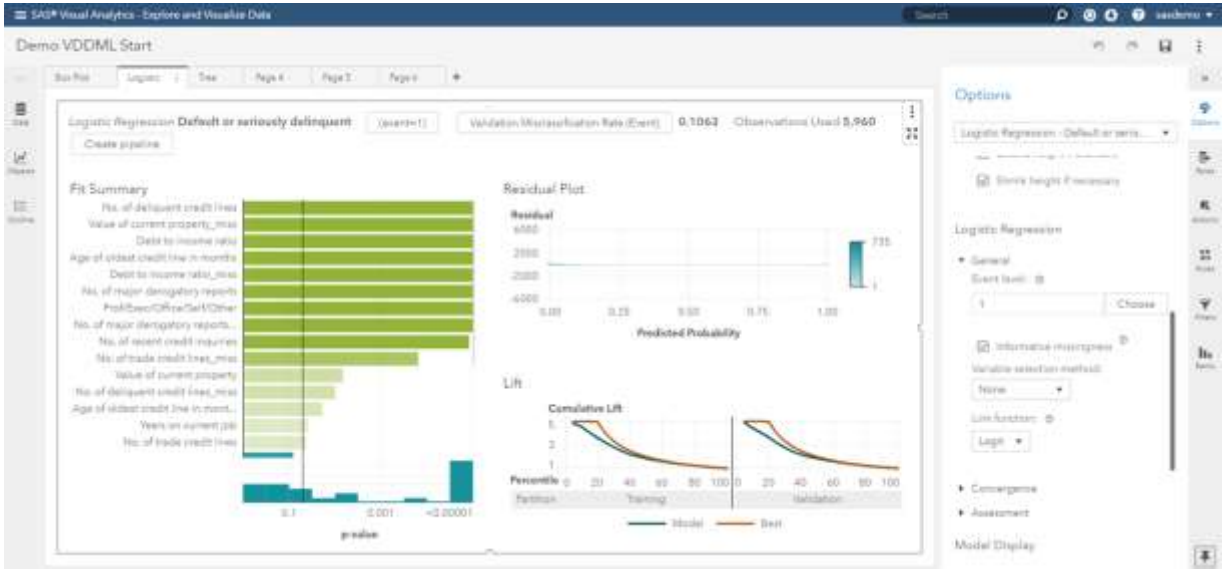


Visual Interfaces

Explore and Visualize Data

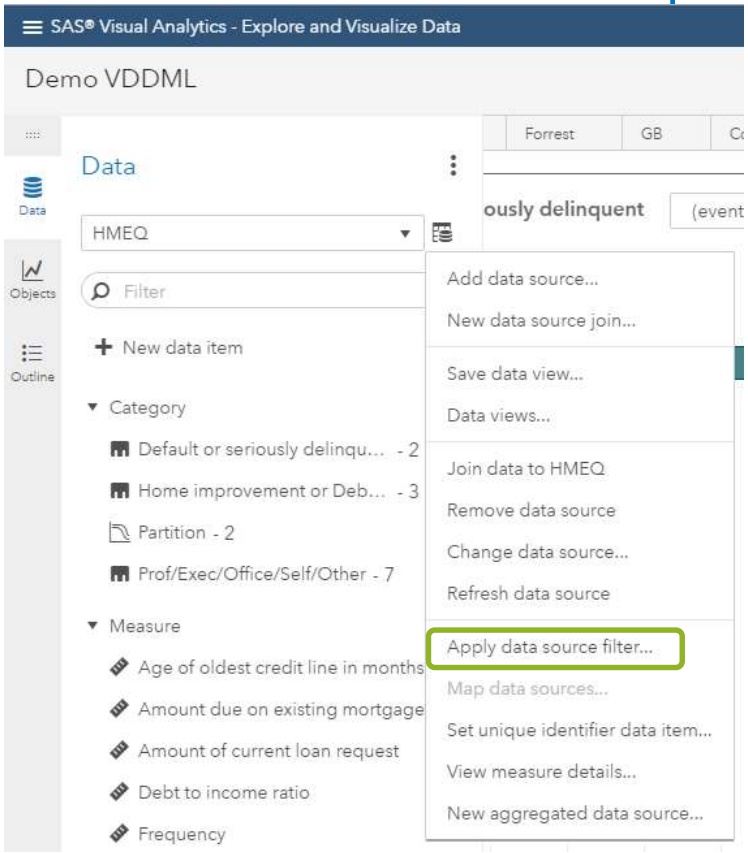
Available for

- Logistic Regression LOGSELECT
- Linear Regression REGSELECT
- Generalized Linear Model GENSELECT
- Neural Network NNET
- Support Vector Machines SVMACHINE



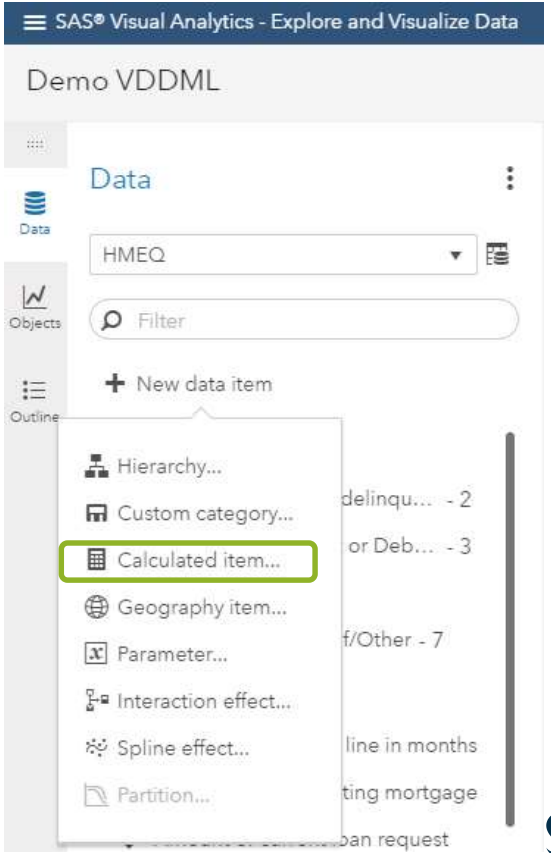
Visual Interfaces

Explore and Visualize Data



Available

- Filter out missing values
- Replace with constant

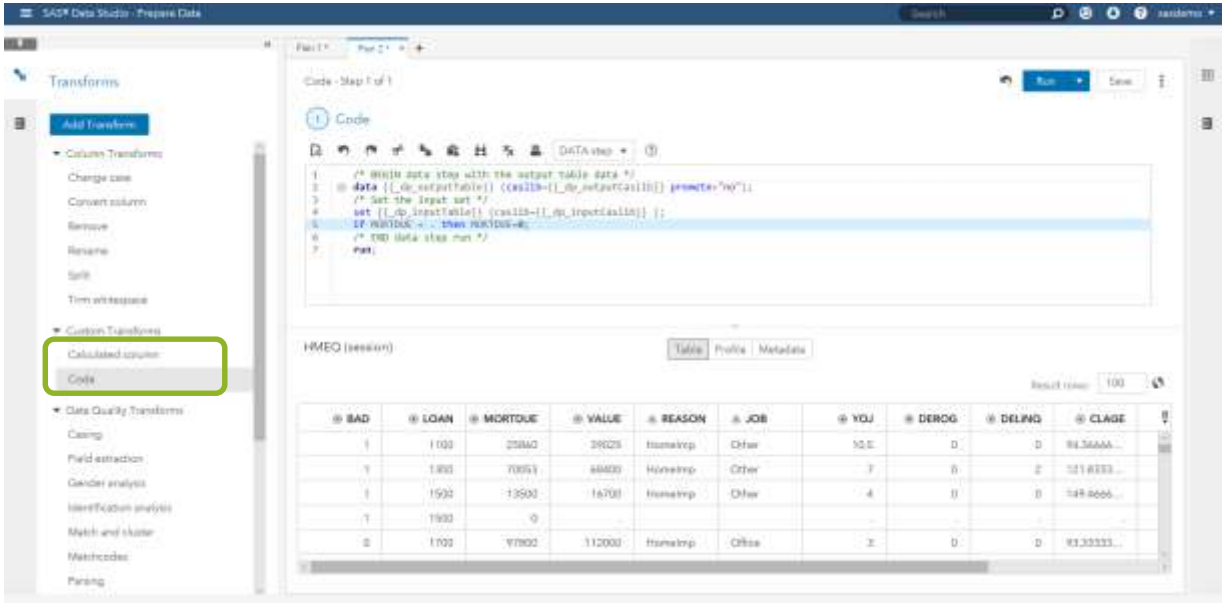


Visual Interfaces

Prepare Data

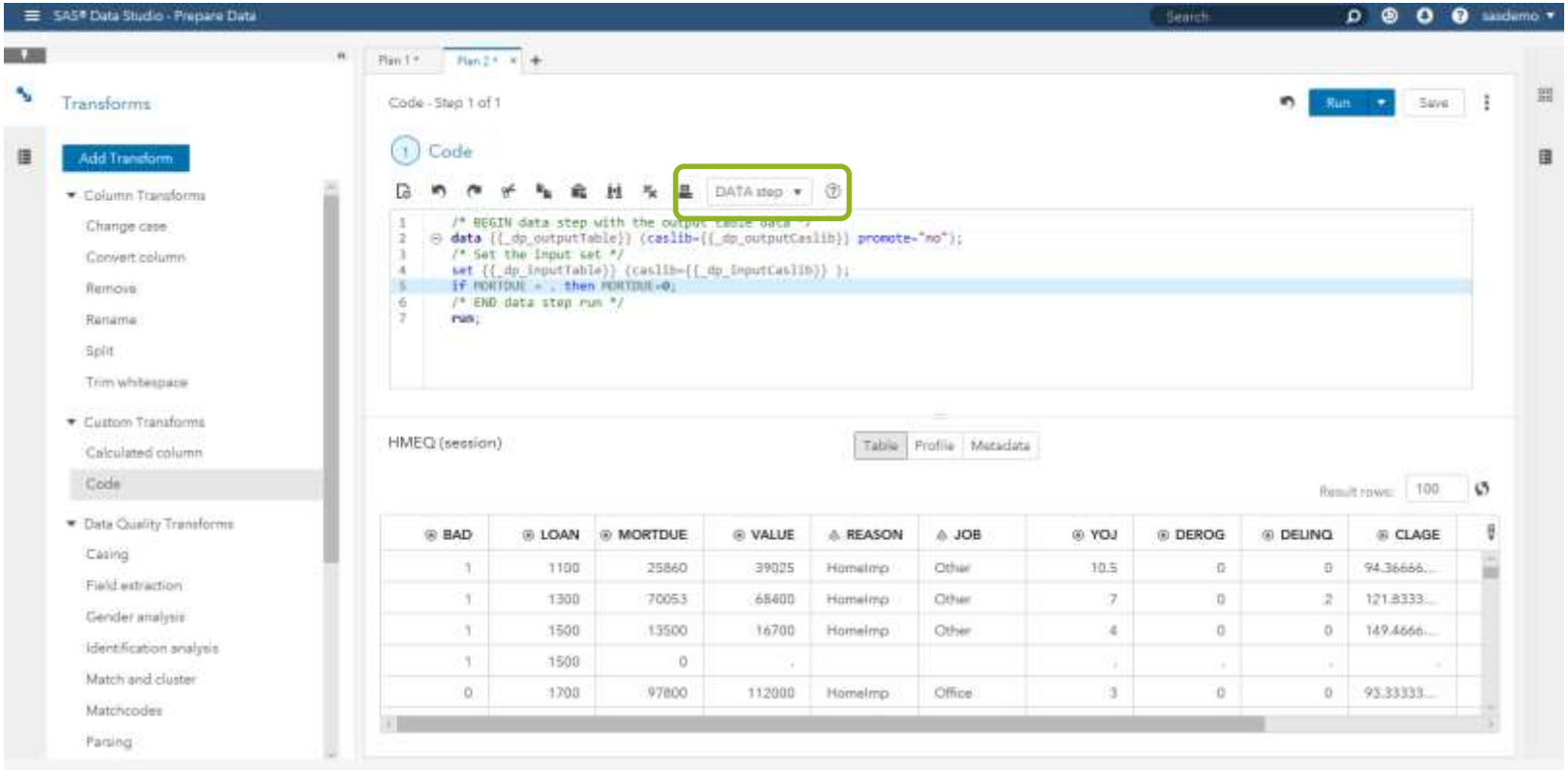
Use **Code** or **Calculated Column**

- Replace with Constant or Zero
- Code for imputation



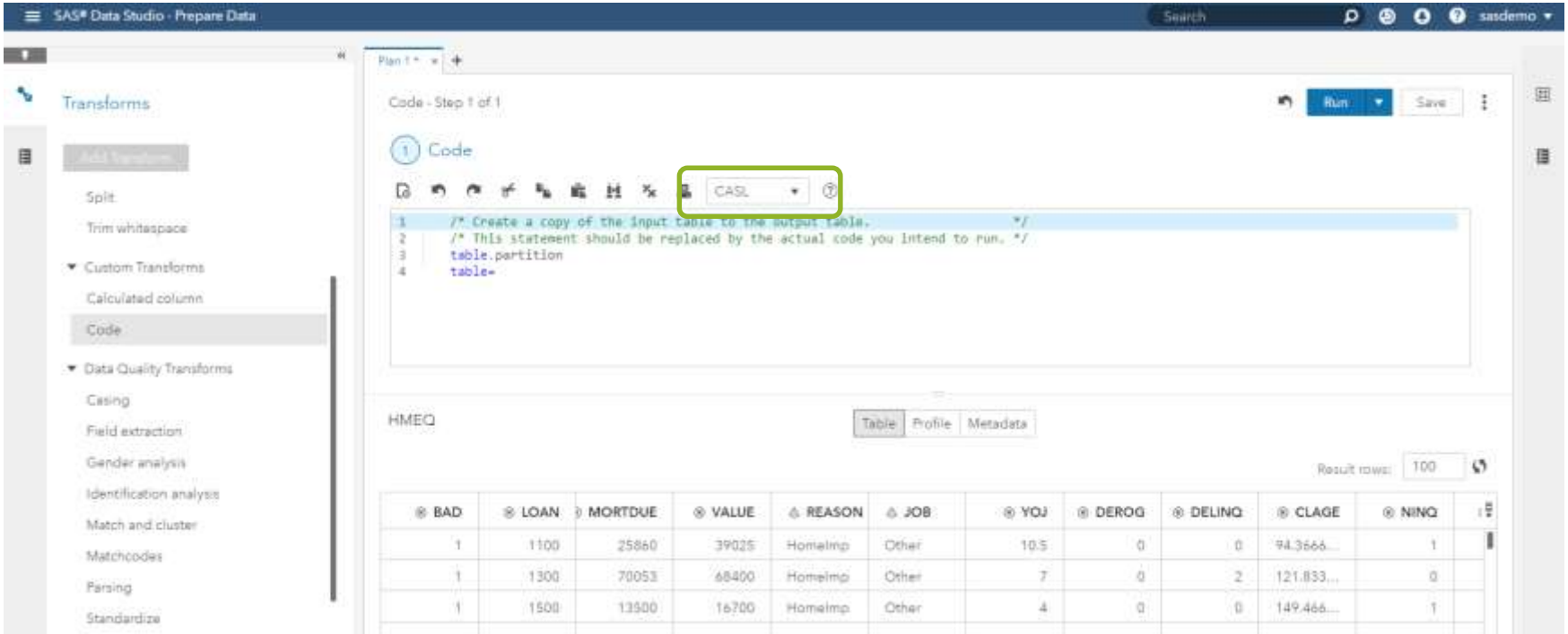
Visual Interfaces

Prepare Data



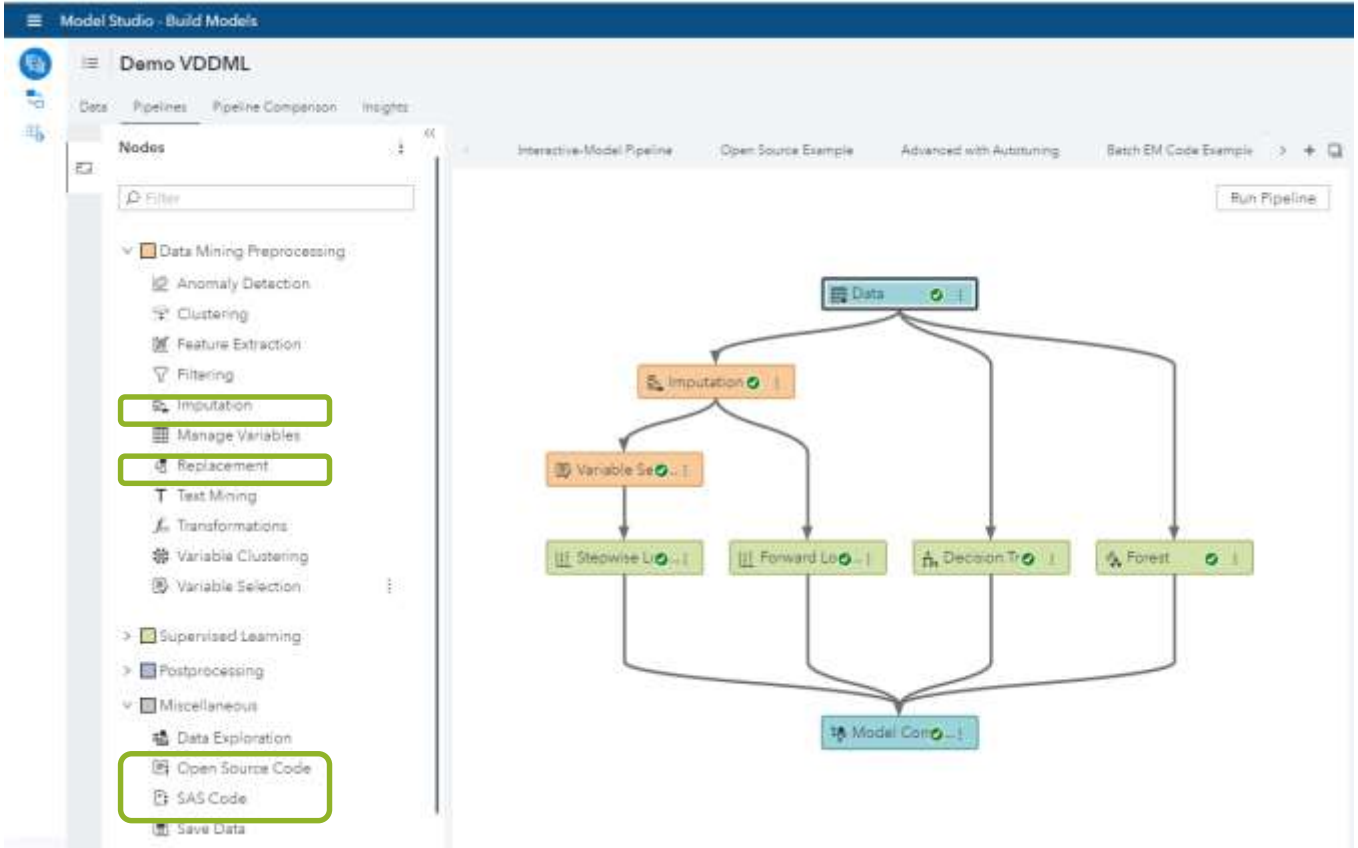
Visual Interfaces

Prepare Data



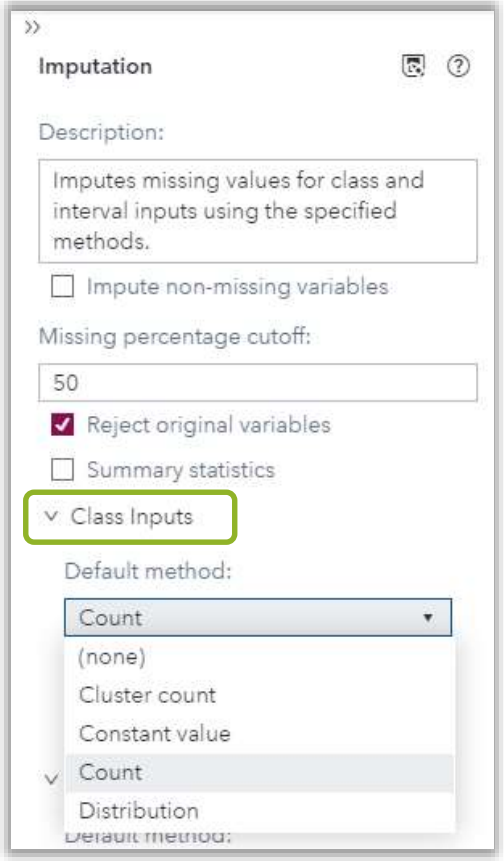
Visual Interfaces

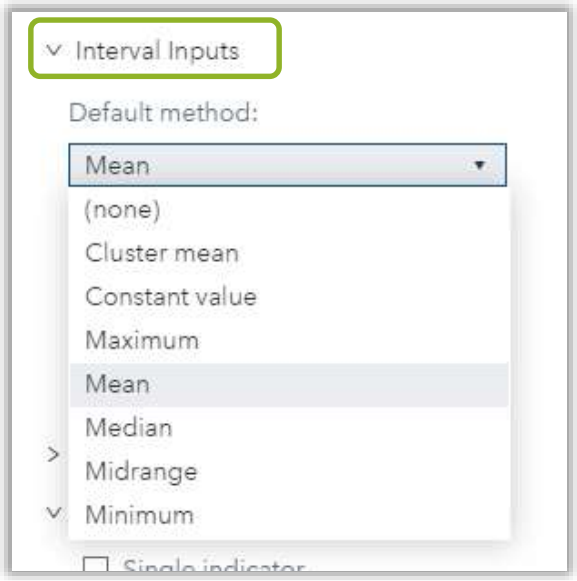
Build Models - Pipelines

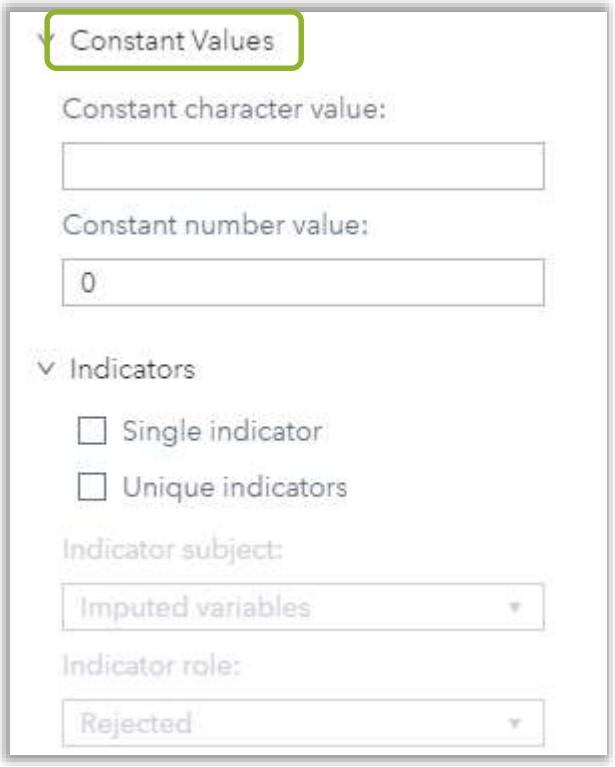


Visual Interfaces

Build Models – Pipelines – Imputation Node

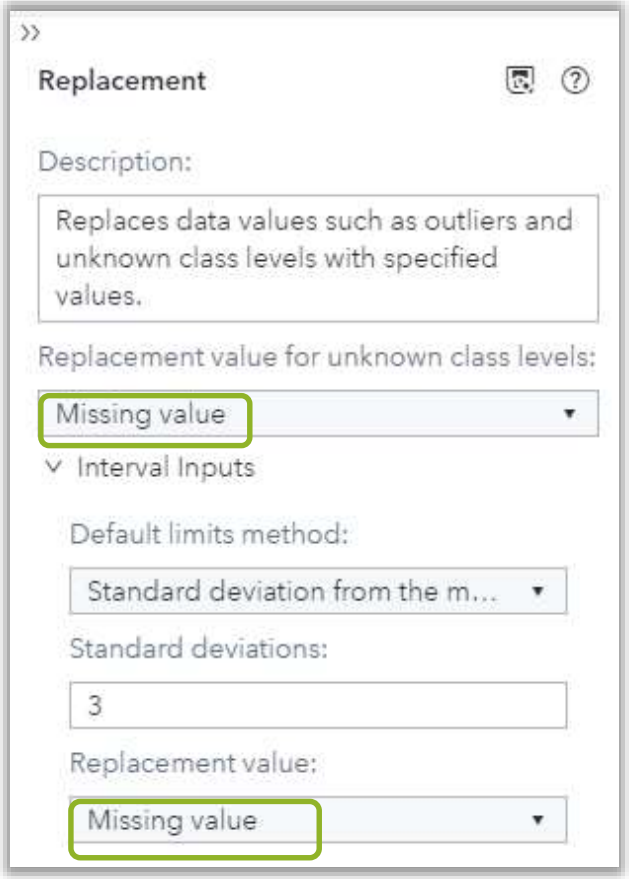






Visual Interfaces

Build Models – Pipelines – Replacement Node



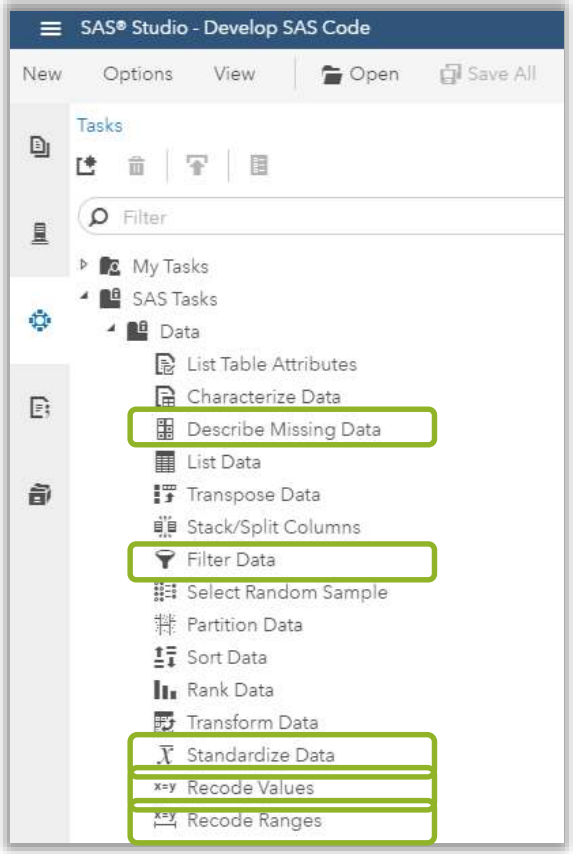
The **Replacement** node is a Data Mining Preprocessing node. It is used to generate score code to replace outliers and unknown class levels with specified values. In some cases, you might want to reassign specified nonmissing values (trim your variable's distribution) before performing imputation calculations for the missing values. This is a typical task for the **Replacement** node.

Programming Interfaces

SAS Studio and Open Source

Programming Interfaces

SAS Studio – Develop SAS Code

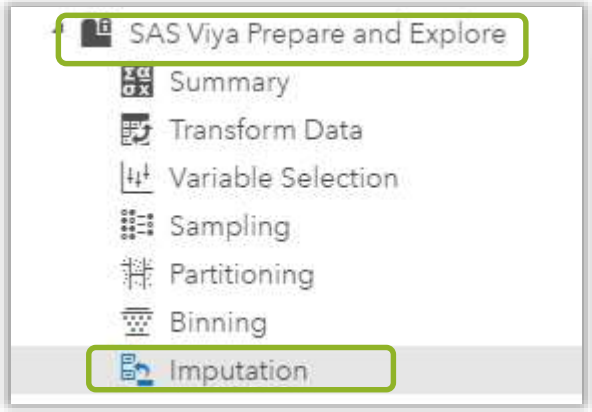


Same options as described for SAS 9

PLUS

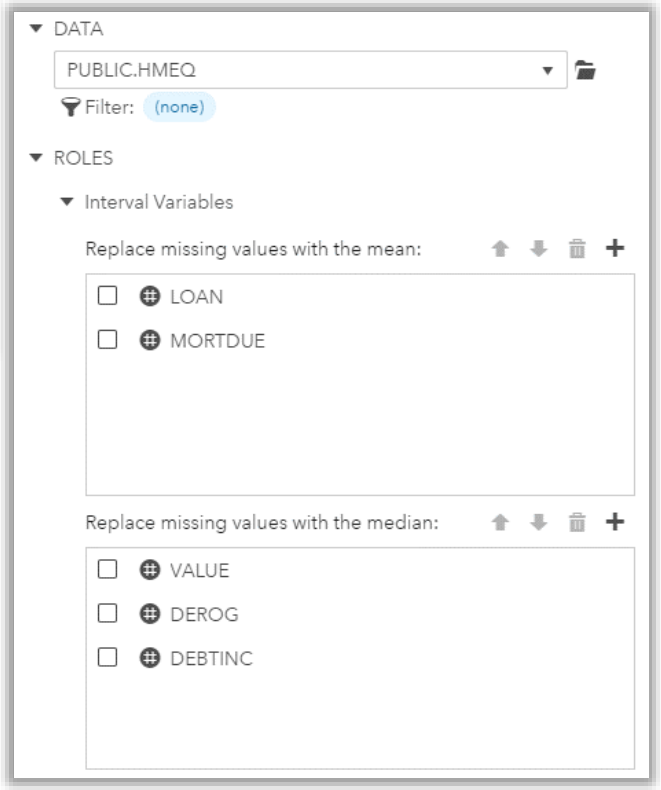
Programming Interfaces

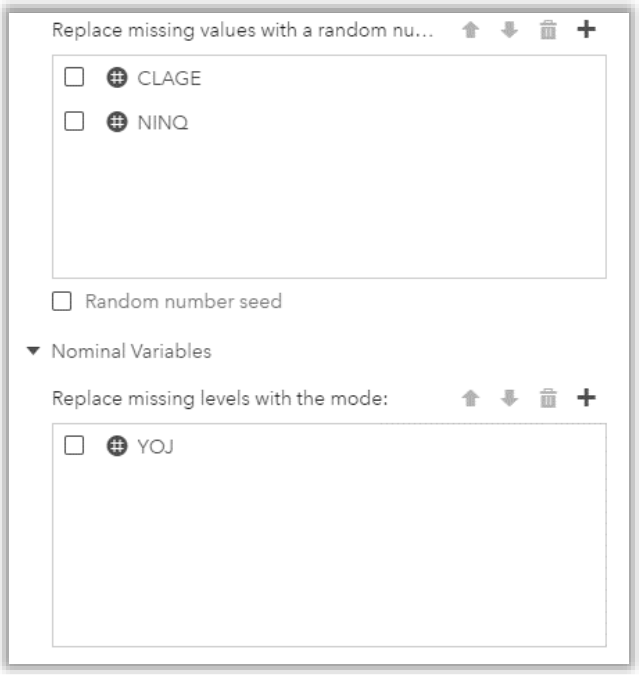
SAS Studio – Develop SAS Code



Replace with

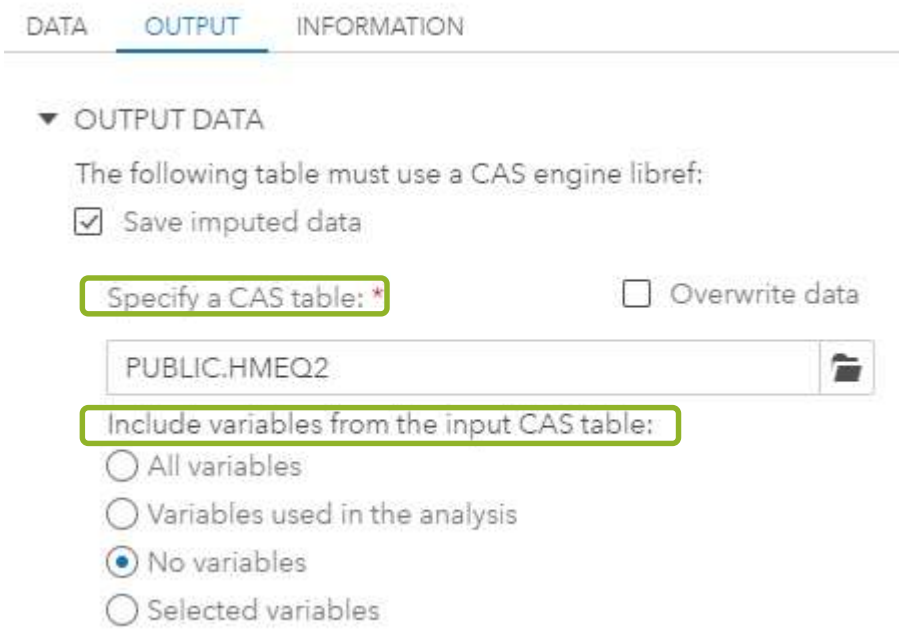
- mean
- median
- random number
- mode





Programming Interfaces

SAS Studio – Develop SAS Code




```
proc varimpute data=PUBLIC.HMEQ;
    input LOAN MORTDUE / ctech=mean;
    input VALUE DEROG DEBTINC / ctech=median;
    input CLAGE NINQ / ctech=random;
    input YOJ / ntech=mode;
    output out=PUBLIC.HMEQ2;
run;
```

Programming Interfaces

SAS Studio – Develop SAS Code

Imputation Method	Number of Variables	Seed
Mean	2	
Random	2	1879166545
Median	3	
Mode	1	

Imputed Values for Interval Variables

Variable	Label	Imputation Method	Result Variable	N	Number of Missing	Imputed Value
LOAN	Amount of current loan request	Mean	IM_LOAN	5960	0	18608
MORTDUE	Amount due on existing mortgage	Mean	IM_MORTDUE	5442	518	73760.8
VALUE	Value of current property	Median	IM_VALUE	5848	112	89231
DEROG	No. of major derogatory reports	Median	IM_DEROG	5252	708	0
DEBTINC	Debt to income ratio	Median	IM_DEBTINC	4693	1267	34.8183
CLAGE	Age of oldest credit line in months	Random	IM_CLAGE	5652	308	
NINQ	No. of recent credit inquiries	Random	IM_NINQ	5450	510	

Imputed Values for Nominal Variables

Variable	Label	Imputation Method	Result Variable	N	Number of Missing	Imputed Value
YOJ	Years on current job	Mode	IM_YOJ	5445	515	0

Programming Interfaces

Develop Code using CAS Actions

- CAS – Cloud Analytic Server
- CAS actions are the tools used to interact with data on the CAS server.
- CAS actions are wrappers for parallel processing algorithms.
- CAS actions can load data, transform data, compute statistics, perform analytics, and create output.

Python Functions ≡ SAS 9.4 Procedures ≡ CAS Actions

CASL – Cloud Analytic Server Language

Programming Interfaces

Develop Code using CAS Actions

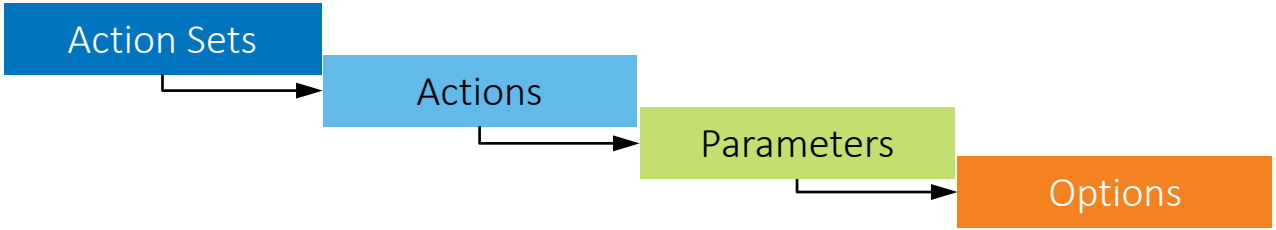
DataPreprocess Action Set

- Actions
  - impute
  - transform

Programming Interfaces

CAS Actions Hierarchies

- The functionality mimics the look and feel of Python syntax, making it easy for Python users to take advantage of CAS.




```
sas.datapreprocess.impute(
    table = dict(),
    inputs = value_list,
    methodContinuous = "median",
    methodNominal="mode",
    casOut = dict()
    replace=TRUE
)
```

Programming Interfaces

Develop Code using CAS Actions

```
PROC CAS;
    datapreprocess.impute /
      table={name="carsInfo"}
      inputs={"msrp", "invoice", "make"}
      methodContinuous="median"
      methodNominal="mode"
      casout={name = "outImpute" replace=True};
    run;
```

The SAS System

Results from dataPreprocess.impute

Imputation Information for CARSINFO

Variable	Imputation Method	Result Variable	N	N Miss	Continuous Imputed Value	Nominal Imputed Value
MSRP	Median	IMP_MSRP	428	0	27635	
Invoice	Median	IMP_Invoice	428	0	25294.5	
Make	Mode	IMP_Make	428	0	.	Toyota

methodContinuous="MAX" | "MEAN" | "MEDIAN" | "MIDRANGE" | "MIN" | "MODE" | "RANDOM" | "VALUE"

methodNominal="MAX" | "MEAN" | "MEDIAN" | "MIDRANGE" | "MIN" | "MODE" | "RANDOM" | "VALUE"

Programming Interfaces

Develop Code using CAS Actions

Jupyter Notebook

```
In [18]: r=sas.dataPreprocess.transform(
           table=hmeq,
           casOut={"name":"hmeq_prepped", "replace":True},
           copyAllVars=True,
           outVarsNameGlobalPrefix="IM",
           requestPackages=[
             {"impute":{"method":"MEAN"}, "inputs":{"clage"}},
             {"impute":{"method":"MEDIAN"}, "inputs":{"delinq"}},
             {"impute":{"method":"VALUE", "valuesInterval":{2}}, "inputs":{"ninq"}},
             {"impute":{"method":"VALUE", "valuesInterval":{35.0, 7, 2}}, "inputs":{"debtinc", "yoj"}}
           ]
         )
         render_html(r)
```

Variable Transformation Information for HMEQ

Variable	Transformation Name	Result Variable	Number of Observations	Number of Missing	Imputed Value
CLAGE	IM	IM_CLAGE	5652	308	179.77
DEBTINC	IM	IM_DEBTINC	4693	1267	35.0000
DELINQ	IM	IM_DELINQ	5380	580	0
NINQ	IM	IM_NINQ	5450	510	2.0000
YOJ	IM	IM_YOJ	5445	515	2.0000

Using SWAT available from GitHub

Resources

Where to learn more

Where to learn more?

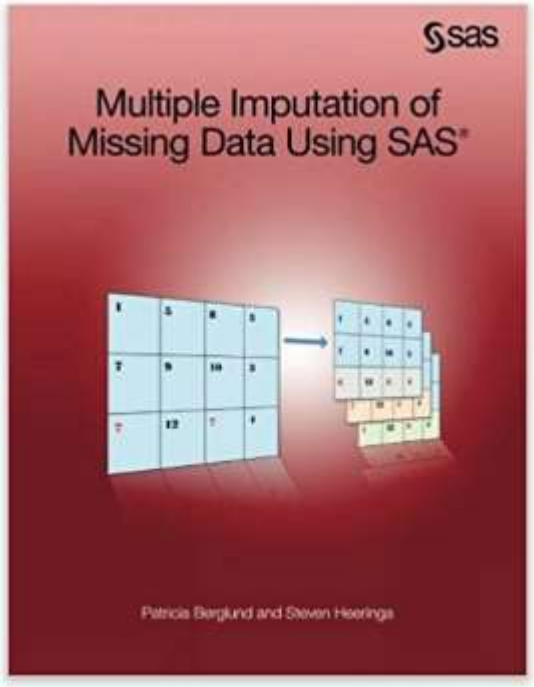
SAS Documentation

- Working with Missing Data in SAS
- Proc HPIMPUTE Documentation
- SAS Enterprise Miner Impute Missing Values
- Proc MI Documentation
- Proc MIANALYZE Documentation

Where to learn more?

Book

Multiple Imputation of Missing Data Using SAS



Where to learn more?

Videos

- Getting Started with SAS Enterprise Miner: Exploring Input Data and Replacing Missing Values
- SAS Enterprise Miner Tip: Imputing Missing Values
- Handling Missing Values in Survey Data
- SAS Missing Data
- Missing Values in SAS Data Step

Where to learn more?

Papers

- Managing Missing Data Using SAS® Enterprise Guide®
  http://support.sas.com/resources/papers/proceedings14/SAS257-2014.pdf
- Hot-Deck Imputation: A Simple DATA Step Approach
  https://analytics.ncsu.edu/sesug/1999/075.pdf
- Imputing Dose Levels for Adverse Events
  https://www.lexjansen.com/pharmasug/2013/HO/PharmaSUG-2013-HO03.pdf
- Identifying and Overcoming Common Data Mining Mistakes
  http://www2.sas.com/proceedings/forum2007/073-2007.pdf
- A SAS® Macro for Single Imputation
  https://www.lexjansen.com/pharmasug/2008/sp/SP10.pdf

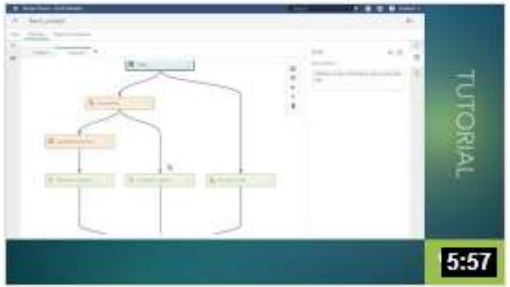
SAS® Viya

Resources

Videos

- 6 minutes getting started video
- 5 minutes getting started video
- 8 minute demo video
- Feature Engineering video

Using the Automated Analysis Feature in SAS® Visual Analytics in SAS® Viya®



Getting Started with Data Mining and Machine Learning Pipelines on SAS® Viya®

Building and Using Pipelines in SAS® Visual Forecasting

SAS® Viya
Resources

SAS Visual Statistics User's Guide

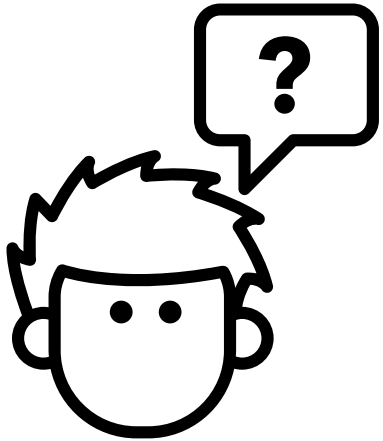
http://support.sas.com/software/products/visual-statistics/index.html#s1=2

SAS Visual Data Mining and Machine Learning User's Guide

http://support.sas.com/software/products/visual-data-mining-machine-learning/index.html#s1=1

Overview, Training, Samples and Tips

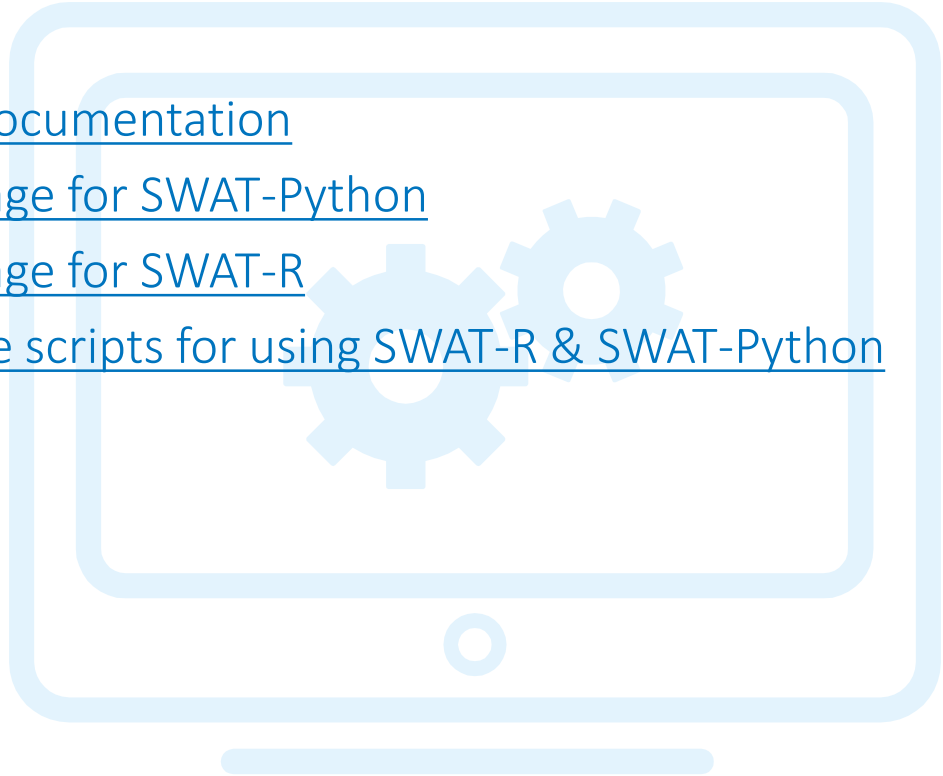
- SAS Viya Overview
- SAS Viya Training
- A Beginner's Guide to Programming in the SAS® Cloud Analytics Services Environment



Resources

Programming

- SAS Studio
- CAS actions documentation
- SAS Github page for SWAT-Python
- SAS Github page for SWAT-R
- More example scripts for using SWAT-R & SWAT-Python



Questions?

Thank you for your time and attention!

Connect with me:
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Twitter: @Melodie_Rush

sas.com