

SAS Enterprise Miner: Code Node Tips

October 16, 2013

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Applications of the Code Node in Enterprise Miner

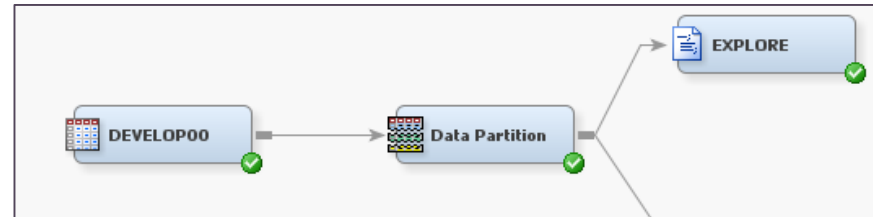
- Explore Data
- Create or Modify Variables
- Change Metadata
- Augment Model Results
- Perform Post Model Analyses
- Generate Graphics

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SAS Code Node: Macros

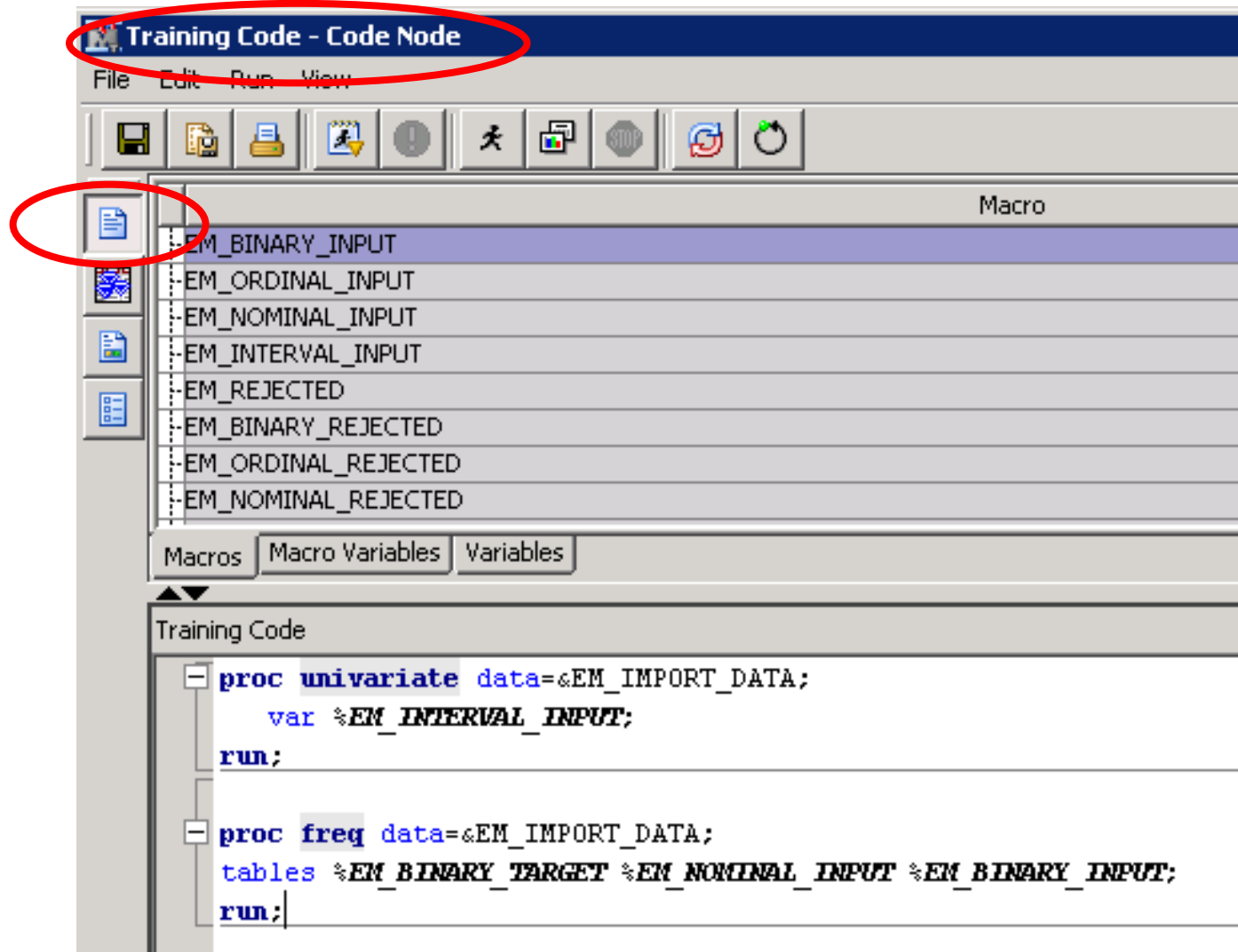
Variables	
EM_INTERVAL	
EM_CLASS	
EM_TARGET	
EM_TARGET_LEVEL	
EM_BINARY_TARGET	
EM_ORDINAL_TARGET	
EM_NOMINAL_TARGET	
EM_INTERVAL_TARGET	
EM_INPUT	
EM_BINARY_INPUT	
EM_ORDINAL_INPUT	
EM_NOMINAL_INPUT	
EM_INTERVAL_INPUT	
EM_REJECTED	
EM_BINARY_REJECTED	
EM_ORDINAL_REJECTED	
EM_NOMINAL_REJECTED	
EM_INTERVAL_REJECTED	
EM_ACCESS	
Macros	Macro Variables



Macro	
Imports	
EM_IMPORT_DATA	
EM_IMPORT_DATA_EMINFO	
EM_IMPORT_DATA_CMETA	
EM_IMPORT_VALIDATE	
EM_IMPORT_VALIDATE_CMETA	
EM_IMPORT_TEST	
EM_IMPORT_TEST_CMETA	
EM_IMPORT_SCORE	
EM_IMPORT_SCORE_CMETA	
EM_IMPORT_TRANSACTION	
EM_IMPORT_TRANSACTION_EMINFO	
EM_IMPORT_TRANSACTION_CMETA	
EM_IMPORT_DOCUMENT	
EM_IMPORT_DOCUMENT_CMETA	
EM_IMPORT_RULES	
EM_IMPORT_REPORTFIT	
EM_IMPORT_RANK	
EM_IMPORT_SCOREDIST	

EM macros and macro variables enable you to write re-usable code, reference data sets, and include variable lists.

Training Code Editor



The Training Code editor is used to write programs that reference data sets or procedures.

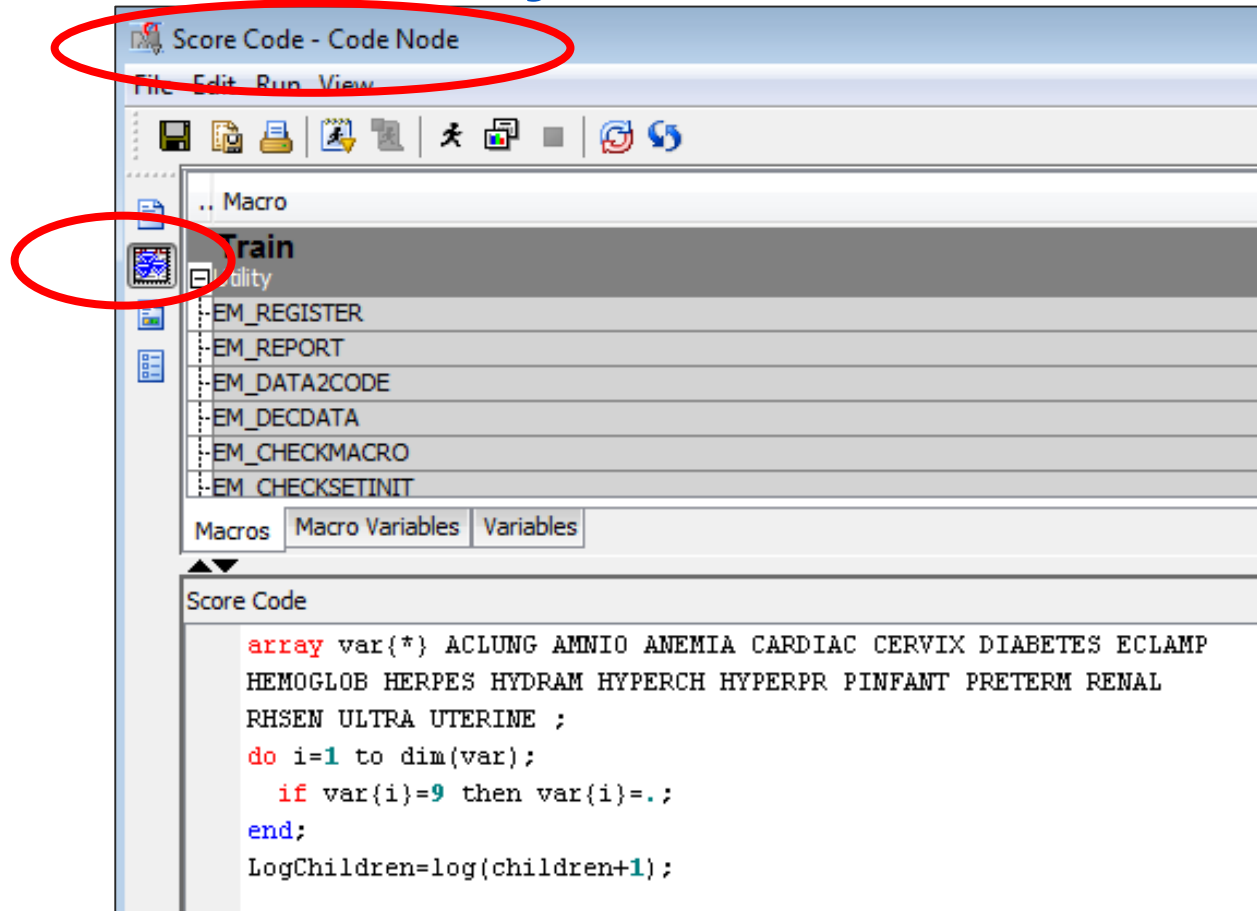
Demo...



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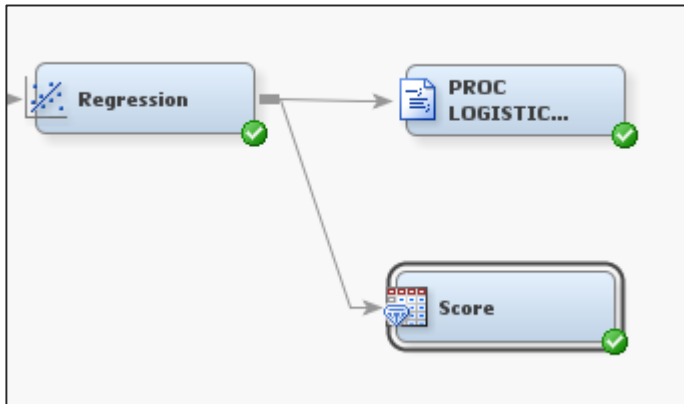
Create or Modify Variables



The Score Editor allows for the creation of custom scored code.

E.g. A value of '9' indicates missing. Replace '9' with SAS –recognized missing values. Log transform right-skewed input variables such number of children.

Create Variables



Code written in the Score Editor is embedded in scoring code. Note: This custom score code is NOT included in OPTIMIZED Score code.

```
* EM SCORE CODE;
* EM Version: 7.1;
* SAS Release: 9.03.01M0P060711;
* Host: CANR8B6RBKLT;
* Encoding: wlatin1;
* Locale: en_US;
* Project Path: C:\EMPROJ;
* Project Name: DMF;
* Diagram Id: EMWS3;
* Diagram Name: new;
* Generated by: canldr;
* Date: 15OCT2013:14:47:26;
*-----*
*-----*
* TOOL: Input Data Source;
* TYPE: SAMPLE;
* NODE: Ids;
*-----*
*-----*
* TOOL: Partition Class;
* TYPE: SAMPLE;
* NODE: Part;
*-----*
*-----*
* TOOL: SASHELP.EMCORE.EMCODETOOL.CLASS;
* TYPE: UTILITY;
* NODE: ECODE;
*-----*
*-----*
array var{*} ACLUNG AMNIO ANEMIA CARDIAC CERVIX DIABETES ECLAMP
HEMOGLOB HERPES HYDRAM HYPERCH HYPERPR PINFANT PRETERM RENAL
RHSEN ULTRA UTERINE;
do i=1 to dim(var);
if var{i}=9 then var{i}=.;
end;
LogChildren=log(children+1);
*-----*
*-----*
* TOOL: Imputation;
* TYPE: MODIFY;
```

Demo...



Applications of the Code Node in Enterprise Miner

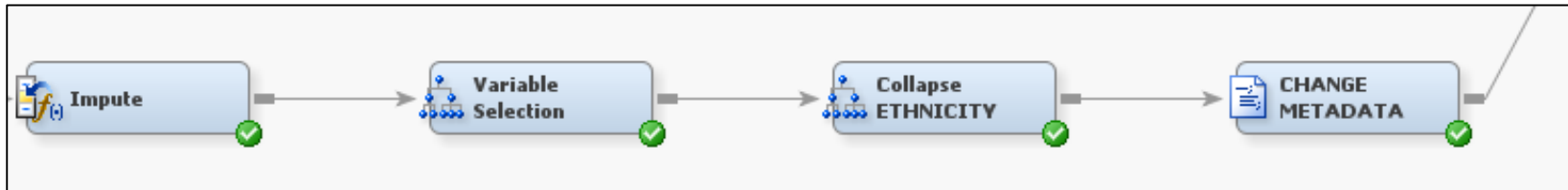
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The %EM_METACHANGE Macro

%EM_METACHANGE allows the following arguments:

- **NAME** = <variable-name> — the name of the variable that you want to modify (required).
- **ROLE** = <variable-role> — assign a new role to the variable (optional).
- **LEVEL** = <UNARY | BINARY | ORDINAL | NOMINAL | INTERVAL> — assign a new measurement level to the variable (optional).
- **ORDER** = <ASC | DESC | FMTASC | FMTDESC> — new level ordering for a class variable (optional).
- **DELETE** = <Y|N> — indicate whether the variable should be removed from the metadata (optional).

Change Metadata

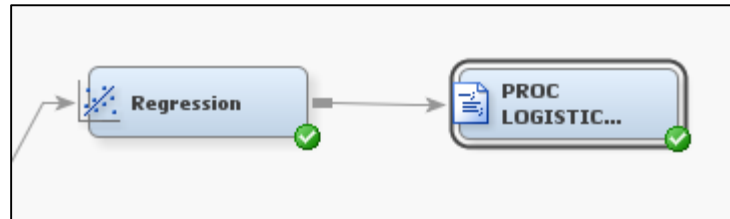


```
EM_OBSLIST01
Macros Macro Variables Variables
Training Code
%EM_METACHANGE (name=ETHNICITYMOM, Role=REJECTED);
%EM_METACHANGE (name=ETHNICITYDAD, Role=REJECTED);
%EM_METACHANGE (name=imp_children, Role=REJECTED);
```

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Augment Model Results



Training Code

```
proc logistic data=em_import_data desc;  
  class %EM_NOMINAL_INPUT %EM_BINARY_INPUT;  
  model %EM_BINARY_TARGET=%EM_INTERVAL_INPUT %EM_NOMINAL_INPUT %EM_BINARY_INPUT/ctable clodds=pl stb;  
  units IMP_YrsLastLiveBirth=5;  
  score data=em_import_validate fitstat;  
  oddsratio _node_ / diff=all cl=pl;  
run;
```

If EM regression models don't include all the options / output you require...

Demo...



Applications of the Code Node in Enterprise Miner

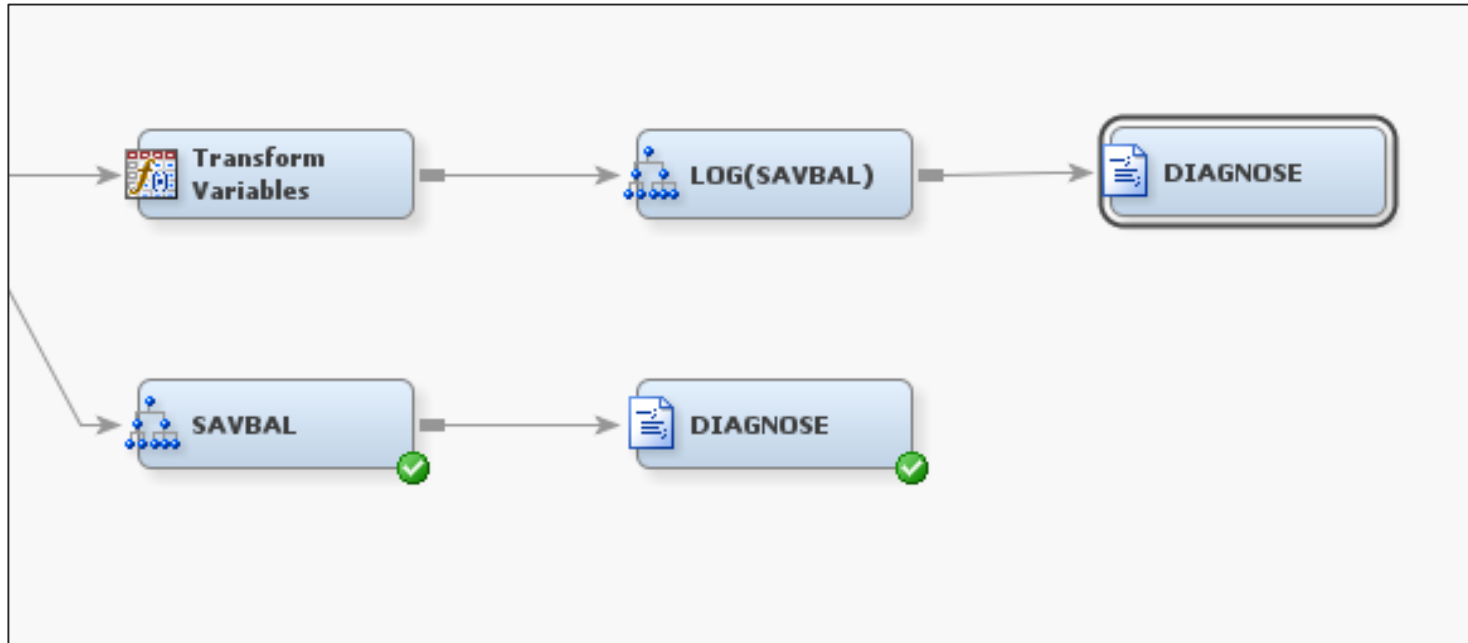
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The %EM_REGISTER and %EM_REPORT macros

%EM_REGISTER — Use the %EM_REGISTER macro to register a unique file key. When you register a key, Enterprise Miner generates a macro variable named &EM_USER_key. You then use &EM_USER_key in your code to associate a file with the key. **Registering a file allows Enterprise Miner to track the state of the file, avoid name conflicts, and insure that the registered file is deleted when the node is deleted from a process flow diagram.**

%EM_REPORT — Use the %EM_REPORT macro to specify the contents of a results window display created using a registered data set. The display contents, or view, can be a data table view or a plot view. Examples of plot types are histogram, bar chart, and line plots. The views (both tables and plots) appear in the results window of the SAS Code node and in any results package files (SPK files).

Post Modeling Analyses



Post Modeling Analyses

Training Code

```
%em_register(type=data,key=data);
```

```
- data &em_user_data ;  
    set &EM_IMPORT_DATA;  
run;
```

```
%em_report(key=data,viewtype=Scatter,  
x=p_&EM_TARGET,y=r_&EM_TARGET,  
description=ScatterPlot,autodisplay=Y);
```

```
- data transform;  
    set &em_import_data;  
    ar=abs(r_&EM_TARGET);  
run;
```

```
title 'Assessing Homogeneity of Variance';  
title2 'Correlation Analysis';
```

```
- proc corr spearman nosimple data=transform;  
    var ar;  
    with p_&EM_TARGET;  
run;
```

Generate Graphics

Training Code - Code Node

File Edit Run View

.. Macro

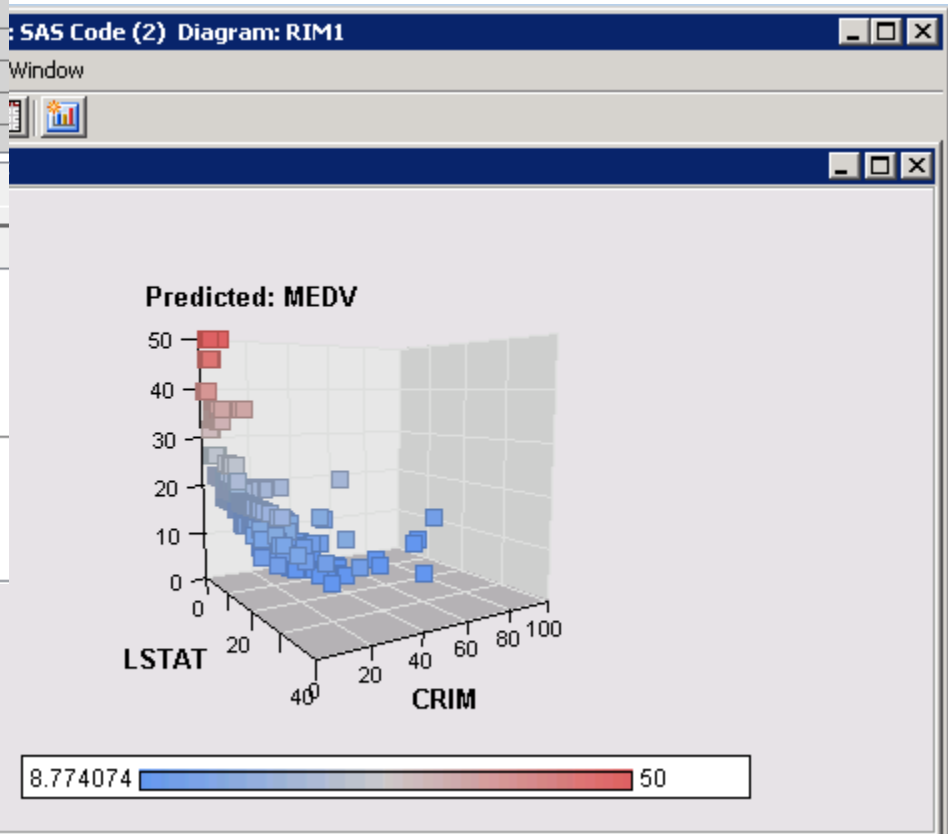
Train

- Utility
- EM_REGISTER
- EM_REPORT
- EM_DATA2CODE
- EM_DECDATA
- EM_CHECKMACRO
- EM_CHECKSETINIT
- EM_ODSLISTON
- EM_ODSLISTOFF

Macros Macro Variables Variables

Training Code

```
%em_register(type=data,key=plot2);  
data em_user_plot2;  
  set &EM_IMPORT_DATA;  
  Pred_MEDV=exp(p_log_medv+(.024638/2));  
run;  
  
%em_report(key=plot2, viewtype=threeDscatter,  
  x=crim, y=lstat, z=pred_medv, color=pred_medv,  
  description=3DScatterPlot, autodisplay=Y);
```



Demo...



Thank You

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