

CUSTOM AND DATA DRIVEN SORT

After completing this hands-on exercise you'll know how...

- *to apply a custom sort to a data item in SAS Visual Analytics Designer.*
- *to create a format driven custom sort based on a SAS User-defined format.*
- *to increase the number of unique values that can be custom sorted (SAS VA 7.4).*

1. Create dataset with formatted column

We are now going to generate a dataset with a numeric column that represents the desired sort order of the rows in the dataset. The numeric values will be formatted using a user-defined format.

1. Open and run the program `customfmt_code.sas`.

This code will generate a copy of SASHELP.CARS with an additional column formatted to reflect the value in the model column.

```
libname cstmfmts 'D:\CourseData';

* sort the data in any order you want;
* copy the output to a new loation;
Proc sort data=sashelp.cars out= cstmfmts.cars_sorted;
  by horsepower enginesize;
run;

* add a numeric key that represents the sort order;
* _n_ will have the value 1 for the first row, 2 for the second row and so on;
data cstmfmts.cars_sorted;
  set cstmfmts.cars_sorted;
  sortedmodel = _n_;
run;


* create a dataset to serve as input to procformat;
data fmts (keep=fmtname start label);
  set cstmfmts.cars_sorted;
  start = sortedmodel;
  label = model;
  fmtname = "modelfmt";
run;

*create the format in the designated format folder;
proc format cntlin=fmts library=cstmfmts;
run;

*make custom format available in format search path;
options insert=(fmtsearch=(cstmfmts));

*Apply format to the source dataset before loading to VA;
Proc datasets library=cstmfmts; /* put the name of the library where AE data set resides*/
  modify cars_sorted;
  format sortedmodel Modelfmt.;
run;
quit;
```

CODE
LOG
RESULTS
OUTPUT DATA



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| Directory | |
|-------------------|------------------------|
| Libref | CSTMFMFS |
| Engine | V9 |
| Physical Name | D:\basics\Data |
| Filename | D:\basics\Data |
| Owner Name | BUILTIN\Administrators |
| File Size | 4KB |
| File Size (bytes) | 4096 |

| # | Name | Member Type | File Size | Last Modified |
|---|-----------------|-------------|-----------|---------------------|
| 1 | CARS_SORTED | DATA | 192KB | 08/12/2019 05:35:40 |
| 2 | CUSTOMERS | DATA | 561MB | 04/01/2019 11:53:59 |
| 3 | CUSTOMERS_CLEAN | DATA | 531MB | 07/10/2018 10:23:12 |
| 4 | EMPLOYEES | DATA | 384KB | 04/01/2019 12:15:49 |

The column 'sortedmodel' is available in the output data, the new format is applied to the column:

CODE LOG RESULTS **OUTPUT DATA**

Table: CSTMFMTS.CARS_SORTED View: Column names Filter:

(none)

Columns Total rows: 428 Total columns: 16 Rows 1-100

| | Wheelbase | Length | sortedmodel |
|---|-----------|--------|-------------------------------|
| <input checked="" type="checkbox"/> Select all | 95 | 155 | Insight 2dr (gas/electric) |
| <input checked="" type="checkbox"/> Origin | 103 | 175 | Civic Hybrid 4dr manual (gas) |
| <input checked="" type="checkbox"/> DriveTrain | 99 | 172 | Jetta GLS TDI 4dr |
| <input checked="" type="checkbox"/> MSRP | 98 | 167 | Aveo 4dr |
| <input checked="" type="checkbox"/> Invoice | 98 | 153 | Aveo LS 4dr hatch |
| <input checked="" type="checkbox"/> EngineSize | 96 | 167 | Accent 2dr hatch |
| <input checked="" type="checkbox"/> Cylinders | 96 | 167 | Accent GL 4dr |
| <input checked="" type="checkbox"/> Horsepower | 96 | 167 | Accent GT 2dr hatch |
| <input checked="" type="checkbox"/> MPG_City | 95 | 167 | Rio 4dr manual |
| <input checked="" type="checkbox"/> MPG_Highway | 95 | 167 | Rio 4dr auto |
| <input checked="" type="checkbox"/> Weight | 95 | 167 | Rio Cinco |
| <input checked="" type="checkbox"/> Wheelbase | 93 | 154 | xA 4dr hatch |
| <input checked="" type="checkbox"/> Length | 98 | 155 | xB |
| <input checked="" type="checkbox"/> sortedmodel | 93 | 163 | Echo 2dr manual |

2. Verify that there are no errors in the log.

2. Add user-defined formats to the SAS Application server

In the previous section we generated a format and stored it in a known location on the server.

In order to load the dataset with the user-defined format into a LASR Server, we need to make the format available for the SAS Application Server of the LASR server in Visual Analytics.

3. Locate the `appserver_autoexec_usermods.sas` file in the folder

`D:\SAS\Config\Lev1\SASApp` and add the following lines to the file.

```
libname cstmfmts 'D:\basics\data';
options insert=(fmtsearch=(Cstmfmts));
```

This code will make the format we generated with the `cstmformat_code.sas` program available for the SAS Application Server.

4. Double click the file D:\SAS\Config\Lev1\SASApp\sas.bat and check that there are no errors in the log.

```
Log - (Untitled)
SAS/QC 14.3

NOTE: Additional host information:
X64_S08R2 WIN 6.1.7601 Service Pack 1 Server

NOTE: SAS initialization used:
real time      1.73 seconds
cpu time       0.63 seconds

NOTE: Unable to open SASUSER.PROFILE. WORK.PROFILE will be opened instead.
NOTE: All profile changes will be lost at the end of the session.
NOTE: Unable to open SASUSER.PROFILE. WORK.PROFILE will be opened instead.
NOTE: All profile changes will be lost at the end of the session.

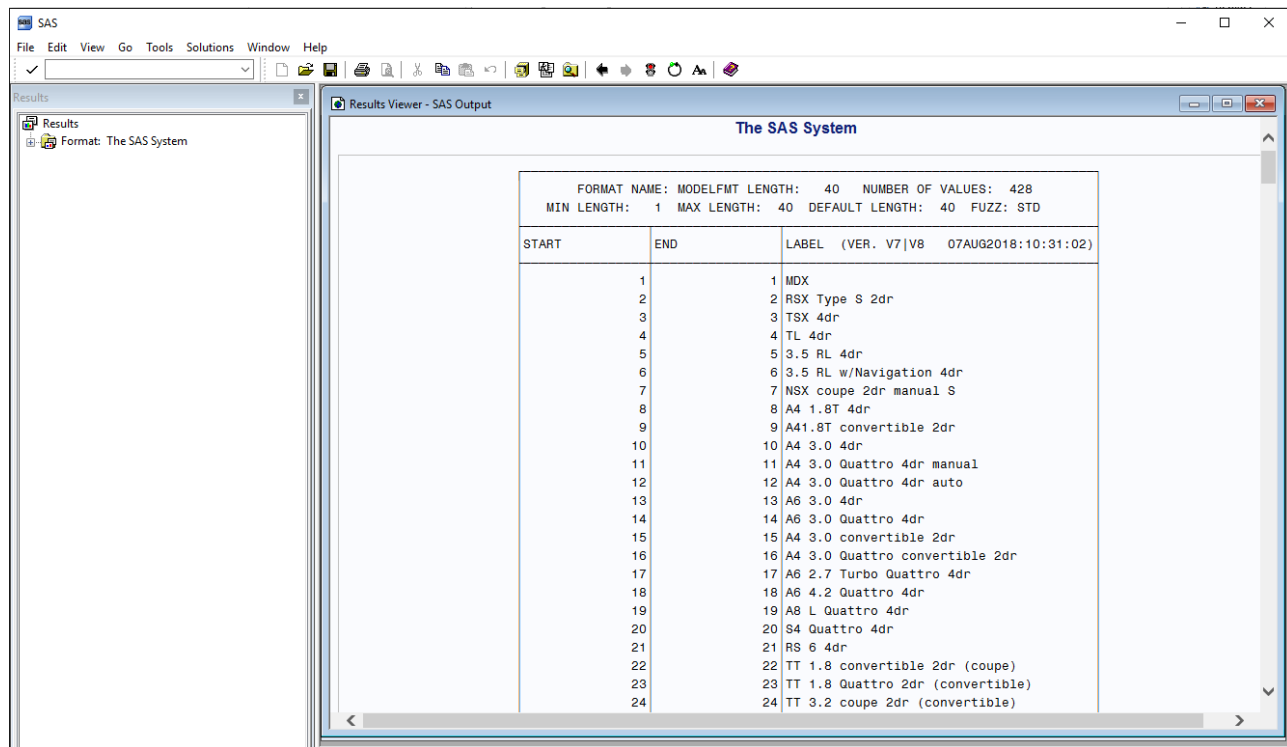
NOTE: No preassigned object definitions were found on the metadata server.

NOTE: AUTOEXEC processing beginning; file is D:\SAS\Config\Lev1\SASApp\appserver_autoexec.sas.

NOTE: Libref CSTMFMTS was successfully assigned as follows:
Engine:      V9
Physical Name: D:\CourseData

NOTE: AUTOEXEC processing completed.
```

5. Double click on Libraries and drill Libraries->Cstmfmts->Formats->Modelfmt and verify that the format is available.

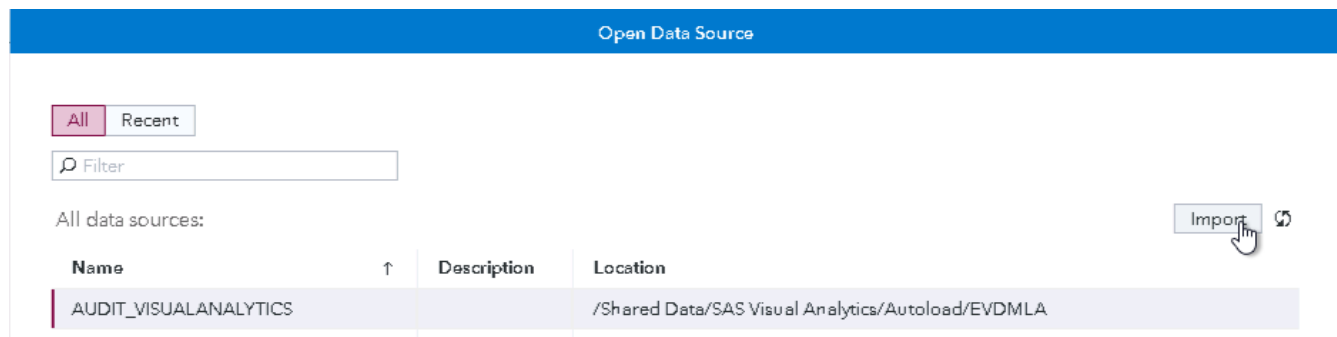


| The SAS System | | |
|---|-----|---------------------------------------|
| FORMAT NAME: MODELfmt LENGTH: 40 NUMBER OF VALUES: 428 | | |
| MIN LENGTH: 1 MAX LENGTH: 40 DEFAULT LENGTH: 40 FUZZ: STD | | |
| START | END | LABEL (VER. V7 V8 07AUG2018:10:31:02) |
| 1 | | 1 MDX |
| 2 | | 2 RSX Type S 2dr |
| 3 | | 3 TSX 4dr |
| 4 | | 4 TL 4dr |
| 5 | | 5 3.5 RL 4dr |
| 6 | | 6 3.5 RL w/Navigation 4dr |
| 7 | | 7 NSX coupe 2dr manual S |
| 8 | | 8 A4 1.8T 4dr |
| 9 | | 9 A41.8T convertible 2dr |
| 10 | | 10 A4 3.0 4dr |
| 11 | | 11 A4 3.0 Quattro 4dr manual |
| 12 | | 12 A4 3.0 Quattro 4dr auto |
| 13 | | 13 A6 3.0 4dr |
| 14 | | 14 A6 3.0 Quattro 4dr |
| 15 | | 15 A4 3.0 convertible 2dr |
| 16 | | 16 A4 3.0 Quattro convertible 2dr |
| 17 | | 17 A6 2.7 Turbo Quattro 4dr |
| 18 | | 18 A6 4.2 Quattro 4dr |
| 19 | | 19 A8 L Quattro 4dr |
| 20 | | 20 S4 Quattro 4dr |
| 21 | | 21 RS 6 4dr |
| 22 | | 22 TT 1.8 convertible 2dr (coupe) |
| 23 | | 23 TT 1.8 Quattro 2dr (convertible) |
| 24 | | 24 TT 3.2 coupe 2dr (convertible) |

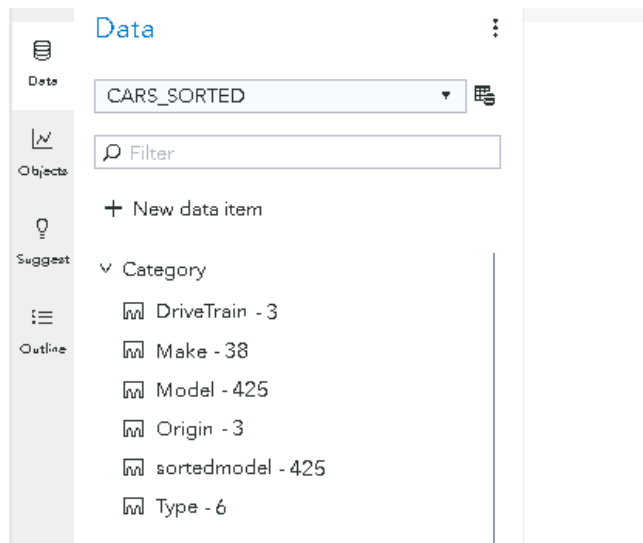
6. Close the SAS application

3. Load the dataset to LASR

7. Open a new tab in Chrome browser. Select the SAS Home Page and login to SAS with Christine and password Student1. Open the Report Builder, click on the Data Icon and select Import.



8. Select 'SAS Data Sets' in 'Local Files', click 'Browse' and open D:\basics\data\cars_sorted.sas7bdat. Click 'Import' and load the data into the LASR Server. The selected dataset should be loaded to the Report Designer.



4. Apply custom sort to column

9. Right click the Make column and select 'Custom Sort'.

10. Move BMW, Jaguar and Volvo to the Sorted Items area. All other values which are not selected are sorted in alphabetic order after the selected items..

Add Custom Sort

Category Data (35):

- Acura
- Audi
- Buick
- Cadillac
- Chevrolet
- Chrysler
- Dodge
- Ford
- GMC
- Honda
- Hummer
- Hyundai

⇌
...
⇌

Sorted Items (3):

- BMW
- Jaguar
- Volvo

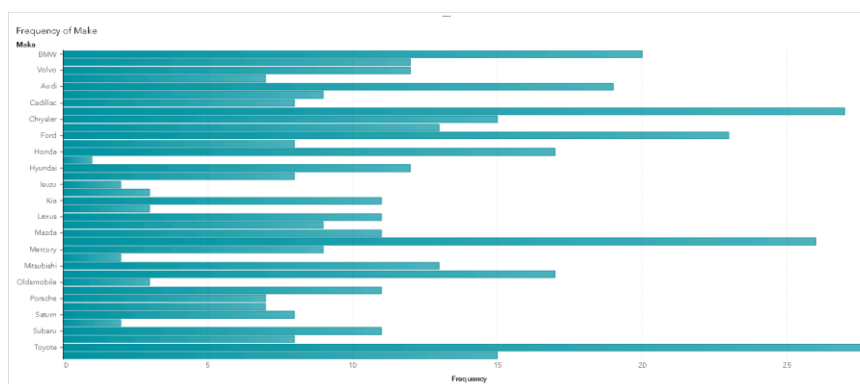
↑
↑
↓
↓

OK
Cancel

11. Press OK

12. Go to Objects, drag a Bar Chart to the canvas, add the Make column as a category to the Bar Chart. Right click on the Make Variable in the bar chart and select Sort -> Make : Ascending.

The Bar Chart is updated using the defined custom sort, BMW, Jaguar and Volvo are placed as the first bars, followed by all other in alphabetic order.



| Make | Frequency |
|------------|-----------|
| BMW | 20 |
| Volvo | 19 |
| Audi | 18 |
| Cadillac | 17 |
| Chrysler | 16 |
| Ford | 15 |
| Honda | 14 |
| Hyundai | 13 |
| Isuzu | 12 |
| Kia | 11 |
| Levin | 10 |
| Mazda | 9 |
| Mercury | 8 |
| Mitsubishi | 7 |
| Oldsmobile | 6 |
| Pontiac | 5 |
| Saturn | 4 |
| Subaru | 3 |
| Toyota | 2 |

7

5. Sort by format and underlying value

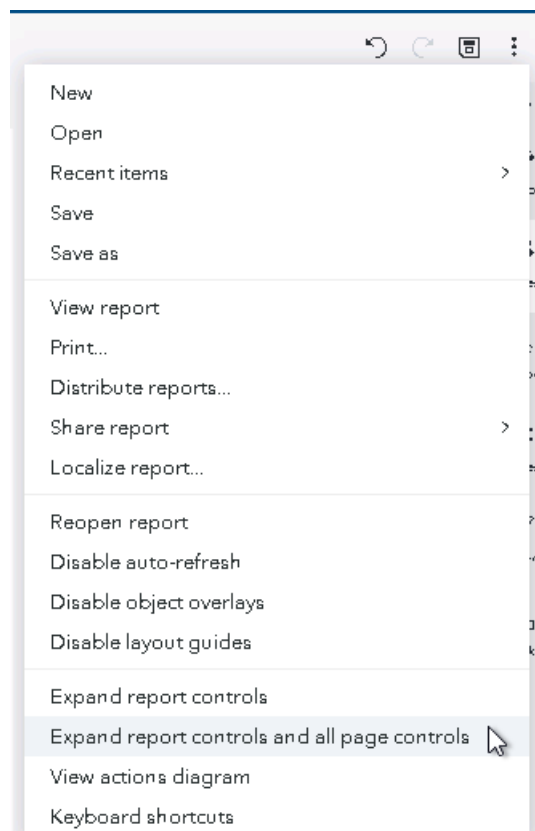
Defining a custom sort in SAS Visual Analytics is can be cumbersome for a large number of values and not dynamic, if new values appear over time. The next exercise will show how to set up a data driven custom sort using the format that we created earlier.

13. Add a new section to your report

14. Add a bar chart and add the column `sortedmodel` and `MPG` (Highway)

15. In the Options Menu (upper right corner)

and select 'Expand report controls and all page controls'



16. Add a drop-down list object as a page prompt and add the column `Make`.

Page 1 Page 2 : +

Make

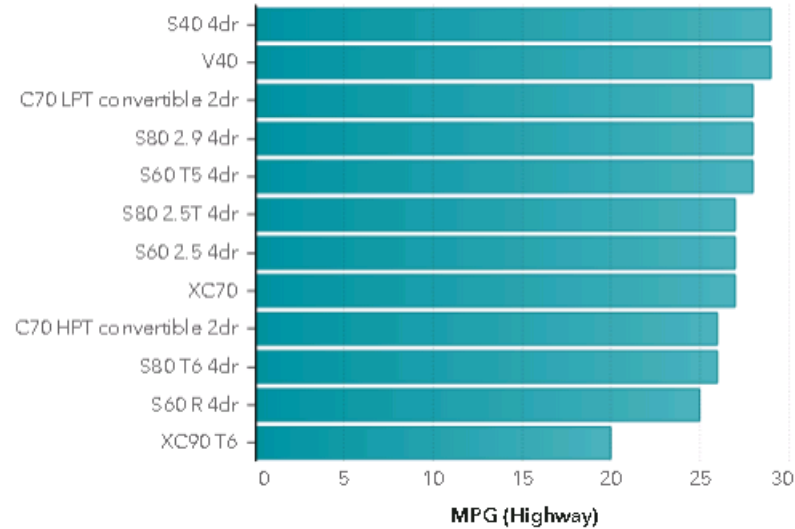
MPG (Highway) by sortedmodel

17. Select Volvo in the drop-down list

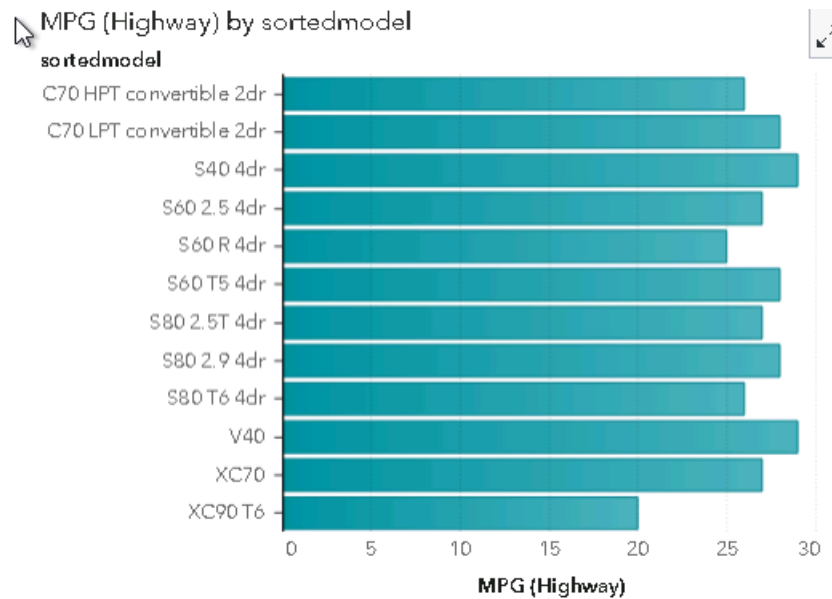
Volvo

MPG (Highway) by sortedmodel

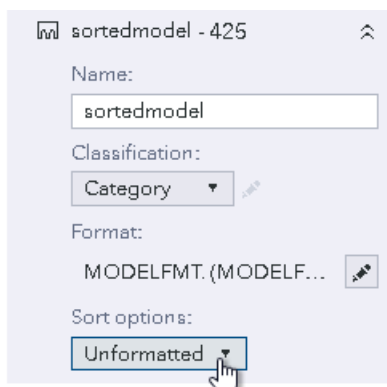
sortedmodel



18. Right click `sortedmodel` and select `sort->sortedmodel: Ascending`. The bar chart is updated and the values are sorted alphabetically.

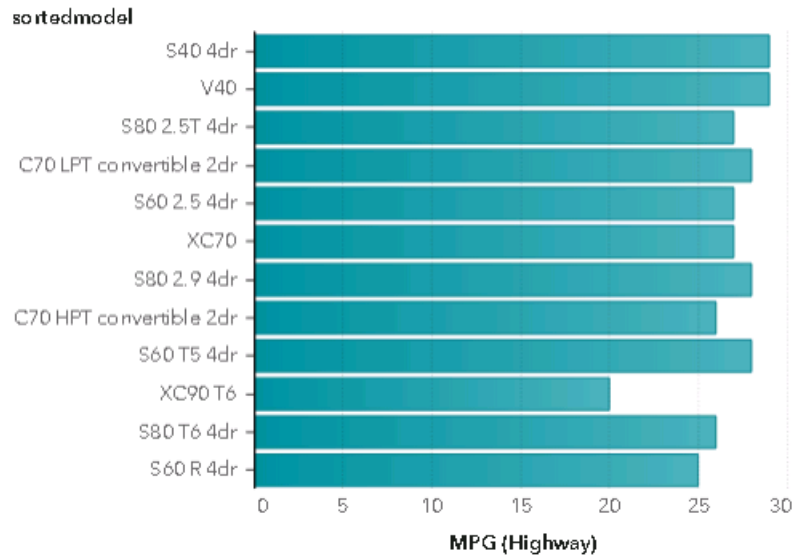


19. Go to the data area and open the options for `sortedmodel`, for Sort options select 'unformatted'



The Bar Chart updates to the sort order defined by the underlying numeric value

MPG (Highway) by sortedmodel

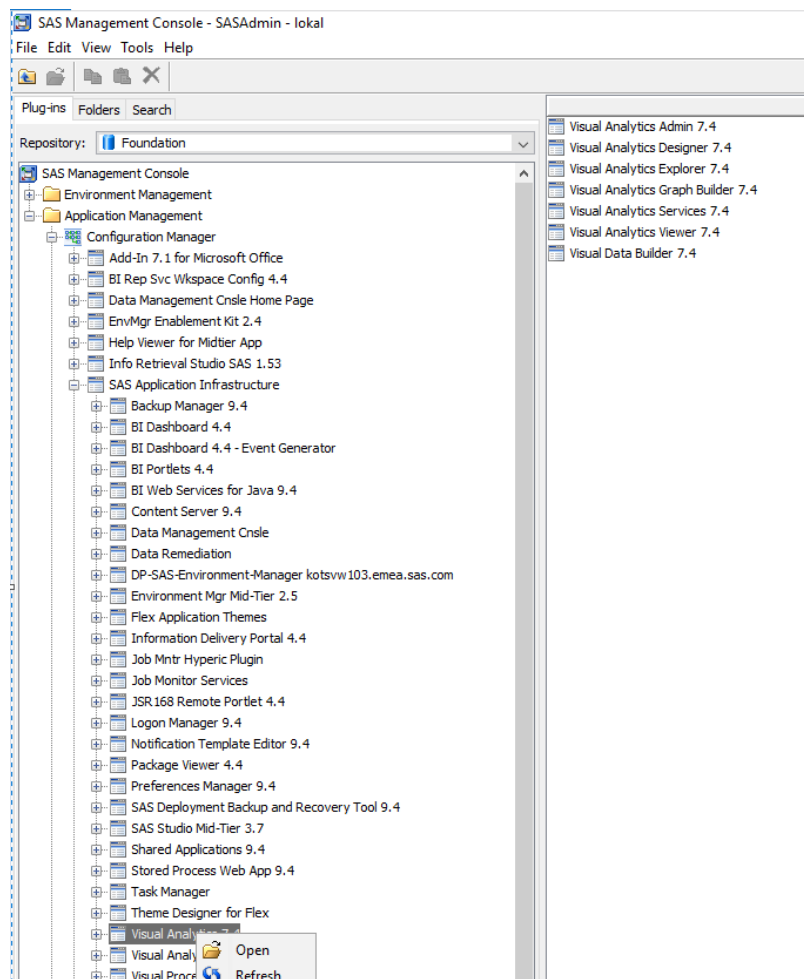


6. How to increase the number of unique values in custom sort

You are **not** going to do this exercise as it requires a restart of the SAS system, which is time consuming. Use these instructions to change it in your own environment.

The limit for number of items in custom sort can be changed in the SAS Management Console.

Open the SMC and browse to Application Management -> Configuration Manager -> SAS Application Infrastructure -> Visual Analytics 7.4



Select the advanced tab and add **va.CustomSortMaxValueLimit**. Set it to the desired value.

Visual Analytics 7.4 Properties

General Settings **Advanced** Authorization

| Property Name | Property Value | Locked |
|---|--|--------|
| App.ClientSidePoolingAdminID | | |
| Email.Host | smtp.dk | |
| Email.Port | 25 | |
| Logon.Style | corporate | |
| las.caching.key.lifetime | 180 | |
| las.caching.permission.lifetime | 900 | |
| las.caching.user.lifetime | -1 | |
| lasrmt.server.monitor.refresh | 60 | |
| sas.web.cdps.knownHosts | http://opnsta.sas.com/,http://opnsta.sas.com/,http://opnsta.sas.com/,http://services.ar... | |
| sas.web.csrf.referers.allowNull | true | |
| sas.web.csrf.referers.blacklist | | |
| sas.web.csrf.referers.knownHosts | http://*.sas.com/ | |
| sas.web.csrf.referers.performCheck | true | |
| sas.web.csrf.referers.skipMethods | | |
| va.AuditingEnabled | false | |
| va.ComparisonEpsilon | 1e-12 | |
| va.CustomSortMaxValueLimit | 100 | |
| va.IgnoreMissingInCountDistinct | false | |
| va.MaxTiesToIncludeOnRank | 100 | |
| va.SASGeomapCommunicationProtocol | http | |
| va.SASGeomapEsriURL | http://services.arcgisonline.com/ArcGIS/rest/services/ | |
| va.SelfService.MaxUploadSizeInMegabytes | 4096 | |
| va.SelfService.ImportGoogleRowLimit | 100000 | |
| va.SelfService.ImportRowsHardCap | | |
| va.SelfService.ImportRowsSoftCap | | |
| va.Uploaded.library.name | SASApp - valib | |
| va.baseSchedulingFolder | /System/Applications/SAS Visual Analytics/ScheduledDistribution | |
| va.defaultLASRLibrary | Visual Analytics LASR | |
| va.defaultMediaDefinition | SBIP://METASERVER/System/Applications/SAS Visual Analytics/media/Default_Media_Defi... | |
| va.defaultPublicFolder | /Shared Data/SAS Visual Analytics/Public/LASR | |

Add Remove

OK Cancel Help