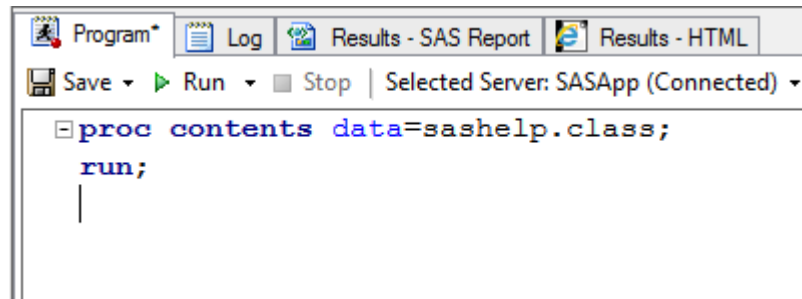


Dictionary taulut

Miten 'perus metadataa' käytetään
koodillisesti joustavuutta lisäämään

Metadata Base SASissa

- Metadata on käytävissä jokaisessa SAS istunnossa, oli sitten kyse yksittäiskäyttäjistä omalla työasemalla tai EG-käyttäjistä palvelinympäristössä.
- Proc Contents kertoo taulun metadatat.



```
Program* | Log | Results - SAS Report | Results - HTML  
Save ▾ | Run ▾ | Stop | Selected Server: SASApp (Connected) ▾  
proc contents data=sashelp.class;  
run;  
|
```

Proc contents listaus

Metadataa

The CONTENTS Procedure

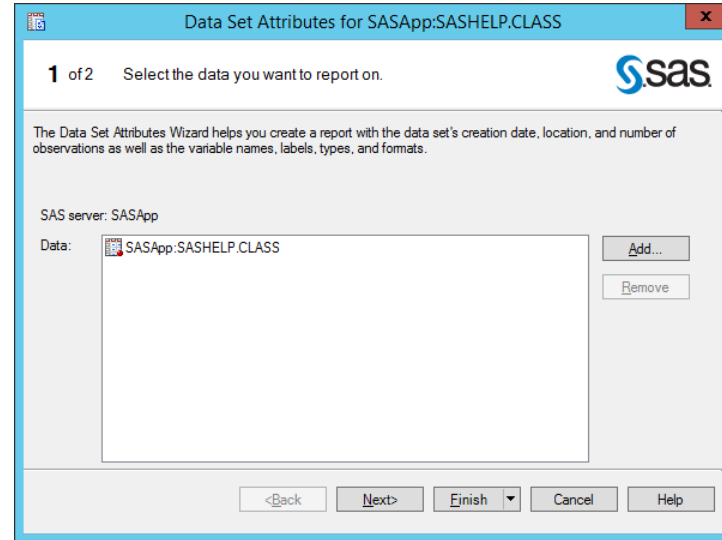
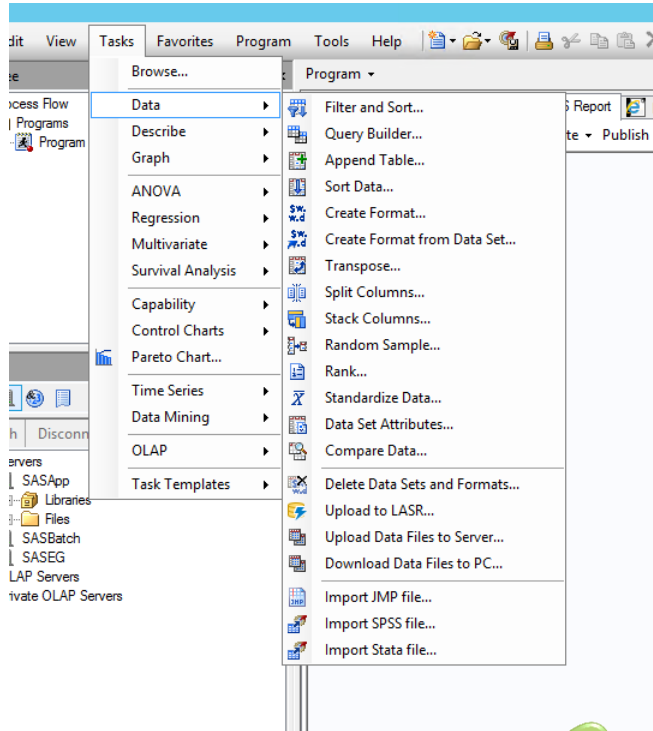
Data Set Name	SASHELP.CLASS	Observations	19
Member Type	DATA	Variables	5
Engine	V9	Indexes	0
Created	06/20/2013 07:29:59	Observation Length	40
Last Modified	06/20/2013 07:29:59	Deleted Observations	0
Protection		Compressed	NO
Data Set Type		Sorted	NO
Label	Student Data		
Data Representation	WINDOWS_64		
Encoding	us-ascii ASCII (ANSI)		

Engine/Host Dependent Information	
Data Set Page Size	65536
Number of Data Set Pages	1
First Data Page	1
Max Obs per Page	1632
Obs in First Data Page	19
Number of Data Set Repairs	0
ExtendObsCounter	YES
Filename	D:\sas94\software\SASFoundation\9.4\core\sasHELP\class.sas7bdat
Release Created	9.0401B0
Host Created	X64_7PRO

Alphabetic List of Variables and Attributes			
#	Variable	Type	Len
3	Age	Num	8
4	Height	Num	8
1	Name	Char	8
2	Sex	Char	1
5	Weight	Num	8

Page Break

Taulun tiedot



Metadattaa

The DATASETS Procedure

Data Set Name	SASHELP.CLASS	Observations	19
Member Type	DATA	Variables	5
Engine	V9	Indexes	0
Created	06/20/2013 07:29:59	Observation Length	40
Last Modified	06/20/2013 07:29:59	Deleted Observations	0
Protection		Compressed	NO
Data Set Type		Sorted	NO
Label	Student Data		
Data Representation	WINDOWS_64		
Encoding	us-ascii ASCII (ANSI)		

Metadatan monet kuosit

- Taulun / kirjaston metadata on listattavissa monen eri proseduurin kautta.
- Base-käyttäjille tutuin lienee CONTENTS-proseduuri. EG:ssä käytetään DATASETS-proseduuria.
- Tulokset ovat samanlaiset, asettelullisesti hieman eroja.
- Onko taustalla olemassa joku data, joka voidaan näin listata eri proseduureilla?

Mitä tietoja metadata voi sisältää?

The image displays three overlapping screenshots of the SAS 'Properties for CLASS' dialog box, illustrating different metadata categories:

- General Tab:** Shows basic file information for 'CLASS'.
 - File name: SASHELP.CLASS
 - Created: Thursday, June 20, 2013 7:29 AM
 - Last modified: Thursday, June 20, 2013 7:29 AM
 - Data Type: SAS Data Set
- Advanced Tab:** Shows data set properties.
 - Server: SASApp
 - SAS reference: SASHELP.CLASS
 - Columns: 5
 - Rows: 19
 - Indexed: No
 - Compressed: No
- Columns Tab:** Shows a table of column metadata.

Name	Type	Length	Format	Informat	Label
Name	Character	8			
Sex	Character	1			
Age	Numeric	8			
Height	Numeric	8			
Weight	Numeric	8			

Nimi, saraketiedot; nimet ja tyypit ja pituudet, sarakkeiden ja rivien lukumäärä

Dictionary taulut

- SAS käynnistyksen yhteydessä tehdään Dictionary-tauluja, jotka sisältävät kirjaston metadatan.
- Dictionary-taulujen perusteella on tehty sashelp-kirjastoon V-alkuiset näkymät, joita voi myös käyttää.

VCATALG
VCFORMAT
VCHKCON
VCNCOLU
VCNTABU
VCOLUMN
VDATAIT
VDCTNRY
VDEST
VENGINE
VERBMGR
VEXTFL
VFILTER
VFORMAT
VFUNC
VGOPT
VIDMSG
VINDEX
VINFOMP
VLIBNAM
VLOCALE
VMACRO
VMEMBER
VOPTION
VOTE1980
VPRMXML
VPROMPT
VREFCON
VREMEMB
VSACCES
VSCATLG
VSLIB
VSTABLE
VSTABWW
VSTYLE
VSVIEW
VTABCON
VTABLE

Käytettävissä olevia Dictionary-taulut

CATALOGS	VCATALG	Contains information about known SAS catalogs.
CHECK_CONSTRAINTS	VCHKCON	Contains information about known check constraints.
COLUMNS	VCOLUMN	Contains information about columns in all known tables.
CONSTRAINT_COLUMN_USAGE	VCNCOLU	Contains information about columns that are referred to by integrity constraints.
CONSTRAINT_TABLE_USAGE	VCNTABU	Contains information about tables that have integrity constraints defined on them.
DATAITEMS	VDATAIT	Contains information about known information map data items.
DESTINATIONS	VDEST	Contains information about known ODS destinations.
DICTIONARIES	VDCTNRY	Contains information about all DICTIONARY tables.
ENGINES	VENGINE	Contains information about SAS engines.
EXTFILES	VEXTFL	Contains information about known external files.
FILTERS	VFILTER	Contains information about known information map filters.
FORMATS	VFORMAT VCFORMAT	Contains information about currently accessible formats and informats.
FUNCTIONS	VFUNC	Contains information about currently accessible functions.
GOPTIONS	VGOPT VALLOPT	Contains information about currently defined graphics options (SAS/GRAPH software). SASHELP.VALLOPT includes SAS system options as well as graphics options.
INDEXES	VINDEX	Contains information about known indexes.
INFOMAPS	VINFOMP	Contains information about known information maps.
LIBNAMES	VLIBNAM	Contains information about currently defined SAS libraries.
MACROS	VMACRO	Contains information about currently defined macro variables.

Käytettävissä olevia Dictionary-taulut

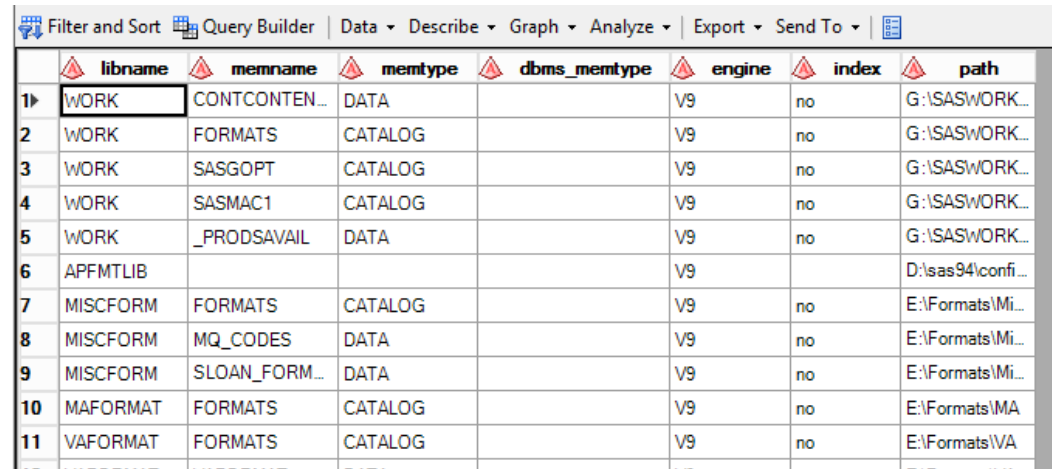
MEMBERS	VMEMBER VSACCES VSCATLG VSLIB VSTABLE VSTABVW VSVIEW	Contains information about all objects that are in currently defined SAS libraries. SASHELP.VMEMBER contains information for all member types; the other SASHELP views are specific to particular member types (such as tables or views).
OPTIONS	VOPTION VALLOPT	Contains information about SAS system options. SASHELP.VALLOPT includes graphics options as well as SAS system options.
REFERENTIAL_CONSTRAINTS	VREFCON	Contains information about referential constraints.
REMEMBER	VREMEMB	Contains information about known remembers.
STYLES	VSTYLE	Contains information about known ODS styles.
TABLE_CONSTRAINTS	VTABCON	Contains information about integrity constraints in all known tables.
TABLES	VTABLE	Contains information about known tables.
TITLES	VTITLE	Contains information about currently defined titles and footnotes.
VIEWS	VVIEW	Contains information about known data views.

Huomautus

- SASHELP kirjastossa on myös muita v-alkusia näkymiä, kuin vain dictionary-tauluista tehdyt näkymät.

```
30
31      GOPTIONS ACCESSIBLE;
32      proc sql;
33          describe table sashelp.vmember
34
35
36
37      ;
ERROR: VIEW SASHELP.VMEMBER cannot be described by the DESCRIBE TABLE statement.
38      quit;
NOTE: PROCEDURE SQL used (Total process time):
      real time           0.00 seconds
      cpu time            0.03 seconds
```

- Näitä ovat mm VLOCALE, VMEMBER
- VPRMXML, V_PROMPT
- VMEMBER



The screenshot shows the SAS Enterprise Guide interface with a table of SASHELP views. The table has columns for libname, memname, memtype, dbms_memtype, engine, index, and path. The 'WORK' library is selected, and the 'VLOCALE' view is highlighted in the list.

	libname	memname	memtype	dbms_memtype	engine	index	path
1▶	WORK	CONTCONTEN...	DATA		V9	no	G:\SASWORK...
2	WORK	FORMATS	CATALOG		V9	no	G:\SASWORK...
3	WORK	SASGOPT	CATALOG		V9	no	G:\SASWORK...
4	WORK	SASMAC1	CATALOG		V9	no	G:\SASWORK...
5	WORK	_PRODSAVAIL	DATA		V9	no	G:\SASWORK...
6	APFMTLIB				V9		D:\sas94\confi...
7	MISCFORM	FORMATS	CATALOG		V9	no	E:\Formats\Mi...
8	MISCFORM	MQ_CODES	DATA		V9	no	E:\Formats\Mi...
9	MISCFORM	SLOAN_FORM...	DATA		V9	no	E:\Formats\Mi...
10	MAFORMAT	FORMATS	CATALOG		V9	no	E:\Formats\MA...
11	VAFORMAT	FORMATS	CATALOG		V9	no	E:\Formats\VA...

Dictionary-taulujen kuvaukset

```
proc sql;  
    describe table dictionary.tables;  
quit;
```

```
proc sql;  
    describe view sashelp.vtable;  
quit;
```

```
create table DICTIONARY.TABLES  
(  
    libname char(8) label='Library Name',  
    memname char(32) label='Member Name',  
    memtype char(8) label='Member Type',  
    dbms_memtype char(32) label='DBMS Member Type',  
    memlabel char(256) label='Data Set Label',  
    typemem char(8) label='Data Set Type',  
    crdate num format=DATETIME informat=DATETIME label='Date Created',  
    modate num format=DATETIME informat=DATETIME label='Date Modified',  
    nobs num label='Number of Physical Observations',  
    obslen num label='Observation Length',  
    nvar num label='Number of Variables',  
    protect char(3) label='Type of Password Protection',  
    compress char(8) label='Compression Routine',  
    encrypt char(8) label='Encryption',  
    npage num label='Number of Pages',  
    filesize num label='Size of File',  
    pcompress num label='Percent Compression',
```

Dictionary-taulujen kuvaukset

```
reuse char(3) label='Reuse Space',
bufsize num label='Bufsize',
delobs num label='Number of Deleted Observations',
nlobs num label='Number of Logical Observations',
maxvar num label='Longest variable name',
maxlabel num label='Longest label',|
maxgen num label='Maximum number of generations',
gen num label='Generation number',
attr char(3) label='Data Set Attributes',
indxtype char(9) label='Type of Indexes',
datarep char(32) label='Data Representation',
sortname char(8) label='Name of Collating Sequence',
sorttype char(4) label='Sorting Type',
sortchar char(8) label='Charset Sorted By',
reqvector char(24) format=$HEX48 informat=$HEX48 label='Requirements Vector',
datarepname char(170) label='Data Representation Name',
encoding char(256) label='Data Encoding',
audit char(3) label='Audit Trail Active?',
audit_before char(3) label='Audit Before Image?',
audit_admin char(3) label='Audit Admin Image?',
audit_error char(3) label='Audit Error Image?',
audit_data char(3) label='Audit Data Image?',
num_character num label='Number of Character Variables',
num_numeric num label='Number of Numeric Variables'
);
```

```
36          quit;
NOTE: PROCEDURE SQL used (Total process time):
      real time           0.02 seconds
      cpu time            0.00 seconds
```

```
37          proc sql;
38            describe view sashelp.vtable;
NOTE: SQL view SASHELP.VTABLE is defined as:
```

```
      select *
      from DICTIONARY.TABLES;
```

```
39          quit;
```

.. eli

- Dictionary-taulut ovat käytettävissä aina SAS:in ollessa käytettävissä.
- Niitä voidaan selata SASHELP-kirjaston kautta.
- Kysely tauluihin hoituu nopeimmin SQL:n kautta.
- Kaikki v-alkuiset näkymät sashelp:issä eivät ole dictionary-taulujen kuvia.
- Dictionary-tauluista löytyvää metadataa voidaan käyttää SAS jobeissa (ja DIS-jobeissa) ajoketjun ohjaamiseen tai aineiston dynaamisuuden varmistamiseen.

Muistathan makrot?

- Makromuuttuja on SAS istunnon (makron suorituksen) ajan muistissa oleva muuttuja.
- Makromuuttujia voidaan luoda
 - Käsien
 - Proc sql:llä
 - Data-vaiheella
- SQL:llä makromuuttujia voidaan luoda into-rakenteella:

```
Proc sql;
```

```
Select max(height) into  
:makspituus
```

```
From sashelp.class;
```

```
Quit;
```



MITEN TARKKAILLAAN – PARAMETRINA KIRJASTO JA TARKKAILUAIKA

```
proc sql noprint;
    create table taulut
    as select LIBNAME, MEMNAME, NOBS, FILESIZE, MODATE from
dictionary.tables where libname = "&LIBRARY" and
    datdif(datepart(modate),today(), 'ACT/ACT')<=&datedif;
    select count(memname) into :lkm from taulut
    where datdif(datepart(modate),today(), 'ACT/ACT')<=&datedif;
    %let lkm=&lkm;
    select libname, memname, modate, nobs format=12., filesize
format=24. into :lib1-:lib&lkm, :mem1-:mem&lkm, :date1-:date&lkm, :nobs1-
:nobs&lkm, :fsize1-:fsize&lkm from taulut
    where datdif(today(),datepart(modate), 'ACT/ACT')<=&datedif;
quit;
```



DQ ENGINE

ERILLINEN KÄSITTELY NUM JA CHAR

```
%do i = 1 %to &lkm;
```

```
proc sql;
```

```
    create table char&i as
```

```
    select * from dictionary.columns
```

```
    where libname="&&lib&i" and memname="&&mem&i" and type='char';
```

```
    create table num&i as
```

```
    select * from dictionary.columns
```

```
    where libname="&&lib&i" and memname="&&mem&i" and type='num';
```

```
quit;
```

```
%end;
```