



SAS Data Dictionary

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Agenda

- Intended target
- Objectives
- Data Source
- SAS Environment
- What are SAS DD tables
- SAS Dictionary Tables (27)
- Reference sheet
- Real life example
- Demo (if available)
- Conclusion
- References
- Question Period



Intended target

- SAS programmer
- SAS Analyst
- Actuaries
- DBA (Data Base Administrator)
- Statistician
- Etc...

- Anyone who uses SAS !!!!



Objectives

- Learn about the existence of the SAS Data Dictionary (SAS DD)
- Learn how to extract information from the SAS DD
- Demonstrate a real life example

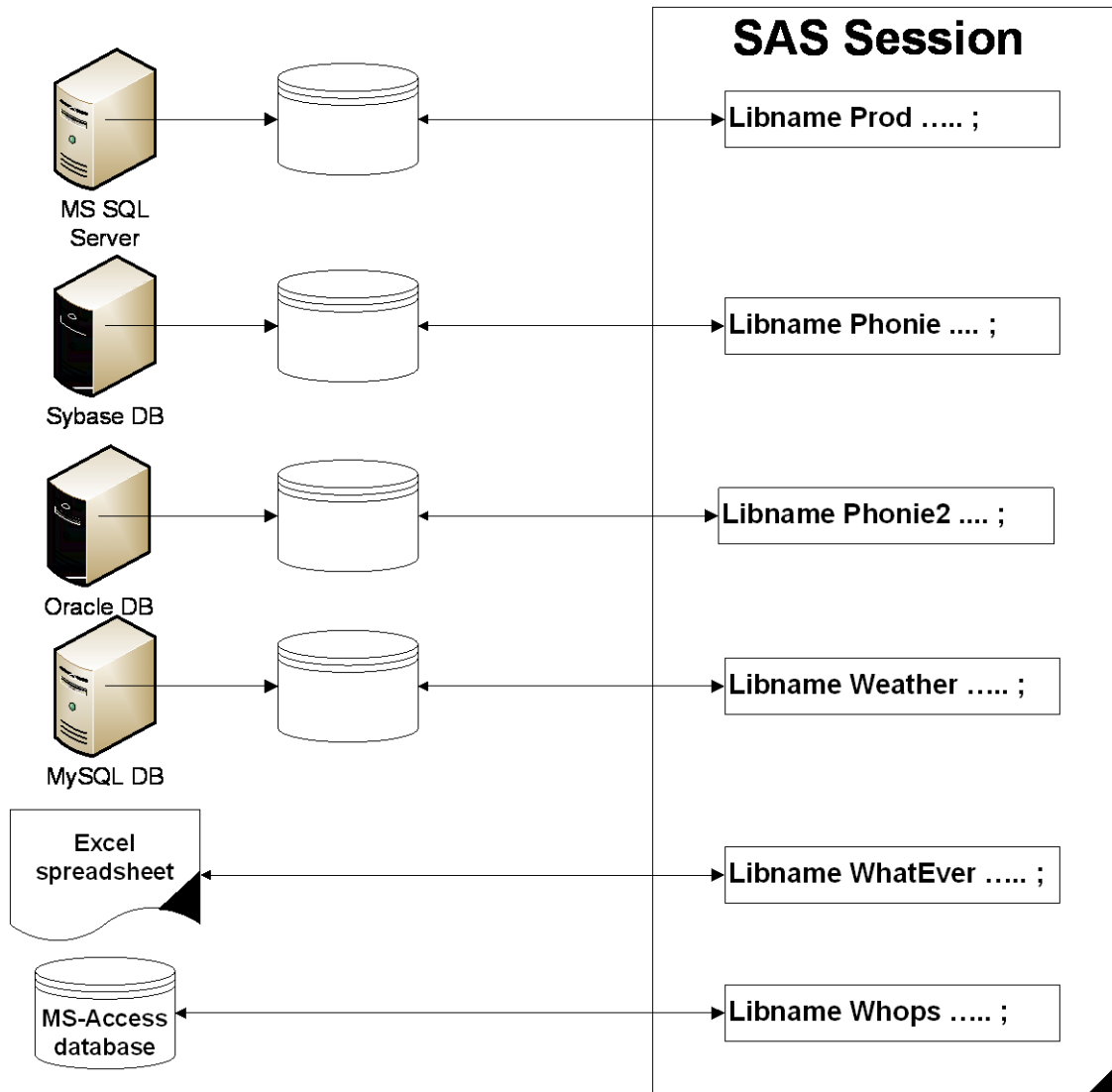


Where does our data come from?

- SAS Tables
- External Databases
 - SQL Server, Oracle, MySQL, Sybase, etc...
- Worksheets
 - Excel, Lotus, etc.
- ASCII flat files
 - .txt, .csv



SAS Work environment (Example)



What are SAS DD tables?

A DICTONARY table is a :

- Read-only SAS view that contains information about SAS libraries, SAS data sets, SAS macros, and external files that are in use or available in the current SAS session.
- Also contains the settings for SAS system options that are currently in effect.

When you access a DICTONARY table

- SAS determines the current state of the SAS session and returns the desired information accordingly. This process is performed each time a DICTONARY table is accessed, so that you always have current information.



How do we access these tables?

DICTIONARY tables can be accessed by a SAS program by using either of these methods:

- run a **PROC SQL** query against the table, using the **DICTIONARY** libref
- use any **SAS procedure** or the **DATA step**, referring to the PROC SQL view of the table in the **Sashelp** library



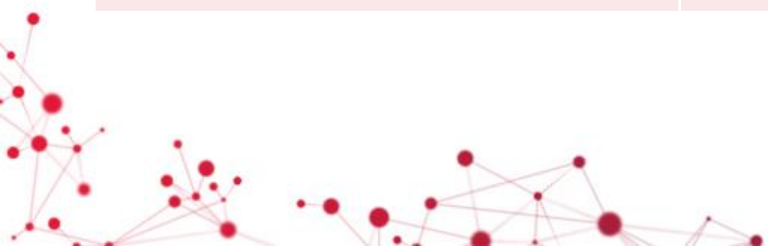
Dictionary Table List (Page 1 of 6)

DICTIONARY Table	Sashelp View	Description
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.



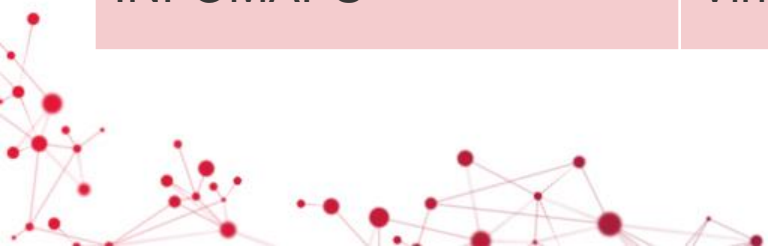
Dictionary Table List (Page 2 of 6)

DICTIONARY Table	Sashelp View	Description
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.



Dictionary Table List (Page 3 of 6)

DICTIONARY Table	Sashelp View	Description
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.

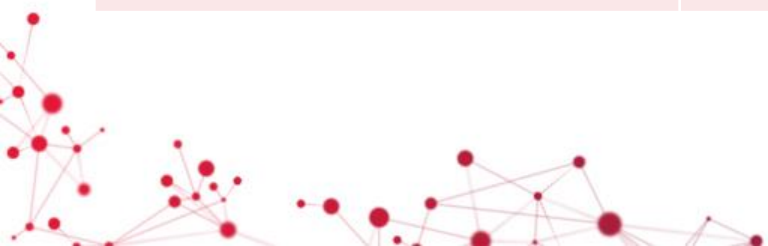


Dictionary Table List (Page 4 of 6)

DICTIONARY Table	Sashelp View	Description
LIBNAMES	Vlibnam	Contains information about currently defined SAS libraries.
MACROS	Vmacro	Contains information about currently defined macro variables.
MEMBERS	Vmember Vsaccess 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.

Dictionary Table List (Page 5 of 6)

DICTIONARY Table	Sashelp View	Description
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.



Dictionary Table List (Page 6 of 6)

DICTIONARY Table	Sashelp View	Description
VIEWS	Vview	Contains information about known data views.
VIEW_SOURCES	Not available	Contains a list of tables (or other views) referenced by the SQL or DATASTEP view, and a count of the number of references.
XATTRS	Vxattr	Contains information about extended attributes.



Dictionary Tables Reference Card

Summary of SAS Dictionary Tables and Views

Notation:

- In headers, **dict** indicates SQL usage (*dictionary.tableName*); **sh** indicates SASHELP usage (*sashelp.viewName*); **PW** identifies tables with no data displayed if member is password-protected.
- indicates a field used for uniquely identifying an observation
- NN** identifies a field whose value may be missing for non-native SAS file types (including SAS Transport files).
- V** identifies a field whose value may be missing or 0 for SAS views
- Highlighted names are unique to Version 9.2 (TS2M0)

Usage Notes:

- MEMNAME:**
 - Native SAS engines store member names in upper case. Other engines (access, excel, *et al.*) preserve case and spacing. Using the EXCEL engine, for example, program references to sheet name "Sheet One" must be "Sheet One\$n"
 - Generation datasets are stored as memname[#nnn] (e.g., MAST, MAST#001)
- Non-native/"foreign" files: if the data source's name exceeds 32 characters, has security limitations, or uses syntax not understood by SAS, the data source will *not* be represented in *any* Table or View.
- Not all tables are shown

<i>dict.catalogs / sh.vCatalog</i>		Catalog Member Attributes
► libname	\$8	Library name [upper case]
► memname	\$32	Member name [upper case]
memtype	\$8	Member type [CATALOG]
► objname	\$32	Object name [upper case]
► objtype	\$8	Object type [SCL FRAME FORMAT FORMATC -MACRO...]
objdesc	\$256	Object description
created	num	Date created [DATETIME informat/format]
modified	num	Date modified [DATETIME informat/format]
alias	\$8	Object alias [upper case]
level	num	Library concatenation level [0, 1, 2, ...]

<i>dict.columns / sh.vColumn</i>		PW Variable Attributes
► libname	\$8	Library name [upper case]

<i>dict.dictionaries / sh.vDctnry</i>		Dictionary Table Attributes
npos	num	Column position [offset within observation. >= 0]
varnum	num	Column number in table [1, 2, 3, ...]
format	\$49	Column format [<i>may</i> include width, period]
informat	\$49	Column informat [<i>may</i> include width, period]

<i>dict.engines / sh.vEngine</i>		Attributes of <i>all</i> available engines
► engine	\$8	Engine name [upper case]
alias	\$8	Alias [upper case]
description	\$40	Description
preferred	\$3	Preferred? [yes no]
properties	\$1024	Engine dialog properties

<i>dict.extfiles / sh.vExtfl</i>		User, system external files
► fileref	\$8	Fileref [upper case] [duplicated for concatenated files]
► xpath	\$1024	Path name or piped command [case preserved]
xengine	\$8	Engine name [upper case]
directory	\$3	Does fileref point to a directory [yes no]
exists	\$3	Does the location exist? [yes no]
fileSize	num	Size of file, in bytes
level	num	File concatenation level
modDate	num	File modification date-time [DATETIME informat/format]
temporary	char	Allocated as a temporary location? [yes no]

<i>dict.formats / sh.vFormat</i>		Attributes of system/user-written formats
► libname	\$8	Library name [upper case] [when source='C']
► memname	\$32	Member name [upper case] [when source='C']
► path	\$1024	Path name [case preserved] [when source='U']
► objname	\$32	Object name [upper case] [e.g. GROUP, TYPE] [when source='U', 'C']

Real life example

- Search
 - A variable
 - A label
 - A Table
 - List current SAS Session parameters
 - Etc...
- Automatization
 - Create loading program
 - Validate source table structure vs actual (live) one
 - Check if change in structure, variable name, variable format, etc.



How to: Available SAS Libraries

** In order to know available libraries **;

proc sql;

create table work.dict_libraries as

select *

from **dictionary.libnames;**

quit;

	libname	engin	path	level	fileformat	readonly	sequential	sysdesc	sysname	sysvalue	temp
1	WORK	V9	W:\SASWork\T20948...	0 7		non	non	Informations dépenda...	Nom du fichier	W:\SASWork\T20...	oui
2	SASDATA	BASE	C:\SAS\Config\Lev1\S...	0 7		non	non	Informations dépenda...	Nom du fichier	C:\SAS\Config\Le...	non
3	SQDPFC13	ODBC	SQD001P1_Dif_1	0 7		non	non	ODBC ACCESS ENG...	Schema/Owner	FC1	non
4	SQDPFC12	ODBC	SQD001P1_Dif_1	0 7		non	non	ODBC ACCESS ENG...	Schema/Owner	FC1	non
5	SQDPAA22	ODBC	SQD001P1_Dif_1	0 7		non	non	ODBC ACCESS ENG...	Schema/Owner	AA2	non
6	SQDPTS21	ODBC	SQD001P1_Dif_1	0 7		non	non	ODBC ACCESS ENG...	Schema/Owner	TS2	non
7	SQDPTS11	ODBC	SQD001P1_Dif_1	0 7		non	non	ODBC ACCESS ENG...	Schema/Owner	TS1	non
8	SQDPTEX1	ODBC	SQD001P1_Dif_1	0 7		non	non	ODBC ACCESS ENG...	Schema/Owner	TEX	non
9	SQDPTB11	ODBC	SQD001P1_Dif_1	0 7		non	non	ODBC ACCESS ENG...	Schema/Owner	TB1	non
10	SQDPRW31	ODBC	SQD001P1_Dif_1	0 7		non	non	ODBC ACCESS ENG...	Schema/Owner	RW3	non
11	SQDPRRX1	ODBC	SQD001P1_Dif_1	0 7		non	non	ODBC ACCESS ENG...	Schema/Owner	RRX	non
12	SQDPRR41	ODBC	SQD001P1_Dif_1	0 7		non	non	ODBC ACCESS ENG...	Schema/Owner	RR4	non
13	SQDPRR11	ODBC	SQD001P1_Dif_1	0 7		non	non	ODBC ACCESS ENG...	Schema/Owner	RR1	non
14	SQDPRC41	ODBC	SQD001P1_Dif_1	0 7		non	non	ODBC ACCESS ENG...	Schema/Owner	RC4	non
15	SQDPRC21	ODBC	SQD001P1_Dif_1	0 7		non	non	ODBC ACCESS ENG...	Schema/Owner	RC2	non
16	SQDPRC11	ODBC	SQD001P1_Dif_1	0 7		non	non	ODBC ACCESS ENG...	Schema/Owner	RC1	non
17	SQDPRB11	ODBC	SQD001P1_Dif_1	0 7		non	non	ODBC ACCESS ENG...	Schema/Owner	RB1	non
18	SQDPPW21	ODBC	SQD001P1_Dif_1	0 7		non	non	ODBC ACCESS ENG...	Schema/Owner	PW2	non
19	SQDPPS21	ODBC	SQD001P1_Dif_1	0 7		non	non	ODBC ACCESS ENG...	Schema/Owner	PS2	non
20	SQDPPR11	ODBC	SQD001P1 Dif 1	0 7		non	non	ODBC ACCESS ENG...	Schema/Owner	PR1	non

How to: Available SAS Datasets (Tables)

** In order to find out available tables **;

```
proc sql;
```

```
  create table work.dict_tables as
```

```
    select *
```

```
    from dictionary.tables;
```

```
quit;
```

	libname	memname	memtype	dbms_memtype	memlabel	typemem	crdate	modate	nobs	obsle	nvar
1	WORK	DICT_1	DATA			DATA	28OCT16:14:40:37	28OCT16:14:40:37	133	4137	11
2	WORK	DICT_2	DATA			DATA	28OCT16:14:43:15	28OCT16:14:43:15	2217	1031	41
3	WORK	_PRODSAVAIL	DATA			DATA	28OCT16:14:40:26	28OCT16:14:40:26	8	78	6
4	SQDPFC13	ADRINEX	DATA	TABLE		DATA	.	.	.	0	11
5	SQDPFC13	ADRSLI	DATA	TABLE		DATA	.	.	.	0	19
6	SQDPFC13	ADRTIER	DATA	TABLE		DATA	.	.	.	0	13
7	SQDPFC13	APPELLA	DATA	TABLE		DATA	.	.	.	0	7
8	SQDPFC13	AUTSICL	DATA	TABLE		DATA	.	.	.	0	8
9	SQDPFC13	CLDTRED	DATA	TABLE		DATA	.	.	.	0	10
10	SQDPFC13	CLIADHO	DATA	TABLE		DATA	.	.	.	0	7
11	SQDPFC13	CLIADMN	DATA	TABLE		DATA	.	.	.	0	13
12	SQDPFC13	CLIADNI	DATA	TABLE		DATA	.	.	.	0	13

How to: Table columns (SAS Datasets variable)

** List all the columns of a table / Variables of a SAS Dataset**;

```
proc sql;
```

```
  create table work.colonnes as
```

```
    select *
```

```
  from dictionary.columns;
```

```
quit;
```

	libname	memname	memtype	name	type	length	npos	varnum	label	format	informat	idxusage	sortedb	xtype
1	WORK	DICT_1	DATA	libname	char	8	8	1	Library Name					0 char
2	WORK	DICT_1	DATA	engine	char	8	16	2	Engine Name					0 char
3	WORK	DICT_1	DATA	path	char	1024	24	3	Pathname					0 char
4	WORK	DICT_1	DATA	level	num	8	0	4	Library Concatena...					0 num
5	WORK	DICT_1	DATA	fileformat	char	8	1048	5	Default File Format					0 char
6	WORK	DICT_1	DATA	readonly	char	3	1056	6	Read-only?					0 char
7	WORK	DICT_1	DATA	sequential	char	3	1059	7	Sequential?					0 char
8	WORK	DICT_1	DATA	sysdesc	char	1024	1062	8	System Informatio...					0 char
9	WORK	DICT_1	DATA	sysname	char	1024	2086	9	System Informatio...					0 char
10	WORK	DICT_1	DATA	sysvalue	char	1024	3110	10	System Informatio...					0 char
11	WORK	DICT_1	DATA	temp	char	3	4134	11	Temp Access?					0 char
12	WORK	DICT_2	DATA	libname	char	8	136	1	Library Name					0 char
13	WORK	DICT_2	DATA	memname	char	32	144	2	Member Name					0 char
14	WORK	DICT_2	DATA	memtype	char	8	176	3	Member Type					0 char
15	WORK	DICT_2	DATA	dbms_memtype	char	32	184	4	DBMS Member Ty...					0 char
16	WORK	DICT_2	DATA	memlabel	char	256	216	5	Data Set Label					0 char
17	WORK	DICT_2	DATA	typemem	char	8	472	6	Data Set Type					0 char
18	WORK	DICT_2	DATA	crdate	num	8	0	7	Date Created	DATETIME.	DATETIME.			0 num
19	WORK	DICT_2	DATA	modate	num	8	8	8	Date Modified	DATETIME.	DATETIME.			0 num

How to: Defined Formats

** Produces the list of all available defined formats in your current SAS Session (work) **;

proc sql;

create table work.d_formats as

select *

from dictionary.formats

where libname = "WORK";

quit;

	libname	memname	path	objname	fmtname	fmttype	source
1	WORK	FORMATS		F_SEXE	F_SEXE	F	C
2	WORK	FORMATS		TELEPHONE	TELEPHONE	F	C

Demo

Psst... Switch screen ... 😊



Conclusion

- SAS Data Dictionary Tables = Your version of Webster for all your available data
- Will it be useful to you? I am convinced it will and sooner than you think. (Now that you know) 😊



References

- **Accessing SAS System Information by Using DICTIONARY Tables**
 - <http://support.sas.com/documentation/cdl/en/sqlproc/62086/HTML/default/viewer.htm#a001385596.htm>
- **Summary of SAS Dictionary Tables and Views**
 - <http://www.codecraftersinc.com/pdf/DictionaryTables.pdf>
 - <http://www.codecraftersinc.com/pdf/DictionaryTablesRefCard.pdf>



Question period !!!





Our commitment to you

We approach every engagement with one objective in mind: to help clients succeed

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