Class : 5

SAS Tutorial

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Working with Date/Time/Date Time :

SAS Date value
is a value that represents the number of days between January 1, 1960, and a specified date. SAS can perform calculations on dates ranging from A.D. 1582 to A.D. 19,900. Dates before January 1, 1960, are negative numbers; dates after January 1, 1960, are positive numbers.

SAS time value
is a value representing the number of seconds since midnight of the current day. SAS time values are between 0 and 86400

SAS datetime value
is a value representing the number of seconds between January 1, 1960, and an hour/minute/second within a specified date.

```
data a;
format y datetime22.;
do i= 0 to 10;
y=i;
output;
end;
run;
```

	y	i
1	01JAN1960:00:00:00	0
2	01JAN1960:00:00:01	1
3	01JAN1960:00:00:02	2
4	01JAN1960:00:00:03	3
5	01JAN1960:00:00:04	4
6	01JAN1960:00:00:05	5

```
data a;
format y date9.;
do i= -1 to 5;
y=i;
output;
end;
run;
```

31DEC1959	-1
01JAN1960	0
02JAN1960	1
03JAN1960	2
04JAN1960	3
05JAN1960	4
06JAN1960	5

```
data a;
format y time.;
do i= 0 to 10;
y=i;
output;
end;
run;
```

	y	i
1	0:00:00	0
2	0:00:01	1
3	0:00:02	2
4	0:00:03	3
5	0:00:04	4
6	0:00:05	5

Formats Date/Time/Date Time :

Format : Which is used to convert standard data to non standard data.
Informant : Which is used to convert Non Standard data into standard data.

10/09/08 : Non-Standard :::: Informant ::::::MMDDYY8.
$40,000 : Non-Standard :::: Informant ::::::Dollar7.
74,000 : Non-Standard :::: Informant ::::::Comma6.
34555 : Standard :::::::::::: Format :::::::: ?? (Comma6., MMDDYY8.,date9……)

Format variable name <$> formatW.d;
W : Total Width
d : Number of decimal place
$: It indicate Character format

i.e, Format Doj **date9.**;
(Format either SAS built or User define format (Proc format))

```
*Convert Non-standard DOJ to Standard DOJ;
data one;
infile datalines dlm="";
input Name$ Doj;
informat Doj DDMMYY8.;
datalines;
Shashi 10/09/19
Ravi 21/12/19
;
run;
```

	Name	Doj
1	Shashi	21802
2	Ravi	21904

```
*Convert Non-standard DOJ to Standard DOJ
  and standard DOJ to Non-Standard DOJ;
data two;
infile datalines dlm="";
input Name$ Doj;
informat Doj DDMMYY8.;
format Doj date9.;
datalines;
Shashi 10/09/19
Ravi 21/12/19
;
run;
```

	Name	Doj
1	Shashi	10SEP2019
2	Ravi	21DEC2019

Formats Date/Time/Date Time :

Input	Format		Output
1	Date7.	1	01JAN60
1	Date9.	1	01JAN1960
1	DDMMYY10.	1	01/01/1960
1	DDMMYY.	18703	17/03/11
1	DDMMYY10.	18703	17/03/2011
1	DDMMYYB.	18703	17 03 11
1	DDMMYYB10.	18703	17 03 2011

There are various date / Time / Date time formats
as per your need your choose your format.
Especially in transections data datetime format is datetime22.

Format	Input	Output
HHMM.	53132	14:46
HOUR.	53132	15
MMSS.	53132	885
TIME.	53132	14:45:32
TOD.	53132	14:45:32

Formats Date/Time/Date Time :

1. **Today** :- Return a current date from a SAS date value.
2. **Day** :- Extract the day of the month from a SAS date and returns a number from 1-31.
3. **Weekdays** :- Returns the day of the week from SAS date and return a number from 1 to 7.
   (Sunday =1; Monday=2;Tuesday=3;Wednesday=4;Thrusday=5;Friday=6;Saturday=7)
4. **Month** :- Extract the month from the SAS date and return a number from 1 to 12.
   (January =1;February=2;March=3;April=4……December=12)
5. **Year** :- Extract the year from the SAS date and returns 4 digit of years.
6. **Qtr** :- Extract the quarter from the SAS date and returns number from 1-4.
   (Jan- March = 1;Apr-June=2;July-Sep=3;October-December=4)
7. **MDY** :- Return a SAS date value from numeric month, day and year value.

Function	Input	Output
Today	Current System Date	21534
Day	13FEB2019	13
Weekday	13FEB2019	4
Month	13FEB2019	2
Qtr	13FEB2019	1
Year	13FEB2019	2019
MDY	(02,13,2019) *Arg should be numeric	21534 (Days From 1 Jan 1960)

Formats Date/Time/Date Time :

	DATE	international airline travel (thousands)	A	B	C	D	E	F	G	H	I	J
1	JAN49	112	22DEC2018	1	7	1	1	1949	01JAN1960	01JAN1949	0	Saturday, Jan 1, 1949
2	FEB49	118	22DEC2018	1	3	2	1	1949	01JAN1960	01FEB1949	31	Tuesday, Feb 1, 1949
3	MAR49	132	22DEC2018	1	3	3	1	1949	01JAN1960	01MAR1949	60	Tuesday, Mar 1, 1949
4	APR49	129	22DEC2018	1	6	4	2	1949	01JAN1960	01APR1949	91	Friday, Apr 1, 1949
5	MAY49	121	22DEC2018	1	1	5	2	1949	01JAN1960	01MAY1949	121	Sunday, May 1, 1949
6	JUN49	135	22DEC2018	1	4	6	2	1949	01JAN1960	01JUN1949	152	Wednesday, Jun 1, 1949
7	JUL49	148	22DEC2018	1	6	7	3	1949	01JAN1960	01JUL1949	182	Friday, Jul 1, 1949
8	AUG49	148	22DEC2018	1	2	8	3	1949	01JAN1960	01AUG1949	213	Monday, Aug 1, 1949
9	SEP49	136	22DEC2018	1	5	9	3	1949	01JAN1960	01SEP1949	244	Thursday, Sep 1, 1949
10	OCT49	119	22DEC2018	1	7	10	4	1949	01JAN1960	01OCT1949	274	Saturday, Oct 1, 1949
11	NOV49	104	22DEC2018	1	3	11	4	1949	01JAN1960	01NOV1949	305	Tuesday, Nov 1, 1949
12	DEC49	118	22DEC2018	1	5	12	4	1949	01JAN1960	01DEC1949	335	Thursday, Dec 1, 1949
13	JAN50	115	22DEC2018	1	1	1	1	1950	01JAN1960	01JAN1950	0	Sunday, Jan 1, 1950
14	FEB50	126	22DEC2018	1	4	2	1	1950	01JAN1960	01FEB1950	31	Wednesday, Feb 1, 1950
15	MAR50	141	22DEC2018	1	4	3	1	1950	01JAN1960	01MAR1950	60	Wednesday, Mar 1, 1950
16	APR50	135	22DEC2018	1	7	4	2	1950	01JAN1960	01APR1950	91	Saturday, Apr 1, 1950
17	MAY50	125	22DEC2018	1	2	5	2	1950	01JAN1960	01MAY1950	121	Monday, May 1, 1950
18	JUN50	149	22DEC2018	1	5	6	2	1950	01JAN1960	01JUN1950	152	Thursday, Jun 1, 1950
19	JUL50	170	22DEC2018	1	7	7	3	1950	01JAN1960	01JUL1950	182	Saturday, Jul 1, 1950

```
data test;
set sashelp.air;
A=today();
B=day(date);
C=weekday(date);
D=month(date);
E=qtr(date);
F=year(date);
G=MDY(1,1,1960);
H=MDY(D,B,F);
I=MDY(month(date),1,year('08JAN1960'd));
J=date;
format A G H date9. J weekdate24.;
run;
```

Character and Numeric Functions:

Trim(variable) *Remove trailing Blank	Cmiss(variable/vector) *count of Missing across row both char & num. Variable.
Strip(variable) *Remove Leading and Trailing Blank	n() * count non missing values
Left(variable) * Left Align a Character String	Scan(String,nth word,delimeter) * Return nth word of the character value
Right(variable) * Right Align a Character String	Find(string,substring,modifier,start position)* It search a target string to specified substring and return numeric value.
Lowcase(variable) * Convert in Low Case	Cat(String1,String2,…Stringn) *Doesnot renove leading and trailing blank before concatenate
Upcase(variable) * Convert in Up Case	Catt(String1,String2,…Stringn) * Remove trailing blank before concatenate
Propcase(variable) * Convert in 1st character in up case and reaming low case	Cats(String1,String2,…Stringn) * Remove leading blank before concatenate
Length(variable) * Return total number of column width	Catx(delimeter,String1,String2,…Stringn) * Remove leading and trailing blank and add delimiter between string
Char(variable,pos) *Return a single character from specified position in a character String	Tranwrd (Source,target,replacement) *Search and replace from character string
Int(variable)	Input(Source,Informat) * Convert to numeric
Ceil(variable)	Put(Source,format) * Round and convert to character
Floor(variable)	Substr(String,Start position,Length) * Extract character from string
Round(variable)	Compress(Source,Character,modifier) *Removes the characters listed in the character argument from the source.
Nmiss(variable/vector) *count of Missing across row both numeric variable	Compbl(String) * Remove multiple blank from a String by translating each occurrence of two or more conjugative blank into single blank.

Character and Numeric Functions:

```
data test;
x=' Ram ';
y=' Sita ';
A=trim(x);
B=strip(x);
C=left(x);
D=right(x);
E=upcase(x);
F=lowcase(x);
g=length(x);
H=x!!y;
I=length(H);
J=char(x,2);
K=length(x);
L=length(D);
run;
```

	x	y	A	B	C	D	E	F	g	H	I	J	K	L
1	Ram	Sita	Ram	Ram	Ram	Ram	RAM	ram	4	Ram Sita	10	R	4	5

proc contents data=test; run;

Variable	Type	Len
A	Char	5
B	Char	5
C	Char	5
D	Char	5
E	Char	5
F	Char	5
H	Char	11
I	Num	8
J	Char	1
K	Num	8
L	Num	8
g	Num	8
x	Char	5
y	Char	6

Character and Numeric Functions:

```
data test2;
infile datalines;
input num;
A=int(num);
B=ceil(num);
C=Floor(num);
D=round(num);
E=round(num,5);
F=round(num,11);
G=round(num,.33);
datalines;
10
15
32.5
79
37.9
-10
-23.6
;
run;
```

num	A	B	C	D	E	F	G
10	10	10	10	10	10	11	9.9
15	15	15	15	15	15	11	14.85
32.5	32	33	32	33	35	33	32.34
79	79	79	79	79	80	77	78.87
37.9	37	38	37	38	40	33	37.95
-10	-10	-10	-10	-10	-10	-11	-9.9
-23.6	-23	-23	-24	-24	-25	-22	-23.76

If A is +ve then int(num)=floor(num)
If A is -ve then int(num)=Ceil(num)
Round: convert to nearest integer with multiple of 2nd argument.

Variable	Type	Len
A	Num	8
B	Num	8
C	Num	8
D	Num	8
E	Num	8
F	Num	8
G	Num	8
num	Num	8

Character and Numeric Functions:

```
data test3;
name='Shashi Kumar';
x=substr(name,1,2);
y=substr(name,3,2);
z=substr(name,1,7);

A=substr('Mohan',3,1);
B=substr(upcase(name),3,4);
run;
```

name	x	y	z	A	B
Shashi Kumar	Sh	as	Shashi	h	ASHI

Variable	Type	Len
A	Char	5
B	Char	12
name	Char	12
x	Char	12
y	Char	12
z	Char	12

Character and Numeric Functions:

```
data test4;
A='Today is FRIDAY';
B=scan(A,2);
C=scan(A,1,'a');
D=scan(A,-1);
E=find(A,'a');
F=find(A,'A');
G=find(A,'a',7);
H=find(A,'a','i',7);
I=' Ram ';
J=' Sita ';
K=cat(I,J,I);
L=catt(I,J,I);
M=cats(I,J,I);
N=catx('/',I,J,I);
O=catx('0',I,J,I);
P=tranwrd(N,'/','*');
Q=tranwrd(N,'Ram','Sita');
R='$500';
S=0;
T=put(S,date9.);
U=input(R,dollar4.);
run;
```

A	B	C	D
Today is FRIDAY	is	Tod	FRIDAY

E	F	G	H
4	14	0	14

I	J	K	L	M	N	O
Ram	Sita	Ram Sita Ram	Ram Sita Ram	RamSitaRam	Ram/Sita/Ram	Ram0Sita0Ram

P	Q	R	S	T	U
Ram*Sita*Ram	Sita/Sita/Sita	$500	0	01JAN1960	500

Variable	Type	Len
A	Char	15
B	Char	200
C	Char	200
D	Char	200
E	Num	8
F	Num	8
G	Num	8
H	Num	8
I	Char	5
J	Char	6
K	Char	200
L	Char	200
M	Char	200
N	Char	200
O	Char	200
P	Char	200
Q	Char	200
R	Char	4
S	Num	8
T	Char	9
U	Num	8

Character and Numeric Functions:

*%%%%%%%%%%%%%%%%%%%% compress %%%%%%%%%%%%%;

data test8;

string='**StudySAS Blog! 17752 ** ' ;
string1=compress(string,'') ; *Compress spaces. This is default;
string2=compress(string,'','ak'); *Compress alphabetic chars(1,2etc);
string3=compress(string,'','d') ; *Compress numerical values;
string4=compress(string,'','l'); *Compress lowercase characters;
string5=compress(string,'','u'); *Compress uppercase characters;
string6=compress(string,'S','k'); *Keeps only specified characters;
string7=compress(string,'!.','P'); *Compress Punctuations only;
string8=compress(string,'s','i'); *upper/lower case specified characters;
string9=compress(string,'','a'); *Compress all upper\lower case characters ;
string10=compress(string,'','s') ; * Compress or delete spaces;
string11=compress(string,'','kd') ; *Compress alphabets (Keeps only digits);

run ;

string	string1	string2	string3	string4
StudySAS Blog! 17752.	StudySASBlog!17752.	StudySAS Blog	StudySASBlog!.	SSASB!17752.

string5	string6	string7	string8
tudylog!17752.	SSS	StudySAS Blog 17752	tudyA Blog! 17752.

string9	string10	string11
!17752.	StudySASBlog!17752.	17752

Thank You ...

Presented By : Shashi Kumar