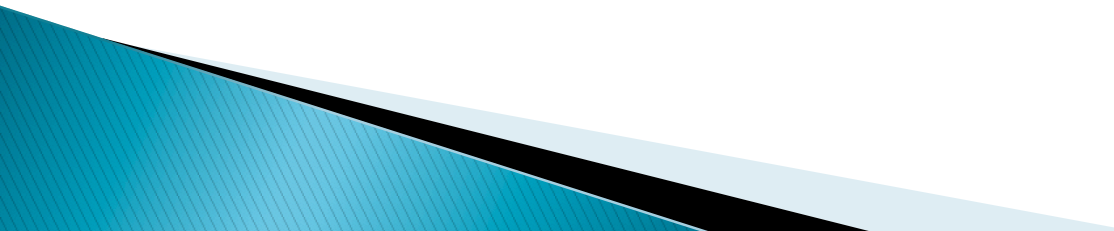


Fun with Formats

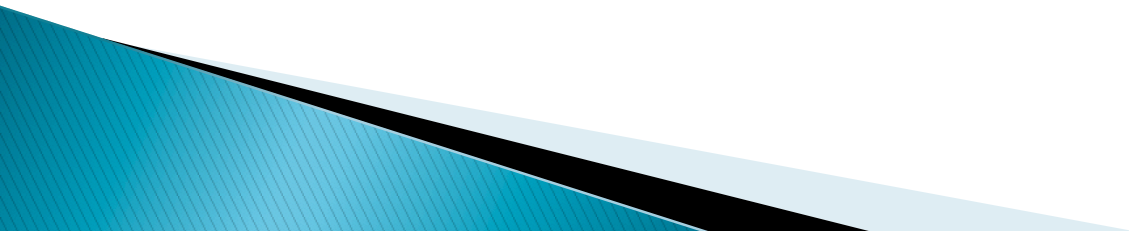
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Coders Corner CC03
PhUSE 2015

Things we will cover

- ▶ Basic formats
 - ▶ Alignment with the put statement
 - ▶ Suppressing errors
 - ▶ Converting format catalogs to datasets
 - and datasets to formats
 - ▶ Picture formats
- 

Also in the paper

- ▶ There is more in the paper than can be presented in 8 minutes so I won't present all of my slides
- ▶ You can refer to the paper or come find me if I miss something that interested you.



Basic formats

► Create a dataset

```
data phuse1 ;  
  length date $9 ;  
  input date $ ;  
  datalines ;  
  13OCT2013  
  12OCT2014  
  11OCT2015  
  ;  
run ;
```

	DATE
1	13OCT2013
2	12OCT2014
3	11OCT2015

Basic formats

► Use some formats

```
data phuse2 ;  
  set phuse1 ;  
  datenum=input(date,date9.) ;  
  dateymd=put(datenum,ymmdd10.) ;  
  year=put(datenum,year.) ;  
  year1=put(year,$4.) ;  
  year2=input(year,3.) ;  
  year3=input(year,best.) ;  
run ;
```

VIEWTABLE: Work.Phuse2							
	DATE	DATENUM	DATEYMD	YEAR	YEAR1	YEAR2	YEAR3
1	13OCT2013	19644	2013-10-13	2013	2013	201	2013
2	12OCT2014	20008	2014-10-12	2014	2014	201	2014
3	11OCT2015	20372	2015-10-11	2015	2015	201	2015

Basic formats

► Create some formats

```
proc format ;  
    value phusel 2013 = 'Brussels'  
                2014 = 'London'  
                2015 = 'Vienna'  
;  
    value $phusec 'Brussels' = 'Belguim'  
                'London' = 'England'  
                'Vienna' = 'Austria'  
;  
run ;
```

Basic formats

► Use our formats

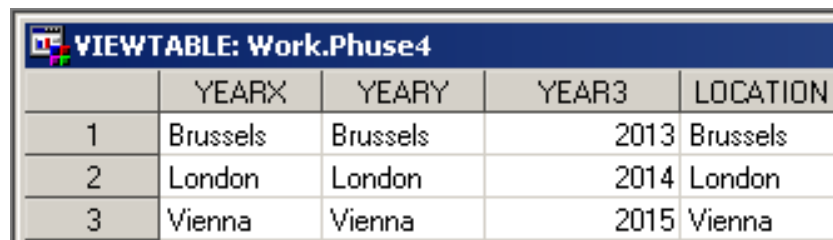
```
data phuse3 ;  
  set phuse2 ;  
  location=put(year3,phuse1.) ;  
  country=put(location,$phusec.) ;  
run ;
```

YEAR3	LOCATION	COUNTRY
2013	Brussels	Belguim
2014	London	England
2015	Vienna	Austria

Basic formats

► Format and Attrib statements

```
data phuse4(keep=year3 yearx yeary location) ;  
  format yearx phusel. ;  
  attrib yeary format=phusel. ;  
  set phuse2 ;  
  yearx=year3 ;  
  yeary=year3 ;  
  location=put(year3,phusel.) ;  
run ;
```



	YEARX	YEARY	YEAR3	LOCATION
1	Brussels	Brussels	2013	Brussels
2	London	London	2014	London
3	Vienna	Vienna	2015	Vienna

Alignment

```
data phuse5 ;  
  set phuse2 ;  
  locl=put(year3,phusel.-l) ;  
  locc=put(year3,phusel.-c) ;  
  locr=put(year3,phusel.-r) ;  
run ;
```

```
proc print data=phuse5 ;  
  var year3 locl locc locr ;  
run ;
```

Obs	YEAR3	LOCL	LOCC	LOCR
1	2013	Brussels	Brussels	Brussels
2	2014	London	London	London
3	2015	Vienna	Vienna	Vienna

Suppressing errors

► Create a dataset with dirty data

```
data phuse6 ;  
  length date $9 ;  
  input date $ ;  
  datalines ;  
  31JAN2016  
  31FEB2016  
  31MAR2016  
  ;  
run ;
```

Suppressing errors

► Run the dirty data

```
data phuse7 ;  
  set phuse6 ;  
  datenum=input(date,date9.) ;  
  dateymd=put(datenum,yymmdd10.) ;  
  check=_error_ ;  
run ;
```

```
NOTE: Invalid argument to function INPUT at line 311 column 11.  
DATE=31FEB2016 DATENUM= . DATEYMD= . CHECK=1 _ERROR_=1 _N_=2  
NOTE: Mathematical operations could not be performed at the following places.  
      missing values.  
      Each place is given by: (Number of times) at (Line):(Column).  
      1 at 311:11  
NOTE: There were 3 observations read from the data set WORK.PHUSE6.  
NOTE: The data set WORK.PHUSE7 has 3 observations and 4 variables.  
NOTE: DATA statement used:  
      real time           0.00 seconds  
      cpu time            0.00 seconds
```

Suppressing errors

► Suppress the note

```
data phuse8 ;  
    set phuse6 ;  
    datenum=input(date,?date9.) ;  
    dateymd=put(datenum,?yymmdd10.) ;  
    check=_error_ ;  
run ;
```

```
DATE=31FEB2016 DATENUM=. DATEYMD=. CHECK=1 _ERROR_=1 _N_=2  
NOTE: There were 3 observations read from the data set WORK.PHUSE6.  
NOTE: The data set WORK.PHUSE8 has 3 observations and 4 variables.  
NOTE: DATA statement used:  
      real time           0.00 seconds  
      cpu time            0.00 seconds
```

Suppressing errors

► Suppress the note and clear the _error_ flag

```
data phuse9 ;  
    set phuse6 ;  
    datenum=input(date, ??date9.) ;  
    dateymd=put(datenum, ??yymmdd10.) ;  
    check=_error_ ;  
run ;
```

```
NOTE: There were 3 observations read from the data set WORK.PHUSE6.  
NOTE: The data set WORK.PHUSE9 has 3 observations and 4 variables.  
NOTE: DATA statement used:  
      real time           0.00 seconds  
      cpu time            0.00 seconds
```

Suppressing errors

► Use a format that doesn't exist

```
data phuse10 ;  
    set phuse1 ;  
    datenum=input(date,date9.) ;  
    dateymd=put(datenum,test.) ;  
run ;
```

```
330 data phuse10 ;  
331     set phuse1 ;  
332     datenum=input(date,date9.) ;  
NOTE: SCL source line.  
333     dateymd=put(datenum,test.) ;
```

48

ERROR 48-59: The format TEST was not found or could not be loaded.

```
334 run ;
```

NOTE: The SAS System stopped processing this step because of errors.

WARNING: The data set WORK.PHUSE10 may be incomplete. When this step was stopped

NOTE: DATA statement used:

real time	0.01 seconds
cpu time	0.01 seconds

Suppressing errors

► Forcing the program to run

```
options nofmterr ;
```

```
337 data phuse10 ;
338   set phuse1 ;
339   datenum=input(date,date9.) ;
NOTE: SCL source line.
340   dateymd=put(datenum,test.) ;
      -----
      484
NOTE 484-185: Format TEST was not found or could not be loaded.

341 run ;

NOTE: There were 3 observations read from the data set WORK.PHUSE1.
NOTE: The data set WORK.PHUSE10 has 3 observations and 3 variables.
NOTE: DATA statement used:
      real time          0.03 seconds
      cpu time           0.01 seconds
```

```
options fmterr ;
```

Converting format catalogs to datasets

Contents of 'Work.Formats'

Name	Size	Type
Phusel	0.3KB	Format
Phusec	0.2KB	Formatc

```
proc format library=work cntlout=phusefmt ;  
run ;
```

VIEWTABLE: Work.Phusefmt

	FMTNAME	START	END	LABEL
1	PHUSEL	2013	2013	Brussels
2	PHUSEL	2014	2014	London
3	PHUSEL	2015	2015	Vienna
4	PHUSEC	Brussels	Brussels	Belguim
5	PHUSEC	London	London	England
6	PHUSEC	Vienna	Vienna	Austria

and datasets to formats

```
data phuse11(keep=fmtname start end label) ;  
  set phuse3 ;  
  fmtname='phuse11' ;  
  start=year3 ;  
  end=year3 ;  
  label=location ;  
run ;
```

VIEWTABLE: Work.Phuse11				
	FMTNAME	START	END	LABEL
1	phuse11	2013	2013	Brussels
2	phuse11	2014	2014	London
3	phuse11	2015	2015	Vienna

```
proc format library=work cntlin=phuse11 ;  
run ;
```

```
358 proc format library=work cntlin=phuse11 ;  
NOTE: Format PHUSELL has been output.
```

and datasets to formats

```
proc format library=work cntlout= phusefmt2 ;  
run ;
```

VIEWTABLE: Work.Phusefmt2				
	FMTNAME	START	END	LABEL
1	PHUSEL	2013	2013	Brussels
2	PHUSEL	2014	2014	London
3	PHUSEL	2015	2015	Vienna
4	PHUSELL	2013	2013	Brussels
5	PHUSELL	2014	2014	London
6	PHUSELL	2015	2015	Vienna
7	PHUSEC	Brussels	Brussels	Belguim
8	PHUSEC	London	London	England
9	PHUSEC	Vienna	Vienna	Austria

Picture formats

► Create a dataset

```
data phuse12 ;  
    input amount ;  
    datalines ;  
    5  
    5.50  
    10  
    30  
    1000  
    2000  
    ;  
run ;
```

Picture formats

► Create some picture formats

```
proc format library=work ;
```

```
    picture euros low-high='000,000€' ;
```

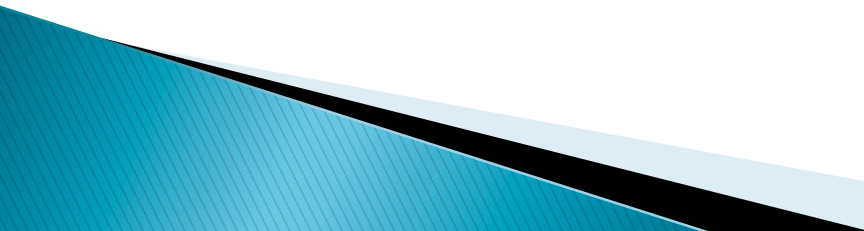
```
    picture eurosr (round) low-high='000,000€' ;
```

```
    picture pound low-high='000,000' (mult=0.73 prefix='£') ;
```

```
    picture poundr (round) low-high='000,000' (mult=0.73
```

```
    prefix='£') ;
```

```
run ;
```



Picture formats

► Apply these formats to our list of amounts

```
data phuse13 ;  
  set phuse12 ;  
  euro=put (amount,euros.) ;  
  euror=put (amount,eurosr.) ;  
  pound=put (amount,pound.) ;  
  poundr=put (amount,poundr.) ;  
run ;
```

VIEWTABLE: Work.Phuse13					
	AMOUNT	EURO	EUROR	POUND	POUNDR
1	5	5€	5€	£3	£4
2	5.5	5€	6€	£4	£4
3	10	10€	10€	£7	£7
4	30	30€	30€	£21	£22
5	1000	1,000€	1,000€	£730	£730
6	2000	2,000€	2,000€	£1,460	£1,460

Picture formats

► Apply these formats to our list of amounts

```
proc format library=work ;  
    picture pounce (round) low-100 ='000,000' (mult=0.73 prefix='£')  
        101-high='Too expensive'  
;  
run ;  
data phuse14 ;  
    set phuse12 ;  
    poundr=put (amount,poundr.) ;  
    pounce=put (amount,pounce.) ;  
run ;
```

VIEWTABLE: Work.Phuse14			
	AMOUNT	POUNDR	POUNCE
1	5	£4	£4
2	5.5	£4	£4
3	10	£7	£7
4	30	£22	£22
5	1000	£730	Too expensive
6	2000	£1,460	Too expensive

Conclusion

- ▶ Formats are one way to transform SAS data and output to match your standards or better express what you are trying to show.

References

- ▶ <http://support.sas.com/onlinedoc/913/docMainpage.jsp>
- ▶ <http://support.sas.com/onlinedoc/913/getDoc/en/lrdict.hlp/a000309859.htm>

Any Questions

