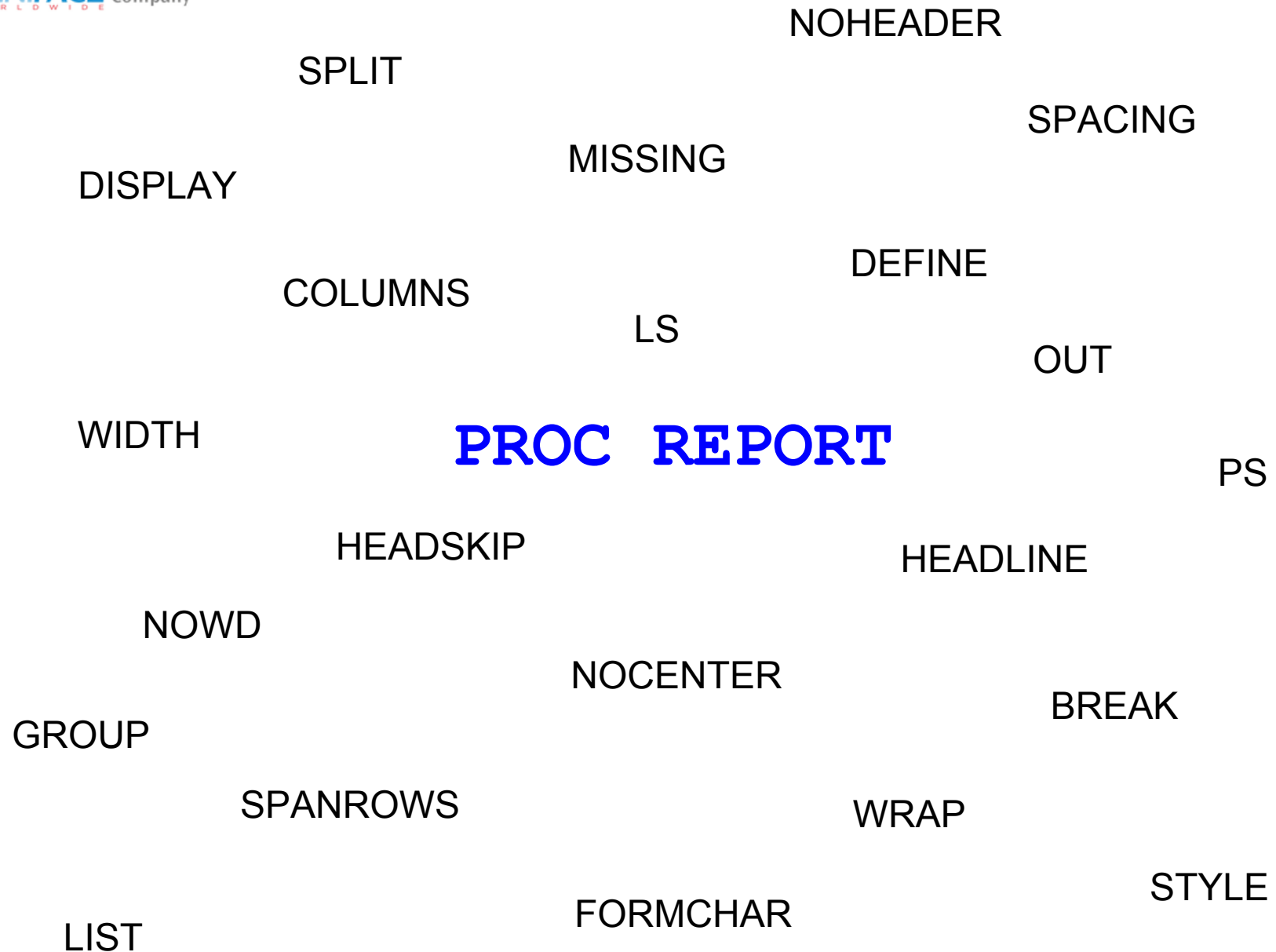


Don't be afraid of PROC REPORT – a step-by-step guide

PhUSE 2015 Vienna

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Let's start simple – basic PROC REPORT

```
title 'Simple report';  
proc report data = ads1;  
run;
```

- All variables of the selected dataset are listed

Basic PROC REPORT output

Simple report

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Date of Sign. on Informed Consent (SAS date)	Sex (DV G	Rac (DV G	Eth nic (DV G	Age	studyid	agegrp	sex	race	ethnic	visit	usubjid
15NOV2012	1	1	2	17	Test Study	Group 1 (12 - < 18 years)	Male	White	Not Hispanic or Latino	V1: ENROLLMENT	1010001
15NOV2012	1	1	2	11	Test Study	Group 2 (6 - < 12 years)	Male	Asian	Not Hispanic or Latino	V1: ENROLLMENT	1010002
16NOV2012	1	1	2	15	Test Study	Group 1 (12 - < 18 years)	Male	White	Not Hispanic or Latino	V1: ENROLLMENT	1010003
16NOV2012	2	1	2	9	Test Study	Group 2 (6 - < 12 years)	Female	White	Not Hispanic or Latino	V1: ENROLLMENT	1010004
16NOV2012	2	1	2	15	Test Study	Group 1 (12 - < 18 years)	Female	White	Not Hispanic or Latino	V1: ENROLLMENT	1010005
19NOV2012	1	1	2	17	Test Study	Group 1 (12 - < 18 years)	Male	White	Not Hispanic or Latino	V1: ENROLLMENT	1010006
19NOV2012	2	1	2	16	Test Study	Group 1 (12 - < 18 years)	Female	Asian	Not Hispanic or Latino	V1: ENROLLMENT	1010007
19NOV2012	1	1	2	16	Test Study	Group 1 (12 - < 18 years)	Male	White	Not Hispanic or Latino	V1: ENROLLMENT	1010008
19NOV2012	1	1	2	14	Test Study	Group 1 (12 - < 18 years)	Male	White	Not Hispanic or Latino	V1: ENROLLMENT	1010009
19NOV2012	2	1	2	17	Test Study	Group 1 (12 - < 18 years)	Female	White	Not Hispanic or Latino	V1: ENROLLMENT	1010010

Selecting variables

```
title 'Selecting variables';  
proc report data = adsl;  
    columns studyid usubjid agegrp sex race ethnic age;  
run;
```

- only variables specified in the `COLUMNS` statement are displayed
- order in which variables are stated in the `COLUMNS` statement determines order of the variables in the output

Selecting variables output

Selecting variables						18:09 Sunday, September 27, 2015	1
studyid	usubjid	agegrp	sex	race	ethnic	Age	
Test Study	1010001	Group 1 (12 - < 18 years)	Male	White	Not Hispanic or Latino	17	
Test Study	1010002	Group 2 (6 - < 12 years)	Male	Asian	Not Hispanic or Latino	11	
Test Study	1010003	Group 1 (12 - < 18 years)	Male	White	Not Hispanic or Latino	15	
Test Study	1010004	Group 2 (6 - < 12 years)	Female	White	Not Hispanic or Latino	9	
Test Study	1010005	Group 1 (12 - < 18 years)	Female	White	Not Hispanic or Latino	15	
Test Study	1010006	Group 1 (12 - < 18 years)	Male	White	Not Hispanic or Latino	17	
Test Study	1010007	Group 1 (12 - < 18 years)	Female	Asian	Not Hispanic or Latino	16	
Test Study	1010008	Group 1 (12 - < 18 years)	Male	White	Not Hispanic or Latino	16	
Test Study	1010009	Group 1 (12 - < 18 years)	Male	White	Not Hispanic or Latino	14	
Test Study	1010010	Group 1 (12 - < 18 years)	Female	White	Not Hispanic or Latino	17	

Defining variables

```
title 'Defining variables';  
proc report data = adsl;  
  columns studyid usubjid agegrp sex race ethnic age;  
  define studyid / 'Study ID';  
  define usubjid / 'Subject ID';  
  define agegrp / 'Age group';  
  define sex / 'Gender';  
  define race / 'Race';  
  define ethnic / 'Ethnicity';  
  define age / 'Age (Years)';  
run;
```

- PROC REPORT uses the variable labels as column headers for the output
- define individual labels for the columns

Defining variables output

Defining variables

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Study ID	Subject ID	Age group	Gender	Race	Ethnicity	Age (Years)
Test Study	1010001	Group 1 (12 - < 18 years)	Male	White	Not Hispanic or Latino	17
Test Study	1010002	Group 2 (6 - < 12 years)	Male	Asian	Not Hispanic or Latino	11
Test Study	1010003	Group 1 (12 - < 18 years)	Male	White	Not Hispanic or Latino	15
Test Study	1010004	Group 2 (6 - < 12 years)	Female	White	Not Hispanic or Latino	9
Test Study	1010005	Group 1 (12 - < 18 years)	Female	White	Not Hispanic or Latino	15
Test Study	1010006	Group 1 (12 - < 18 years)	Male	White	Not Hispanic or Latino	17
Test Study	1010007	Group 1 (12 - < 18 years)	Female	Asian	Not Hispanic or Latino	16
Test Study	1010008	Group 1 (12 - < 18 years)	Male	White	Not Hispanic or Latino	16
Test Study	1010009	Group 1 (12 - < 18 years)	Male	White	Not Hispanic or Latino	14
Test Study	1010010	Group 1 (12 - < 18 years)	Female	White	Not Hispanic or Latino	17

- `DEFINE` statement offers more options to change the appearance of the output

DEFINE options – WIDTH, FORMAT, SPACING

```
title 'Define width, format and spacing';  
proc report data = adsl;  
  columns studyid usubjid agegrp sex race ethnic age;  
  define studyid / 'Study ID' width=10.;  
  define usubjid / 'Subject ID';  
  define agegrp / 'Age group' spacing=4.;  
  define sex / 'Gender' spacing=4.;  
  define race / 'Race';  
  define ethnic / 'Ethnicity';  
  define age / 'Age (Years)' width=11. format=5.2;  
run;
```

WIDTH:

- define individual column width
- default is variable length for char variables and 8 for num variables

FORMAT:

- assign formats to the variables

SPACING:

- specify number of blank chars between columns
- default is 2

DEFINE options – WIDTH, FORMAT, SPACING output

Define width, format and spacing

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Study ID	Subject ID	Age group	Gender	Race	Ethnicity	Age (Years)
Test Study	1010001	Group 1 (12 - < 18 years)	Male	White	Not Hispanic or Latino	17.00
Test Study	1010002	Group 2 (6 - < 12 years)	Male	Asian	Not Hispanic or Latino	10.50
Test Study	1010003	Group 1 (12 - < 18 years)	Male	White	Not Hispanic or Latino	15.00
Test Study	1010004	Group 2 (6 - < 12 years)	Female	White	Not Hispanic or Latino	8.50
Test Study	1010005	Group 1 (12 - < 18 years)	Female	White	Not Hispanic or Latino	15.00
Test Study	1010006	Group 1 (12 - < 18 years)	Male	White	Not Hispanic or Latino	17.00
Test Study	1010007	Group 1 (12 - < 18 years)	Female	Asian	Not Hispanic or Latino	16.00
Test Study	1010008	Group 1 (12 - < 18 years)	Male	White	Not Hispanic or Latino	16.00
Test Study	1010009	Group 1 (12 - < 18 years)	Male	White	Not Hispanic or Latino	14.00
Test Study	1010010	Group 1 (12 - < 18 years)	Female	White	Not Hispanic or Latino	17.00

DEFINE options – ORDER, JUSTIFICATION

```

title 'Defining data order and justification';
proc report data = adsl;
  columns studyid usubjid agegrp sex race ethnic age;
  define studyid / 'Study ID'      width=10.;
  define usubjid  / 'Subject ID';
  define agegrp   / 'Age group'     spacing=4. order descending;
  define sex      / 'Gender'        spacing=4. center;
  define race     / 'Race';
  define ethnic   / 'Ethnicity';
  define age      / 'Age (Years)'   width=11. format=5.2;
run;

```

- order rows according to their formatted values
- output displays only first occurrence of the variable with the order option
- default order is ascending (can be changed using the DESCENDING option)

DEFINE options – ORDER, JUSTIFICATION output

Defining data order and justification

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Study ID	Subject ID	Age group	Gender	Race	Ethnicity	Age (Years)
Test Study	1010002	Group 2 (6 - < 12 years)	Male	Asian	Not Hispanic or Latino	10.50
Test Study	1010004		Female	White	Not Hispanic or Latino	8.50
Test Study	1010001	Group 1 (12 - < 18 years)	Male	White	Not Hispanic or Latino	17.00
Test Study	1010003		Male	White	Not Hispanic or Latino	15.00
Test Study	1010005		Female	White	Not Hispanic or Latino	15.00
Test Study	1010006		Male	White	Not Hispanic or Latino	17.00
Test Study	1010007		Female	Asian	Not Hispanic or Latino	16.00
Test Study	1010008		Male	White	Not Hispanic or Latino	16.00
Test Study	1010009		Male	White	Not Hispanic or Latino	14.00
Test Study	1010010		Female	White	Not Hispanic or Latino	17.00

- `order=data` → displays data by order in the input data set
- `order=formatted` → sorts the data by the formatted values
- `order=internal` → sorts the data as PROC SORT would sort it
- `define sortvar /`
`order=internal noprint` → sorts the data, but does not display variable in output

PROC REPORT – LIST option

```
proc report data = ads1 LIST;  
run;
```

- generates a PROC REPORT with DEFINE statements for all variables in the dataset in the Log window
- copy code from the Log window into the program window to use as starting point

PROC REPORT – LIST option log output

NOTE: Multiple concurrent threads will be used to summarize data.

```
PROC REPORT DATA=WORK.ADSL LS=142 PS=44 SPLIT="/" CENTER ;
COLUMN DMINFDT SEXD RACED ETHNICD AGE STUDYID AGEGRP SEX RACE ETHNIC VISIT USUBJID;
```

```
DEFINE DMINFDT / SUM FORMAT= DATE9. WIDTH=9 SPACING=2 RIGHT "Date of Sign. on Informed Consent (SAS date)" ;
DEFINE SEXD / SUM FORMAT= 3. WIDTH=3 SPACING=2 RIGHT "Sex (DVG Number)" ;
DEFINE RACED / SUM FORMAT= 3. WIDTH=3 SPACING=2 RIGHT "Race (DVG Number)" ;
DEFINE ETHNICD / SUM FORMAT= 3. WIDTH=3 SPACING=2 RIGHT "Ethnicity (DVG Number)" ;
DEFINE AGE / SUM FORMAT= 3. WIDTH=3 SPACING=2 RIGHT "Age" ;
DEFINE STUDYID / DISPLAY FORMAT= $25. WIDTH=25 SPACING=2 LEFT "STUDYID" ;
DEFINE AGEGRP / DISPLAY FORMAT= $25. WIDTH=25 SPACING=2 LEFT "AGEGRP" ;
DEFINE SEX / DISPLAY FORMAT= $10. WIDTH=10 SPACING=2 LEFT "SEX" ;
DEFINE RACE / DISPLAY FORMAT= $10. WIDTH=10 SPACING=2 LEFT "RACE" ;
DEFINE ETHNIC / DISPLAY FORMAT= $25. WIDTH=25 SPACING=2 LEFT "ETHNIC" ;
DEFINE VISIT / DISPLAY FORMAT= $15. WIDTH=15 SPACING=2 LEFT "VISIT" ;
DEFINE USUBJID / DISPLAY FORMAT= $10. WIDTH=10 SPACING=2 LEFT "USUBJID" ;
RUN;
```

NOTE: There were 10 observations read from the data set WORK.ADSL.

NOTE: The PROCEDURE REPORT printed pages 1-2.

NOTE: PROCEDURE REPORT used (Total process time):

```
real time      0.24 seconds
cpu time       0.02 seconds
```

Defining SPANNING HEADERS and SPLIT character

```
title 'Defining spanning headers and split character';
proc report data = adsl split='#';
  columns studyid usubjid
    ('Demographics#___' (agegrp sex race ethnic age));
  define studyid / 'Study ID'          width=10.;
  define usubjid / 'Subject ID';
  define agegrp / 'Age group'          spacing=4. order descending;
  define sex / 'Gender'                spacing=4. center;
  define race / 'Race';
  define ethnic / 'Ethnicity';
  define age / 'Age# (Years)'          width=7. format=5.2;
run;
```

- define a spanning header over multiple columns
- SPLIT character forces PROC REPORT to create a line break whenever it appears

Defining SPANNING HEADERS and SPLIT character output

Defining spanning headers and split characters

1

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Demographics						
Study ID	Subject ID	Age group	Gender	Race	Ethnicity	Age (Years)
Test Study	1010002	Group 2 (6 - < 12 years)	Male	Asian	Not Hispanic or Latino	10.50
Test Study	1010004		Female	White	Not Hispanic or Latino	8.50
Test Study	1010001	Group 1 (12 - < 18 years)	Male	White	Not Hispanic or Latino	17.00
Test Study	1010003		Male	White	Not Hispanic or Latino	15.00
Test Study	1010005		Female	White	Not Hispanic or Latino	15.00
Test Study	1010006		Male	White	Not Hispanic or Latino	17.00
Test Study	1010007		Female	Asian	Not Hispanic or Latino	16.00
Test Study	1010008		Male	White	Not Hispanic or Latino	16.00
Test Study	1010009		Male	White	Not Hispanic or Latino	14.00
Test Study	1010010		Female	White	Not Hispanic or Latino	17.00

PROC REPORT options - HEADLINE and HEADSKIP

```

title 'Using the headline and headskip option';
proc report data = adsl split='#' headline headskip;
  columns studyid usubjid
           ('Demographics#___' (agegrp sex race ethnic age));
  define studyid / 'Study ID'      width=10.;
  define usubjid / 'Subject ID';
  define agegrp / 'Age group'      spacing=4. order descending;
  define sex / 'Gender'           spacing=4. center;
  define race / 'Race';
  define ethnic / 'Ethnicity';
  define age / 'Age#(Years)'      width=7. format=5.2;
run;

```

- HEADLINE draws a line under all column headings and the spaces between them
- HEADSKIP creates an empty row beneath all column headings

PROC REPORT options - HEADLINE and HEADSKIP output

Using the headline and headskip option

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Demographics

Study ID	Subject ID	Age group	Gender	Race	Ethnicity	Age (Years)
Test Study	1010002	Group 2 (6 - < 12 years)	Male	Asian	Not Hispanic or Latino	10.50
Test Study	1010004		Female	White	Not Hispanic or Latino	8.50
Test Study	1010001	Group 1 (12 - < 18 years)	Male	White	Not Hispanic or Latino	17.00
Test Study	1010003		Male	White	Not Hispanic or Latino	15.00
Test Study	1010005		Female	White	Not Hispanic or Latino	15.00
Test Study	1010006		Male	White	Not Hispanic or Latino	17.00
Test Study	1010007		Female	Asian	Not Hispanic or Latino	16.00
Test Study	1010008		Male	White	Not Hispanic or Latino	16.00
Test Study	1010009		Male	White	Not Hispanic or Latino	14.00
Test Study	1010010		Female	White	Not Hispanic or Latino	17.00

SAS ® options – PAGESIZE and LINESIZE

```
option pagesize=44 linesize=125;
```

```
title 'Using the pagesize and linesize option';
proc report data = adsl split='#' headline headskip spacing=3;
  columns studyid usubjid
    ('Demographics#____' (agegrp sex race ethnic age));
  define studyid / 'Study ID'          width=10.;
  define usubjid / 'Subject ID';
  define agegrp / 'Age group'          spacing=4. order descending;
  define sex / 'Gender'                spacing=4. center;
  define race / 'Race';
  define ethnic / 'Ethnicity';
  define age / 'Age#(Years)'          width=7. format=5.2;
run;
```

- PAGESIZE and LINESIZE control general width / height of the output
- used as PROC REPORT options they overwrite the general SAS® options

SAS ® options – PAGESIZE and LINESIZE output

Using the pagesize and linesize option

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1

Demographics

Study ID	Subject ID	Age group	Gender	Race	Ethnicity	Age (Years)
Test Study	1010002	Group 2 (6 - < 12 years)	Male	Asian	Not Hispanic or Latino	10.50
Test Study	1010004		Female	White	Not Hispanic or Latino	8.50
Test Study	1010001	Group 1 (12 - < 18 years)	Male	White	Not Hispanic or Latino	17.00
Test Study	1010003		Male	White	Not Hispanic or Latino	15.00
Test Study	1010005		Female	White	Not Hispanic or Latino	15.00
Test Study	1010006		Male	White	Not Hispanic or Latino	17.00
Test Study	1010007		Female	Asian	Not Hispanic or Latino	16.00
Test Study	1010008		Male	White	Not Hispanic or Latino	16.00
Test Study	1010009		Male	White	Not Hispanic or Latino	14.00
Test Study	1010010		Female	White	Not Hispanic or Latino	17.00

SAS ® options – NOCENTER and PAGENO

```
option pagesize=44 linesize=125 nocenter pageno=7;

title 'Using the nocenter and pageno option';
proc report data = ads1 split='#' headline headskip spacing=3;
  columns studyid usubjid
           ('Demographics#____' (agegrp sex race ethnic age));
  define studyid / 'Study ID'          width=10.;
  define usubjid / 'Subject ID';
  define agegrp / 'Age group'          spacing=4. order descending;
  define sex / 'Gender'                spacing=4. center;
  define race / 'Race';
  define ethnic / 'Ethnicity';
  define age / 'Age#(Years)'          width=7. format=5.2;
run;
```

- NOCENTER tells PROC REPORT to left-justify the report and summary text
- PAGENO controls the number used as starting number for the page numbering

SAS ® options – NOCENTER and PAGENO output

Using the nocenter and pageno option

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Demographics						
Study ID	Subject ID	Age group	Gender	Race	Ethnicity	Age (Years)
Test Study	1010002	Group 2 (6 - < 12 years)	Male	Asian	Not Hispanic or Latino	10.50
Test Study	1010004		Female	White	Not Hispanic or Latino	8.50
Test Study	1010001	Group 1 (12 - < 18 years)	Male	White	Not Hispanic or Latino	17.00
Test Study	1010003		Male	White	Not Hispanic or Latino	15.00
Test Study	1010005		Female	White	Not Hispanic or Latino	15.00
Test Study	1010006		Male	White	Not Hispanic or Latino	17.00
Test Study	1010007		Female	Asian	Not Hispanic or Latino	16.00
Test Study	1010008		Male	White	Not Hispanic or Latino	16.00
Test Study	1010009		Male	White	Not Hispanic or Latino	14.00
Test Study	1010010		Female	White	Not Hispanic or Latino	17.00

SAS ® options – NODATE and NONUMBER

```
option pagesize=44 linesize=125 nocenter pageno=7
    nodate nonumber;
```

```
title 'Using the nodate and nonumber option';
proc report data = adsl split='#' headline headskip spacing=3;
    columns studyid usubjid
        ('Demographics#___' (agegrp sex race ethnic age));
    define studyid / 'Study ID'          width=10.;
    define usubjid / 'Subject ID';
    define agegrp / 'Age group'          spacing=4. order descending;
    define sex / 'Gender'                spacing=4. center;
    define race / 'Race';
    define ethnic / 'Ethnicity';
    define age / 'Age#(Years)'          width=7. format=5.2;
run;
```

- NODATE and NONUMBER suppress the output of date / page number in output

SAS ® options – NODATE and NONUMBER output

Using the nodate and nonumber option

Demographics						
Study ID	Subject ID	Age group	Gender	Race	Ethnicity	Age (Years)
Test Study	1010002	Group 2 (6 - < 12 years)	Male	Asian	Not Hispanic or Latino	10.50
Test Study	1010004		Female	White	Not Hispanic or Latino	8.50
Test Study	1010001	Group 1 (12 - < 18 years)	Male	White	Not Hispanic or Latino	17.00
Test Study	1010003		Male	White	Not Hispanic or Latino	15.00
Test Study	1010005		Female	White	Not Hispanic or Latino	15.00
Test Study	1010006		Male	White	Not Hispanic or Latino	17.00
Test Study	1010007		Female	Asian	Not Hispanic or Latino	16.00
Test Study	1010008		Male	White	Not Hispanic or Latino	16.00
Test Study	1010009		Male	White	Not Hispanic or Latino	14.00
Test Study	1010010		Female	White	Not Hispanic or Latino	17.00

SAS ® options – Date as footnote

```
option pagesize=44 linesize=125 ...;
title 'Adding the date as a footnote';
```

```
footnote "%left(%qsysfunc(date()),date9.)";
```

```
proc report data = adsl split='#' headline headskip spacing=3;
  columns studyid usubjid
           ('Demographics#____' (agegrp sex race ethnic age));
  define studyid / 'Study ID'      width=10.;
  define usubjid / 'Subject ID';
  define agegrp / 'Age group'      spacing=4. order descending;
  define sex / 'Gender'           spacing=4. center;
  define race / 'Race';
  define ethnic / 'Ethnicity';
  define age / 'Age#(Years)'      width=7. format=5.2;
run;
```

- Date can be retrieved over the system date and added as a footnote

SAS ® options – Date as footnote output

Adding the date as a footnote

Study ID	Subject ID	Age group	Demographics			Age (Years)
			Gender	Race	Ethnicity	
Test Study	1010002	Group 2 (6 - < 12 years)	Male	Asian	Not Hispanic or Latino	10.50
Test Study	1010004		Female	White	Not Hispanic or Latino	8.50
Test Study	1010001	Group 1 (12 - < 18 years)	Male	White	Not Hispanic or Latino	17.00
Test Study	1010003		Male	White	Not Hispanic or Latino	15.00
Test Study	1010005		Female	White	Not Hispanic or Latino	15.00
Test Study	1010006		Male	White	Not Hispanic or Latino	17.00
Test Study	1010007		Female	Asian	Not Hispanic or Latino	16.00
Test Study	1010008		Male	White	Not Hispanic or Latino	16.00
Test Study	1010009		Male	White	Not Hispanic or Latino	14.00
Test Study	1010010		Female	White	Not Hispanic or Latino	17.00

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PROC PRINTTO

```
option pagesize=44 linesize=125 ...;
```

```
FILENAME outfile "Pathtoyourdirectory/output.lst";
```

```
PROC PRINTTO FILE = outfile NEW;  
RUN;
```

```
title 'Adding the date as a footnote';
```

```
footnote "%left(%qsysfunc(date()),date9.)";
```

```
proc report data = adsl split='#' headline headskip spacing=3;
```

```
...
```

```
run;
```

```
PROC PRINTTO;  
RUN;
```

PROC PRINTTO (II)

- Previous examples would be displayed in output window or in a file called similar to the program
- redirect the output to a physical file named as desired
- one opening call before the `PROC REPORT` including the filename
- one closing call after the `PROC REPORT`
- `NEW` option forces the procedure to clear the old output before creating a new one

Questions?

ACCOVION

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