

ON PATHS LESS TRODDEN...

Excursions

in SAS/GRAPH®

and

PROCTABULATE

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PART I:

PROC TABULATE

PROC TABULATE: GENERAL

- Powerful
- Tricky
 - has its own book:
 - *The SAS Guide to TABULATE Processing*

PROC TABULATE: GENERAL

- Often used as a big brother to PROC FREQ to display counts and sums that require more than two levels of nesting on a page
- Can aggregate any level of its elements' detail
 - label formatting can help distinguish aggregations of variables

PROC TABULATE: TYPES OF VARIABLES

Uses two kinds of variables:

- classification variables
 - CLASS statement
 - can be either numeric or character variables
 - can be grouped with a FORMAT statement
 - default statistic is N
- analysis variables
 - VAR statement
 - must be numeric
 - default statistic is SUM

PROC TABULATE: INTERRELATING VARIABLES

- CONCATENATION
 - can concatenate variables and statistics to each other in any dimension
- CROSSING (nesting)
 - reveals much of the power of PROC TABULATE
 - can cross variables and statistics with each other and also with formats

**PROC TABULATE:
DIMENSIONS OF DISPLAY**

- Can aggregate and display the aggregations in three dimensions (in ascending order of necessity):
 - column
 - row
 - page
- Dimensional specifications are separated with commas and can be quite complex

**PROC TABULATE:
DIMENSIONS OF DISPLAY**

- Can aggregate in any dimension with ALL
 - can use labels to distinguish levels of aggregation
- Can also group data over pages with a BY statement--works if there is no need to aggregate across BY groups

**PROC TABULATE:
AVAILABLE STATISTICS**

- Can display many of the statistics available through PROC MEANS
- Percentages: PCTN (the percentage a cell comprises of a count) and PCTSUM (the percentage that a cell comprises of a sum)
 - it is **IMPERATIVE** and often tricky to use the correct denominator!
 - wise to test on “easy” data before applying it to the real data

**PROC TABULATE:
LIMITATIONS**

- Can consume large (perhaps excessive) amounts of CPU time
- Version 8 is the first to include an OUTput dataset

**PROC TABULATE:
DOWNLOADING OUTPUT**

- Transfer as text
- May help to eliminate cell separators with the NOSEPS and/or FORMCHAR
 - pro: this can make the output easier to work with in a spreadsheet
 - con: this can make the output confusing to interpret by obscuring inter-cell relationships

PART II:

SAS/GRAPH

**SAS/GRAPH:
THE G-PREFIX**

- All SAS/GRAPH PROCs begin with G-
- Requires a special set of SAS options--GOPTIONS

**SAS/GRAPH:
OUTPUT**

- Connects with output equipment using appropriate GOPTIONS and JCL
- Can print output directly from the mainframe or download to a PC and process with Adobe Acrobat®
- Can also output directly to Intranet/Internet

**SAS/GRAPH:
COORDINATES**

SAS/GRAPH
measures coordinates
from the upper left
corner of the page

**SAS/GRAPH:
TEXT**

- | | |
|--------------------------------------|--|
| • Can control any text in the output | • Can control many aspects of text in the output |
| – headings | – font |
| – axes | – color |
| – footnotes | – weight |
| – annotations | – slant |

**SAS/GRAPH:
ANNOTATIONS**

- Add text to the outputs from SAS/GRAPH PROCs
- Stored in a SAS dataset that includes
 - text of the annotation
 - a value to link it to the input for the PROC
 - formatting information

**SAS/GRAPH:
COLORS**

- Can control colors of many elements of output, including
 - text
 - figures
 - borders
- Realization is device-dependent--colors may show up differently on (e.g.,) monitors and printers
- SAS can assign a default sequence of colors, or programmers can select sequences that they want

SAS/GRAPH: COLORS

Can use several naming schemes:

- SAS idiomatic color names
 - eight pages of choices in the Version 6 manual
- RGB (RED/GREEN/BLUE) scheme
- HLS (HUE/LIGHTNESS/SATURATION) scheme
- grey-scale scheme

SAS/GRAPH: PROC GCHART

Provides many standard graphing capabilities:

- star charts
- block charts
- pie charts
- bar charts

SAS/GRAPH: PROC GCHART

BAR CHARTS

- horizontal bars (HBAR)

SAS/GRAPH: PROC GCHART

BAR CHARTS

- horizontal bars (HBAR)
- vertical bars (VBAR)

-SAS/GRAPH: PROC GSLIDE

- Great for text screens
 - every element may need an observation in an ANNOTATE dataset
 - also generates some graphics of its own (e.g., bar charts)

SAS/GRAPH: PROC GCHART

Provides many standard graphing capabilities:

- star charts
- block charts
- pie charts

**SAS/GRAPH:
PROC GCHART**

BAR CHARTS

- horizontal bars (HBAR)
- vertical bars (VBAR)
- can group bars with a GROUP statement and stack them with a SUBGROUP statement

**SAS/GRAPH:
PROC GCHART**

Interesting use of the term
“midpoint” to mean “category”

- not used in its strict mathematical sense to mean the half-way point between the two ends of a quantitative continuum
- can be used for any value, grouped or elemental, of a numeric or character variable

**SAS/GRAPH:
PROC GPLOT**

**Cannot connect values
in PROC GCHART--
need to use GPLOT**

**SAS/GRAPH:
PROC GPLOT**

- Can use SAS's default symbols, or programmers can select which to use
- Can assign SYMBOL definitions comparably to AXIS or TITLE definitions
- Can use some pre-defined SAS symbols (e.g., DOT, SQUARE, DIAMOND) or can use letters, including their analogues in SPECIAL and MARKER fonts

**SAS/GRAPH:
PROC GPLOT**

Joining symbols:

INTERPOLATION options

- no joining required
- lines (straight lines)
- splines (curved lines)
- needles
 - join symbols to the x-axis rather than to each other
 - can be made to look like bars on a bar graph

**SAS/GRAPH:
PROC GPLOT**

Several plots on a single graph

- OVERLAY option: several plots keyed to a single set of axes
- PLOT2 option: one or more plots keyed to the same x-axis as the first set of plots and to a second y-axis printed on the graph's right

**SAS/GRAPH:
PROC GREPLAY**

**Great for presenting
output from several
SAS/GRAPH
procedures as panels
on a single page**

**SAS/GRAPH:
PROC GREPLAY**

**Use a template partly
generated through PROC
GSLIDE and assigned in
PROC GREPLAY**

**SAS/GRAPH:
PROC GREPLAY**

**Requires an internal (to the SAS job) catalog
of output from preceding procedures**
– created by GOUT (graph output) clauses in
preceding procedures

**SAS/GRAPH:
PROC GREPLAY**

**Requires an interior (to the SAS job) catalog
of output from preceding procedures**
– created by GOUT (graph output) clauses in
preceding procedures
– referenced in GREPLAY with the IGOUT
(input graph output catalog)

**SAS/GRAPH:
PROC GREPLAY**

**Need to assign proper
co-ordinates for each
corner of each panel**

QUESTIONS ?