Abstract

Too much information is itself the biggest barrier to information delivery/absorption.

Pulitzer's first rule for journalists was: "Put it before them briefly so they will read it."

This is a tutorial about design and construction of data presentation for effective communication. The tutorial explains and shows how to emphasize, order, rank, and subset information, and how to handle the viewer's concerns when presenting partial information. Though my original intention had been to discuss only tabular presentation of data, graphic techniques for showing what's important are illustrated as well.

Many of the design principles require no special programming tricks. For others, the tutorial provides working SAS* macros, readily usable for your data presentation applications.

Make It Easy To Read

Unless you have no other way to emphasize a word or string of text, never use all upper case. Mixed upper and lower case is the printed communication standard. Mixed case is easier to read—that's why it's the standard. Use bold or italics for emphasis.

Avoid Useless Precision

For business presentations and reports, one is typically not doing science. Therefore, usually suppress excessive decimals. If the sum of a group of rounded values would be "wrong", a note to the audience or reader will suffice.

"Let Part Stand for the Whole"

Somewhere I read the above recommendation for effective communication. I cannot cite the published source. The point is that often, if not almost always, the essence or the most significant is enough. And, if more turns out to truly be desired, it can be supplied on demand, rather than as routine.

"First Things First"

The cover for a recent issue of Ora-dot-com said, "The intelligence of a civilization can be measured by its ability to prioritize information."

Sequencing Information Presentation in a Report

- First page, an Exception Report (Exhibit 3)
  To monitor actual measurements versus goals or thresholds, any exceptions must be on Page 1 if hardcopy, or selectable as Option 1 if online. All exceptions should be on the same page/screen, even if the items unrelated. The user may not bother to look further if everything is OK.

- Second page, a Summary Report (Exhibit 4).
  If the report includes trend charts and/or historical tables, there should be a one-page summary to show all the current report-month (or report-week or report-day) critical values.

- Then, everything else.

Sequencing Information in a Table, List, or Graph

- To provide a tool for rapid identification and assessment of categories of significance, order table or graph entries by decreasing value of the measurement of interest. (Exhibits 5, 6, 7, 10, 11)

- To provide an all-encompassing look-up tool for a large set of categories, order table or graph entries alphabetically by category name.

Subset Ranking Reports

- Focus attention on high-impact categories

- Often the high-ranking categories that can be fit on one page account for 80-99% of the total of the measurement of interest, even if the full list of categories would run to several pages.

- Limit the list—show only:
  - Top 10, Top 40, Top NN, etc. (Exhibit 5)
  - values above a minimum cut-off (Exhibit 6)

See Exhibits 5A, 6A, and 8 for the programs and the TOPNN macro.

- When limiting the list, provide a subtitle that your program (in my case, the TOPNN macro) automatically loads with a statement of what percent of the total for all observations is accounted for by the Top NN observations listed in the ranking report.
Nested Ranking Report (Exhibit 7)

The Nested Ranking Report includes all the observations, not just the Top NN or those that are above a specified minimum. It is used for the situation where the observations belong to a CLASS and a SUBCLASS. The RANKNEST macro assumes that the response (or RANKVAR) has already been summed to the SUBCLASS level. See Exhibits 7A and 9 for the program and macro. You can generalize the macro to sum the response at the SUBCLASS level.

At the end of the report, the grand total response is listed. For PAGEBY= YES, the report starts a new page every time the CLASS changes.

Nested Ranking is a natural “drill-down” from a simple CLASS level summary report.

Ranking Shares of the Whole When Numerous:
Annotated Ranked Horizontal Bar Chart (Exhibit 10)

When the shares of the whole are too numerous or too small, there may not be room to display the slice name, value, and percent of whole. The annotated ranked horizontal bar chart is a feasible solution. (See Exhibits 10A and 10B for the program and macro.)

In any case, an ordered horizontal bar chart is a good way to compare response across categories, especially when you do not want to show percent of whole.

Ranking Shares of the Whole When Few:
New, Improved Pie Chart (Exhibit 11)

When the shares of the whole are few or moderate in number, the best alternative is my New, Improved Pie Chart. For how to create it, see my paper “Reinventing the Pie Chart: Improved and Reliable Communication for This Popular Business Chart”, elsewhere in these Proceedings.

Summarizing Shares of the Whole into Two:
Power of the Pac-Man Pie Chart (Exhibits 1 & 2)

The idea of a two-part pie chart may seem trivial, if not silly. But when the share of interest to your message is either tiny or huge, the image is very “impactful” and, therefore, memorable.

In the case of Exhibit 2, you can easily satisfy any curiosity about “Other” with a table displayed below the pie chart. But it is essential to not blunt the visual message by splitting the big wedge into a lot of tiny ones which may be as small as or smaller than the wedge whose smallness you wish to emphasize.

Notices

SAS and SAS/GRAPH are registered trademarks of SAS Institute Inc., Cary, NC, USA. Pac-Man is a registered trademark of Namco Ltd., Tokyo, Japan.

I used SAS System Release 6.08. My SAS code was tested, but any adopted by you must be tested, and you must assume responsibility for consequences of its use.

Author
Dr. LeRoy Bessler
P.O. Box 96
Fox Point, WI 53201-0096, USA
Telephone: 414-351-6748

IBM Mainframe Data Analysis Software
Market Shares

SAS - 91%
Other

Source: Computer Intelligence, 1993

Exhibit 1. Pac-Man Pie Chart

Allocation of Personal Time
(Probably Exaggerated)

Other
Fun - 9%

Source: Ascetic Life, April 1995

Exhibit 2. The Other Pac-Man
Ralph's Grocery Store
Exceptions - March 1992

<table>
<thead>
<tr>
<th>Exception</th>
<th>Actual Value</th>
<th>Goal or Threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grocery Returns (% of sales)</td>
<td>2.30</td>
<td>1</td>
</tr>
<tr>
<td>Employee Hours Late or Absent (% of scheduled)</td>
<td>3.03</td>
<td>1</td>
</tr>
</tbody>
</table>

*If no exceptions listed, then no goals missed, no thresholds reached.

Exhibit 3. Exception Report

Ralph's Grocery Store
Summary - March 1992

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$14,153</td>
</tr>
<tr>
<td>Operating Costs (Rent, Utilities, Etc.)</td>
<td>$1,139</td>
</tr>
<tr>
<td>Returns</td>
<td>$326</td>
</tr>
<tr>
<td>Store Open Hours</td>
<td>264</td>
</tr>
<tr>
<td>Employee Hours Scheduled</td>
<td>528</td>
</tr>
<tr>
<td>Employee Hours Worked</td>
<td>512</td>
</tr>
<tr>
<td>Employee Hours Late or Absent</td>
<td>16</td>
</tr>
</tbody>
</table>

For history, see appropriate graphs elsewhere in this report.

Exhibit 4. Summary Report (Headings suppressed with LABEL var='00'X)
Top 10 SAS PROCs Used From 12-01-93 To 01-31-95

This list accounts for 89.9% of the total count.

<table>
<thead>
<tr>
<th>Rank</th>
<th>PROC</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DATASTEP</td>
<td>212,421</td>
</tr>
<tr>
<td>2</td>
<td>SORT</td>
<td>70,214</td>
</tr>
<tr>
<td>3</td>
<td>PRINT</td>
<td>26,836</td>
</tr>
<tr>
<td>4</td>
<td>GPlot</td>
<td>22,564</td>
</tr>
<tr>
<td>5</td>
<td>MEANS</td>
<td>19,183</td>
</tr>
<tr>
<td>6</td>
<td>FORMAT</td>
<td>17,522</td>
</tr>
<tr>
<td>7</td>
<td>REG</td>
<td>15,642</td>
</tr>
<tr>
<td>8</td>
<td>PRINTTO</td>
<td>11,449</td>
</tr>
<tr>
<td>9</td>
<td>DATASETS</td>
<td>9,265</td>
</tr>
<tr>
<td>10</td>
<td>CONTENTS</td>
<td>7,940</td>
</tr>
</tbody>
</table>

Exhibit 5. Top 10 Ranking Report

STOPN=DATA=IN_DATA;
CLASSVAR=SASPROC;
CVARLABL='PROC';
RANKVAR=COUNT;
RVARFMT=COUNT;
RVARLABL='Count';
WIND="=;
RUN;

Exhibit SA. Program for Exhibit 5

Ranked List of SAS PROCs Used From 12-01-93 To 01-31-95

This list accounts for 86.3% of the total count.

Only values not less than 10,998 are listed.

<table>
<thead>
<tr>
<th>Rank</th>
<th>PROC</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DATASTEP</td>
<td>212,421</td>
</tr>
<tr>
<td>2</td>
<td>SORT</td>
<td>70,214</td>
</tr>
<tr>
<td>3</td>
<td>PRINT</td>
<td>26,836</td>
</tr>
<tr>
<td>4</td>
<td>GPlot</td>
<td>22,564</td>
</tr>
<tr>
<td>5</td>
<td>MEANS</td>
<td>19,183</td>
</tr>
<tr>
<td>6</td>
<td>FORMAT</td>
<td>17,522</td>
</tr>
<tr>
<td>7</td>
<td>REG</td>
<td>15,642</td>
</tr>
<tr>
<td>8</td>
<td>PRINTTO</td>
<td>11,449</td>
</tr>
<tr>
<td>9</td>
<td>DATASETS</td>
<td>9,265</td>
</tr>
<tr>
<td>10</td>
<td>CONTENTS</td>
<td>7,940</td>
</tr>
</tbody>
</table>

Exhibit 6. Ranking Report With Cutoff

STOPN=DATA=IN_DATA;
CLASSVAR=SASPROC;
CVARLABL='PROC';
RANKVAR=COUNT;
RVARFMT=COUNT;
RVARLABL='Count';
WIND="=;
MINVAR=10998;
RUN;

Exhibit 6A. Program for Exhibit 6

Ranking Report on SAS System Use, 12-01-93 To 01-31-95

<table>
<thead>
<tr>
<th>Rank</th>
<th>Product</th>
<th>PROC</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Base SAS</td>
<td>DATASTEP</td>
<td>212,421</td>
</tr>
<tr>
<td>2</td>
<td>PRINT</td>
<td>PRINT</td>
<td>22,564</td>
</tr>
<tr>
<td>3</td>
<td>MEANS</td>
<td>MEANS</td>
<td>19,183</td>
</tr>
<tr>
<td>4</td>
<td>FORMAT</td>
<td>FORMAT</td>
<td>17,522</td>
</tr>
<tr>
<td>5</td>
<td>REG</td>
<td>REG</td>
<td>15,642</td>
</tr>
<tr>
<td>6</td>
<td>PRINTTO</td>
<td>PRINTTO</td>
<td>11,449</td>
</tr>
<tr>
<td>7</td>
<td>DATASETS</td>
<td>DATASETS</td>
<td>9,265</td>
</tr>
<tr>
<td>8</td>
<td>CONTENTS</td>
<td>CONTENTS</td>
<td>7,940</td>
</tr>
</tbody>
</table>

Exhibit 7. Nested Ranking Report

STOPN=DATA=IN_DATA;
CLASSVAR=PRODUCT;
SUBCLASS=SASPROC;
RANKVAR=COUNT;
RVARFMT=COUNT;
RVARLABL='Count';
WIND="=;
MINVAR=10983;
RUN;

Exhibit 7A. Program for Exhibit 7

Exhibit 5

Exhibit 6

Exhibit 7
XMACRO TOPNN

```plaintext
DATA;
SET DATA;
GLOBAL BELLOMHN;
IF _N_ = 1 THEN CALL SYMPUT('BELLOMHN', 'N');
IF SKNEVAR = '+' THEN DO;
   IF BRANKVAR = 'B' THEN RETURN;
   ELSE DO;
      CALL SYMPUT('BELLOMHN', 'N');
      DELETE;
   END;
END;
KEEP CLASSVAR B RANKVAR;
RUN;
```

```plaintext
PROC SORT OUT=FORTOP; BY DESCENDING B RANKVAR;
RUN;
DATA TOREPORT;
SET FOR.TOPNN.
IF _N_ < ANN + 1;
RANK ;; _N_;
RUN;
```

```plaintext
PROC MEANS DATA=&DATA NOPRINT SUM N;
VAR B RANKVAR;
OUTPUT OUT=ALL SUM=N SUMTOP N=NTOT;
RUN;
```

```plaintext
PROC MEANS DATA=TOREPORT NOPRINT SUM N;
VAR B RANKVAR;
OUTPUT OUT=TOPNN SUM=N SUMTOP N=NTOT;
RUN;
DATA _NULL_; MERGE ALL TOPNN;
FORHT PCTTOT S.I. PCTTOT = ROUNDHIIII • (SUMTOP
I SUMTOT) * 100;
```

```plaintext
GLOBAL RANKLEN:
CALL SYMPUT('RANKLEN', LENGTH(LEFT(ANN) I 2);
GLOBAL MIN;
IF AHTTLMIN .. 1 THEN CALL SYMPUT('MIN', TRIM(LEFT(PUT(&MINRVAR,&RVARFMT)) I 1);
GLOBAL PCTTOT;
CALL SYMPUT('PCTTOT', TRIM(LEFT(PCTTOT)) I 1);
GLOBAL HTTLTOP;
FORMAT TILTPON $14.;
IF HTOP = 1 THEN DO;
   TILTPON = "Top Ann;"
   CALL SYMPUT('TILTPON', 'Top Ann');
   END;
ELSE DO;
   TILTPON = "Ranked List of;"
   IF AHTTLMIN .. 1 THEN CALL SYMPUT('TILTPON', 'Top Ann');
   ELSE CALL SYMPUT('TILTPON', 'Top Ann');
GLOBAL TILTPON;
CALL SYMPUT('TILTPON', 'Top Ann');
RUN;
```

```plaintext
OPTIONS MISSING=' ', NODATE NONUMBER;
PROC PRINT DATA=TOREPORT NOOBS U LABEL SPLIT='*';
FORMAT RANK B RANKVAR; FORMAT B RANKVAR B RANKVAR;
LABEL RANK = "Rank" B RANKVAR = "Rank";
VAR RANK B ECLASSVAR B ECLASSVAR B RANKVAR;
SUM B RANKVAR; TITLE1 'TILTPON TILTPON';
TITLE2 "This list accounts for BPTOT of the total";
EXHIBIT TILTPON(TILTPON);
SUM B XHTLMIN; XHTLMIN = 1 XTHEN NDD;
```

```plaintext
EXHIBIT TOPNN;
```

Exhibit 8. TOPNN Macro

---

XMACRO RANKNEST

```plaintext
DATA _NULL_; SET DATA END=LAST;
GLOBAL CLASSVAR;
RETAIN CLASS 1.2 CLASSES = MAX(CLASS1 .. LENGTH(CLASS1)) + 1;
IF LAST THEN CALL SYMPUT('CLASSLEN', CLASS1); CLASSES);
RUN;
```

```plaintext
PROC SORT DATA=DATA OUT=SORT1;
BY CLASS;
RUN;
```

```plaintext
PROC MEANS DATA=SORT1 NOPRINT SUM N;
BY CLASS;
VAR RANKVAR;
OUTPUT OUT=COUNTED N=CLASSIZE;
```

```plaintext
DATA _NULL_; SET COUNTED;
GLOBAL RANKLEN;
CALL SYMPUT('RANKLEN', LENGTH(LEFT(CLASSIZE)));
RUN;
```

```plaintext
PROC SORT DATA=COUNTED OUT=SORT2;
BY DESCENDING RANKVAR;
RUN;
```

```plaintext
DATA RANKDATA;
SET SORT2.
LENGTH RANK RANKLEN;
RANK = TRIM(LEFT(RANK));
XLET RANKLEN = XEVAL('RANKLEN + CLASSIZE + 2); LENGTH RANKCLAS + 1;
RANKCLAS = TRIM(LEFT(RANK));
KEEP ACLASS RANKCLAS;
RUN;
```

```plaintext
PROC SORT DATA=RANKDATA OUT=SORT3;
BY RANKCLAS;
RUN;
```

```plaintext
PROC PRINT DATA=TOPRINT LABEL;
IF PAGEBY = "YES" THEN DO;
   PAGEBY RANKCLAS;
   XEND;
   OPTIONS MISSING=' ', NODATE NONUMBER;
   PROC PRINT DATA=TOPRINT LABEL SIF XTHEN XDD;
   PAGEBY RANKCLAS;
   XEND;
   BY RANKCLAS;
   KEEP RANKCLAS BSUBCLASS BCLASSVAR;
   RUN;
```

```plaintext
PROC SORT DATA=MERGED OUT=TOPPRINT;
BY RANKCLAS DESCENDING BCLASSVAR;
RUN;
```

```
Exhibit 9. RANKNEST Macro

---

307
State and Local Government Employment By State In October 1991

State Name, Percent of USA Total, and Employee Count

<table>
<thead>
<tr>
<th>State</th>
<th>Percent of USA Total</th>
<th>Employee Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>California</td>
<td>10.9%</td>
<td>1,429,149</td>
</tr>
<tr>
<td>New York</td>
<td>8.6%</td>
<td>1,123,044</td>
</tr>
<tr>
<td>Texas</td>
<td>7.2%</td>
<td>951,388</td>
</tr>
<tr>
<td>Florida</td>
<td>5.0%</td>
<td>657,460</td>
</tr>
<tr>
<td>Illinois</td>
<td>4.3%</td>
<td>565,158</td>
</tr>
<tr>
<td>Ohio</td>
<td>4.0%</td>
<td>530,147</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>3.7%</td>
<td>485,736</td>
</tr>
<tr>
<td>Michigan</td>
<td>3.7%</td>
<td>480,402</td>
</tr>
<tr>
<td>New Jersey</td>
<td>3.2%</td>
<td>417,913</td>
</tr>
<tr>
<td>Georgia</td>
<td>2.9%</td>
<td>383,290</td>
</tr>
<tr>
<td>North Carolina</td>
<td>2.7%</td>
<td>360,844</td>
</tr>
<tr>
<td>Virginia</td>
<td>2.6%</td>
<td>338,478</td>
</tr>
<tr>
<td>Indiana</td>
<td>2.2%</td>
<td>288,789</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>2.1%</td>
<td>278,831</td>
</tr>
<tr>
<td>Washington</td>
<td>2.0%</td>
<td>266,290</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>1.9%</td>
<td>256,022</td>
</tr>
<tr>
<td>Tennessee</td>
<td>1.9%</td>
<td>249,897</td>
</tr>
<tr>
<td>Missouri</td>
<td>1.9%</td>
<td>246,434</td>
</tr>
<tr>
<td>Maryland</td>
<td>1.9%</td>
<td>245,953</td>
</tr>
<tr>
<td>Louisiana</td>
<td>1.9%</td>
<td>244,064</td>
</tr>
<tr>
<td>Minnesota</td>
<td>1.8%</td>
<td>235,058</td>
</tr>
<tr>
<td>Alabama</td>
<td>1.8%</td>
<td>232,437</td>
</tr>
<tr>
<td>South Carolina</td>
<td>1.5%</td>
<td>200,233</td>
</tr>
<tr>
<td>Kentucky</td>
<td>1.5%</td>
<td>195,563</td>
</tr>
<tr>
<td>Arizona</td>
<td>1.4%</td>
<td>189,447</td>
</tr>
<tr>
<td>Colorado</td>
<td>1.4%</td>
<td>185,912</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>1.4%</td>
<td>185,106</td>
</tr>
<tr>
<td>Iowa</td>
<td>1.2%</td>
<td>164,052</td>
</tr>
<tr>
<td>Oregon</td>
<td>1.2%</td>
<td>157,642</td>
</tr>
<tr>
<td>Connecticut</td>
<td>1.2%</td>
<td>155,718</td>
</tr>
<tr>
<td>Kansas</td>
<td>1.2%</td>
<td>154,745</td>
</tr>
<tr>
<td>Mississippi</td>
<td>1.2%</td>
<td>151,964</td>
</tr>
<tr>
<td>Arkansas</td>
<td>0.9%</td>
<td>123,132</td>
</tr>
<tr>
<td>New Mexico</td>
<td>0.8%</td>
<td>100,602</td>
</tr>
<tr>
<td>Nebraska</td>
<td>0.7%</td>
<td>98,219</td>
</tr>
<tr>
<td>West Virginia</td>
<td>0.7%</td>
<td>91,332</td>
</tr>
<tr>
<td>Utah</td>
<td>0.7%</td>
<td>90,727</td>
</tr>
<tr>
<td>Maine</td>
<td>0.5%</td>
<td>64,582</td>
</tr>
<tr>
<td>Hawaii</td>
<td>0.5%</td>
<td>64,390</td>
</tr>
<tr>
<td>Nevada</td>
<td>0.5%</td>
<td>62,680</td>
</tr>
<tr>
<td>Idaho</td>
<td>0.4%</td>
<td>57,164</td>
</tr>
<tr>
<td>Montana</td>
<td>0.4%</td>
<td>52,006</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>0.4%</td>
<td>51,046</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>0.4%</td>
<td>46,670</td>
</tr>
<tr>
<td>Alaska</td>
<td>0.3%</td>
<td>43,978</td>
</tr>
<tr>
<td>South Dakota</td>
<td>0.3%</td>
<td>38,054</td>
</tr>
<tr>
<td>Delaware</td>
<td>0.3%</td>
<td>36,997</td>
</tr>
<tr>
<td>Wyoming</td>
<td>0.3%</td>
<td>35,780</td>
</tr>
<tr>
<td>North Dakota</td>
<td>0.3%</td>
<td>35,581</td>
</tr>
<tr>
<td>Vermont</td>
<td>0.2%</td>
<td>30,236</td>
</tr>
</tbody>
</table>

USA Total = 13,130,342

Exhibit 10. Annotated Ranked Horizontal Bar Chart:
For When No Pie Chart Will Work
XMACRO HSARANNO(OATA".

DATA _NULL_;  
HIDPOINT;
HIDPTLEN;  
MLBLSHIF"-D;  
RESPONSE;  
RESPFMT".;  
RMNSHIF"0;  
RMAXSHIF"12;  
BarFILL"X2;  
BarSPACE"0.35;  
BarWidth"D.55;  
HIDPOINT:StNAl:E;  
MIDPTLEN;StNAl:T;  
MIDPTLEN = MAX(MIDPTLEN,LENGTH{&HIDPOINTll;  
IF LAST-THEN CALL SYMPUT{MPLBLLEN,LENGTH{&HIDPOINTll;:  
RUN;
PROC SORT DATA=DATA OUT=SORTED;
RUN;
PROC FREQ DATA=SORTEO;
TABLE MIDPOINT , OUT "PERCENTS NOPRINT;
WEIGHT RESPONSE;
RUN;
DATA TOGCHART(J(EEP"MIDPOINT RESPONSEI  
TOANN02 (J(EEP"MIDPOINT MPLABELl;  
MERGE SORTED PERCENTS; BY MIDPOINT;
OUTPUT TOGCHART;  
FORMAT PCTCHARS $<4.;  
PCTCHARS :: LEFT(ROUND(PERCENT,D.I»;  
IF PCTCHARS " INT{PCTCHARS)  
THEN PCTCHARS " TRIM{PCTCHARS) II '.0';  
LENGTH MPLABEL $ 21;  
IF PCTCHARS < 1  
THEN MPLABEL " STNAME II' II SUBSTR(PCTCHARS,1,3) II 'x';  
ELSE  
MPLABEL " STNAME II' II PCTCHARS II 'x';  
OUTPUT TOANN02;  
RUN;
DATA ANN0TEXT;  
SET TOOGCHART;

Exhibit 10A. Program for Exhibit 10

XMACRO HSARANNO(DATA,  
MIDPOINT,  
MIDPTLEN,  
MLBLSHIF="-8",  
RESPONSE,  
RESPFMT=".",  
RMNSHIF="0",  
RMAXSHIF="12",  
BarFILL="X2",  
BarSPACE="0.35",  
BarWidth="D.55",  
HIDPOINT:StNAl:E,  
MIDPTLEN;StNAl:T,  
MIDPTLEN = MAX(MIDPTLEN,LENGTH{&HIDPOINTll;:  
IF LAST-THEN CALL SYMPUT{MPLBLLEN,LENGTH{&HIDPOINTll;:  
RUN;
PROC SORT DATA=DATA OUT=SORTED;  
BY RESPONSE;
RUN;
PROC FREQ DATA=SORTED OUT=PERCENTS NOPRINT;  
WEIGHT RESPONSE;
RUN;
DATA TOOGCHART(KEEP=MIDPOINT RESPONSE)  
TOANN02 (KEEP=MIDPOINT MPLABEL);  
MEAN SORTED PERCENTS; BY MIDPOINT;
OUTPUT TOOGCHART;  
FORMAT PCTCHARS $<4.;  
PCTCHARS :: LEFT(ROUND(PERCENT,D.I»;  
IF PCTCHARS " INT{PCTCHARS)  
THEN PCTCHARS " TRIM{PCTCHARS) II '.0';  
LENGTH MPLABEL $ 21;  
IF PCTCHARS < 1  
THEN MPLABEL " STNAME II' II SUBSTR(PCTCHARS,1,3) II 'x';  
ELSE  
MPLABEL " STNAME II' II PCTCHARS II 'x';  
OUTPUT TOOGCHART;  
RUN;
DATA ANN0TEXT;  
SET TOOGCHART;

Exhibit 10B. HBARANNO Macro
1991 Per Capita Consumption of Beverages in Six Categories

Estimates from "Beverage World 1992–1993 Data Bank"

<table>
<thead>
<tr>
<th>Share</th>
<th>Gallons</th>
<th>Beverage Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>51.2%</td>
<td>48.4</td>
<td>Soft Drinks</td>
</tr>
<tr>
<td>24.5%</td>
<td>23.2</td>
<td>Beer</td>
</tr>
<tr>
<td>12.3%</td>
<td>11.6</td>
<td>Fruit Juices and Drinks</td>
</tr>
<tr>
<td>8.5%</td>
<td>8.0</td>
<td>Bottled Water</td>
</tr>
<tr>
<td>2.0%</td>
<td>1.9</td>
<td>Wine</td>
</tr>
<tr>
<td>1.5%</td>
<td>1.4</td>
<td>Spirits</td>
</tr>
</tbody>
</table>

Exhibit 11. New, Improved Pie Chart