ADVANCED FEATURES OF PROC REPORT WORKSHOP
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Abstract
This workshop is designed for users who have an existing knowledge of PROC REPORT's syntax. The paper will focus on uses of the FLOW option, the creation of multi-column reports, customized report breaks, and creating reports containing counts and percentages.

Background
One of the main advantages of using PROC REPORT versus PROC PRINT for generating reports is that PROC REPORT provides much more flexibility and control over the appearance of the report. Prior to PROC REPORT most of the tasks discussed in this paper required a substantial amount of work in the Data Step prior to reporting, which now can all be done in a single SAS procedure.

The FLOW Option
The FLOW option on the DEFINE statement can be used to improve the appearance of reports that have data which require more than one row to display its values.

Without the FLOW option, truncation will result for any value that exceeds the width defined by the WIDTH= option:

PROC REPORT DATA=STOREDAT NOWINDOWS;
   COLUMNS STORE DEPT SALEAMT COMMENT;
   DEFINE STORE/GROUP ORDER=FORMATTED 'STORE';
   DEFINE DEPT /GROUP ORDER=FORMATTED 'DEPT';
   DEFINE SALEAMT/ANALYSIS SUM FORMAT=DOLLAR10.2 WIDTH=10 'AMOUNT OF/SALE';
   DEFINE COMMENT/DISPLAY WIDTH=10 FLOW ORDER=FORMATTED 'COMMENT';
RUN;

(See Output #1 for results)

Short of providing a width large enough that will accommodate the value, but will also increase the amount of white space on the report, the FLOW option can be used which allows the column to flow on to another line each time it exceed the specified width without truncating the value:

PROC REPORT DATA=STOREDAT NOWINDOWS;
   COLUMNS STORE DEPT SALEAMT COMMENT;
   DEFINE STORE/DISPLAY ORDER=FORMATTED 'STORE';
   DEFINE DEPT /DISPLAY ORDER=FORMATTED 'DEPT';
   DEFINE SALEAMT/ANALYSIS SUM FORMAT=DOLLAR10.2 WIDTH=10 'AMOUNT OF/SALE';
   DEFINE COMMENT/DISPLAY WIDTH=10 FLOW ORDER=FORMATTED 'COMMENT';
RUN;

(See Output #2 for results)

The FLOW option may split a word within the column when flowing the text. Unfortunately, there is no way to prevent this from happening.

It is also possible to dynamically create a comment on a report by creating them as a COMPUTED variable with accompanying logic:

PROC REPORT DATA=STOREDAT NOWINDOWS;
   COLUMNS STORE DEPT SALEAMT SALECOMM;
   DEFINE STORE/GROUP ORDER=FORMATTED 'STORE';
   DEFINE DEPT /GROUP ORDER=FORMATTED 'DEPT';
   DEFINE SALEAMT/ANALYSIS SUM FORMAT=DOLLAR10.2 WIDTH=10 'AMOUNT OF/SALE';
   DEFINE SALECOMM/COMPUTED FLOW ORDER=FORMATTED 'SALES/COMMENT';
   COMPUTE SALECOMM/CHAR LENGTH=30;
   IF SALEAMT.SUM > 1000 AND DEPT IN (100, 110,150) THEN SALECOMM='EXCEEDED DAILY SALES GOAL';
   ELSE IF SALEAMT.SUM < 1000 AND DEPT IN (100, 110,150) THEN SALECOMM='AT OR BELOW DAILY SALES GOAL';
   ELSE SALECOMM='NOT MONITORING AT THIS TIME';
ENDCOMP;
The PANELS Option
Creating multi-column reports is very easy within PROC REPORT by using the PANELS= option on the PROC statement. This is especially useful if you want a list of something like store numbers, zip codes or phone numbers. A lot of paper would be wasted if you tried to print a small amount of data down the left-hand side of each page:

PROC REPORT DATA=STOREINF NOWINDOWS;
  COLUMNS STORE;
  DEFINE STORE/DISPLAY ORDER=FORMATTED
    'STORE/NUMBERS';
  RUN;

(See Output #4 for results)

The PANELS= option will create a multi-column report based on the number of panels specified. This is sometimes referred to as phonebook style report:

PROC REPORT DATA=STOREDAT
  PANELS=2;
  COLUMNS STORE;
  DEFINE STORE/ORDER ORDER=FORMATTED
    '101010'='NORFOLK STORE',
    '101110'='SOUTHDALE STORE';
  RUN;

(See Output #5 for results)

By specifying PANELS=99, PROC REPORT will print as many columns as will fit across the page before going on to a new page:

PROC REPORT DATA=STOREDAT
  PANELS=99;
  COLUMNS STORE;
  DEFINE STORE/GROUP ORDER=FORMATTED
    'STORE/NUMBERS';
  DEFINE DEPT/GROUP 'DEPT';
  DEFINE SALEAMT/ANALYSIS SUM
    'AMOUNT/OF SALE';
  DEFINE TAX/COMPUTED FORMAT=DOLLAR10.2 WIDTH=10
    'SALES/TAX';
  DEFINE NET/COMPUTED FORMAT=DOLLAR10.2 WIDTH=10
    'NET/SALE';
  COMPUTE TAX=
    SALEAMT.SUM * .05;
  COMPUTE NET=
    SALEAMT.SUM - TAX;
  RUN;

(See Output #6 for results)

The Various Uses of the COMPUTE Block
COMPUTE Blocks are used most often to dynamically create new variables or to create customized report breaks.

The following is an example of how a COMPUTE Block can be used to create customized report breaks:

PROC REPORT DATA=STOREDAT
  NOWINDOWS HEADLINE HEADSKIP;
  COLUMNS STORE DEPT SALEAMT TAX NET;
  PANELS=99;
  DEFINE STORE/GROUP ORDER=FORMATTED
    'STORE';
  DEFINE DEPT/GROUP 'DEPT';
  DEFINE SALEAMT/ANALYSIS SUM
    FORMAT=DOLLAR10.2 WIDTH=10
    'AMOUNT/OF SALE';
  DEFINE TAX/COMPUTED FORMAT=DOLLAR10.2 WIDTH=10
    'SALES/TAX';
  DEFINE NET/COMPUTED FORMAT=DOLLAR10.2 WIDTH=10
    'NET/SALE';
  COMPUTE TAX=
    SALEAMT.SUM * .05;
  COMPUTE NET=
    SALEAMT.SUM - TAX;
  RUN;

A number of DATA step statements:

- assignment statements
- LENGTH
- CALL routines
- LINK
- DO (all varieties)
- RETURN
- END
- IF THEN/ELSE
- GO TO
- sum statement

- DM statement
- %INCLUDE statement
- macro variables
- null statements

Compute Blocks
Compute Blocks are essential in creating more sophisticated reports within PROC REPORT. They support a number of SAS language features:

- all the DATA step functions
- comments
ENDCOMP;

COMPUTE AFTER STORE;
LINE '=';
LINE 52*'**';
LINE '=';
LINE '"' TOTAL SALES FOR ' STORE $STORNAM.' WERE: ' SALEAMT.SUM DOLLAR10.2 '"';
LINE '=';
LINE 52*'**';
LINE '=';
ENDCOMP;
RUN;

(see Output #7 for results)

Since we are creating customized break text, the BREAK statement is not needed. The COMPUTE Block will control the entire breaking and text writing process.

Just like when PUTting literal text (anything within quotes) we are in control of the entire process, so if blanks within the literal strings are forgotten, text will run together (notice how blanks were left in the literal strings before the value of variables were written out). Similar to the feature available on PUT statement, multipliers (52*'**') can be specified which will print the character '**' fifty-two times.

If a location is not specified with a pointer reference (@), SAS will center the text in the COMPUTE block if the CENTER system option is in effect.

If you happen to have a BREAK statement in effect with a SUPPRESS option specified in addition to the COMPUTE block (you shouldn't really need BREAK statement), the values for STORE will not appear on the report. If for some reason a BREAK statement is needed in addition to a COMPUTE block DO NOT USE THE SUPPRESS OPTION ON THE BREAK STATEMENT.

Notice on the output generated that the format used when writing out values on the LINE statement determines the amount of space used to write its values. Character variables will fill the space with trailing blanks, whereas numeric variables fill the space with leading blanks.

### Controlling Space and Grand Totals

The trailing blanks on character variables and leading blanks on numeric variables can be controlled by using the $VARYING. format on the LINE statement. In addition to using the $VARYING. format, assignment statements are needed in the COMPUTE blocks to convert values and to check lengths:

```sas
PROC FORMAT;
VALUE $STORNAM
'101010'='NORFOLK STORE'
'101110'='SOUTHDALE STORE';
RUN;
```

(see the entire format is not shown here)

```sas
PROC REPORT DATA=STOREDAT NOWINDOWS
HEADLINE HEADSKIP;
```

```sas
COLUMNS STORE DEPT SALEAMT TAX NET;
```

```sas
DEFINE STORE/GROUP ORDER=FORMATTED
'STORE';
DEFINE DEPT/GROUP 'DEPT';
DEFINE SALEAMT/ANALYSIS SUM
FORMAT=DOLLAR10.2
WIDTH=10 'AMOUNT/OF SALE';
DEFINE TAX/COMPUTED FORMAT=DOLLAR10.2
WIDTH=10 'SALES/TAX';
DEFINE NET/COMPUTED FORMAT=DOLLAR10.2
WIDTH=10 'NET/SALE';
```

```sas
COMPUTE TAX;
TAX=SALEAMT.SUM *.05;
ENDCOMP;
```

```sas
COMPUTE NET;
NET=SALEAMT.SUM - TAX;
ENDCOMP;
```

```sas
COMPUTE AFTER STORE;
STOREC=PUT(STORE,$STORNAM.);
VARLEN1=LENGTH(STOREC);
SALESC=LEFT(PUT(SALEAMT.SUM,DOLLAR10.2));
VARLEN2=LENGTH(SALESC);
```

```sas
LINE '=';
LINE @7 52*'**';
LINE '=';
LINE @7 '" TOTAL SALES FOR ' STOREC $VARYING. VARLEN1 ' WERE: ' SALESC $VARYING. VARLEN2 @57 '"';
LINE '=';
LINE @7 52*'**';
LINE '=';
ENDCOMP;
RUN;
```

(see Output #8 for results)

Since the character variable REGION is actually a
formatted value, in addition to checking its length with the LENGTH function, the format's value needs to be associated with the variable. This is done by using the PUT function. It could have been done all in one step:

```
VARLEN1=LENGTH(PUT(STORE,$STORNAM.));
```

If the character variable was a normal unformatted character variable, the PUT would not be necessary, only the LENGTH function would be required. Since the $VARYING. format can only be used on character variables, to control the spacing on a numeric variable it must first be converted to a character using the LEFT and PUT functions and then find its length with the LENGTH function. ALL NUMERIC VARIABLES MUST BE CONVERTED TO CHARACTER, THE LENGTH STATEMENT ALONE IS NOT ENOUGH. Similarly this could have all been done in one step:

```
VARLEN2=LENGTH(LEFT(PUT(SALEAMT.SUM,DOLLAR10.2)));
```

Since the text will now vary in length (it will not be padded out with spaces after characters or before numerics), the length of the text string will vary. Therefore, the location of the '*' literal with a pointer references will have to be fixed to a location (like @7) when writing out the text line. Once a pointer reference (@) is used anywhere within the COMPUTE block the centering option, if in effect, is turned off for the entire COMPUTE block, that is why the location of the '*' string (@7 52* '*') was also fixed. If left as it was in the last example (52* '*'), the string of asterisks would be left aligned because the centering is automatically turned off.

Adding Counts in Customized Breaks

Counts can be added in customized breaks by using the N statistic defined on the COLUMNS statement (if this style of referencing does not look familiar to you, reference my paper on Advanced Features of PROC REPORT presented at SUGI ’94, and MWSUG ’95 conferences):

```
PROC FORMAT;
  VALUE $STORNAM
    '101010'='NORFOLK STORE'
    '101110'='SOUTHDALE STORE'
RUN;
PROC REPORT DATA=STOREDAT NOWINDOWS
  HEADLINE HEADSKIP;
  COLUMNS STORE DEPT SALEAMT TAX NET N;
  DEFINE STORE/GROUP ORDER=FORMATTED 'STORE';
  DEFINE DEPT/GROUP 'DEPT';
  DEFINE SALEAMT/ANALYSIS SUM
  DEFINE TAX/COMPUTED FORMAT=DOLLAR10.2 WIDTH=10 'AMOUNT OF/SALE';
  DEFINE NET/COMPUTED FORMAT=DOLLAR10.2 WIDTH=10 'NET/SALE';
  DEFINE N/NOPRINT ;
  COMPUTE TAX;
    TAX=SALEAMT.SUM * .05;
  ENDCOMP;
  COMPUTE NET;
    NET=SALEAMT.SUM - TAX;
  ENDCOMP;
  COMPUTE AFTER STORE;
    STOREC=PUT(STORE, $STORNAM.);
    VARLEN1=LENGTH(STOREC);
    SALESC=LEFT(PUT(SALEAMT.SUM,DOLLAR10.2));
    VARLEN2=LENGTH(SALESC);
    LINE ' '; 
    LINE @7 52*'***';
    LINE ' '; 
    LINE @7 '" TOTAL SALES FOR ' STOREC $VARYING. VARLEN1 
        WERE: ' SALESC $VARYING. VARLEN2 '@57 '*';
    LINE @7 '" TOTAL NUMBER OF SALES WERE: ' 
        N COMMA10. @57 '*';
    LINE ' '; 
    LINE @7 52*'***';
    LINE ' '; 
ENDCOMP;
RUN;
(see output #9 for results)
```

While it may look odd that the total number of sales are 43 and 35 when only 4 and 3 lines of data are printing, respectively. This IS correct. Keep in mind that grouping is in effect on this report. Grouping causes only one summarized line to appear for each group value, but the count reflects how many total observations the grouping represents.

Calculating Percentages

To calculate a percentage you need to first know the total so you can divide each value by the total in order to arrive at the percentage. This is accomplished in PROC REPORT by using a COMPUTE Block to accumulate the total before each group:

```
PROC REPORT DATA=STOREDAT NOWINDOWS;
  COLUMNS STORE DEPT SALEAMT PCTSALES;
```
Cumulative percentages are easy to calculate on PROC REPORT, all you need to do is add some additional logic within the COMPUTE Block to accumulate information:

```
PROC REPORT DATA=STOREDAT NOWINDOWS;
  COLUMNS STORE DEPT SALEAMT PCTSALES CUMPCT;
  DEFINE STORE/GROUP ORDER=FORMATTED 'STORE';
  DEFINE DEPT/GROUP ORDER=FORMATTED 'DEPT';
  DEFINE SALEAMT/ANALYSIS SUM
    FORMAT=DOLLAR10.2 WIDTH=10 'AMOUNT OF/SALE';
  DEFINE PCTSALES/COMPUTED
    FORMAT=PERCENT7.2 'PERCENT/OF/SALES';
  COMPUTE BEFORE STORE;
    STORETOT=SALEAMT.SUM;
  ENDCOMP;
  COMPUTE PCTSALES;
    PCTSALES=SALEAMT.SUM/STORETOT;
  ENDCOMP;
  BREAK AFTER STORE/SKIP SUMMARIZE;
RUN;
```

```
(See Output #11 for results)
```

```
Note, if the PERCENT format is used to display the value, you do not need to divide by 100.
```

```
Rather than each group adding up to 100 percent, you can also calculate a percentage based on what percent the group represents of the whole by using a COMPUTE BEFORE without a specified variable:

```
PROC REPORT DATA=STOREDAT NOWINDOWS;
  COLUMNS STORE DEPT SALEAMT PCTSALES;
  DEFINE STORE/GROUP ORDER=FORMATTED 'STORE';
  DEFINE DEPT/GROUP ORDER=FORMATTED 'DEPT';
  DEFINE SALEAMT/ANALYSIS SUM
    FORMAT=DOLLAR10.2 WIDTH=10 'AMOUNT OF/SALE';
  DEFINE PCTSALES/COMPUTED
    FORMAT=PERCENT7.2 'PERCENT/OF/SALES';
  DEFINE CUMPCT/COMPUTED
    FORMAT=PERCENT7.2 WIDTH=10 'CUMULATIVE/PERCENT/OF/SALES';
  COMPUTE BEFORE;
    STORETOT=SALEAMT.SUM;
    CUMTOT=0;
  ENDCOMP;
  COMPUTE PCTSALES;
    PCTSALES=SALEAMT.SUM/STORETOT;
    IF DEPT NE ' ' THEN CUMTOT+PCTSALES;
  ENDCOMP;
  COMPUTE CUMPCT;
    CUMPCT=CUMTOT;
  ENDCOMP;
  BREAK AFTER STORE/SKIP SUMMARIZE;
  RBREAK AFTER/SKIP SUMMARIZE;
RUN;
```

```
(See Output #12 for results)
```

The Percent of Sales appearing at the bottom of the report appears to be incorrect, but it IS correct, given what you are asking PROC REPORT to do. At the RBREAK level PCTSALES is calculated as: SALEAMT.SUM/STORETOT. For this row, the value of SALEAMT.SUM is $9,920 (sales for everyone). STORETOT is a data step variable whose value only changes when it is explicitly changed. At the RBREAK level, the value of STORETOT is $4,400 (from the
previous store) so: 225=9920/4400 * 100 (multiplied by 100 because the SAS format PERCENT is being used, which automatically displays the result multiplied by 100).

Solving the Previous Problem
We can suppress the display of this column by changing some code and using a user-defined format for displaying the percentage value:

```sas
PROC FORMAT;
  PICTURE PCT LOW-100='009.9%'
     101-HIGH={ };RUN;

PROC REPORT DATA=STOREDAT NOWINDOWS;
  COLUMNS STORE DEPT SALEAMT PCTSALES CUMPCT;
  DEFINE STORE/GROUP ORDER=FORMATTED
    'STORE';
  DEFINE DEPT/GROUP 'DEPT';
  DEFINE SALEAMT/ANALYSIS SUM
    FORMAT=DOLLAR10.2 WIDTH=10
    'AMOUNT OF/SALE';
  DEFINE PCTSALES/COMPUTED FORMAT=PCT7.2
    WIDTH=7 'PERCENT/OF/SALES';

  DEFINE CUMPCT/COMPUTED
    FORMAT=PERCENT7.2 WIDTH=10
    'CUMULATIVE/PERCENT/OF/SALES';

  COMPUTE BEFORE STORE;
    STORETOT=SALEAMT.SUM;
    CUMTOT=0;
    ENDCOMP;

  COMPUTE PCTSALES;
    PCTSALES=SALEAMT.SUM/STORETOT * 100;
    PCTSALE=SALEAMT.SUM/STORETOT;
    IF DEPT NE ' ' THEN CUMTOT=PCTSALE;
    ENDCOMP;

  COMPUTE CUMPCT;
    CUMPCT=CUMTOT;
    ENDCOMP;

  BREAK AFTER STORE/SKIP SUMMARIZE;
  RBREAK AFTER/SKIP SUMMARIZE;
  RUN;

(see output #13 for results)
```

The user-defined format was used to suppress the display of the bogus percent value. Because this format is used rather than the SAS-defined PERCENT format, the COMPUTE block that calculates PCTSALES has to be changed as well in order to multiply the results by 100 and then to create an additional variable that does multiply by 100 so that it can be used for accumulation.

In Summary
PROC REPORT is a powerful new Base SAS Procedure which provides us with more control over our report's appearance than any other existing Base SAS Proc.

We have seen in the course of this paper how PROC REPORT can create customized report breaks, multi-column reports containing counts and percents and some uses of the FLOW option.

While not discussed in this presentation some new features will be available in Version 6.11 like the BOX and ID options and new statistics like PCTN and PCTSUM.

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Useful Publications


Any questions or comments regarding the paper may be directed to the author:

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Output #1 (Partial Output):

<table>
<thead>
<tr>
<th>STORE</th>
<th>DEPT</th>
<th>SALE</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>101010</td>
<td>100</td>
<td>$50.00</td>
<td>COUPONS #8</td>
</tr>
<tr>
<td>101010</td>
<td>100</td>
<td>$60.00</td>
<td>COUPONS #1</td>
</tr>
<tr>
<td>101010</td>
<td>100</td>
<td>$60.00</td>
<td>COUPONS #3</td>
</tr>
<tr>
<td>101010</td>
<td>100</td>
<td>$60.00</td>
<td>COUPONS #8</td>
</tr>
<tr>
<td>101010</td>
<td>100</td>
<td>$70.00</td>
<td>NO COUPONS</td>
</tr>
</tbody>
</table>

Output #2 (Partial Output):

<table>
<thead>
<tr>
<th>STORE</th>
<th>DEPT</th>
<th>SALE</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>101010</td>
<td>100</td>
<td>$50.00</td>
<td>COUPONS #8,11,20,2</td>
</tr>
<tr>
<td>101010</td>
<td>100</td>
<td>$60.00</td>
<td>COUPONS #10,20,20,21</td>
</tr>
<tr>
<td>101010</td>
<td>100</td>
<td>$60.00</td>
<td>COUPONS 3,5,15,14 USED</td>
</tr>
<tr>
<td>101010</td>
<td>100</td>
<td>$60.00</td>
<td>COUPONS #8,11,20,2 USED</td>
</tr>
</tbody>
</table>

Output #3 (Partial Output):

<table>
<thead>
<tr>
<th>STORE</th>
<th>DEPT</th>
<th>SALE</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>101010</td>
<td>100</td>
<td>$1,020.00</td>
<td>EXCEEDED DAILY SALES GOAL</td>
</tr>
<tr>
<td>110</td>
<td></td>
<td>$1,290.00</td>
<td>EXCEEDED DAILY SALES GOAL</td>
</tr>
<tr>
<td>120</td>
<td></td>
<td>$1,550.00</td>
<td>NOT</td>
</tr>
</tbody>
</table>

Output #4 (Partial Output):

<table>
<thead>
<tr>
<th>STORE NUMBERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>101010</td>
</tr>
<tr>
<td>101030</td>
</tr>
<tr>
<td>101050</td>
</tr>
<tr>
<td>101070</td>
</tr>
<tr>
<td>101090</td>
</tr>
<tr>
<td>... ETC ...</td>
</tr>
</tbody>
</table>
Output #5 (Partial Output):

<table>
<thead>
<tr>
<th>STORE NUMBERS</th>
<th>STORE NUMBERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>101010</td>
<td>102170</td>
</tr>
<tr>
<td>101030</td>
<td>102190</td>
</tr>
<tr>
<td>101050</td>
<td>102210</td>
</tr>
<tr>
<td>101070</td>
<td>102230</td>
</tr>
<tr>
<td>101090</td>
<td>102250</td>
</tr>
</tbody>
</table>

........... ETC ...........

Output #6 (Partial Output):

<table>
<thead>
<tr>
<th>STORE NUMBERS</th>
<th>STORE NUMBERS</th>
<th>STORE NUMBERS</th>
<th>STORE NUMBERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>101010</td>
<td>102170</td>
<td>103330</td>
<td>104490</td>
</tr>
<tr>
<td>101030</td>
<td>102190</td>
<td>103350</td>
<td>104510</td>
</tr>
<tr>
<td>101050</td>
<td>102210</td>
<td>103370</td>
<td>104530</td>
</tr>
<tr>
<td>101070</td>
<td>102230</td>
<td>103390</td>
<td>104550</td>
</tr>
<tr>
<td>101090</td>
<td>102250</td>
<td>103410</td>
<td>104570</td>
</tr>
</tbody>
</table>

............ ETC ............

Output #7 (Partial Output):

<table>
<thead>
<tr>
<th>Store</th>
<th>Dept</th>
<th>Amount of Sale</th>
<th>Sales Tax</th>
<th>Net Sale</th>
</tr>
</thead>
<tbody>
<tr>
<td>101010</td>
<td>100</td>
<td>$1,020.00</td>
<td>$51.00</td>
<td>$969.00</td>
</tr>
<tr>
<td>110</td>
<td></td>
<td>$1,290.00</td>
<td>$64.50</td>
<td>$1,225.50</td>
</tr>
<tr>
<td>120</td>
<td></td>
<td>$1,550.00</td>
<td>$77.50</td>
<td>$1,472.50</td>
</tr>
<tr>
<td>130</td>
<td></td>
<td>$1,660.00</td>
<td>$83.00</td>
<td>$1,577.00</td>
</tr>
</tbody>
</table>

* total sales for Norfolk Store were: $5,520.00 *

.............................. etc ..............................
**Output #8 (Partial Output):**

<table>
<thead>
<tr>
<th>Store</th>
<th>Dept</th>
<th>Amount of Sale</th>
<th>Sales Tax</th>
<th>Net Sale</th>
</tr>
</thead>
<tbody>
<tr>
<td>101010</td>
<td>100</td>
<td>$1,020.00</td>
<td>$51.00</td>
<td>$969.00</td>
</tr>
<tr>
<td>110</td>
<td>$1,290.00</td>
<td>$64.50</td>
<td>$1,225.50</td>
<td></td>
</tr>
<tr>
<td>120</td>
<td>$1,550.00</td>
<td>$77.50</td>
<td>$1,472.50</td>
<td></td>
</tr>
<tr>
<td>130</td>
<td>$1,660.00</td>
<td>$83.00</td>
<td>$1,577.00</td>
<td></td>
</tr>
<tr>
<td>140</td>
<td>$1,800.00</td>
<td>$90.00</td>
<td>$1,710.00</td>
<td></td>
</tr>
</tbody>
</table>

* total sales for Norfolk Store were: $18,020.00 *

**Output #9 (Partial Output):**

<table>
<thead>
<tr>
<th>Store</th>
<th>Dept</th>
<th>Amount of Sale</th>
<th>Sales Tax</th>
<th>Net Sale</th>
</tr>
</thead>
<tbody>
<tr>
<td>101010</td>
<td>100</td>
<td>$1,020.00</td>
<td>$51.00</td>
<td>$969.00</td>
</tr>
<tr>
<td>110</td>
<td>$1,290.00</td>
<td>$64.50</td>
<td>$1,225.50</td>
<td></td>
</tr>
<tr>
<td>120</td>
<td>$1,550.00</td>
<td>$77.50</td>
<td>$1,472.50</td>
<td></td>
</tr>
<tr>
<td>130</td>
<td>$1,660.00</td>
<td>$83.00</td>
<td>$1,577.00</td>
<td></td>
</tr>
<tr>
<td>140</td>
<td>$1,800.00</td>
<td>$90.00</td>
<td>$1,710.00</td>
<td></td>
</tr>
</tbody>
</table>

* total sales for Norfolk Store were: $5,520.00 *

* total number of sales were: 43 *

**Output #10 (Partial Output):**

<table>
<thead>
<tr>
<th>Store</th>
<th>Dept</th>
<th>Amount of Sale</th>
<th>Percent of Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>101010</td>
<td>100</td>
<td>$1,020.00</td>
<td>18.5%</td>
</tr>
<tr>
<td>110</td>
<td>$1,290.00</td>
<td>23.4%</td>
<td></td>
</tr>
<tr>
<td>120</td>
<td>$1,550.00</td>
<td>28.1%</td>
<td></td>
</tr>
<tr>
<td>130</td>
<td>$1,660.00</td>
<td>30.1%</td>
<td></td>
</tr>
<tr>
<td>101010</td>
<td>$5,520.00</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

............. etc  ..............
Output #11:

<table>
<thead>
<tr>
<th>Store</th>
<th>Dept</th>
<th>Amount of Sale</th>
<th>Percent of Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>101010</td>
<td>100</td>
<td>$1,020.00</td>
<td>10.3%</td>
</tr>
<tr>
<td></td>
<td>110</td>
<td>$1,290.00</td>
<td>13.0%</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>$1,550.00</td>
<td>15.6%</td>
</tr>
<tr>
<td></td>
<td>130</td>
<td>$1,660.00</td>
<td>16.7%</td>
</tr>
<tr>
<td>101010</td>
<td></td>
<td>$5,520.00</td>
<td>55.6%</td>
</tr>
<tr>
<td>101110</td>
<td>100</td>
<td>$1,380.00</td>
<td>13.9%</td>
</tr>
<tr>
<td></td>
<td>110</td>
<td>$1,440.00</td>
<td>14.5%</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>$1,580.00</td>
<td>15.9%</td>
</tr>
<tr>
<td>101110</td>
<td></td>
<td>$4,400.00</td>
<td>44.4%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$9,920.00</td>
<td>100%</td>
</tr>
</tbody>
</table>

Output #12:

<table>
<thead>
<tr>
<th>Store</th>
<th>Dept</th>
<th>Amount of Sale</th>
<th>Percent of Sales</th>
<th>Percent of Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>101010</td>
<td>100</td>
<td>$1,020.00</td>
<td>18.5%</td>
<td>18.5%</td>
</tr>
<tr>
<td></td>
<td>110</td>
<td>$1,290.00</td>
<td>23.4%</td>
<td>41.8%</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>$1,550.00</td>
<td>28.1%</td>
<td>69.9%</td>
</tr>
<tr>
<td></td>
<td>130</td>
<td>$1,660.00</td>
<td>30.1%</td>
<td>100%</td>
</tr>
<tr>
<td>101010</td>
<td></td>
<td>$5,520.00</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>101110</td>
<td>100</td>
<td>$1,380.00</td>
<td>31.4%</td>
<td>31.4%</td>
</tr>
<tr>
<td></td>
<td>110</td>
<td>$1,440.00</td>
<td>32.7%</td>
<td>64.1%</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>$1,580.00</td>
<td>35.9%</td>
<td>100%</td>
</tr>
<tr>
<td>101110</td>
<td></td>
<td>$4,400.00</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$9,920.00</td>
<td>225%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Output #13:

<table>
<thead>
<tr>
<th>Store</th>
<th>Dept</th>
<th>Amount of Sale</th>
<th>Percent of Sales</th>
<th>Percent of Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>101010</td>
<td>100</td>
<td>$1,020.00</td>
<td>18.4%</td>
<td>18.4%</td>
</tr>
<tr>
<td></td>
<td>110</td>
<td>$1,290.00</td>
<td>23.3%</td>
<td>41.8%</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>$1,550.00</td>
<td>28.0%</td>
<td>69.9%</td>
</tr>
<tr>
<td></td>
<td>130</td>
<td>$1,660.00</td>
<td>30.0%</td>
<td>100%</td>
</tr>
<tr>
<td>101010</td>
<td></td>
<td>$5,520.00</td>
<td>100.0%</td>
<td>100%</td>
</tr>
<tr>
<td>101110</td>
<td>100</td>
<td>$1,380.00</td>
<td>31.3%</td>
<td>31.3%</td>
</tr>
<tr>
<td></td>
<td>110</td>
<td>$1,440.00</td>
<td>32.7%</td>
<td>64.1%</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>$1,580.00</td>
<td>35.9%</td>
<td>100%</td>
</tr>
<tr>
<td>101110</td>
<td></td>
<td>$4,400.00</td>
<td>100.0%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$9,920.00</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>