Iterative and conditional processing in SAS macro programs

- **mprint** option was used so that SAS log will show code actually generated by macro programs

```sas
%macro daily;
   proc means data=books.ytdsales(where=(datesold=today()))
      maxdec=2 sum;
   title "Daily Sales Report for &sysdate";
   class section;
   var salepric;
   run;
   %if &sysday=Friday %then %do;
      proc means data=books.ytdsales
         (where=(today()-6 le datesold le today()))
         sum maxdec=2;
      title "Weekly Sales Report Week Ending &sysdate";
      class section;
      var salepric;
      run;
    %end;
%mend daily;

%daily

%macro makesets;
   data
      %do i=1 %to 12;
         month&i
      %end;
   set books.ytdsales;
   mosale=month(datesold);
   if mosale=1 then output month1;
   %do i=2 %to 12;
      else if mosale=&i then output month&i;
   %end;
   run;
%mend makesets;
```

```sas
%makesets
```
Some useful character functions in SAS

- Character functions operate on the values of character variables
- Also called string functions

The Compress function: removing selected characters

- Compress function with single argument removes only blanks
- Optional second argument is list of all characters to be removed (enclosed in single or double quotes)

```sas
options linesize = 72;

data phonebook;
  length first last $ 10;
  input first last phone $ 21-33;
  phone1 = compress(phone); 
  phone2 = compress(phone,'()-');
  datalines;
  Kate Cowles (319)354-3684
  Brendan Holly 3193543684
  Mysterious Stranger 515 555 1212
;
  proc print data = phonebook;
  run;
```

SUBSTR: extract a part of a character variable

- Arguments
  - Character variable
  - Which position to start at
  - How many characters to extract
- Extracted sections will be padded out with blanks to length of original variable

<table>
<thead>
<tr>
<th>Obs</th>
<th>first</th>
<th>last</th>
<th>phone</th>
<th>phone1</th>
<th>phone2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kate</td>
<td>Cowles</td>
<td>(319)354-3684</td>
<td>(319)354-3684</td>
<td>3193543684</td>
</tr>
<tr>
<td>2</td>
<td>Brendan</td>
<td>Holly</td>
<td>3193543684</td>
<td>3193543684</td>
<td>3193543684</td>
</tr>
<tr>
<td>3</td>
<td>Mysterious</td>
<td>Stranger</td>
<td>515 555 1212</td>
<td>5155551212</td>
<td>5155551212</td>
</tr>
</tbody>
</table>
The concatenation operator: `||`

- glues together pieces to make a complete character string

```sas
data phonebook;
set phonebook;
area = substr(phone2,1,3);
exchg = substr(phone2,4,3);
rest = substr(phone2,7,4);
phone3 = '(' || area || ' ' || exchg || '-' || rest ;
run;

proc print data = phonebook;
run;
```

Fixed version

```sas
data phonebook;
set phonebook;
area = substr(phone2,1,3);
exchg = substr(phone2,4,3);
rest = substr(phone2,7,4);
phone3 = '(' || compress(area) || ' ' || compress(exchg) || '-' || compress(rest);
run;
```

```
proc print data = phonebook;
run;
```

Contents of phonebook dataset

The CONTENTS Procedure

Data Set Name: WORK.PHONEBOOK
Observations: 3
Member Type: DATA
Variables: 9
Engine: V8
Created: 10:43 Wednesday, July 16, 2003
Observation Length: 140
Last Modified: 10:43 Wednesday, July 16, 2003
Deleted Observations: 0
Protection: Compressed: NO
Data Set Type: Sorted: NO
Label:

<table>
<thead>
<tr>
<th>#</th>
<th>Variable</th>
<th>Type</th>
<th>Len</th>
<th>Pos</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>area</td>
<td>Char</td>
<td>13</td>
<td>59</td>
</tr>
<tr>
<td>7</td>
<td>exchg</td>
<td>Char</td>
<td>13</td>
<td>72</td>
</tr>
<tr>
<td>1</td>
<td>first</td>
<td>Char</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>last</td>
<td>Char</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>phone</td>
<td>Char</td>
<td>13</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>phone1</td>
<td>Char</td>
<td>13</td>
<td>33</td>
</tr>
<tr>
<td>5</td>
<td>phone2</td>
<td>Char</td>
<td>13</td>
<td>46</td>
</tr>
<tr>
<td>9</td>
<td>phone3</td>
<td>Char</td>
<td>13</td>
<td>98</td>
</tr>
<tr>
<td>8</td>
<td>rest</td>
<td>Char</td>
<td>13</td>
<td>85</td>
</tr>
</tbody>
</table>

-----Engine/Host Dependent Information-----

Data Set Page Size: 16384
Number of Data Set Pages: 1
First Data Page: 1
Max Obs per Page: 116
Obs in First Data Page: 3
Number of Data Set Repairs: 0
File Name: /usr/tmp/SAS_workF4D500005960_mouse/phonebook.sas7bdat
Release Created: 8.0202M0
Host Created: HP-UX
Inode Number: 53106
Access Permission: rw------
Owner Name: UNKNOWN
File Size (bytes): 24576

-----Alphabetic List of Variables and Attributes-----