I. SAS Help
- SAS manuals - Located in Jennifer Blalocks office on the 11th floor and can be borrowed
- SAS help online – http://www.sas.com
- You can detailed information about all of the possible options for any of the procedures by:
  - Help
  - SAS System Help
  - Search
  - Search In
    - Base SAS Software
    - Numeric functions ; Proc Print Syntax; Proc Univariate Syntax, etc.
    - SAS/STAT Software
    - Proc GLM syntax, etc.

II. Labels: Assigns “labels” to a variable
- More important when SAS restricted variable names were restricted to 8 characters
- Can be up to 40 characters long
- Can be enclosed in single quotes, double quotes (if you want the label to contain an apostrophe) or without quotes
- Usually found in the DATA step and remain in effect the rest of the program, but can be used in some of the procedures (in which case they are only valid for that procedure).

```
LABEL dob     = date of birth 
Dcat    = 'Dose Category'
Patient = “Patient's name”
;
```

III. Titles and Footnotes:
- Title is the statement that appears at the top of each page of output
- You can have multiple lines of a title by naming them … title1 title2 … etc.
- These stay in SAS’s memory until you clear them or use them for a different title
- Title statements are contained in single quotes, unless you want the statement to contain an apostrophe … then it should be contained in double quotes

```
DATA one;
.. .. ..
title1 'Output for Problem 1';
proc print data=one;
run;
title1;
title;
title1 'Output for Problem 2';
```

- Footnotes work the same … except the statements are at the bottom of the page.
IV. Proc Univariate

- **Generates basic descriptive statistics** on a variable such as
  - Mean
  - Standard Deviation
  - Percentiles (Quantiles)
  - Minimum and Maximum values
  - Largest and smallest 5 observations

- **T-test - for if the mean is equal to 0**
  - To test if the mean is different from some other variable you must create a new variable to test in which you subtract that value from all observations.
  - Example to test if “examscore” mean = 5 you must create a variable in which you subtract 5 from each observation and then test if the new variable is equal to 0.

<table>
<thead>
<tr>
<th>Basic Code looks like:</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROC UNIVARIATE DATA=&lt;data set name&gt; &lt;options&gt;;</td>
</tr>
<tr>
<td>BY &lt;variables&gt;;</td>
</tr>
<tr>
<td>VAR &lt;variables&gt;;</td>
</tr>
<tr>
<td>ID &lt;variables&gt;;</td>
</tr>
<tr>
<td>RUN;</td>
</tr>
</tbody>
</table>

- **BY** gives you the same output but it gives it for each class of the by variable
  - Ex. if you used BY gender then you would get an output for males separate than the output for females

- **VAR** is where you list the variables that you want the descriptive statistics on
  - You can list one or many (with a space in between each variable listed)

- **ID** allow you to use a variable such as id number or name to identify which observations are the extreme observations (by default it will use the observation number)

- Examples will be shown in class

V. SAS Functions

- These are SAS’s functions that it can perform on the data. (see partial list in textbook p.35)
  - **Numeric / Mathematical Functions**
    - Examples - Square Root, Absolute, Cosine, etc
  - **Character Functions**
    - Allow you to align the data, extract portions of a variable value
  - **Probability Functions**
    - Find probabilities and critical values of many discrete and continuous distributions