Performing a one-way ANOVA for a given set of samples: This test is used to test a hypothesis concerning the means of three or more populations (or treatments). To do a one-way ANOVA with your TI-83

- Type [STAT] [EDIT] then enter the data values for samples 1, 2, ..., k in lists $L_1, L_2, \ldots, L_k$ respectively, then [QUIT] - you might have to name the lists beyond $L_2$.
- Then type [STAT] [TESTS] [F] [ENTER] and fill in ANOVA($L_1, L_2, \ldots, L_k$).
- Read the results as follows:
  - $F =$ the test value
  - $p =$ the p-value
  - FACTOR
    - $df =$ degrees of freedom of the Factors (or between groups) = $df_N$
    - $SS =$ Sum of squares of the Factors (or between groups) = $SS_B$
    - $MS =$ Variance, or Mean square of the Factors (or between groups) = $s^2_B$
  - ERROR
    - $df =$ degrees of freedom of the Errors (or within groups) = $df_D$
    - $SS =$ Sum of squares of the Errors (or within groups) = $SS_W$
    - $MS =$ Variance, or Mean square of the Errors (or within groups) = $s^2_W$
  - The term $Sxp$ is the pooled standard deviation and is not of interest to us at this point.
- You may then fill in the ANOVA table

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>$SS$</th>
<th>$df$</th>
<th>$MS$</th>
<th>$F$</th>
<th>P-value</th>
<th>F-Crit.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor</td>
<td>$SS_B$</td>
<td>$df_N$</td>
<td>$s^2_B$</td>
<td>$F$</td>
<td>$p$</td>
<td>$F_{df_N, df_D, \alpha}$</td>
</tr>
<tr>
<td>Error</td>
<td>$SS_W$</td>
<td>$df_D$</td>
<td>$s^2_W$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$SS_B + SS_W$</td>
<td>$N - 1$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- You can obtain the critical value $F_{df_N, df_D, \alpha}$ using Table H, or using the INVF program given earlier, use $\alpha$ as area to the right, $DF1 = df_N$ and $DF2 = df_D$.

If you get an error message while doing an ANOVA on your TI-83, type [MEM] [5] [2] [2]. If this does not work, type in [MEM] [4] [ENTER] then type [STAT] [5] [ENTER] and retype the data value in the lists.