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/* Paired Samples - Module 13 */
ods pdf file='H:\_SAS\Mod13_Ex_Paired.pdf' notoc;

/* View Dataset */
title 'View Dataset';
proc print data=bio.beers;
run;

/* Paired T-test using PAIRED statement in PROC TTEST - with graphs*/
title "Using PAIRED statement in PROC TTEST";
ods graphics on;
proc ttest data=bio.beers;
paired before*after;
run;
ods graphics off;
title; /* Clear title */

/* Create difference variables */
data bio.beers2;
set bio.beers;
diff_BA = Before - After;
diff_AB = After - Before;
run;

/* View new variables in dataset */
title 'View New Dataset - with calculated differences';
proc print data=bio.beers2;
run;

/* Paired T-test using PROC TTEST with difference we calculate - this is
a one sample t-test - with graphs */
title 'PROC TTEST using Differences - one sample t-test';
ods graphics on;
proc ttest data=bio.beers2 h0=0;
var diff_ba;
run;
ods graphics off;

ods graphics on;
proc ttest data=bio.beers2 h0=0;
var diff_ab;
run;
ods graphics off;
title;

/* Paired T-test, Sign Test, and Wilcoxon Signed-Rank test using PROC UNIVARIATE
for difference we calculate - these are one sample tests */

/* The CIBASIC option requests confidence intervals (Module 11) */

title 'One Sample tests using PROC Univariate';
proc univariate data=bio.beers2 mu0=0 cibasic;
var diff_ba diff_ab;
run;
title;
ods pdf close;

```