

### ***View Dataset***

<b>Obs</b>	<b>Before</b>	<b>After</b>
1	6.25	6.85
2	2.96	4.78
3	4.95	5.57
4	3.94	4.01
5	4.85	5.91
6	4.81	5.34
7	6.60	6.09
8	5.33	5.84
9	5.19	4.19
10	4.88	5.75
11	5.75	6.25
12	5.26	7.23
13	3.16	4.55
14	6.65	6.42
15	5.49	5.25
16	4.05	5.59
17	4.42	3.96
18	4.99	5.93
19	5.01	6.03
20	4.69	3.72

# Using PAIRED statement in PROC TTEST

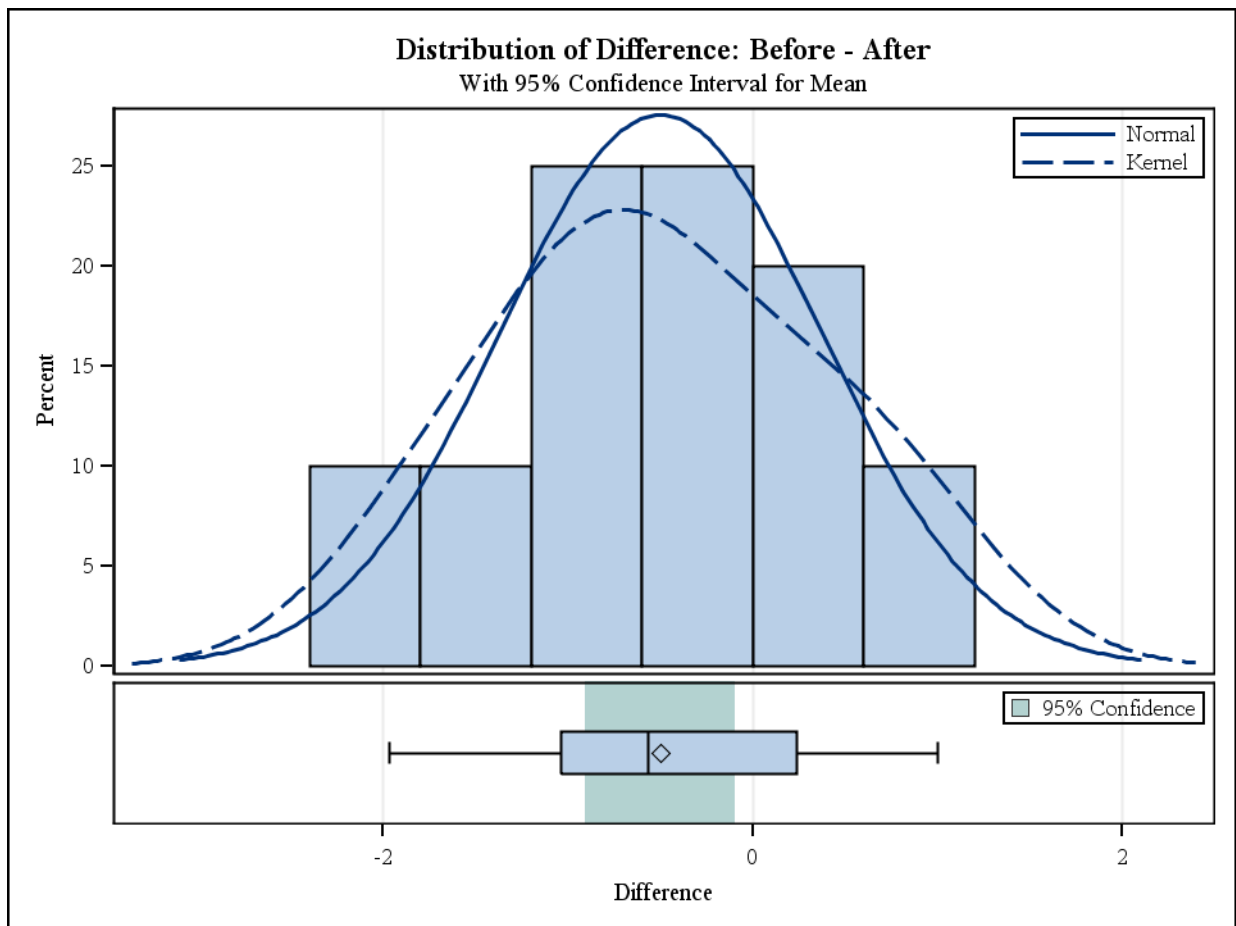
## The TTEST Procedure

Difference: Before - After

N	Mean	Std Dev	Std Err	Minimum	Maximum
20	-0.5015	0.8686	0.1942	-1.9700	1.0000

Mean	95% CL Mean		Std Dev	95% CL Std Dev	
-0.5015	-0.9080	-0.0950	0.8686	0.6606	1.2687

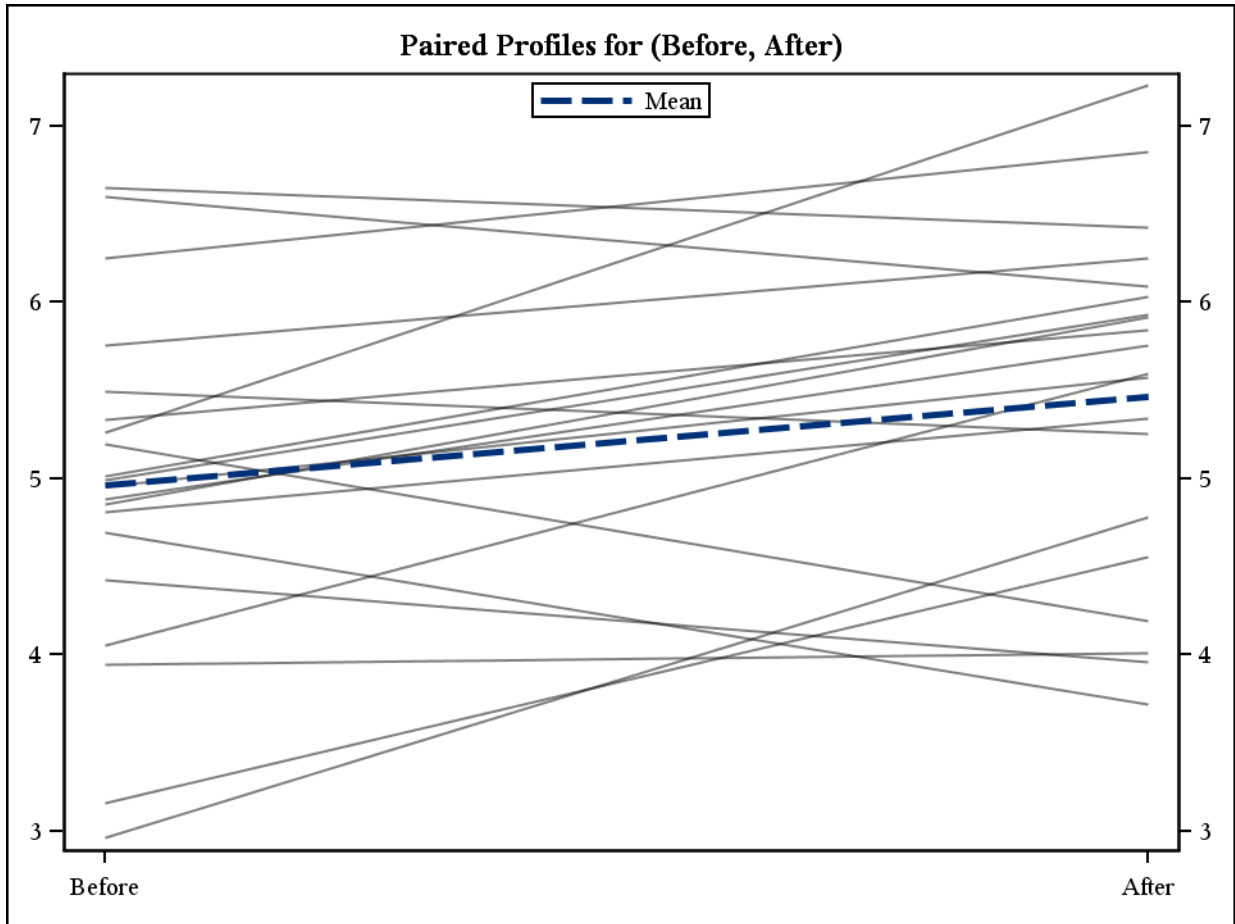
DF	t Value	Pr >  t
19	-2.58	0.0183



*Using PAIRED statement in PROC TTEST*

*The TTEST Procedure*

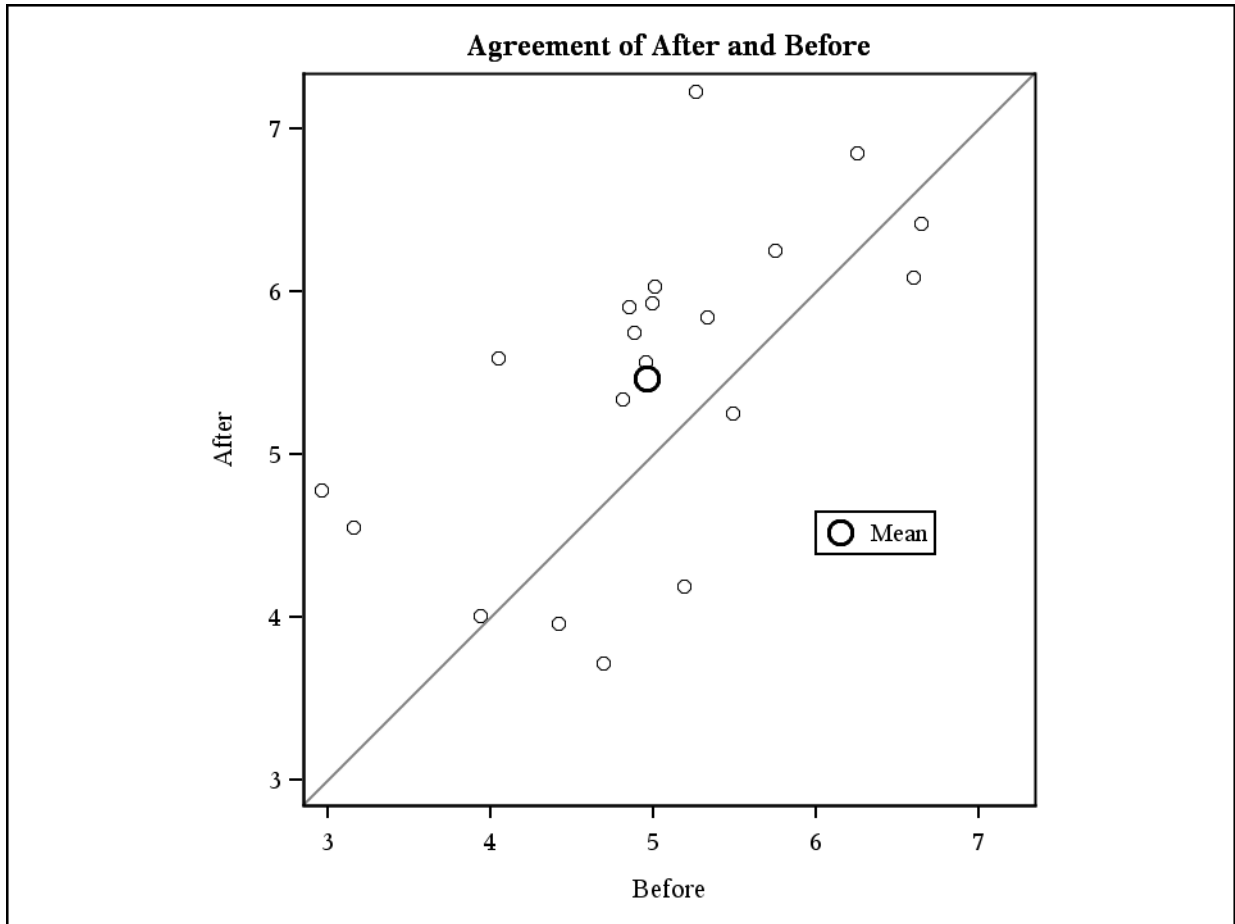
*Difference: Before - After*



*Using PAIRED statement in PROC TTEST*

*The TTEST Procedure*

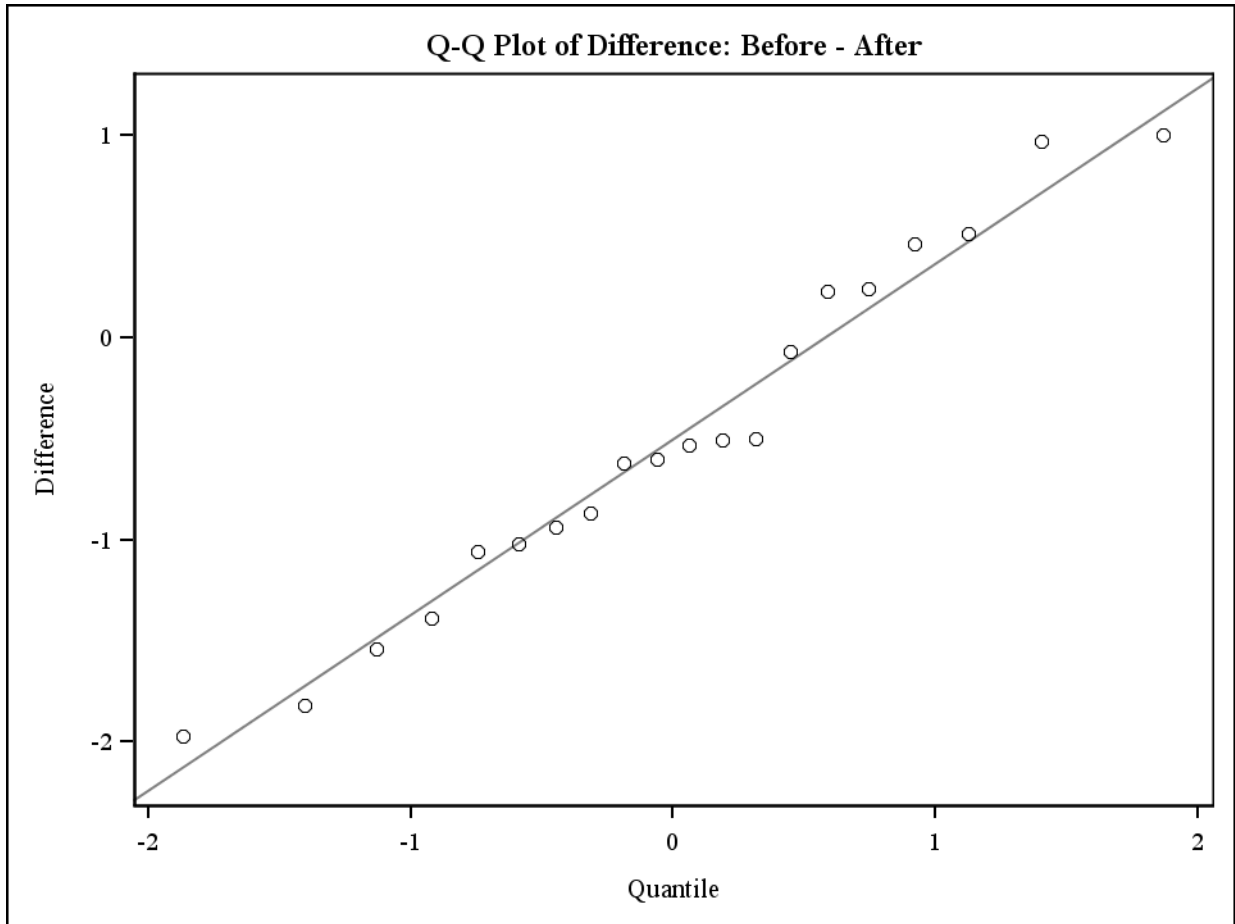
*Difference: Before - After*



*Using PAIRED statement in PROC TTEST*

*The TTEST Procedure*

*Difference: Before - After*



***View New Dataset - with calculated differences***

<b>Obs</b>	<b>Before</b>	<b>After</b>	<b>diff_BA</b>	<b>diff_AB</b>
1	6.25	6.85	-0.60	0.60
2	2.96	4.78	-1.82	1.82
3	4.95	5.57	-0.62	0.62
4	3.94	4.01	-0.07	0.07
5	4.85	5.91	-1.06	1.06
6	4.81	5.34	-0.53	0.53
7	6.60	6.09	0.51	-0.51
8	5.33	5.84	-0.51	0.51
9	5.19	4.19	1.00	-1.00
10	4.88	5.75	-0.87	0.87
11	5.75	6.25	-0.50	0.50
12	5.26	7.23	-1.97	1.97
13	3.16	4.55	-1.39	1.39
14	6.65	6.42	0.23	-0.23
15	5.49	5.25	0.24	-0.24
16	4.05	5.59	-1.54	1.54
17	4.42	3.96	0.46	-0.46
18	4.99	5.93	-0.94	0.94
19	5.01	6.03	-1.02	1.02
20	4.69	3.72	0.97	-0.97

# PROC TTEST using Differences - one sample t-test

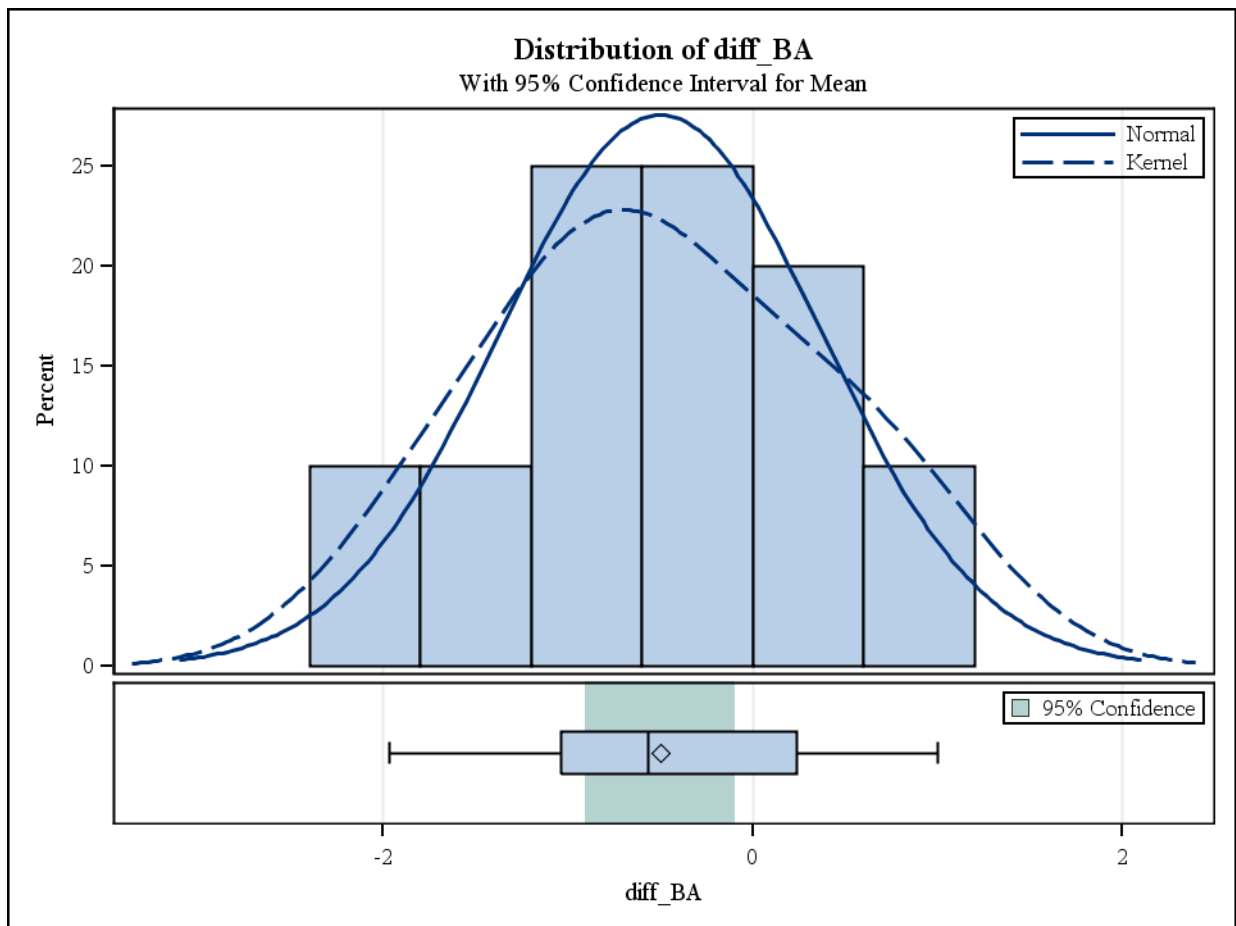
## The TTEST Procedure

Variable: *diff\_BA*

N	Mean	Std Dev	Std Err	Minimum	Maximum
20	-0.5015	0.8686	0.1942	-1.9700	1.0000

Mean	95% CL Mean		Std Dev	95% CL Std Dev	
-0.5015	-0.9080	-0.0950	0.8686	0.6606	1.2687

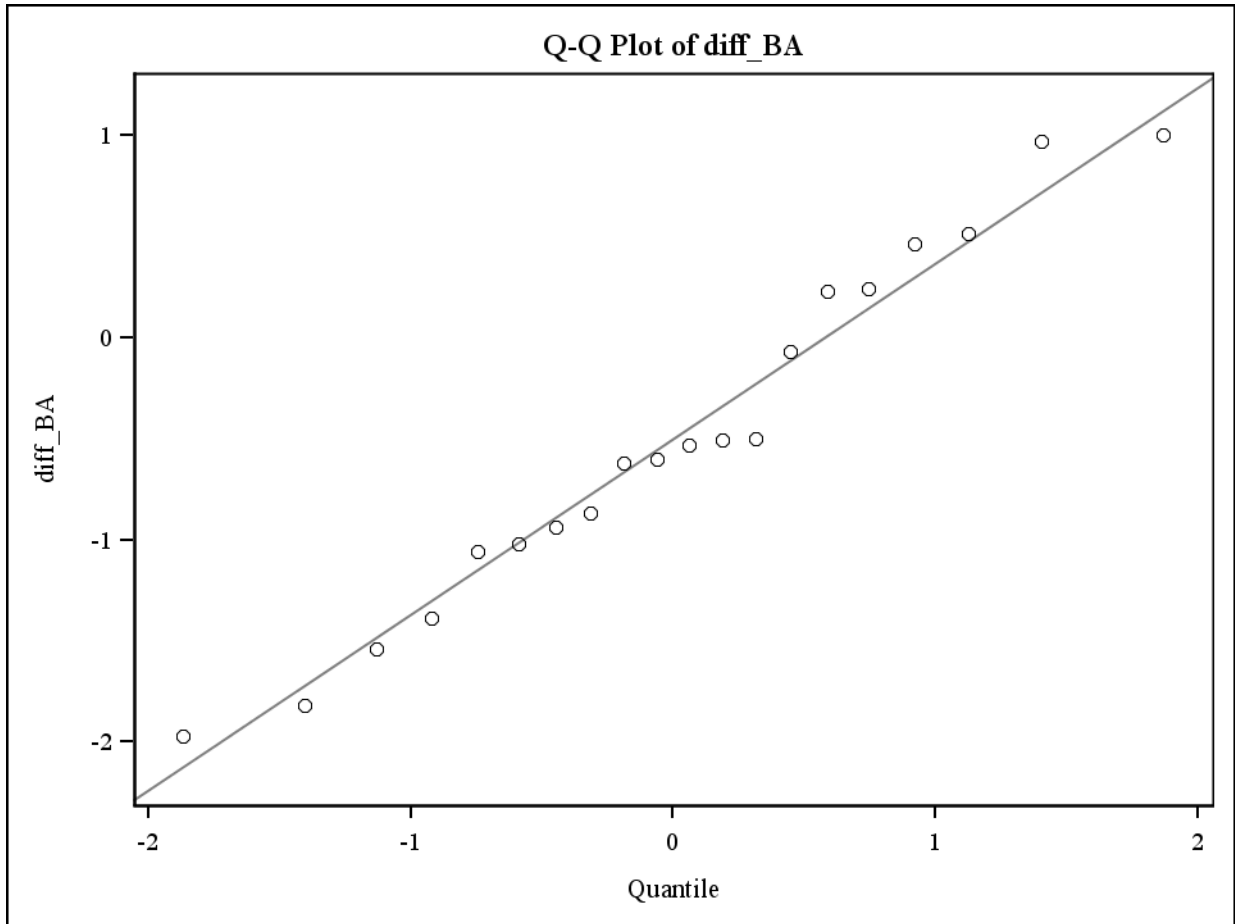
DF	t Value	Pr >  t
19	-2.58	0.0183



*PROC TTEST using Differences - one sample t-test*

*The TTEST Procedure*

*Variable: diff\_BA*





# PROC TTEST using Differences - one sample t-test

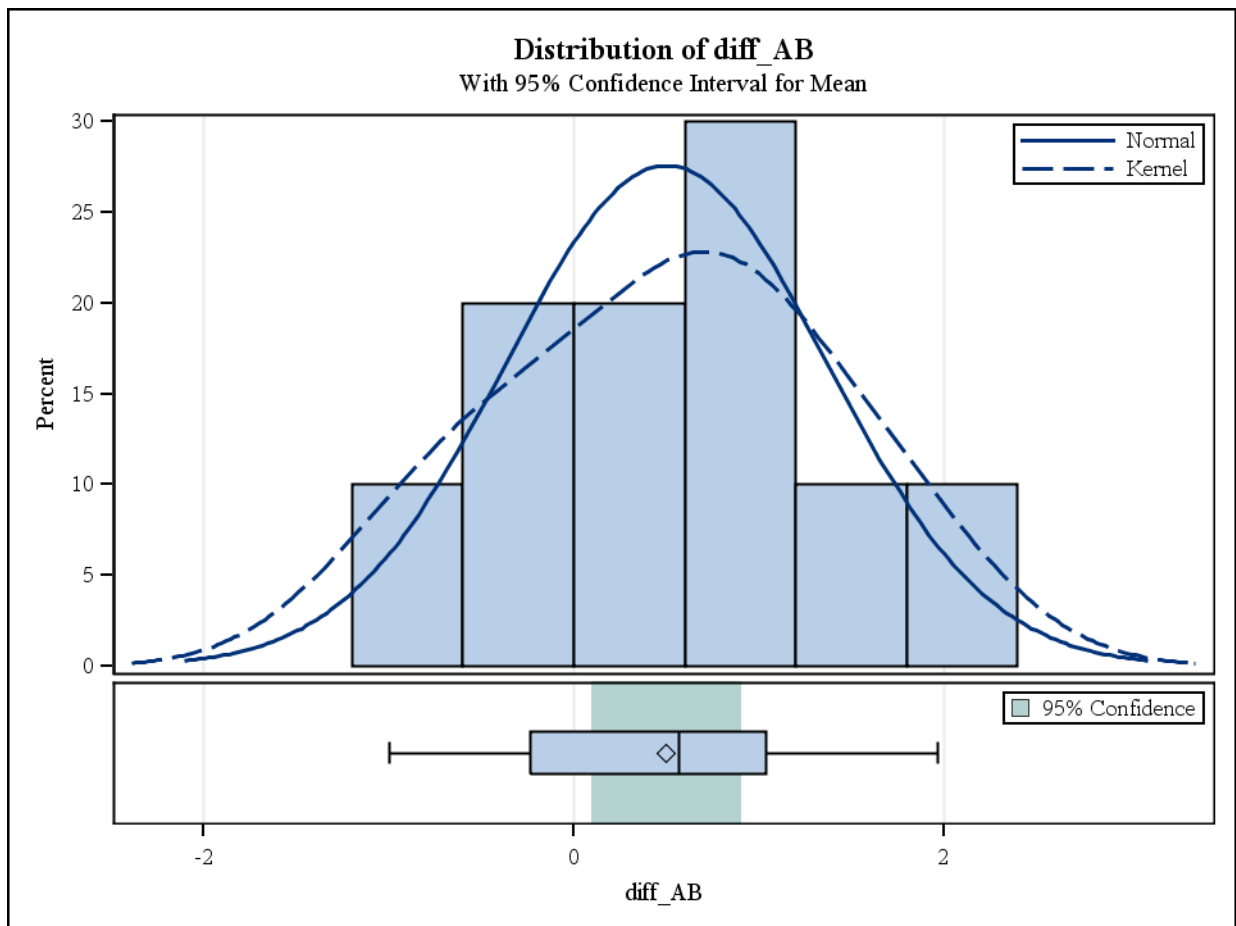
## The TTEST Procedure

Variable: *diff\_AB*

N	Mean	Std Dev	Std Err	Minimum	Maximum
20	0.5015	0.8686	0.1942	-1.0000	1.9700

Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0.5015	0.0950	0.9080	0.8686	0.6606	1.2687

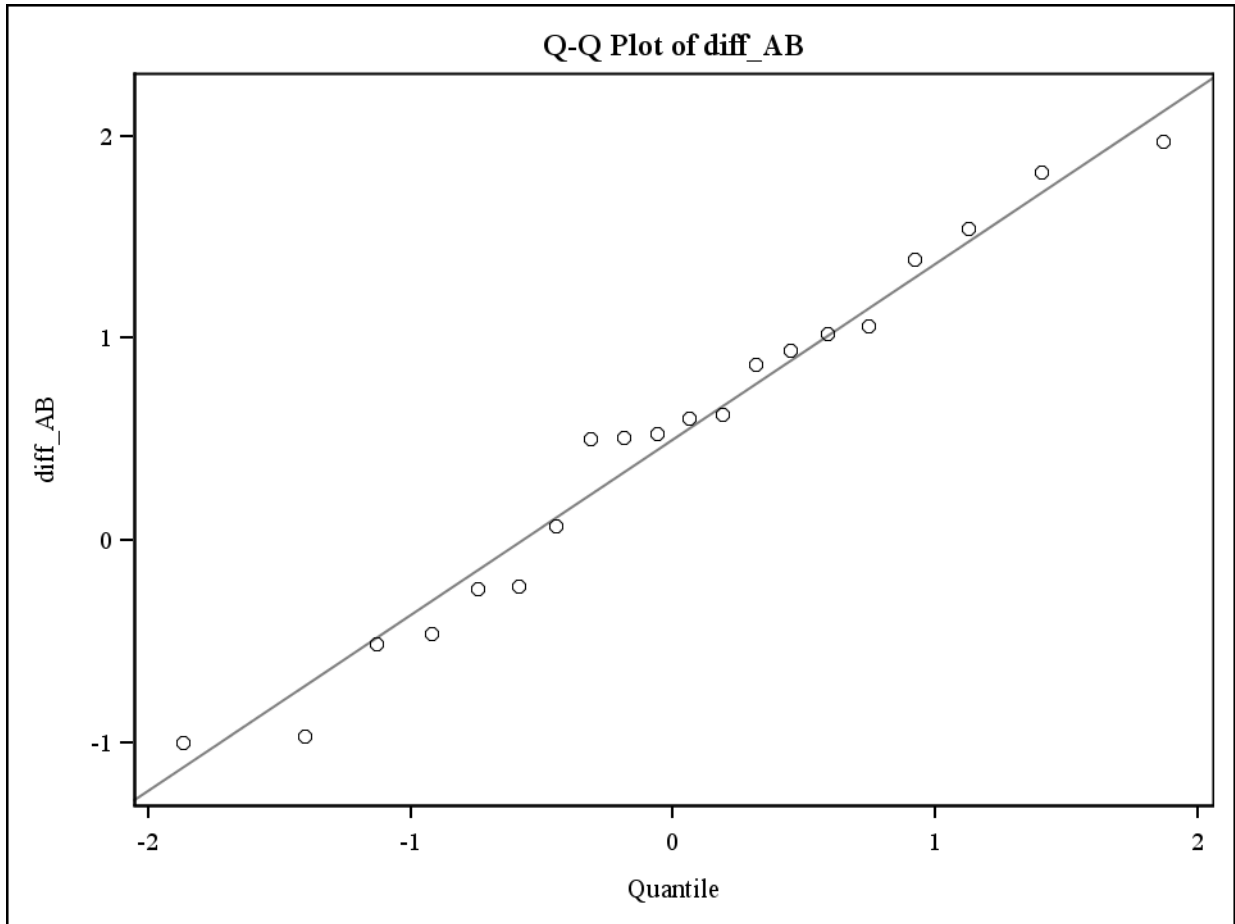
DF	t Value	Pr >  t
19	2.58	0.0183



*PROC TTEST using Differences - one sample t-test*

*The TTEST Procedure*

*Variable: diff\_AB*



**One Sample tests using PROC Univariate**

**The UNIVARIATE Procedure**

**Variable: diff\_BA**

Moments			
N	20	Sum Weights	20
Mean	-0.5015	Sum Observations	-10.03
Std Deviation	0.86860005	Variance	0.75446605
Skewness	0.14667632	Kurtosis	-0.7496941
Uncorrected SS	19.3649	Corrected SS	14.334855
Coeff Variation	-173.20041	Std Error Mean	0.19422488

Basic Statistical Measures			
Location		Variability	
Mean	-0.50150	Std Deviation	0.86860
Median	-0.56500	Variance	0.75447
Mode	.	Range	2.97000
		Interquartile Range	1.27500

Basic Confidence Limits Assuming Normality			
Parameter	Estimate	95% Confidence Limits	
Mean	-0.50150	-0.90802	-0.09498
Std Deviation	0.86860	0.66056	1.26865
Variance	0.75447	0.43634	1.60948

Tests for Location: $\mu_0=0$				
Test	Statistic		p Value	
Student's t	t	-2.58206	Pr >  t	0.0183
Sign	M	-4	Pr >=  M	0.1153
Signed Rank	S	-62.5	Pr >=  S	0.0176

*One Sample tests using PROC Univariate*

*The UNIVARIATE Procedure*

*Variable: diff\_BA*

Quantiles (Definition 5)	
Quantile	Estimate
100% Max	1.000
99%	1.000
95%	0.985
90%	0.740
75% Q3	0.235
50% Median	-0.565
25% Q1	-1.040
10%	-1.680
5%	-1.895
1%	-1.970
0% Min	-1.970

Extreme Observations			
Lowest		Highest	
Value	Obs	Value	Obs
-1.97	12	0.24	15
-1.82	2	0.46	17
-1.54	16	0.51	7
-1.39	13	0.97	20
-1.06	5	1.00	9

**One Sample tests using PROC Univariate**

**The UNIVARIATE Procedure**

**Variable: diff\_AB**

Moments			
N	20	Sum Weights	20
Mean	0.5015	Sum Observations	10.03
Std Deviation	0.86860005	Variance	0.75446605
Skewness	-0.1466763	Kurtosis	-0.7496941
Uncorrected SS	19.3649	Corrected SS	14.334855
Coeff Variation	173.200409	Std Error Mean	0.19422488

Basic Statistical Measures			
Location		Variability	
Mean	0.501500	Std Deviation	0.86860
Median	0.565000	Variance	0.75447
Mode	.	Range	2.97000
		Interquartile Range	1.27500

Basic Confidence Limits Assuming Normality			
Parameter	Estimate	95% Confidence Limits	
Mean	0.50150	0.09498	0.90802
Std Deviation	0.86860	0.66056	1.26865
Variance	0.75447	0.43634	1.60948

Tests for Location: $\mu_0=0$				
Test	Statistic		p Value	
Student's t	t	2.582059	Pr >  t	0.0183
Sign	M	4	Pr >=  M	0.1153
Signed Rank	S	62.5	Pr >=  S	0.0176

*One Sample tests using PROC Univariate*

*The UNIVARIATE Procedure*

*Variable: diff\_AB*

Quantiles (Definition 5)	
Quantile	Estimate
100% Max	1.970
99%	1.970
95%	1.895
90%	1.680
75% Q3	1.040
50% Median	0.565
25% Q1	-0.235
10%	-0.740
5%	-0.985
1%	-1.000
0% Min	-1.000

Extreme Observations			
Lowest		Highest	
Value	Obs	Value	Obs
-1.00	9	1.06	5
-0.97	20	1.39	13
-0.51	7	1.54	16
-0.46	17	1.82	2
-0.24	15	1.97	12