STAT430

HW2

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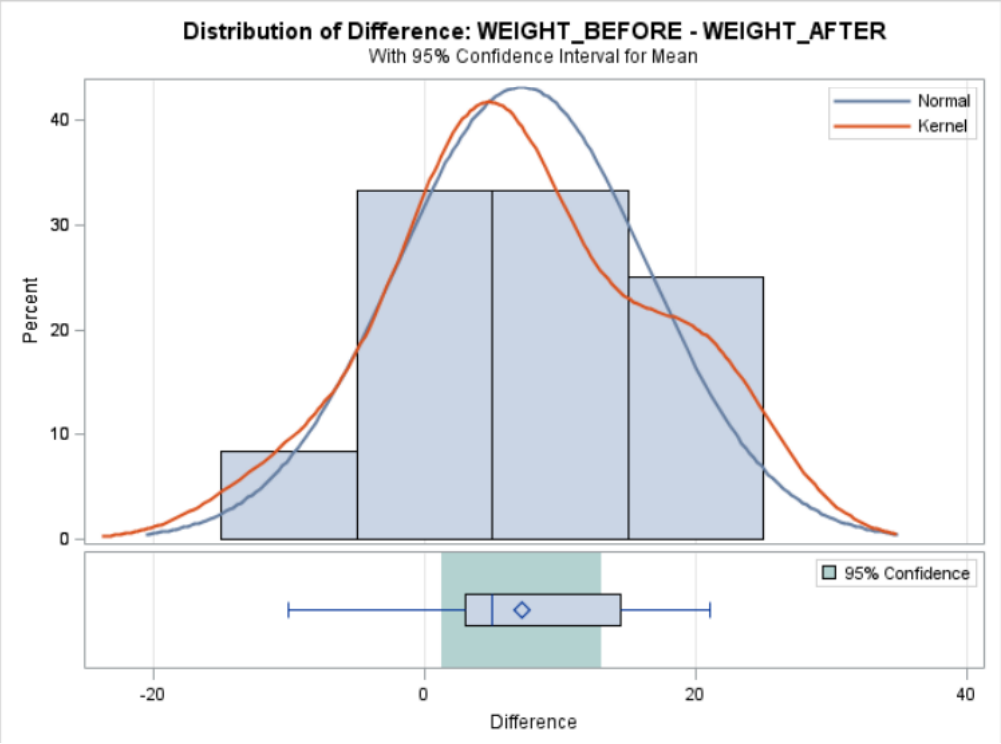
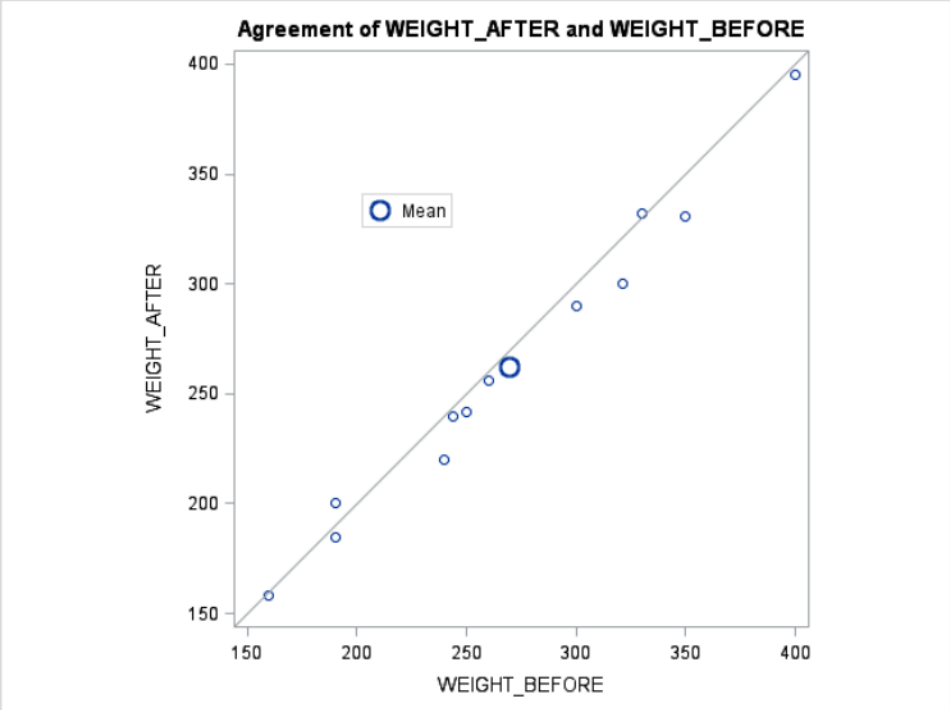
1. The company should purchase the rights to the South Beach Diet.
2. Firstly, according to the paired T-test, the Mean of the difference between WEIGHT_BEFORE and WEIGHT_AFTER (WEIGHT_BEFORE - WEIGHT_AFTER) is 7.1667, which means the average weight reducing 7.1667 after they went on the South Beach Diet. Secondly, the P-value of the difference is 0.0212 in the case of CL is 95%, which means we would accept the Ha when P-value < 0.05. Therefore, the company should purchase the rights to the South Beach Diet.
3. The paired test of this analysis is a T-test, while the premise of using the T hypothesis test is that the data must meet the normal distribution. In other words, the distribution of difference (WEIGHT_BEFORE - WEIGHT_AFTER) is normal. The UNIVARIATE Procedure in the analysis shows that
   i. The distribution of WEIGHT_BEFORE is normal. This is because the P-values of Shapiro-Wilk test, Kolmogorov-Smirnov test, Cramer-von Mises test, and Anderson-Darling test are all greater than 0.05 (suppose CL is 95%), which means we should accept Ho in this case. Thus, the distribution of WEIGHT_BEFORE is normal.
   ii. Similar to WEIGHT_BEFORE, the distribution of WEIGHT_AFTER is also normal since the P-values of all the four normality tests are greater than 0.05.
   iii. Therefore, the distribution of difference (WEIGHT_BEFORE - WEIGHT_AFTER) is normal. We could also infer this conclusion from the normality tests for difference.

   The following picture shows that we have 95% confidence to say that the difference follows a normal distribution.



The mean of this difference is positive, which means the weight is decreased after the patients went on this diet.

Also, the relationship between WEIGHT_BEFORE and WEIGHT_AFTER is linear. If a patient weight more before, they will loss more weight during the diet process.



Next plot shows the P-Value of this difference is less than 0.05.

Difference: WEIGHT_BEFORE - WEIGHT_AFTER

N	Mean	Std Dev	Std Err	Minimum	Maximum
12	7.1667	9.2425	2.6681	-10.0000	21.0000

Mean	95% CL Mean		Std Dev	95% CL Std Dev	
7.1667	1.2942	13.0391	9.2425	6.5474	15.6927

DF	t Value	Pr > |t|
11	2.69	0.0212