Means Extra Practice - Solutions

AP 2005B

(a) ****Use 95% confidence**

μ_D=true mean difference in growth (cm)

Matched Pair *t* interval
1. random 1. randomly assigned
2. sample size 2. n=12
stated as approx. normal

df=11

(-2.754, -1.276)

According to my sample, I am 95% confident that the true mean difference in growth between the treated and untreated seeds is between -2.754 and -1.276 cm.

(b) Yes there is sufficient evidence because zero (suggesting no difference) is not contained in the interval.

AP 2009

(a) μ_S-μ_N=true mean difference in response time (minutes)

2 sample *t* interval
1. random 1. randomly assigned
2. sample size 2. n_S=n_N=50,
both greater than 30

(-0.3732, 2.3732)

df=96.004

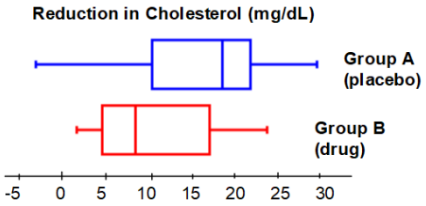
According to my sample, I am 95% confident that the true mean difference in response time between the south and north fire stations is between -0.373 and 2.373 minutes.

(b) No. Zero is contained in the interval, suggesting the mean difference could be 0 minutes.

AP 2011

$\mu_{drug} - \mu_{placebo}$ = true mean difference in cholesterol (mg/dL)

Ho: $\mu_{drug} = \mu_{placebo}$
Ha: $\mu_{drug} > \mu_{placebo}$



Two Sample *t* Test

1. Random
2. Sample size

1. Randomly assigned
2. $n_d = n_p = 10$

Both groups have no outliers.
Group A shows slight left skew and Group B shows slight right skew.

t=1.617697136
p=0.0619095762
df=17.295561
$\bar{x}_1$=16.4
$\bar{x}_2$=10.2

According to my sample, I fail to reject Ho with Pval=.062 > α=.05.
There is no evidence to suggest that the mean cholesterol reduction (mg/dL) with the drug is better than the placebo drug.

AP 2007

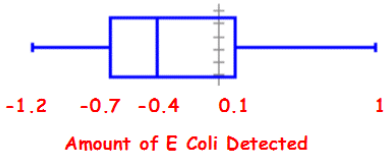
4. Investigators at the U.S. Department of Agriculture wished to compare methods of determining the level of *E. coli* bacteria contamination in beef. Two different methods (A and B) of determining the level of contamination were used on each of ten randomly selected specimens of a certain type of beef. The data obtained, in millimicrobes/liter of ground beef, for each of the methods are shown in the table below.

		Specimen									
		1	2	3	4	5	6	7	8	9	10
Method	A	22.7	23.6	24.0	27.1	27.4	27.8	34.4	35.2	40.4	46.8
	B	23.0	23.1	23.7	26.5	26.6	27.1	33.2	35.0	40.5	47.8
		0.3	-0.5	-0.3	-0.6	-0.8	-0.7	-1.2	-0.2	0.1	1

Is there a significant difference in the mean amount of *E. coli* bacteria detected by the two methods for this type of beef? Provide a statistical justification to support your answer.

μ_d = true mean difference in E. coli (millimicrobes/L) detected on beef

Ho: $\mu_{drug} = 0$
Ha: $\mu_{drug} \neq 0$



Matched Pair *t* Test

3. Random
4. Sample size

1. Randomly assigned
2. $n = 10$

The data is approx. symmetric w/ no outliers.
Group A shows slight left skew and Group B shows slight right skew.

t=-1.456283667
p=0.1792962269
$\bar{x}$=-0.29
Sx=0.6297265721
n=10

According to my sample, I fail to reject Ho with Pval=0.179 > α=.05.
There is no evidence to suggest that the mean difference of *E. coli* bacteria detected on meat is different from 0 millimicrobes/L).