Problem Set 10

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STAT 100, SECTION 0221

PROBLEM #1

A.

$\mu_1 = \mu_2$

$\mu_1 \neq \mu_2$

B.

This is a two-sided test because it specifically states “to determine whether there is a ***difference*** between the mean number of correct identifications.”

C.

$$t = \frac{37.56 - 36.21}{\sqrt{\frac{(6.34)^2}{195} + \frac{(5.97)^2}{195}}}$$

$$t = 2.165$$

D.

$$p - value = 2[1 - P(Z < |t|)$$

$$2.165 \rightarrow -2.17 \rightarrow 0.0150 \rightarrow 0.0150 \times 2 = 0.0300$$

E.

$$Since\ p - value = 0.03 < 0.05 = alpha,\ we\ reject\ Ho.$$

PROBLEM #2

A.

$\mu_1 = \mu_2$

$\mu_1 > \mu_2$

B. This is a one-sided test because it specifically states “to determine whether the mean gain in SAT Verbal scores is ***higher*** for students who were coached after their first attempt.”

C.

$$t = \frac{26.53 - 24.38}{\sqrt{\frac{(9.77)^2}{152} + \frac{(9.81)^2}{158}}}$$

$t = 1.933$

D.

$p - value = [1 - P(Z < |t|)]$

$1.933 \rightarrow 1.93 \rightarrow 0.9732 \rightarrow 1 - 0.9732 = 0.0268$

E.

$Since\ p - value = 0.0268 > 0.01,\ we\ cannot\ reject\ Ho.$

F.

$Since\ p - value = 0.0268 < 0.05,\ we\ reject\ Ho.$

G.

$We\ can\ reject\ Ho\ at\ both\ \alpha = 0.01\ and\ \alpha = 0.05.$

$p - value < 0.01\ and\ p - value < 0.05$

$p - value < 0.01$

$p - value = P(Z > t_o) = 1 - P(Z < t_o) < 0.01$

$1 - 0.01 = 0.99 = using\ the\ Z - table = P(Z < 2.33)$

$t_o \geq 2.33 \rightarrow any\ value \geq 2.33,\ for\ it\ to\ statify\ both\ conditions.$