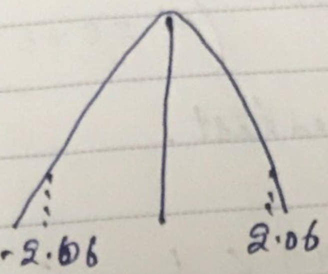
Subject: T Test Assignment

Date

1) $u = 72$ $\bar{x} = 69$, $\sigma_{Sample} = 6.5$. $n = 25$

H_0: $u = 72$, H_1: $u \neq 72$ → T test for Single Samples

$t_{n-1} = \dfrac{\bar{x} - u}{\left(\dfrac{\sigma}{\sqrt{n}}\right)}$



$= \dfrac{69 - 72}{\dfrac{6.5}{\sqrt{25}}} = -2.307$

$t_{critical}$ = $\pm$ 0.264 for ($\alpha = 0.05$ & dof = 24)

As $t_{n-1} < t_{critical}$ reject the null hypothesis.

∴ Aerobic Programe does lowered heart rate

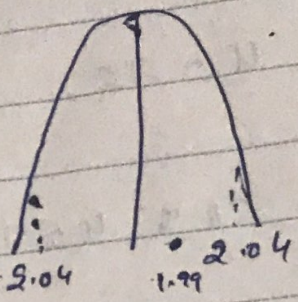
2) $u = 15$, $\bar{x} = 17$, $n = 30$, $\sigma_{Sample} = 5.5$

Ho: Avg lifetime of a shoe

H1: Avg lifetime is not 15 months - T test for Single Sample

Subject :

$$t_{n-1} = \frac{\bar{x} - 4}{(\sigma/\sqrt{n})} = \frac{17-15}{(5.5/\sqrt{30})} = 1.99$$



$t_{critical}$ for $(\alpha = 0.05$ & ~~df~~ dof $.(30-1) = 2.045$

For two tailed test.

As $t_{n-1} = 1.99 < t_{critical} = 2.045$ therefore we accept the null hypothesis.

3) T test for independent Samples

~~Pop. Std~~ Pop standard deviation = $\sqrt{\frac{(n-1)\times sd_1^2 + (n-1)\times sd_2^2}{(n-1)+(n-1)}}$

=) $\sqrt{\frac{(15-1)\times(6.63)^2 + (15-1)(6.20)^2}{28}}$

$\sqrt{\frac{\cancel{615} \; 615.39 + 538.16}{28}}$

Subject :

Date

$= 6.41$

Standard error $=$ pop std $\sqrt{\frac{1}{n_1}+\frac{1}{n_2}}$

$= 6.4 \left(\sqrt{\frac{2}{15}}\right)$

$= 2.34$

$t_{n-1} = \dfrac{\bar{x}_1 - \bar{x}_2}{SE} = \dfrac{30-26}{2.34} = 1.71$

$t_{critical}$ ($\alpha = 0.05$, dof $= 28$) $= 2.048$

As $t_{n-1} < t_{critical}$, therefore we accept null hypothe

4) Difference $=$ 3, 8, 5, 2, 5, 0, 3, 3, 6, 4, 6, 4, 1, 9, 1

~~Pa~~ ~~Pa~~ Paired T test

Mean of difference $= 60/15 = 4$

Standard deviation of difference $= 2.56$

$SE = 6/\sqrt{n} = \dfrac{2.56}{\sqrt{15}} = 0.66$

Scanned with CamScanner

Date

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$$t_{n-1} = \frac{\bar{x}_1 - \bar{x}_2}{St}$$

$$= \frac{30 - 26}{0.66} = 6.06$$

~~$t_{critical}$ at (~~

~~$t_{critical}(dof = 14, \alpha = 0.05) = 2.145$~~

~~$t_{n-1} < t_{critical}$,~~

$t_{critical}(\alpha = 0.05, dof = 14) = 2.145$

As $t_{n-1} > t_{critical}$, therefore we reject null hypothesis.

As per the Question the Relaxation group is significantly different than the Control group.

Subject: Date

5) $\bar{x} = 18$, $u = 16$, $\sigma = 2.05$. — Two tailed T test

$H_0: u \leq 16$

$H_1: u > 16$

$$t_{n-1} = \frac{\bar{x} - u}{\sigma} = \frac{18 - 16}{\left(\frac{2.05}{\sqrt{10}}\right)} = \frac{2}{0.64} = 3.078$$

$t_{critical}$ ($\alpha = 0.025$, ~~dof~~ dof = 9) = 2.262

~~As t_{n-1}~~ As $t_{n-1} > t_{critical}$, therefore we reject null hypothesis.

The End