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Steps 1-3:

Claim: there is a linear correlation between pulse rate and white blood cell counts

hypothesis: $H_0: \rho = 0$ $H_1: \rho \neq 0$. $n = 5$

step 4: significance level: $\alpha = 0.05$.

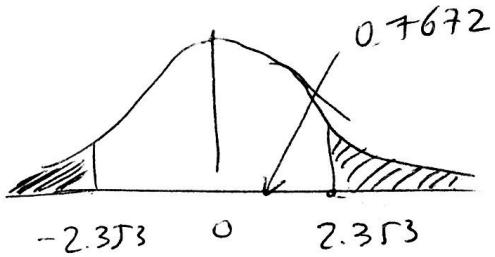
step 5: $t^{stat} = \frac{r}{\sqrt{\frac{1-r^2}{n-2}}} = \frac{0.405}{\sqrt{\frac{1-0.405^2}{5-2}}} = 0.7672$.

it follows a student t distribution with $n-2=3$ degrees of freedom.

step 6: t_α and $-t_\alpha$.

$t_\alpha = 2.353$

$-t_\alpha = -2.353$



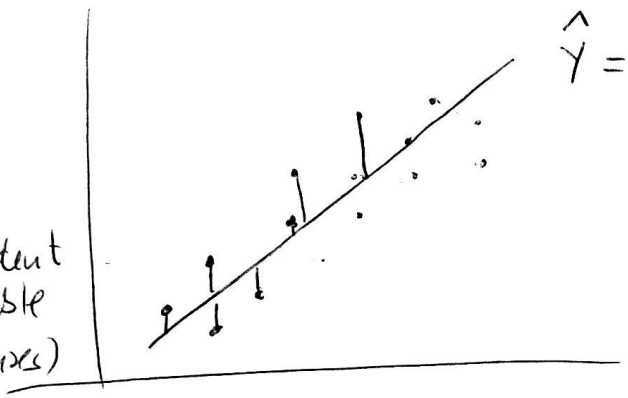
step 7: we fail to reject the null hypothesis. because the t^{stat} is between $t_\alpha = 2.353$ and $-t_\alpha = -2.353$.

step 8: there is not enough evidence to say that there is a linear correlation between pulse rate and white blood cell counts.

the type of error that we could be making is the type II error, which is to fail to reject H_0 when the null hypothesis is false.

regression equation

(x_1, y_1)
(x_2, y_2)
(x_n, y_n)



$\hat{y} = b_0 + b_1 x$

$b_0 = \bar{y} - b_1 \bar{x}$

$b_1 = r \frac{s_y}{s_x}$

$Y = \beta_0 + \beta_1 X$

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$\hat{y} = b_0 + b_1 x$

$b_0 = \bar{y} - b_1 \bar{x}$

$b_1 = r \frac{s_y}{s_x}$

Y: white blood cell count
X: pulse rate

$b_1 = 0.405 \cdot \frac{1.916}{12.884} = 0.0602$

$b_0 = 7.72 - 0.0602 \cdot 78 = 3.0244$

$\hat{y} = 3.0244 + 0.0602x$

prediction:

$\hat{y} = 3.0244 + 0.0602 \cdot 70.$