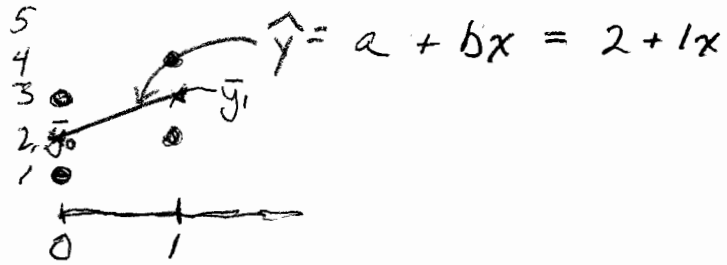


A SIMPLE EXAMPLE

4/10/08

DATA

i	X	Y
1.	0	1
2.	0	3
3.	1	2
4.	1	4



$$\bar{x} = .5 \quad s_x = \sqrt{\frac{1}{3}(1)} = 0.5774$$

$$\bar{y} = 2.5 \quad s_y = \sqrt{\frac{1}{3}((1-2.5)^2 + (3-2.5)^2 + (2-2.5)^2 + (4-2.5)^2)} = 1.291$$

i	Z _x	Z _y	Z _x Z _y	ŷ _i	residual	resid ²
1	-.87	-1.16	1.01	2	-1	1
2	-.87	0.39	-.34	2	1	1
3	.87	-0.39	-.34	3	-1	1
4	.87	1.16	1.01	3	1	1
			1.34			4

$$b = r \frac{s_y}{s_x} = .4472 \frac{1.291}{0.5774} = 0.9999 \approx 1.00$$

$$a = \bar{y} - b\bar{x} = 2.5 - (.9999) \cdot .5 \approx 2.0$$

$$r = \frac{1}{n-1} \sum Z_x Z_y = \frac{1}{4-1} \cdot 1.34 = 0.447 = .45$$

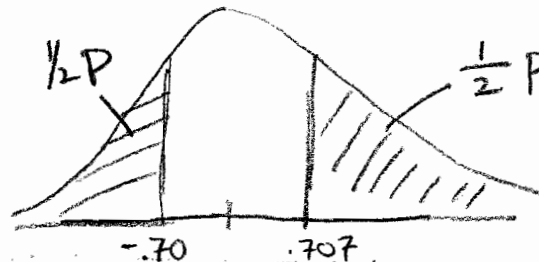
$$s_{y|x} = \sqrt{\frac{1}{n-2} \sum \text{residuals}^2} = \sqrt{\frac{1}{4-2} \cdot 4} = 1.4142$$

$$SE_b = \frac{s_{y|x}}{\sqrt{n-1} \cdot s_x} = \frac{1.4142}{\sqrt{4-1} \cdot 0.5774} = 1.414$$

$$H_0: \beta = 0$$

$$t = \frac{b}{SE_b} = \frac{1}{1.414} = 0.707$$

$$df = n - 2 = 4 - 2 = 2$$



$$\frac{1}{2} P = \frac{1}{2} (.553) = .2665$$

INTRO TO DUMMY VARIABLES: CATEGORICAL VARIABLES CORRELATION AND (LIKE THIS PROBLEM)

$$\bar{y}_{x=0} = \frac{1+3}{2} = 2$$

$$\bar{y}_{x=1} = \frac{2+4}{2} = 3$$

$$s_{x=0} = 1.4142$$

$$s_{x=1} = 1.4142$$

$$n_{x=0} = 2$$

$$n_{x=1} = 2$$

NOTE: $\bar{y}_1 - \bar{y}_0 = 3 - 2 = 1 = b$

ALSO: $H_0: \mu_1 = \mu_2$

$$t = \frac{\bar{y}_1 - \bar{y}_0}{SE_{\bar{y}_1 - \bar{y}_2}} = \frac{3-2}{\sqrt{1.4142^2 (\frac{1}{2} + \frac{1}{2})}}$$

$$= \frac{1}{1.4142} = 0.707$$