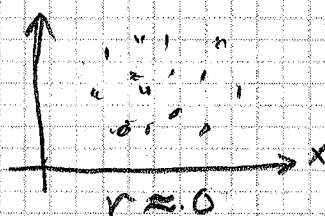
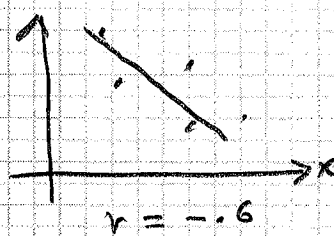
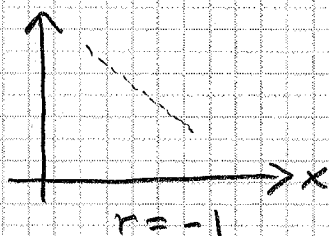
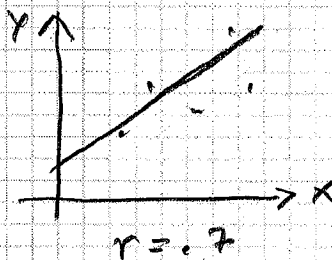
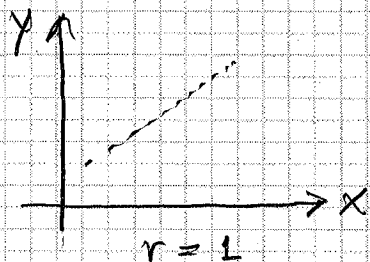


THE COEFFICIENT OF CORRELATION

is a measure of the strength and direction of the linear relationship between two variables x and y



$$-1 \leq r \leq 1$$

X	Y	X ²	Y ²	XY
1	2	1	4	2
2	4	4	16	8
3	5	9	25	15
4	7	16	49	28
5	8	25	64	40

ΣX	ΣY	ΣX^2	ΣY^2	ΣXY
15	26	55	158	93

$$SS_{xy} = \Sigma xy - \frac{\Sigma x \Sigma y}{n} = 93 - \frac{15 \times 26}{5} = 15$$

$$SS_{xx} = \Sigma x^2 - \frac{(\Sigma x)^2}{n} = 55 - \frac{15^2}{5} = 10$$

$$SS_{yy} = \Sigma y^2 - \frac{(\Sigma y)^2}{n} = 158 - \frac{26^2}{5} = 22.8$$

$$r = \frac{SS_{xy}}{\sqrt{SS_{xx} \cdot SS_{yy}}} = \frac{15}{\sqrt{10 \cdot 228}} = .99$$

= .99 very strong positive correlation between x and y

NOTE: $\hat{\beta}_1$ and r always have the same sign

$$\hat{\beta}_1 = \frac{SS_{xy}}{SS_{xx}}$$