

(8)

Solution:

$$\hat{b}_0 = \bar{y} - \hat{b}_1 \bar{x}$$

plug-in into (2)  
and solve for  $\hat{b}_1$ 

$$\Rightarrow \hat{b}_1 = \frac{(xy) - N\bar{x}\bar{y}}{(x^2) - N(\bar{x})^2}$$

$$= \frac{\text{Cov}(x, y)}{\text{Var}(x)}$$

Slope of  
regression lineObservation from  $\hat{b}_0 = \bar{y} - \hat{b}_1 \bar{x}$ 
 $\bar{y} = \hat{b}_0 + \hat{b}_1 \bar{x} \Rightarrow$  Mean of  $x$ -values  
and mean of  $y$ -values  
are on the regression  
line
