

PRACTICE LESSON 3.3

EXERCISE 1

X	Y
0	4
0	5
0	5
0	6
0	7
0	8
1	
1	
1	
1	
Σ	4

$\bar{Y} = 7$

$$\bar{Y}_0 = \frac{\sum Y_0}{n_0} = \frac{35}{6} = 5.83$$

$$\bar{Y} = \frac{n_0 \cdot \bar{Y}_0 + n_1 \cdot \bar{Y}_1}{N}$$

$$7 = \frac{6 \cdot 5.83 + 4 \cdot \bar{Y}_1}{10}$$

$$70 = 34.98 + 4 \cdot \bar{Y}_1$$

$$70 - 34.98 = 4 \bar{Y}_1$$

$$\frac{35.02}{4} = \bar{Y}_1$$

$$8.755 = \bar{Y}_1$$

$$\hat{Y} = a + bX \rightarrow \boxed{\hat{Y} = 5.83 + 2.925X}$$

$$a = \bar{Y}_0 = 5.83$$

$$b = \bar{Y}_1 - \bar{Y}_0 = 8.755 - 5.83 = 2.925$$

* 5.83 = average satisfaction in people that live alone

* 2.925 = increase in the average satisfaction in people that live with others when comparing with people that live alone.

Another way to solve the exercise:

$$\bar{Y} = a + b\bar{X}$$

$$7 = 5.83 - b \cdot 0.4$$

$$-1.17 = -0.4b$$

$$\frac{-1.17}{-0.4} = b$$

$$2.925 = b$$

$$a = \bar{Y}_0 = 5.83$$

$$\bar{X} = \frac{4}{10} = 0.4$$

$$\hat{Y} = a + bX$$

$$\boxed{\hat{Y} = 5.83 + 2.925X}$$