

1. Normal random variable.

Note: X , scale reading, is normal with $\mu = 10.05$ and $\sigma = 0.02$.

$$(a) P(X > 10.08) = P\left(\frac{X - \mu}{\sigma} > \frac{10.08 - 10.05}{0.02}\right) = P(Z > 1.50) \\ = 1 - P(Z \leq 1.50) = 1 - .9332 = .0668 \Rightarrow 6.7\%$$

$$(b) z = -0.44 \quad \therefore P(Z \leq -0.44) \approx .33$$

$$z = \frac{x - \mu}{\sigma}; -0.44 = \frac{x - 10.05}{0.02}; x = 10.05 + (-0.44)(0.02) = 10.04$$

2. Correlation and regression by calculator.

$$(a) r = .947$$

$$(b) b = r\left(\frac{s_y}{s_x}\right) = .947\left(\frac{8.72}{11.47}\right) = 0.720$$

$$a = \bar{y} - b\bar{x} = 80.40 - (0.720)(79.70) = 23.016$$

$$\hat{y} = 23.016 + 0.720x$$

3. Contingency table.

(a) Conditional percentages are as follows.

Gender	Type of duty		
	Managerial	Supervision	Labor
Female	4.1%	19.2%	76.7%
Male	6.0%	13.0%	81.0%

(b) Proportionately, more women than men are supervisors, and more men than women are managers and laborers.

4. Probability.

A : {selected member has checking account}

B : {selected member has savings account}

Note: $P(A) = .92$; $P(B) = .77$; $P(A \cap B) = .72$

$$(a) P(A \cup B) = P(A) + P(B) - P(A \cap B) = .92 + .77 - .72 = .970$$

$$(b) P(A|B) = \frac{P(A \cap B)}{P(B)} = \frac{.72}{.77} = .935$$

$$(c) P(A \cap B) = .72 \text{ but } P(A)P(B) = (.92)(.77) = .708 \\ \Rightarrow \text{Two events are not independent.}$$

5. Binomial random variable.

Note: X , number of investors, is binomial with $n = 15$ and $p = .40$.

(a) $\mu = np = (15)(.40) = 6.0$

(b) $P(X \leq 5) = .4032$

(c) $P(X = 0) = .0005$

(d) $P(X = 10) = P(X \leq 10) - P(X \leq 9) = .9907 - .9662 = .0245$

6. Correlation and regression by SPSS.

(a) $r^2 = .566 \Rightarrow$ Approximately 57% of the variability in the data is accounted for by the regression model.

(b) $\hat{y} = -3.784 + 0.402(42) = 13.1$