1. \( \hat{p} = \frac{492}{806} \approx 0.61 \)

\[ H_0: p = \frac{1}{2} = 0.5 \]

\[ H_1: p > \frac{1}{2} \quad \text{(one-tail)} \]

Test statistic: \( Z = \frac{\hat{p} - p}{\sqrt{\frac{p(1-p)}{n}}} = \frac{0.61 - 0.5}{0.0176} = 6.25 \) (when rounded)

Therefore, the \( p \)-value is less than \( 0.0001 \) (using Table A-2)

Since \( 0.0001 < 0.01 \), we reject the null hypothesis.

The evidence suggests that the majority of people prefer window seats.

2. \( \hat{p} = 0.459 \)

\[ H_0: p = 0.5 \]

\[ H_1: p < 0.5 \quad \text{(one-tail)} \]

\[ Z = \frac{0.459 - 0.5}{\sqrt{\frac{0.5(1-0.5)}{514}}} = -1.86 \] (when rounded)

Therefore, the \( p \)-value is (using Table A-2): \( 0.0314 \)

\( 0.0314 < 0.05 \) so for \( \alpha = 0.05 \) we reject \( H_0 \), i.e., the evidence suggests that less than half of human resource professionals see piercings and tattoos as big red flags.
Since \( 0.314 > 0.01 \), then if \( \alpha = 0.01 \) we don't reject \( H_0 \). Therefore the evidence does not support that less than half of the professionals see piercings and tattoos as a red flag.

(3) \( n = 62 \) so \( df = 61 \).
\[
\bar{x} = 1.911, \quad s = 1.065, \quad \alpha = 0.05
\]
\( H_0: \mu = 1.800 \)
\( H_1: \mu > 1.800 \) (one tail)

The test statistic is
\[
t = \frac{\bar{x} - \mu}{s/\sqrt{n}} = \frac{1.911 - 1.800}{1.065/\sqrt{62}} = \frac{0.111}{0.135} \approx 0.821
\]

(\text{after rounding})

We look at row \( df = 60 \) (closest to \( df = 61 \)) in Table A.3. We see that \( 0.821 \) is smaller than every number in that row, therefore the \( p \)-value is at least \( 0.10 \).

\( p \)-value \( > 0.10 > 0.05 = \alpha \)

Therefore we fail to reject the null hypothesis.

The evidence does not support the conclusion that \( \mu > 1.800 \).
(4) a) \(n = 25\) so \(df = 24\). \(t = 1.733\)

It's a one-tail test.

Using Table 4-3 on row 24

\(1.711 < 1.733 < 2.064\).

Since it's a one-tail test

\[0.025 < P\text{-value} < 0.05\]

b) \(n = 21\) so \(df = 20\). \(t = -2.242\). Two-tail test

\(2.086 < 2.242 < 2.528\)

Since it's two-tail

\[0.02 < P\text{-value} < 0.05\]

(5) a) Using Table A-6 with \(a = 0.05\) and \(n = 8\) we get that the critical value for \(r\) is 0.707.

Since \(0.74 > 0.707\) the evidence supports that the paired data is linearly correlated.

b) \(n = 5\) and \(a = 0.05\) so the critical value for \(r\) is 0.878.

Since \(r = 0.867\) and \(0.867 < 0.878\)

the evidence does not support that the paired data is linearly correlated.
6) The predicted value is \( \hat{y} = 3.14(1.50) + (-0.00396) \)
\[ = 4.71 - 0.00396 \]
\[ = 4.70604 \]
\[ \approx 4.71 \]

4.71 is very close to 4.70 so the result compares well.

7) \( r = 0.7 \), \( s_x = 1.3 \), \( s_y = 1.7 \) so

\[ b_1 = r \frac{s_y}{s_x} = (0.7) \frac{1.2}{1.3} = 0.915 \ldots \]

Since \( b_1 = 0.915 \) and \( \bar{x} = 17.2 \) and \( \bar{y} = 11.1 \)
then

\[ b_0 = \bar{y} - b_1 \bar{x} = 11.1 - 0.915(17.2) \]
\[ = 11.1 - 15.738 \]
\[ = -4.638 \]

So the regression equation is

\[ \hat{y} = 0.915x - 4.638 \]