Below are descriptive statistics and a correlation matrix for 3 variables—Y, X1, and X2—which were observed for 100 randomly selected individuals.

**X1 X2 Y Mean Variance**

**X1** 1.000 8.040 2.108

**X2** 0.350 1.000 6.112 4.103

**Y** 0.150 0.220 1.000 4.063 5.125

1. Report the prediction equation for the regression of Y on X1 and X2.







1. Interpret the values of a, b1, and b2

a: When both X1 and X2 equal zero, we expect Y to equal 1.716

b1: Net of X2, a one unit increase in X1 is associated with a 0.130 unit increase in Y

b2: Net of X1, a one unit increase in X2 is associated with a 0.213 unit increase in Y

1. Compute and interpret the value of R2Y•X1X2

This means that 5.4% of the variation in Y is accounted for by X1 and X2

1. Test the hypothesis that 2Y•X1X2 equals zero. Use =0.05.

H0: 2Y•X1X2=0 H1: 2Y•X1X2≠0

Critical value F\* with dfNUM=2 and DFDENOM=97 is between 3.07 and 3.15









Because F < F\*, we fail to reject the null hypothesis that 2Y•X1X2 equals zero. That is, we cannot reject the hypothesis that the two explanatory variables account for *none* of the variation in Y.

1. Test the hypothesis that 1 equals zero. Use =0.05.

H0: 1=0 H1:1≠0

Critical value t\* with N-3=97 degrees of freedom is between 1.98 and 2.00



Because t < t\*, we fail to reject the null hypothesis that 1 equals zero.

1. Test the hypothesis that 2 equals zero. Use =0.05.

H0: 2=0 H1:2≠0

Critical value t\* with N-3=97 degrees of freedom is between 1.98 and 2.00



Because t < t\*, we fail to reject the null hypothesis that 2 equals zero.

1. Report the zero-order correlation between X1 and Y. Then compute the partial correlation between X1 and Y after controlling for X2 and compare it to the zero-order correlation.

The zero-order correlation between X1 and Y is 0.150. The first order correlation is



The correlation between X1 and Y is reduced by almost half by controlling for X2.