

## Statistics Assignments Using Excel®

### Assignment #11: Correlation and Regression

Company X primarily uses two techniques to evaluate job applicants: (a) *intelligence* as measured by a standard IQ scale, and (b) a formal *interview* in which they are judged on a 1 (*Poor*) to 7 (*Excellent*) scale. An Industrial-Organizational Psychologist working for Company X is interested in investigating the validity of this selection process. To do so he collects data from the personnel files of 17 employees hired during 2007. He records their IQ score, interview score, and the result of their 1-year performance review in which their work performance was assessed on a scale from 0 (*Very Poor*) to 10 (*Very Good*).

<b>IQ</b>	<b>INTERVIEW</b>	<b>PERFORMANCE</b>
103	7	5
119	5	9
100	4	7
103	7	6
112	5	9
129	6	10
89	6	7
99	6	5
84	7	7
104	4	7
89	4	8
132	6	8
87	4	7
109	4	9
139	5	10
93	2	7
83	5	5

#### Part I:

Determine the correlations (Pearson  $r$ 's) for the following three variable pairs:

- IQ & Performance
- Interview & Performance
- IQ & Interview

1. First determine these correlations by creating your own Excel spreadsheet formula.

$$r = \frac{\sum(Z_X Z_Y)}{N}$$

2. Second, verify your answers using either the =CORREL or =PEARSON function.
3. Create a scatterplot for each correlation. Clearly label the axes

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The following textbook contains detailed instructions for using spreadsheets in an introductory statistics class:  
 Tagler, M. J. (2009). *Understanding basic statistics with spreadsheets*. New York, NY: Pearson Custom.

Part II:

Determine the regression line for predicting job performance ( $Y$ ) from IQ scores ( $X$ ).

1. First, create your own spreadsheet formulas to determine:

The slope:

$$b = r \left( \frac{S_Y}{S_X} \right)$$

And the y-intercept:

$$a = \bar{Y} - b(\bar{X})$$

2. Second, verify your answers using the =SLOPE and =INTERCEPT functions.
3. Third, verify your answers by including the regression line in the job performance – IQ scatterplot, by doing the following:
  - Click on the chart to highlight it, select the Chart menu, and select “Add Trendline...”
  - Select “Linear” as the type, and on the Options tab select “Display equation on chart”

Insert a textbox reporting your results (including statistical significance) and what you think the I/O Psychologist should conclude.

Do a final save and submit your work.

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