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Practice: Exploring Correlations (Example)

In JMP, open the file **Impurity.jmp**.

In this scenario, a catalyst is required for the chemical reactions to occur to produce a polymer. The catalyst contains a chemical that can create an impurity in the polymer. The lower the impurity the better. In this exercise, you explore the relationship between **Impurity** and the continuous variables.

1. Select **Graph Builder** on the Graph menu to create a scatterplot and calculate the correlation coefficient for **Impurity** (Y zone) and **Reaction Time** (X zone). Click the ellipse icon above the graph to display the density ellipse. In the Ellipse outline of the control panel, select the **Correlation** check box.

    a. What is the correlation between **Impurity** and **Reaction Time**?

    b. How would you describe the relationship between **Impurity** and **Reaction Time**?

    a. The correlation coefficient is 0.022.

    b. There is no apparent relationship between the two variables.

2. Select the **Multivariate** platform on the Analyze, Multivariate Methods menu to create a scatterplot matrix for **Impurity**, **Temp**, **Catalyst Conc**, and **Reaction Time**.

    a. Which of the three variables is most strongly correlated with **Impurity**?

    b. How would you describe the relationship between **Impurity** and **Catalyst Conc**? For example, is the relationship weak or strong? Is it positive or negative? Does there appear to be a curvilinear relationship? Does there appear to be no relationship?

    c. Can we conclude that an increase in the values of **Catalyst Conc** causes an increase in the values of **Impurity**?

    a. Catalyst Conc **-** The correlation between **Impurity** and **Catalyst Conc** is 0.8381.

    b. The correlation is strong positive. As a general rule, correlations greater than 0.70 are considered strong positive.

    c. No, correlation does not mean causation.

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