

Multiple linear regression in JMP

1) Data exploration: Scatterplot matrix (dataset case0902.jmp)

- Select “multivariate” then put all variables or choose some of them in y-columns box

To determine the axes of the scatterplot matrix you must examine the diagonal of the matrix. The column in the plot determines the X axis, while the plot's row in the matrix determines the Y axis. The ellipses in each plot would contain about 95% of the data if both X and Y were normally distributed. Skinny, tilted ellipses are a graphical depiction of a strong correlation. Ellipses that are almost circles are a graphical depiction of weak correlation. The correlation matrix shows the level of correlation among the variables (response + explanatory).

2) Compute the multiple linear regression (dataset case0901.jmp)

- Select "**Analyze --> Fit Model.**"
- In the "Select Columns" list in the dialog box that follows, click "**flowers**"; then click the "**Y**" button to designate flowers as the response variable.
- Click "**time**" in the "Select Columns" list and click "**Add**" to designate time as an explanatory variable. Do the same for “intens”.
- Select "**Standard Least Squares**" from the pop-up menu labeled "Personality" if it is not already selected. (This should be the default.)
- Select "**Minimal Report**" from the pop-up menu labeled "Emphasis."
- Leave the checkbox labeled "No Intercept" unchecked.
- Click "**Run Model.**"

3) Once the Regression is Run

Display confidence limits for parameters.

- On the output of step 2), right-click anywhere on the table under the label "Parameter Estimates."
- Select "**Columns --> Lower 95%**" from the resulting pop-up menu.
- Right-click on the table again, this time selecting "**Columns --> Upper 95%**" from the pop-up menu.

Save Columns

This menu lives under the red triangle governing the whole regression. Options under this menu will save a new column to your data table. Use this menu to obtain:

- Residuals
- Predicted (or —Fitted) Values
- Mean confidence interval
- Individual confidence Interval

This menu is especially useful for **making new predictions** from your regression. Before you fit your model, add a row of data including the explanatory variables you want to use in your prediction. Leave the Y variable blank. When you save predicted values and intervals JMP should save them to the row of —“fake data” as well.

4) Including Interactions and Quadratic Terms in multiple linear regression:

Now for the dataset case0901.jmp, try to add the quadratic term of “time” or interaction term between “time” and “intens” and check the significance for each term.

(To include a variable as a quadratic, go to the Fit Model dialog box. Select the variable you want to include as a quadratic. Then click on the —Macros menu and select —Polynomial to Degree. The —Degree field under the Macros button controls the degree of the polynomial. The degree field shows —2 by default, so the Polynomial to Degree macro will create a quadratic.

To include an interaction term, select the variables you want to include as an interaction, then hit the —Cross button.)