

Release notes for June 2016 StatCrunch updates

Major additions:

- Optional graphs and tabular output have been added to the hypothesis testing and confidence interval features under the following four menus: **Stat > Z Stats**, **Stat > T Stats**, **Stat > Proportion Stats** and **Stat > Variance Stats**. See page 2 for details.
- A new **zooming tool** has been added under the graph editor menu found in most graphs. This tool overrides the default selection behavior and will zoom in the graph to a user-drawn rectangle. See page 3 for details.
- Titles across all of StatCrunch graphs have been upgraded to include, by default, any *Where* statement or *Group by* information relevant to the graph. In addition, graphs now have both an editable title and subtitle through the graph editor menu or by double-clicking the title region. See page 4 for details.

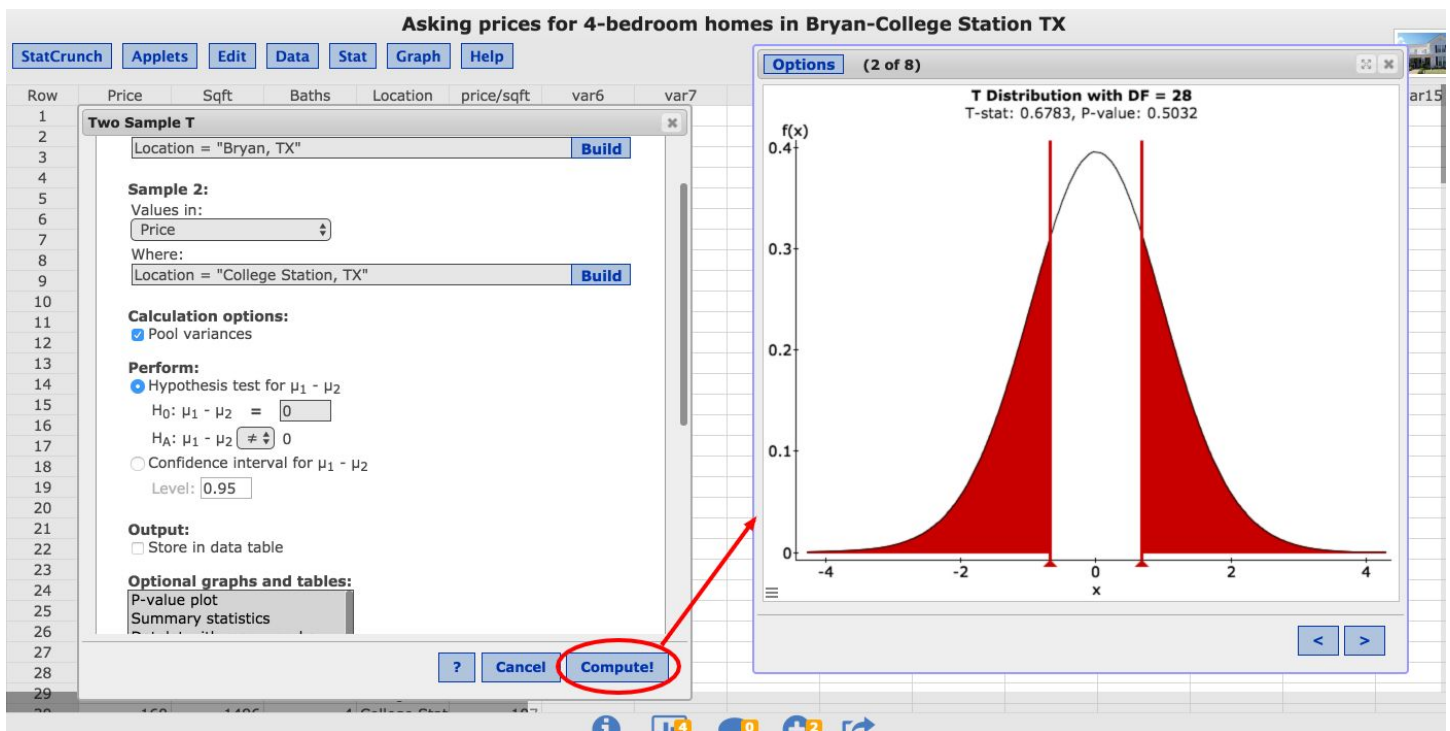
Minor fixes and enhancements:

- An eraser tool has been added to the paint suite for graphs.
- It is now possible to rapidly move through multiple pages of results using the left and right arrow keys while the result is in focus. Navigation previously required manually clicking arrow buttons.
- The **Data > Arrange > Stack** procedure now has an optional ID column that can be specified by the user.
- The repeated measures ANOVA procedure has been rewritten. New options (*Plot interactions*, *Display means table*, and *Save residuals and fitted values*) have been added to this procedure.
- An ellipsis (“...”) is now used for the display of long graph titles and subtitles.
- In the simple linear regression procedure, the Natural Log transformation has been renamed from “log” to “ln” for clarity.
- In the Chrome browser on the iPhone (not desktop), graphs with legends would not display properly along with other issues. These issues have all been corrected.
- The multiple linear regression now gives correct results when there are multiple variables that need to be dropped because of multicollinearity.
- **Stat > Calculator > Discrete Uniform** now gives correct results for non-integer values.

Optional graphs and tables for hypothesis testing/confidence interval features

All hypothesis testing and confidence interval features under **Stat > Z Stats**, **Stat > T Stats**, **Stat > Proportion Stats** and **Stat > Variance Stats** now contain additional options for graphs and tables. New options include summary statistic tables and Shapiro-Wilk normality tests when appropriate. The optional graphs include a histogram with a green mean marker, a dotplot with a green mean marker, a boxplot with a green mean marker, a QQ plot, and a plot of the confidence interval (when a confidence interval is being calculated). Additionally, a new graph was created called a **P-value plot**. This plot will give a graphical representation of the test statistic and P-value appropriate for the hypothesis test.

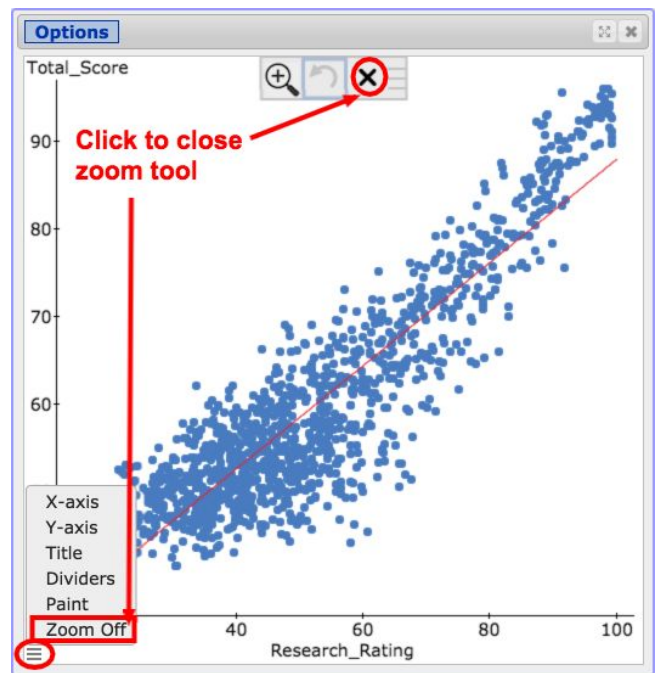
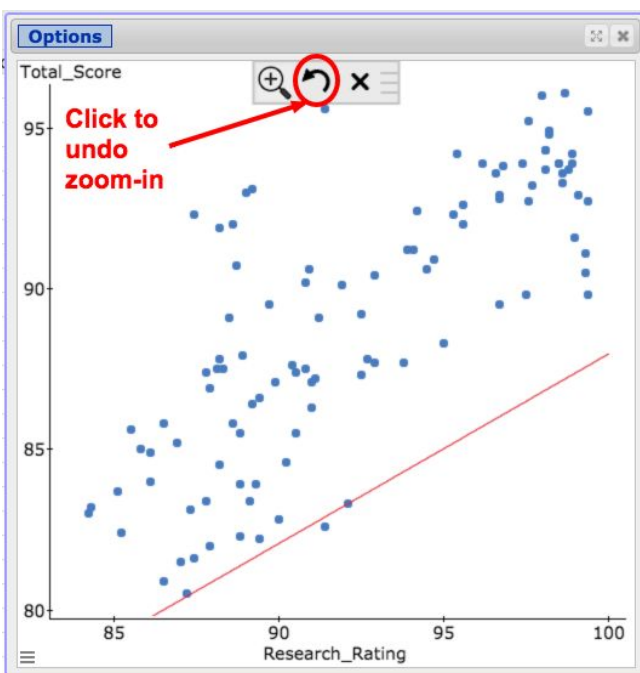
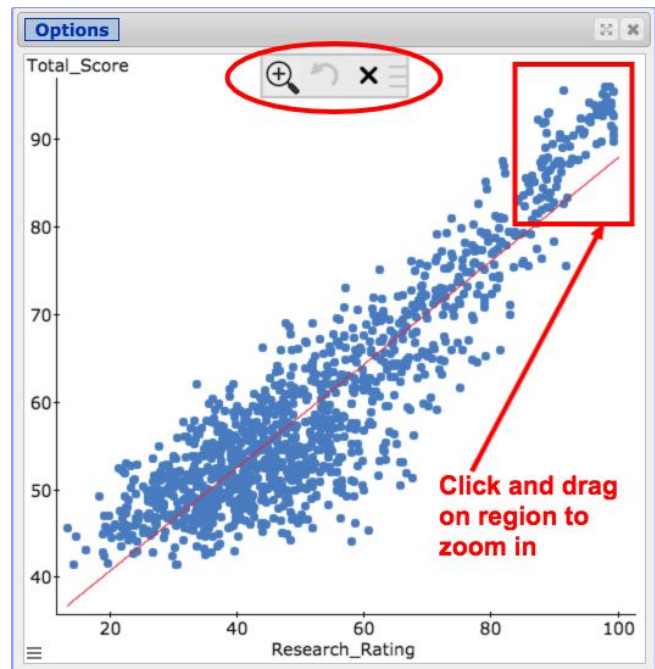
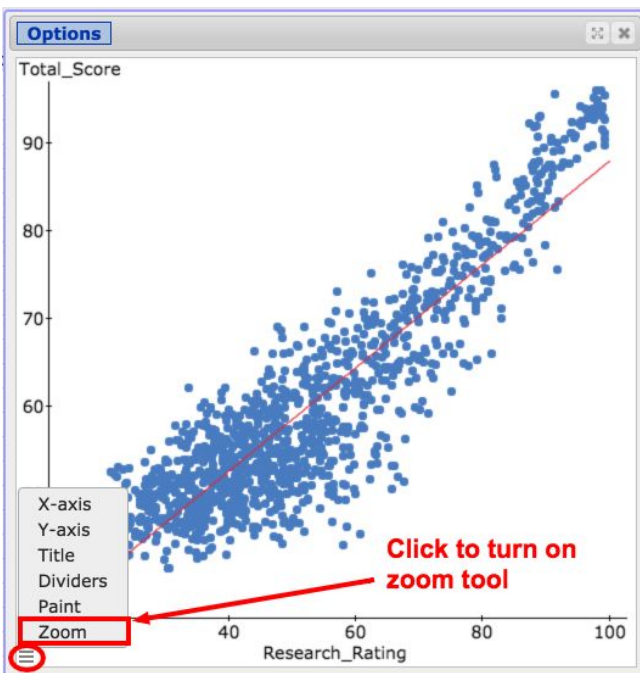
The screenshot shown below is an example of the new optional output using a dataset containing randomly selected sales data of four-bedroom homes for two adjoining cities in Texas. The scenario is for a hypothesis test to see if the average sales price is different for four-bedroom homes between the two cities using a two-sample t test. This two-sided hypothesis test uses the T distribution with 28 degrees of freedom, and the P-value plot below shows red markers at the positive and negative values of the test statistic. The P-value is represented by the red area under the T distribution in the regions more extreme in magnitude than the observed test statistic.



A new zooming tool for graphs

A zooming tool has been added to most graphs to allow for zooming in on certain regions of a graph. The tool can be activated by selecting the *Zoom* option under the graph editor menu (three-bar menu) in the bottom left corner of graphs. Once activated, the tool will override the default selection behavior when clicking and dragging on a graph. The rectangle created by clicking and dragging will define the zoomed region.

Below is a scatter plot example. To zoom the graph, turn on the *Zoom* option found in the graphical editor menu at the bottom left of the graph. A menu will appear on the top of the graph indicating that the default interaction has been replaced by zooming. A zoomed region was created in the top right corner of the scatterplot. The resulting zoomed graph is shown in the third screenshot. The ranges of both axes have changed in the zoomed graph. Clicking the *Undo* button (highlighted below) within the Zoom menu will undo the zooming in order to return back to the original graph. Zooming can be turned off by clicking the "X" icon in the Zoom menu, or by selecting *Zoom off* in the graph editor menu.



Upgraded titles for graphs

To clarify what is being displayed in a graph, all StatCrunch graphs have improved titles that include *Where* statements and/or *Group by* options specified by the user. A title will appear as a bolded first line in the title region of the graph. A subtitle appears below the title line with non-bolded text. The subtitle will often include information that clarifies what user inputs have been applied to the graph. The editing of titles has also been upgraded to include both titles and subtitles. Both the title and the subtitle are editable by double-clicking on the title region, or by selecting the *Title* option in the graph editor menu to the bottom left corner of the graph.

Below is an example of a histogram where both a *Where* statement and a *Group by* column are used. Both appear in the subtitle of the histogram shown below. In this case, the data is for movie box office budgets with the graph shown being for the 6th month (June) and only including movies released after the year 2000.

