

Release notes for March 2016 StatCrunch updates

Major additions:

- The Power/Sample size calculators have been redesigned in several respects and also separated into two menu items: **Power/Sample size** and **Width/Sample size**. See page 2 for details.
- New distributional calculators have been added under the **Stat > Calculators** menu including discrete uniform, uniform, geometric, and lognormal distributions. See page 3 for details.

Minor fixes and enhancements:

- A new procedure, **Data > Compute > From column**, where each cell in a selected column contains an expression such as **5+6** or **sqrt(2)** or **var1+1** or **sum(var1)**. The results are placed in a new column.
- The graphs for discrete distribution calculators are improved when plotting a large number of unique values.
- The **Mean/SD vs. Median/IQR** applet now has the ability to choose the lower and upper bound when simulating data.
- The dragging and dropping of files directly into StatCrunch has been improved.
- Minor bugs were fixed for various statistical routines and applets.
- A bug with session downloading in Safari has been fixed. The downloaded session file now has the proper **.scs** extension.
- StatCrunch expressions now better support scientific notation for numeric values.

Power/Sample size calculators redesigned

Under the **Stat** menu are various calculators for performing sample size calculations related to the power of a hypothesis test or width of a confidence interval. These calculators are found within the **Z Stats**, **T Stats**, **Proportion Stats**, and **Variance Stats** submenus. The **Power/ Sample size** calculators have been upgraded with better graphics, faster calculations, and interface improvements. Most notably the **Alternative** input now allows for choices between greater than, less than, and not equal (as compared with one-sided or two-sided). Below is an example of the one sample Z power/ sample size calculator with a less than alternative hypothesis.

The screenshot shows the StatCrunch interface with the 'Stat' menu open. The 'One Sample T Power/Sample Size' calculator is selected. The 'Options' dialog box is open, showing a graph of Power vs. Difference, $\mu - \mu_0$. The graph shows a curve starting at 1.0 for a difference of -1.5 and decreasing to 0.0 at a difference of 0.5. A red dot is placed on the curve at a difference of -1.0, with a horizontal line extending to the y-axis at a power of approximately 0.815. The 'Required parameters' section shows Alpha: 0.05, Std. dev.: 1, and Alternative: $\mu < \mu_0$. The 'Enter all but one' section shows Difference, $\mu - \mu_0$: -1, Power: 0.81501945, and Sample size: 8. A 'Compute' button is at the bottom.

The power/sample size calculators also previously included a tab for calculating the width or sample size of a confidence interval. Now the **Width/ Sample size** has its own menu item below the **Power/ Sample size** calculators. Below is an example showing the calculation of the sample size per group of 753 needed in order to create a 95% confidence interval for the difference of two proportions with a width less than or equal to 0.1.

The screenshot shows the StatCrunch interface with the 'Stat' menu open. The 'Confidence Interval for Difference in Proportions' calculator is selected. The 'Options' dialog box is open, showing a graph of Width vs. Sample size per group. The graph shows a curve starting at approximately 0.16 for a sample size of 400 and decreasing to approximately 0.08 for a sample size of 1000. A red dot is placed on the curve at a sample size of 753, with a horizontal line extending to the y-axis at a width of approximately 0.099995081. The 'Required parameters' section shows Confidence level: 0.95, First proportion: 0.4, and Second proportion: 0.5. The 'Enter one' section shows Width: 0.099995081 and Sample size per group: 753. A 'Compute' button is at the bottom.

New distributional calculators

Additional distributional calculators have been added under the **Stat > Calculators** menu. The new calculator options are **Discrete Uniform**, **Geometric**, **Lognormal**, and **Uniform**.

Below is an example of the geometric calculator with the probability of success equal to 0.2. In this scenario, there is a probability of 0.08589935 that it will take more than 10 trials before obtaining the first success. Note that this calculator computes probabilities for the number of trials before the first success.

The screenshot shows the StatCrunch interface with the 'Stat' menu open, highlighting 'Geometric'. The 'Options' window for the Geometric Calculator is displayed, showing a bar chart of the probability mass function $f(x)$ for a geometric distribution with $p = 0.2$. The x-axis represents the number of trials x (0 to 30), and the y-axis represents the probability $f(x)$ (0 to 0.2). The calculated probability $P(X > 10) = 0.08589935$ is shown below the chart.

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