



# StatsMate for iPad

User Guide

# Overview

StatsMate is an easy-to-use powerful statistical calculator for iPad. It has been featured by Apple on Apps For Learning Math in the App Stores around the world.

- StatsMate comes with
  - ▶ 17 Probability Distribution Calculators
  - ▶ 10 Hypothesis Testing Calculators
  - ▶ 4 p-Value Calculators
  - ▶ 2 Confidence Interval Calculators
  - ▶ A Basic Data Analysis Calculator with Histogram Creator
  - ▶ 2 ANOVA Calculators
  - ▶ A Linear Regression Calculator
- You can export datasets created by StatsMate as a PDF file, a Microsoft Excel spreadsheet, a CSV file, or a text file. You can export calculation and analysis results via AirPrint, email, message, or open in other apps.
- StatsMate comes with a customized keyboard with built-in scientific calculator.
- With Dataset Management, you can manage, save, and import datasets created on other apps or devices. You can store your datasets locally or on the iCloud. Supported document types are Microsoft Excel spreadsheet, CSV, plain text, and rich text.

StatsMate for iPad comes with a built-in scientific calculator.

The screenshot displays the StatsMate app interface. On the left is a menu titled "Statistical Tests" with a "Back" button. The menu items include:

- Hypothesis Testings for Level- $\alpha$
- One-sample z Test ( $\mu$ )
- One-proportion z Test ( $p$ )
- One-sample t Test ( $\mu$ )
- Two-sample z Test ( $\mu_1, \mu_2$ )
- Two-sample t Test ( $\mu_1, \mu_2$ )
- Paired Sample t Test ( $d$ )
- Two-proportion z Test ( $p_1, p_2$ )
- Chi Square Test for SD ( $\sigma$ )
- F Test for two SD's ( $\sigma_1, \sigma_2$ )
- p-Values
  - p-Value for Z Tests
  - p-Value for t Tests
  - p-Value for F Tests
  - p-Value for Chi Square Tests
- Confidence Intervals
  - Large-Sample CI
  - CI for Population Variance

The main area shows the "One-sample z Test ( $\mu$ )" screen. It includes a "Null Hypothesis" field with the text  $H_0 : \mu = \mu_0$ . A calculator overlay is positioned in the foreground, displaying the number "3.0" and a grid of mathematical functions:  $x!$ ,  $1/x$ ,  $C$ ,  $+/-$ ,  $\div$ ,  $\times$ ,  $x^2$ ,  $x^3$ ,  $7$ ,  $8$ ,  $9$ ,  $+$ ,  $e^x$ ,  $y^x$ ,  $4$ ,  $5$ ,  $6$ ,  $-$ ,  $\log$ ,  $\sqrt{x}$ ,  $1$ ,  $2$ ,  $3$ ,  $=$ ,  $\ln$ ,  $x\sqrt{y}$ ,  $0$ , and  $.$ .

Below the calculator, the "DATA:" section contains a table with the following entries:

Null Value ( $\mu_0$ )	Null Value ( $\mu_0$ )
P(Type I error) ( $\alpha$ )	P(Type I error) ( $\alpha$ )
Sample Mean ( $\bar{x}$ )	0
SD ( $\sigma$ or $s$ )	1
Sample Size ( $n$ )	1

The "RESULT:" section shows:

RR:

z =

# Probability Distributions

In *Probability Distributions* mode, you can calculate the probability from a critical point, and calculate the critical point from a probability.

The screenshot shows the 'Chi Square Distribution' calculator interface. At the top, there is a 'Main Menu' link on the left, the title 'Chi Square Distribution' in the center, and an information icon (i) and an 'Export' icon (upward arrow) on the right. Below the title, there are two callout boxes: 'More information' pointing to the information icon, and 'Export the result' pointing to the export icon. The main area features a graph of a Chi Square distribution curve with a shaded upper tail area. A callout box 'Tap to change the area type' points to a vertical line on the left side of the graph. Another callout box 'Enter a critical value to find the probability' points to the 'a' input field in the table below. The table has the following data:

Area Type	
Upper Tail : $P(X \geq a)$	
a	2.365974
b	
Probability	0.5
DF (v)	3

Below the table, there are two more callout boxes: 'Enter parameters for each distribution' pointing to the 'Probability' and 'DF (v)' fields, and 'Enter a probability to find the critical value' pointing to the 'Probability' field. At the bottom, there is a note: 'To find critical value (a), enter 'probability' or DF (v).'

Tab on 'Shaded Area' to change the area type.

The curve and area shown above are for illustrative purposes only.

StatsMate calculates the following probability distributions:

- Uniform Distribution
- Normal Distribution
- Chi Square Distribution
- Gamma Distribution
- Exponential Distribution
- Beta Distribution
- t Distribution
- Noncentral t Distribution
- F Distribution
- Lognormal Distribution
- Weibull Distribution
- Cauchy Distribution
- Binomial Distribution
- Poisson Distribution
- Geometric Distribution
- Negative Binomial Distribution
- Hypergeometric Distribution

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# Statistical Tests

In *Statistical Tests* mode, you can do hypothesis testings and calculate p-values and confidence intervals.

The screenshot shows a mobile application interface for a "One-sample z Test (μ)". At the top left is a "Main Menu" link. The title "One-sample z Test (μ)" is centered. On the top right, there are three icons: an information icon (i), a share icon, and a "Calculator" label. Below the title, the interface is divided into sections for "Null Hypothesis" and "Test Statistic Value". The null hypothesis is  $H_0 : \mu = \mu_0$ . The test statistic value is  $z = \frac{\bar{x} - \mu_0}{\sigma/\sqrt{n}}$ . Below this, the "Alternative Hypothesis" section is currently set to "Upper-Tailed Test (Ha: μ > μ₀)". A "Calculate from a dataset" button is located below the hypothesis options. At the bottom, there are two sections: "DATA:" and "RESULT:". The "DATA:" section contains a table with input fields for "Null Value (μ₀)", "P(Type I error) (α)", "Sample Mean (x bar)", "SD (σ or s)", and "Sample Size (n)". The "RESULT:" section contains input fields for "RR:", "z =", "Decision:", and "p-value:". Five callout boxes provide instructions: "Export the result" points to the share icon; "More information" points to the information icon; "Tap to change the alternative hypothesis" points to the "Upper-Tailed Test" option; "Calculate parameters from a dataset" points to the "Calculate from a dataset" button; and "Enter all values required to calculate the rejection region and test statistic." points to the "DATA:" section.

**Export the result**

**More information**

**Tap to change the alternative hypothesis**

**Calculate parameters from a dataset**

**Enter all values required to calculate the rejection region and test statistic.**

Main Menu      One-sample z Test (μ)      ⓘ      📄      Calculator

Null Hypothesis      Test Statistic Value

$H_0 : \mu = \mu_0$        $z = \frac{\bar{x} - \mu_0}{\sigma/\sqrt{n}}$

Alternative Hypothesis

Upper-Tailed Test (Ha:  $\mu > \mu_0$ )

Calculate from a dataset

DATA:

Null Value ( $\mu_0$ )	Null Value ( $\mu_0$ )
P(Type I error) ( $\alpha$ )	P(Type I error) ( $\alpha$ )
Sample Mean (x bar)	0
SD ( $\sigma$ or s)	1
Sample Size (n)	1

RESULT:

RR:

z =

Decision:

p-value:

StatsMate performs the following statistical tests and calculations:

### Hypothesis Testings

- One-sample z Test ( $\mu$ )
- One-proportion z Test ( $p$ )
- One-sample t Test ( $\mu$ )
- Two-sample z Test ( $\mu_1, \mu_2$ )
- Two-sample t Test ( $\mu_1, \mu_2$ )
- Two-sample Pooled-t Test ( $\mu_1, \mu_2$ )
- Paired Sample t Test ( $d$ )
- Two-proportion z Test ( $p_1, p_2$ )
- Chi Square Test for SD ( $\sigma$ )
- F Test for two SD's ( $\sigma_1, \sigma_2$ )

### p-Values

- p-Value for Z Tests
- p-Value for t Tests
- p-Value for F Tests
- p-Value for Chi Square Tests

### Confidence Intervals

- Large-Sample Confidence Intervals
- Confidence Intervals for Population Variance

# Data Analysis

In Data Analysis mode, you can perform basic data analysis, linear regression, one-way ANOVA, and randomized block design ANOVA.

The screenshot shows the 'One-Way ANOVA' screen in StatsMate. At the top, there is a navigation bar with 'Main Menu', 'One-Way ANOVA', and 'Calculator'. Below this is a 'Calculate' button. A '+' icon is used to 'Add new column'. Below the navigation bar are 'Save Data' and 'Import Data' buttons. A data table is displayed with 6 rows and 3 columns. A 'Delete a Column' button is located below the table. A 'Column 4' header is visible above the table. Callouts provide instructions for each feature.

Tap to calculate

One-Way ANOVA

Calculator

+

Add new column

Calculate

Save Data

Import Data

Export data

1	1	3
2	2	2
3	3	5
4	4	
5	5	
6		

Tap to save or import data (Dataset Management required)

Tap to edit data. Swipe to delete a single cell.

Delete a Column

StatsMate now supports multiple column datasets.

A segment control will show up if there are more than 9 columns.

In Basic Data Analysis, once you tap 'Calculate,' select the functions you want to calculate then tap 'Calculate.'

Back

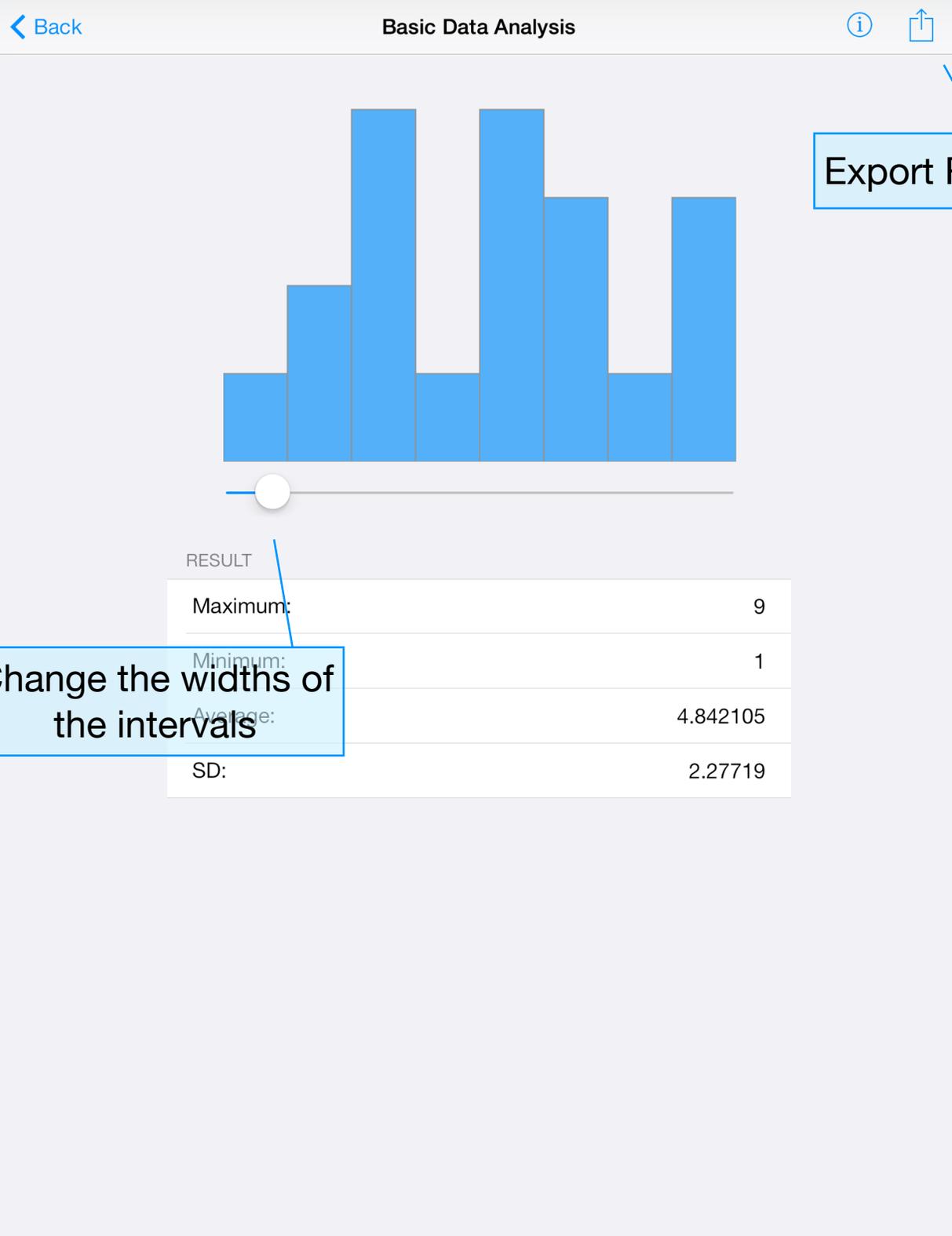
Calculate

Select the functions you want to calculate

Select All

Histogram	<input checked="" type="checkbox"/>
Count	<input type="checkbox"/>
Maximum	<input checked="" type="checkbox"/>
Minimum	<input checked="" type="checkbox"/>
Average	<input checked="" type="checkbox"/>
SD	<input checked="" type="checkbox"/>
Sample SD	<input type="checkbox"/>
Variance	<input type="checkbox"/>
Median	<input type="checkbox"/>
DEVSQ	<input type="checkbox"/>
Geometric Mean	<input type="checkbox"/>
Harmonic Mean	<input type="checkbox"/>
I2 Norm	<input type="checkbox"/>

# Examples of Result Pages



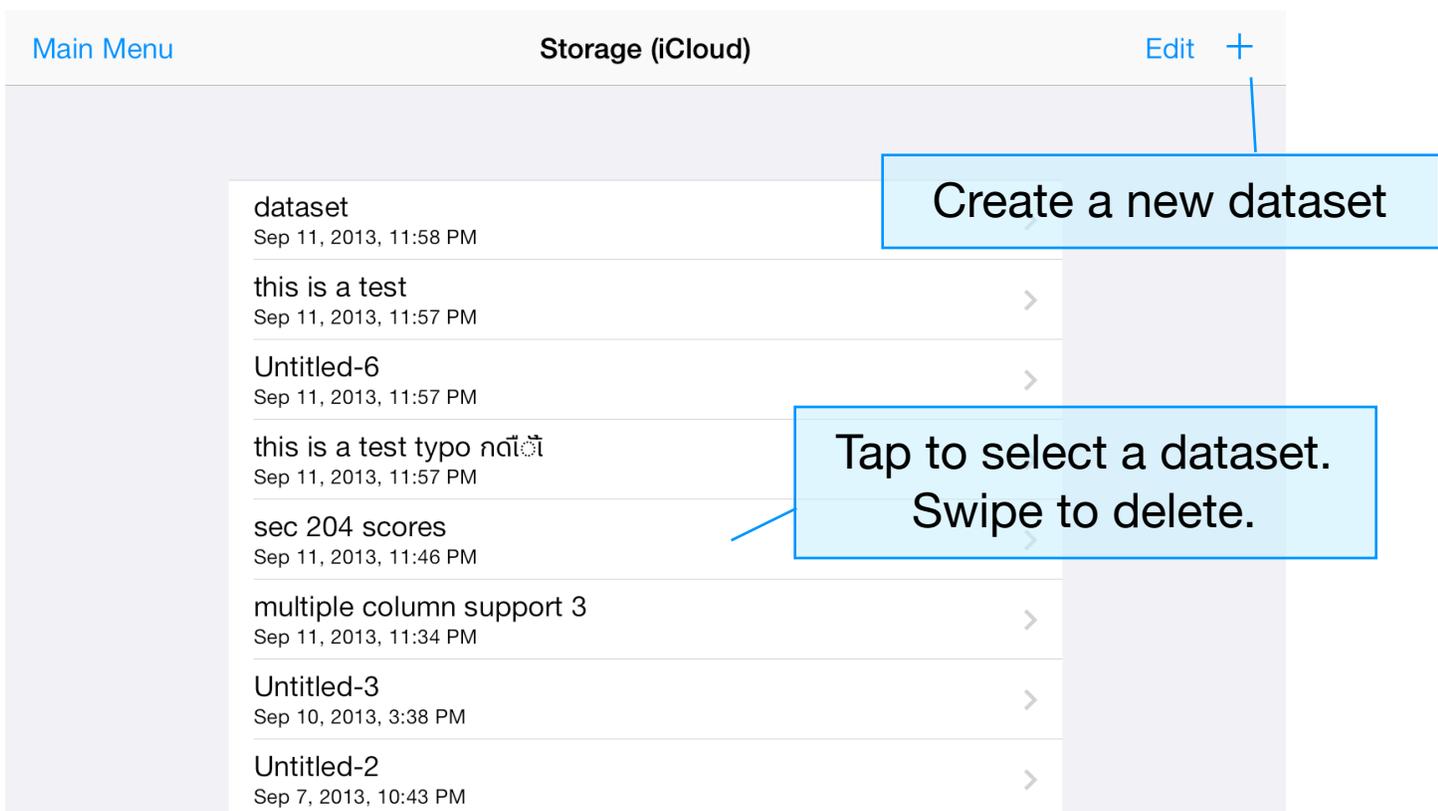
Change the widths of the intervals

Export Result

# Dataset Management

With Dataset Management, you can save and manage your data. You can also import datasets created on other apps or devices. StatsMate now support multiple column datasets.

You can store your data locally or on the iCloud\*. If you choose to store your data on the iCloud, you data will be synced across all of your iOS devices. You can change the preference anytime in Setting -> StatsMate.



\*StatsMate 3.0 internal file format is different than those in the older versions. If you store your data on the iCloud, older version of StatsMate on other devices might crash. Please update StatsMate on all of your devices.

Tap to change filename

Export

Done



Add Column

Filename multiple column support 3

1-9

10-19

Create a new column

If there are more than 9 columns, a segment control will appear.

1	2	3	1.36	-9	8	8	1	8
4	5	6	2.96	6	3	5	2	3
7	8	9	4.89	3	6		3	6
10	11	12		6			4	3.14
	13	14						
		15						

Swipe to delete a cell

Delete a Column



- CSV (Comma-Separated-Value Document)

StatsMate only supports CSV documents that use 'comma' (,) as the separator for columns and use 'new line' as the separator for rows.

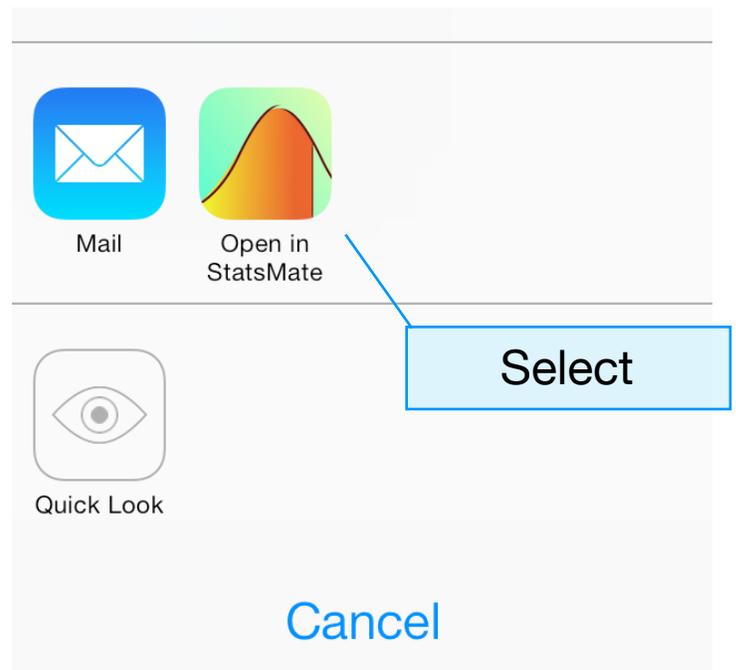
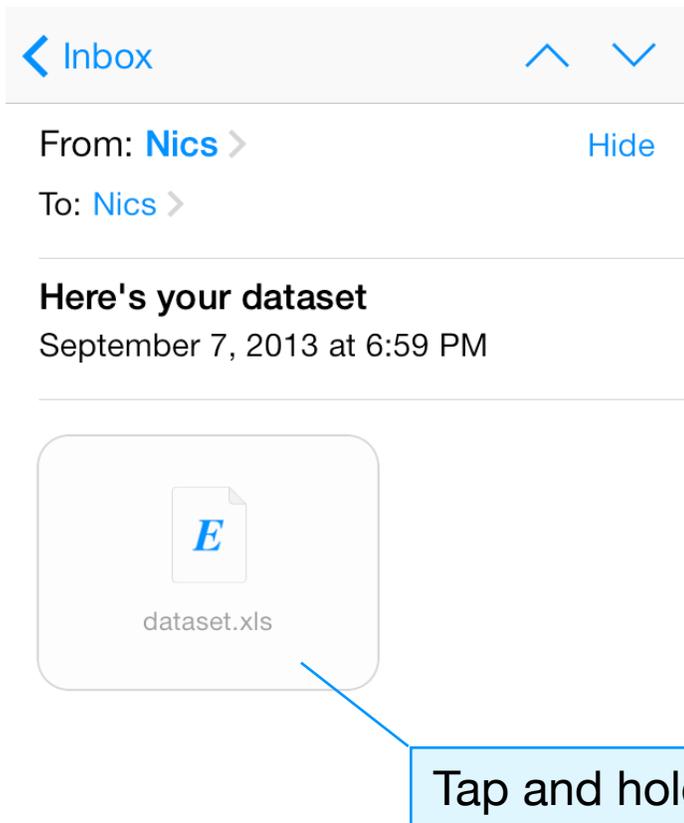
- Plain Text and Rich Text Documents

Use 'comma' (,) as the separator for columns and use 'new line' as the separator for rows. Do not include any text.

```
1,122,13  
2,3,123  
3,212,123  
4,123,3  
5,43,3  
5,454,45  
6,32,35  
4,123,56  
7,,78
```

## How to import data

1. Create your dataset using other apps or devices.
2. Transfer the file to your iOS devices via email, message, Airdrop, or any other apps that are able to export files such as Dropbox.
3. Activate the 'Open in...' option. This depends on the app you are using. For example, in Mail, tap and hold the attachment to activate 'Open in...' option.
4. In the 'Open in...' menu, select 'Open in StatsMate' from the list.



# Setting

You can set displayed number format in the Setting app. Go to the Setting app on your home screen, then scroll down to StatsMate.

You can also select where to store your data here.

