Yet Another Tip Calculator
Version 1.1

User Guide

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Introduction

Yet Another Tip Calculator (YATC) was designed to allow you to enter the subtotal, tip percentage, and number of people in your party (for splitting the check) using as few touches as possible.

With **YATC**, you easily calculate tips in just a few steps:
1. Enter the **post-tax subtotal** amount using the number pad.
2. Adjust the tip percentage using the wheel picker on the left.
3. Select the number of people by which to split the check using the wheel picker on the right.

And you're done! The total amount of the check and total per person will be displayed in the results area at the bottom of the display. You may use the email button to send yourself, or any recipient, a summary of the tip transaction.

By default, **YATC** will calculate the exact tip on the post-tax subtotal. To calculate the tip on the pre-tax subtotal, visit the Settings view, which is accessed from the About view or by tapping on the subtotal amount area, and enter sales tax preferences. A different tip calculation method — checksum, palindrome (aka mirror), or rounded up/down — can be chosen from the bottom buttons.

YATC works with all international currencies supported on the iPhone. Currently, English is the only language supported. Support for other languages will be provided in a future release.

Specifications

- The maximum subtotal supported is 7 digits long, not including the currency symbol, decimal separator, or thousands separator. In USD, the maximum value is $99,999.99.
- Tip range: 5% – 50%
- Split range: 2 – 30 people
- Sales tax range: 0% – 99.99%

Features

- Email a summary of the tip transaction.
- Tip can be calculated on pre-tax or post-tax subtotal.
- If the iPhone keyboard is silenced, the sound effects in this app are also muted.
- Automatic support for your local currency via the iPhone region settings.
- Split check evenly between several (up to 30) people.
- Tip fraud prevention: Optional application of checksum or palindrome to check total or per-person total; swipe left or right to change target.
- Optional rounding on check total or per-person total; swipe left or right to change the rounding target.
- Shake to clear (with sound effects!).
- Larger wheel pickers are easier to use than sliders.
- Always-visible number pad, instead of having to "tap" to bring up the number pad, facilitates entering of subtotal.
- In-app bug reporting is available from the About view.

Overview

This section describes the three different views — the Main Calculator view, the About view, and the Settings view — of **Yet Another Tip Calculator (YATC)**, and gives an overview of the functionality on each view.

Main Calculator View

1. **Subtotal Area:** The post-tax subtotal, which is entered using the number pad, will be displayed here. Tapping the subtotal area will take you to the Settings view.

2. **Tip Percent Picker Wheel:** Select the desired tip percent (5% – 50%) from this wheel picker. The selected tip percent may differ from the actual tip percent due to rounding and the selected tip calculation method.

3. **Results Area:** The total tip and grand total amount are displayed on the left side of this display. If the number of guests, which is chosen from the right wheel picker (#7), is greater than one, then the per-person tip and total are displayed on the right side. For information about the calculation of these values, please see the Tip Calculation section.

4. **Tip Calculation Method Buttons:** Choose your tip calculation method from these buttons.

5. **About Button:** ⓘ Tap this button to go to the About view, where you can continue to the Settings view, email technical support, and read the included User Guide.

6. **Summary Email Button:** ✉ Tap this button to email yourself, or any recipient, a summary of your tip transaction.

7. **Number of Guests Picker Wheel:** If you want to split the check evenly, select the number of guests from this picker wheel. You may split the check evenly between 2 – 30 people.

8. **Sales Tax:** If you have turned **Tip on Pre-Tax** *ON*, the sales tax you entered will be displayed in the upper right corner of the subtotal area. Both **Sales Tax %** and **Tip on Pre-Tax** are configured on the Settings view and are covered in more detail in the Sales Tax section.

About View

1. **Settings Button:** Tap this button to go to the Settings view, where you can configure preferences related to sales tax and enter an email address, which is used as the default recipient when emailing a summary of your tip transaction.

2. **User Guide Button:** Tap this button to read the User Guide that is included with the app.

3. **Email Support Button:** Tap this button to submit a bug report or contact technical support.

4. **Visit Button:** Tap this button to launch Safari and visit http://www.orbona.com.

5. **Done Button:** Tap this button to return to the Main Calculator view.

Settings View

1. **About Button:** Tap this button to return to the About view.

2. **Tip on Pre-Tax:** This setting controls whether the tip is calculated on the pre- or post-tax subtotal. For more information, please see the Sales Tax section.

3. **Sales Tax:** Enter the sales tax rate for your location here. For more information, please see the Sales Tax section.

4. **Sales Tax Rounding:** Select the rounding mode, determined by your local government, that is used for sales tax in your location. For more information, please see the Sales Tax section.

5. **Email Address:** This email address will be used as the default recipient when you email a summary of your tip transaction.

6. **Done Button:** Tap this button to return to the Main Calculator view.

Sales Tax

Preferences related to sales tax are specified on the Settings view, which is accessed from the About view or by tapping in the subtotal area on the main calculator view. There are three preferences related to sales tax. **Sales Tax %** is the sales tax rate charged in your location. **Tip on Pre-Tax** and **Sales Tax Rounding mode** are two additional settings that control how **YATC** uses the sales tax percentage.

When **Tip on Pre-Tax** is *ON*, **YATC** will calculate the pre-tax amount from the entered post-tax subtotal and sales tax percentage. The Exact tip calculation will then determine the tip from the pre-tax subtotal.

If **Tip on Pre-Tax** is *OFF*, then the Exact tip calculation will determine the tip from the post-tax subtotal as entered. All other tax calculation methods are derived from the Exact tip calculation results.

The tip transaction summary email will include sales tax information, including the calculated pre-tax subtotal, only when **Tip on Pre-Tax** is *ON*. Similarly, the main calculator view will display the entered sales tax percentage in the upper right of the subtotal area only when **Tip on Pre-Tax** is *ON*.

Tip on Pre-Tax is Off: The upper right corner of the subtotal display is empty

Tip on Pre-Tax is On: Sales tax is displayed in the upper right corner of the subtotal display

Sales Tax Rounding mode allows you to choose the rounding mode for sales tax in your location. The laws concerning rounding of sales tax vary by region; for example, each U.S. state has different rules governing how sales tax should be rounded. It is beyond the scope of this application to track the different sales tax laws for each state, province, and country. Therefore, the calculated pre-tax amount may differ by a very small amount, usually by no more than $0.01 (or 1/100th of your native currency), from the pre-tax amount shown on your receipt. To achieve greater accuracy when calculating the pre-tax amount, you can specify how sales tax is rounded in your location:

- *Traditional:* For this rounding mode, the sales tax calculation was carried to the third decimal place and rounded to a whole cent. If the third decimal place is a number greater than or equal to five, then the sales tax was rounded up. The following examples demonstrate the expected behavior for this rounding mode:

    - **5.235** rounds up to **5.24**.
    - **0.357** rounds up to **0.36**.
    - **6.924** rounds down to **6.92**.
    - **8.240** rounds down to **8.24**.

- *Up:* For this rounding mode, the sales tax calculation was carried to the third decimal place and rounded up to the next cent if the third decimal place was greater than or equal to one. The following examples demonstrate the expected behavior for this rounding mode:

    - **2.131** rounds up to **2.14**.
    - **9.291** rounds up to **9.30**.
    - **8.240** rounds down to **8.24**.

While these rounding modes will cover many regions, they are not perfectly suited for states such as Florida, which use a bracket system for calculating sales tax. The app could have been designed to allow you to enter the exact tax amount, but doing so would clutter the interface and defeat the intended simplicity.

Notes on Splitting

YATC allows you to split the check total evenly between all guests. The picker wheel on the right allows you to choose the number of guests. The per-person total is calculated by dividing the check total, which is the subtotal + the tip amount, by the number of guests. This sounds simple enough, but there are two important caveats to keep in mind.

Caveat #1

Checksum, palindrome, or rounding tip methods can be applied to the check total or per-person total; swiping your finger across the results area changes the target. Swiping from the left to the right sets the per-person total as the target. Swiping from the right to the left sets the check total as the target.

When applying these methods to the check total, the check total *might not equal*:
> (the number of people by which to split the check) × (the total amount per person)

Similarly, the tip total might not equal:
> (the number of people by which to split the check) × (the tip amount per person)

For example, let's say six friends go out to dinner. They each order the exact same item — the all-you-can-eat lobster buffet — and the check subtotal with tax is $216.23. They decide Dean will charge the amount to his credit card and the others will pay him back. Dean thinks the server looks a bit shifty and, being the only one of the group with an iPhone, whips out this trusty app. He selects the checksum method for the tip calculation; the resulting checksum total is $255.22, with a per-person total of $42.54. You will probably notice that 6 × $42.54 = $255.24, which is slightly greater than $255.22.

In this scenario, modifying the check total to equal the (per-person total × the number of people) will break the checksum (or palindrome or rounded amount), and will require recalculation of the checksum. A new checksum will trigger recalculation of new per-person amounts, and the cycle will continue until we find a checksum total that is evenly divisible by the number of guests. Adding this functionality would negatively affect the performance of the app. We made a decision that the current solution, where the per-person amount × number of people is close, if not exactly equal, to the check total, was best.

When applying these methods to the total amount per person, the check total *will equal*:
> (the number of people by which to split the check) × (the total amount per person)

Similarly, the tip total will equal:
> (the number of people by which to split the check) × (the tip amount per person)

Let's continue with the above example. While Dean is using this app to calculate the checksum total, the other five are searching for cash in their wallets, but none of them has enough to pay Dean back immediately. Since Dean doesn't like people owing him money, they ask the server to provide separate checks, which will allow them each to charge their portion. They agree with Dean's assessment of the sketchy server, so they ask him to calculate the checksum on the per-person amount. While he could re-enter the subtotal amount per person based on the new checks, it is faster for him to calculate the checksum results per person by swiping his finger to the right across the already calculated results. The finger swipe will switch the checksum target to the per-person total rather than the check total. The new per-person total, with the checksum applied, is $42.56, and the check total is $255.36, which is equal to 6 × $42.56.

The checksum is calculated based
*on the grand total*

The checksum is calculated based
on the per person total

Although the above example uses checksum, the same concepts apply to palindrome and rounding.

Caveat #2

If the check total is a multiple of the number of guests, but the subtotal is not, then the tip amount per person will not exactly equal (the tip percent × the subtotal per person).

For example, let's say three friends go out for lunch. The subtotal is $40.00, and they want to tip 20%. The subtotal for each person, prior to applying the tip, would be $40.00/3 = $13.34 (rounding up from $13.333333...). The check total would be $40.00 + (0.20)×$40.00 = $48.00. The total amount for each person is $48.00/3 = $16.00. The tip amount per person is $16.00-$13.34 = $2.66, which is not exactly (0.20)×($13.34)=$2.67 (rounded up from $2.6680).
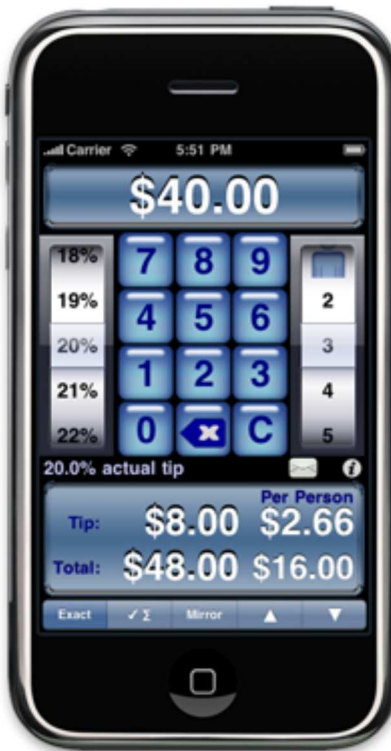
Splitting the Check: Caveat #2

What is Tip Fraud?

Tip fraud occurs when unscrupulous restaurant servers modify credit card receipts in order to receive a higher tip. Waiters and waitresses that are unhappy with the tip amount might add $5 or $10 to the tip line of credit card receipts. For example, let's say you went out to lunch and your service was abysmal, so you left a tip of 10%.

Subtotal:	$48.63
Tip:	$4.86
Total:	$53.49

The server feels that this is unfair, and modifies the tip by changing writing a 9 over the 4 in the tip. Changing the 3 to an 8 in the "Total" line is also trivial.

Subtotal:	$48.63
Tip:	$9.86
Total:	$58.49

While it is difficult to prevent these alterations, you can make it easier to identify modified amounts on your credit card statements by using a checksum or palindrome tip technique.

Paying with cash is the only surefire way to avoid becoming a victim of tip fraud. If you pay with a credit card, you should check your credit card receipts against the charged amount that appears on your statement. Comparing receipts to statements is a tedious task. However, if you use a checksum or palindrome technique, you can almost always catch tip fraud without having to compare your receipts to your statements. Both the checksum or palindrome methods:

- Allow you to make a quick scan of your credit card statement, and
- Allow you to verify that no adjustments have been made to the amount you charged.

If you do notice a suspicious transaction, retrieve your copy of the receipt to confirm that it doesn't match the amount on your statement. Then, do the following:

1. **Notify your credit card issuer.** They should credit you the difference between the actual amount and the amount you paid due to this fraud.
2. **Notify the restaurant.** The manager will want to know if there is a dishonest employee and might even offer you free meal or discount for your troubles.
3. **Notify the police and report the crime (optional).** Even if the tip fraud was just a small amount, reporting it to the police will help build a case against and protect others from the thieving server.

There is a chance that your server didn't intentionally commit tip fraud. Perhaps he or she was in a rush, and accidentally hit the wrong keys when entering the amount. Please consider this before reporting your potentially innocent server.

Tip Calculation Methods

This app offers a variety of tip calculation methods, including exact, checksum, palindrome (aka mirror), and rounded up or down. These different methods are selected from the bottom buttons.

The tip calculation methods can be applied to either the check total or the per-person total. By default, the tip calculation method will be applied to the check total. To switch the target to the per-person total, swipe your finger from the left to the right across the results area. To switch the target back to the check total, swipe your finger from the right to the left.

Exact

When the Exact tip calculation method is selected and the check is not being split, then the tip amount will equal (the selected tip percentage × the pre- or post-tax subtotal amount), rounded to the nearest $0.01, or 1/100th of your native currency. This tip amount is known as the **exact tip amount**. The **exact tip amount** + the subtotal amount equals the **exact check total**. These two values are used in the calculations for checksum, palindrome, and rounded up/down. For more information about using the pre- or post-tax subtotal amount, see the Sales Tax section.

This tip was calculated on the pre-tax subtotal

This tip was calculated on the post-tax subtotal

If the number of people by which to split the check is greater than one, then the total amount per person and tip amount per person are calculated by dividing the exact check total and exact tip total by the number of guests, respectively. Finally, the check total and tip total is calculated by multiplying the number of guests by the per-person total and per-person tip amount, respectively. In situations where the exact check total is not evenly divisible by the number of guests, the final check total might be greater than the exact check total by as much as $0.01, or 1/100th of your native currency, per guest. Please refer to the Splitting section for more information.

Checksum

The checksum is a popular technique in the fight against tip fraud. Adjusting your tip to embed a checksum makes it easer to identify amounts that have been altered. This app adjusts the amount of the ***exact tip amount*** (see Exact) so that the last digit in the sum of the numbers total to the left of the decimal separator equals the right-most digit to the right of the decimal separator.

In our tip fraud example, the original total ($53.49) has "53" to the left of the decimal separator. 5 + 3 = 8, so the final digit to the right of the decimal separator should be eight instead of nine. To embed the checksum, the total can be adjusted to $53.58 or $53.48 by adding nine cents or subtracting one cents from the tip amount. We do not believe in under tipping, so this app will add cents to the tip as long as the amount added does not increase the dollar amount, which would then force a recalculation of the checksum. If adding cents to the tip will increase the dollar amount, then cents are subtracted from the tip in order to achieve the checksum total.

Subtotal:	$48.63	
Tip:	$4.95	(increased from $4.86)
Total:	$53.58	(5+3=8)

The checksum methods can be applied to either the check total or the per-person total. By default, the tip calculation method will be applied to the check total. To switch the target to the per-person total, swipe your finger from the left to the right across the results area. To switch the target back to the check total, swipe your finger from the right to the left.
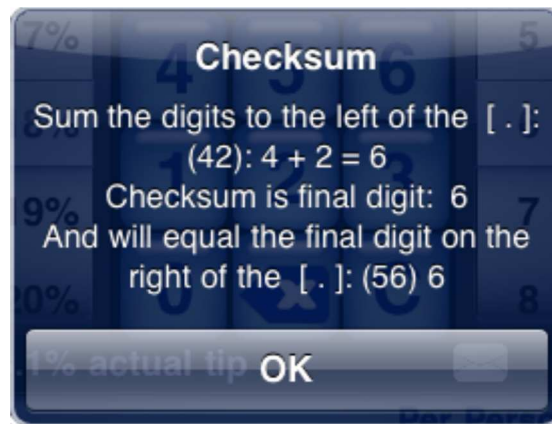

This checksum is calculated based on the grand total
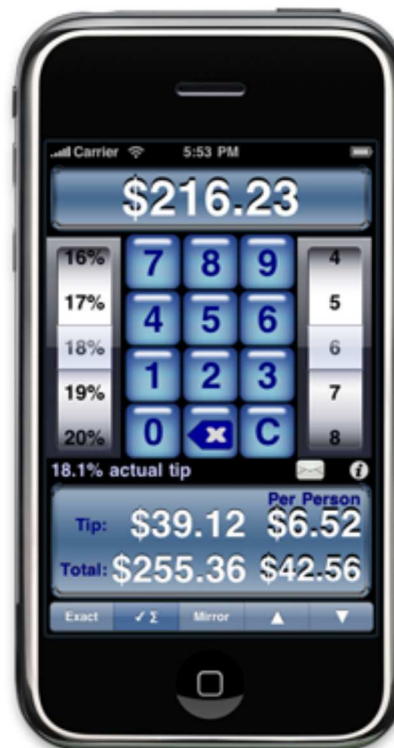
The checksum is calculated based on the per person total

Double tapping in the results area at the bottom of the display will bring up an alert that explains the checksum.

If splitting the bill, the check total might not equal:

       (the number of people by which to split the check) × (the total amount per person)

Please refer to the Splitting section for more information.

Palindrome (aka Mirror)

> A palindrome is a word, line, verse, number, sentence, etc., reading the same backward as forward ("palindrome." Dictionary.com Unabridged (v 1.1). Random House, Inc. 28 May. 2009.).

Palindromes provide another method of combating tip fraud because, like the checksum method, they make it easier to spot modified amounts on a credit card statement. It is arguably easier to recognize a palindrome amount than a checksum amount on a credit card statement, but it is also easier for the disgruntled server to notice the palindrome and modify the tip amount to create a more expensive palindrome.

This app creates a palindrome (excluding the thousands and decimal separators) by modifying the *exact tip amount* (see Exact) or the per-person total (see Splitting) so that the amount reads the same backwards as forwards. Examples include:

- $0.10
- $23.32
- $146.41
- $2,055.02

By default, the palindrome will be applied to the check total. To switch the target to the per-person total, swipe your finger from the left to the right across the results area. To switch the target back to the check total, swipe your finger from the right to the left.

*The palindrome is calculated
based on the grand total*

*The palindrome is calculated
based on the per person total*

If splitting the bill, the check total might not equal:
        (the number of people by which to split the check) × (the total amount per person)
Please refer to the Splitting section for more information.

Rounded

Selecting the round up or round down buttons will round the check total or per-person total, depending on the selected target, up or down to the nearest dollar, respectively. If "round down" will cause the check total to be less than subtotal amount of the bill, then "N/A" will be displayed.

By default, the check total will be rounded. To round the per-person total, swipe your finger from the left to the right across the results area. To switch the target back to the check total, swipe your finger from the right to the left.

The previous "exact" example, rounded up

The previous "exact" example, rounded down

Exact, calculated from pre-tax subtotal

If splitting the bill, the check total might not equal:

(the number of people by which to split the check) × (the total amount per person)

Please refer to the Splitting section for more information.

Version History

Version	Date	Changes
1.1	2010-02-23	• Added ability to calculate the tip on the pre- or post-sales tax amount via the new Settings view, which is accessed from the About view or by tapping on the subtotal • Added ability to store a default email address, which will be populate the recipient field when you email a summary of the tip transaction • Fixed a bug where the subtotal amount was not initially displayed in the correct format for the selected international region if the subtotal amount was zero • Fixed a bug where tip percentages were not displayed in the correct format for the selected international region • Fixed a rarely occurring bug with the shake-to-clear functionality • Enlarged the font used for the "table of contents" section of this guide so that the links would be easier to click • The "Rnd ↓" on the tip type selection button has been replaced with a down arrow • The "Rnd ↑" on the tip type selection button has been replaced with an up arrow • The "C" (clear) button no longer sets the split count (number of guests) to one
1.0.2	2010-01-16	• Fixed a bug where the number pad click sound and the swoosh sound were not silenced when the "Keyboard Clicks" setting, which is located in the Sounds section of the Settings app, was set to "off" • Added support for rotation to landscape mode when viewing this User Guide • Performance and error handling improvements
1.0.1	2009-12-28	• Summary email now displays actual tip percent in addition to selected tip percent
1.0	2009-07-31	• Initial release