

**tabulate, summarize()** — One- and two-way tables of summary statistics

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## Description

`tabulate, summarize()` produces one- and two-way tables (breakdowns) of means and standard deviations. See [\[R\] tabulate oneway](#) and [\[R\] tabulate twoway](#) for one- and two-way frequency tables. See [\[R\] table](#) for a more flexible command that produces one-, two-, and  $n$ -way tables of frequencies and a wide variety of summary statistics. `table` is better, but `tabulate, summarize()` is faster. Also see [\[R\] tabstat](#) for yet another alternative.

## Quick start

Tabulation of `v1`, reporting means and standard deviations of `x` and frequencies

```
tabulate v1, summarize(x)
```

As above, but report summary statistics for the two-way tabulation of `v1` and `v2`

```
tabulate v1 v2, summarize(x)
```

Weighted summary statistics using frequency weight `wvar`

```
tabulate v1 v2 [fweight=wvar], summarize(x)
```

Report only the mean of `x` for each group

```
tabulate v1 v2, summarize(x) means
```

Do not report standard deviations

```
tabulate v1 v2, summarize(x) nostandard
```

Show numeric values of `v1` and `v2` rather than value labels

```
tabulate v1 v2, summarize(x) nolabel
```

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## Syntax

```
tabulate varname1 [varname2] [if] [in] [weight] [, options]
```

<i>options</i>	Description
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Main

<code>summarize(varname<sub>3</sub>)</code>	report summary statistics for <i>varname<sub>3</sub></i>
<code>[no]means</code>	include or suppress means
<code>[no]standard</code>	include or suppress standard deviations
<code>[no]freq</code>	include or suppress frequencies
<code>[no]obs</code>	include or suppress number of observations
<code>no<code>label</code></code>	show numeric codes, not labels
<code>wrap</code>	do not break wide tables
<code>missing</code>	treat missing values of <i>varname<sub>1</sub></i> and <i>varname<sub>2</sub></i> as categories

`by` and `collect` are allowed; see [U] 11.1.10 Prefix commands.

`aweight`s and `fweight`s are allowed; see [U] 11.1.6 `weight`.

## Options

Main

`summarize(varname3)` identifies the name of the variable for which summary statistics are to be reported. If you do not specify this option, a table of frequencies is produced; see [R] `tabulate oneway` and [R] `tabulate twoway`. The description here concerns `tabulate` when this option is specified.

`[no]means` includes or suppresses only the means from the table.

The `summarize()` table normally includes the mean, standard deviation, frequency, and, if the data are weighted, number of observations. Individual elements of the table may be included or suppressed by the `[no]means`, `[no]standard`, `[no]freq`, and `[no]obs` options. For example, typing

```
. tabulate category, summarize(myvar) means standard
```

produces a summary table by `category` containing only the means and standard deviations of `myvar`. You could also achieve the same result by typing

```
. tabulate category, summarize(myvar) nofreq
```

`[no]standard` includes or suppresses only the standard deviations from the table; see `[no]means` option above.

`[no]freq` includes or suppresses only the frequencies from the table; see `[no]means` option above.

`[no]obs` includes or suppresses only the reported number of observations from the table. If the data are not weighted, the number of observations is identical to the frequency, and by default only the frequency is reported. If the data are weighted, the frequency refers to the sum of the weights. See `[no]means` option above.

`nolabel` causes the numeric codes to be displayed rather than the label values.

`wrap` requests that no action be taken on wide tables to make them readable. Unless `wrap` is specified, wide tables are broken into pieces to enhance readability.

`missing` requests that missing values of *varname<sub>1</sub>* and *varname<sub>2</sub>* be treated as categories rather than as observations to be omitted from the analysis.

## Remarks and examples

`tabulate` with the `summarize()` option produces one- and two-way tables of summary statistics. When combined with the `by` prefix, it can produce  $n$ -way tables as well.

Remarks are presented under the following headings:

*One-way tables*

*Two-way tables*

### One-way tables

#### ► Example 1

We have data on 74 automobiles. Included in our dataset are the variables `foreign`, which marks domestic and foreign cars, and `mpg`, the car's mileage rating. Typing `tabulate foreign` displays a breakdown of the number of observations we have by the values of the `foreign` variable.

```
. use https://www.stata-press.com/data/r17/auto
(1978 automobile data)
```

```
. tabulate foreign
```

Car origin	Freq.	Percent	Cum.
Domestic	52	70.27	70.27
Foreign	22	29.73	100.00
Total	74	100.00	

We discover that we have 52 domestic cars and 22 foreign cars in our dataset. If we add the `summarize(varname)` option, however, `tabulate` produces a table of summary statistics for `varname`:

```
. tabulate foreign, summarize(mpg)
```

Car origin	Summary of Mileage (mpg)		Freq.
	Mean	Std. dev.	
Domestic	19.826923	4.7432972	52
Foreign	24.772727	6.6111869	22
Total	21.297297	5.7855032	74

We also discover that the average gas mileage for domestic cars is about 20 mpg and the average foreign is almost 25 mpg. Overall, the average is 21 mpg in our dataset.



#### □ Technical note

We might now wonder if the difference in gas mileage between foreign and domestic cars is statistically significant. We can use the `oneway` command to find out; see [R] [oneway](#). To obtain an analysis-of-variance table of `mpg` on `foreign`, we type

```
. oneway mpg foreign
```

Source	Analysis of variance			F	Prob > F
	SS	df	MS		
Between groups	378.153515	1	378.153515	13.18	0.0005
Within groups	2065.30594	72	28.6848048		
Total	2443.45946	73	33.4720474		
Bartlett's equal-variances test: $\chi^2(1) = 3.4818$ $\text{Prob} > \chi^2 = 0.062$					

The  $F$  statistic is 13.18, and the difference between foreign and domestic cars' mileage ratings is significant at the 0.05% level.

There are several ways that we could have statistically compared mileage ratings—see, for instance, [R] `anova`, [R] `oneway`, [R] `regress`, and [R] `ttest`—but `oneway` seemed the most convenient. □

## Two-way tables

### ▷ Example 2

`tabulate`, `summarize` can be used to obtain two-way as well as one-way breakdowns. For instance, we obtained summary statistics on `mpg` decomposed by `foreign` by typing `tabulate foreign, summarize(mpg)`. We can specify up to two variables before the comma:

```
. generate wgtcat = autocode(weight,4,1760,4840)
. tabulate wgtcat foreign, summarize(mpg)
      Means, Standard Deviations and Frequencies of Mileage (mpg)
```

wgtcat	Car origin		Total
	Domestic	Foreign	
2530	28.285714	27.0625	27.434783
	3.0937725	5.9829619	5.2295149
	7	16	23
3300	21.75	19.6	21.238095
	2.4083189	3.4351128	2.7550819
	16	5	21
4070	17.26087	14	17.125
	1.8639497	0	1.9406969
	23	1	24
4840	14.666667	.	14.666667
	3.32666	.	3.32666
	6	0	6
Total	19.826923	24.772727	21.297297
	4.7432972	6.6111869	5.7855032
	52	22	74

In addition to the means, standard deviations, and frequencies for each weight–mileage cell, also reported are the summary statistics by weight, by mileage, and overall. For instance, the last row of the table reveals that the average mileage of domestic cars is 19.83 and that of foreign cars is 24.77—domestic cars yield poorer mileage than foreign cars. But we now see that domestic cars yield better gas mileage within weight class—the reason domestic cars yield poorer gas mileage is because they are, on average, heavier. ◀

### ▷ Example 3

If we do not specify the statistics to be included in a table, `tabulate` reports the mean, standard deviation, and frequency. We can specify the statistics that we want to see using the `means`, `standard`, and `freq` options:

```
. tabulate wgtcat foreign, summarize(mpg) means
      Means of Mileage (mpg)
```

wgtcat	Car origin		Total
	Domestic	Foreign	
2530	28.285714	27.0625	27.434783
3300	21.75	19.6	21.238095
4070	17.26087	14	17.125
4840	14.666667	.	14.666667
Total	19.826923	24.772727	21.297297

When we specify one or more of the `means`, `standard`, and `freq` options, only those statistics are displayed. Thus, we could obtain a table containing just the means and standard deviations by typing `means standard` after the `summarize(mpg)` option. We can also suppress selected statistics by placing `no` in front of the option name. Another way of obtaining only the means and standard deviations is to add the `nofreq` option:

```
. tabulate wgtcat foreign, summarize(mpg) nofreq
      Means and Standard Deviations of Mileage (mpg)
```

wgtcat	Car origin		Total
	Domestic	Foreign	
2530	28.285714	27.0625	27.434783
	3.0937725	5.9829619	5.2295149
3300	21.75	19.6	21.238095
	2.4083189	3.4351128	2.7550819
4070	17.26087	14	17.125
	1.8639497	0	1.9406969
4840	14.666667	.	14.666667
	3.32666	.	3.32666
Total	19.826923	24.772727	21.297297
	4.7432972	6.6111869	5.7855032

◀

## Also see

[R] [table](#) — Table of frequencies, summaries, and command results

[R] [table summary](#) — Table of summary statistics

[R] [tabstat](#) — Compact table of summary statistics

[R] [tabulate oneway](#) — One-way table of frequencies

[R] [tabulate twoway](#) — Two-way table of frequencies

[D] [collapse](#) — Make dataset of summary statistics

[SVY] [svy: tabulate oneway](#) — One-way tables for survey data

[SVY] [svy: tabulate twoway](#) — Two-way tables for survey data

[U] [12.6 Dataset, variable, and value labels](#)

[U] [26 Working with categorical data and factor variables](#)