Considering Categorical Data

Colby Community College

Example 1

The following table summarizes two categorical variables from the `loans` data set.

		homeownership			
		rent	mortgage	own	Total
app_type	individual	3496	3839	1170	8505
	joint	362	950	183	1495
	Total	3858	4789	1353	10000

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Definition

A table that summarizes data for two categorical variables in this way is called a **contingency table**.

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The **row totals** provide the total counts across each row.

The **column totals** provide the total counts down each column.

Note

You can also create a table that considers only a single variable.

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Example 2

homeownership	Count
rent	3858
mortgage	4789
own	1353
Total	10000

Definition

A **bar plot** plots a bar for each variable outcome, the height is the frequency of the outcome.

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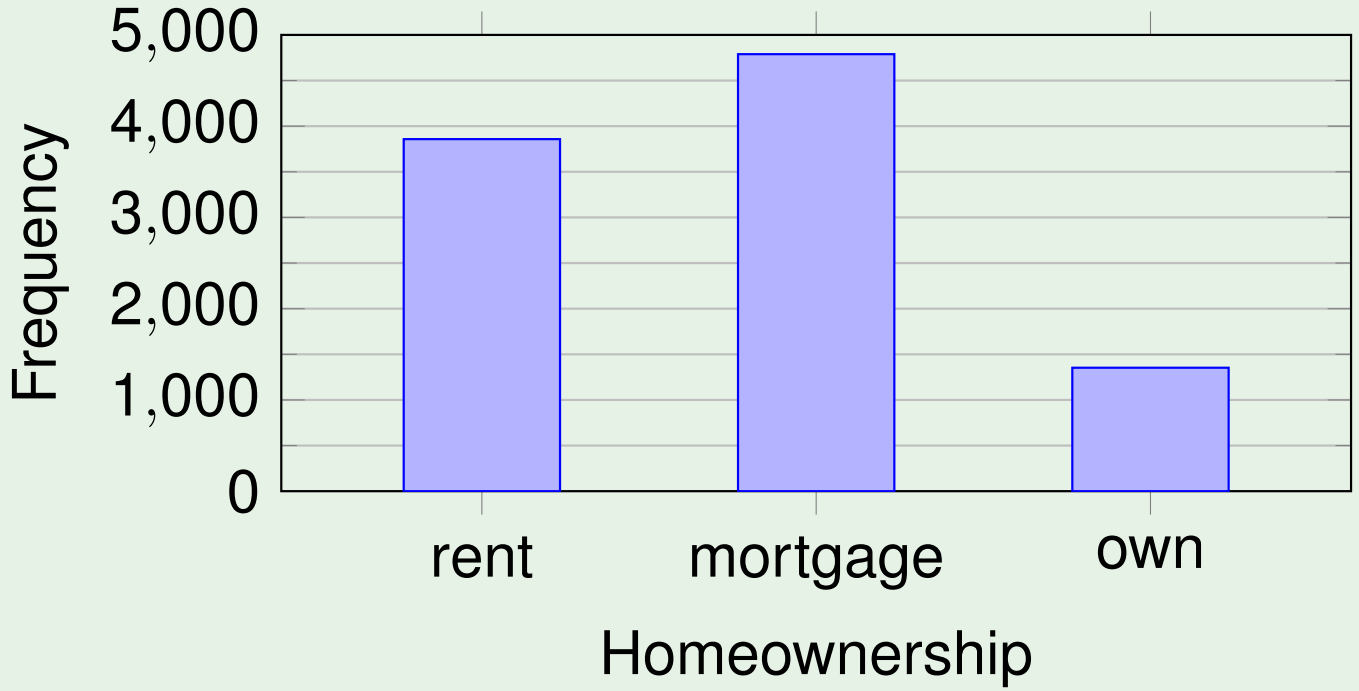
Example 3



Definition

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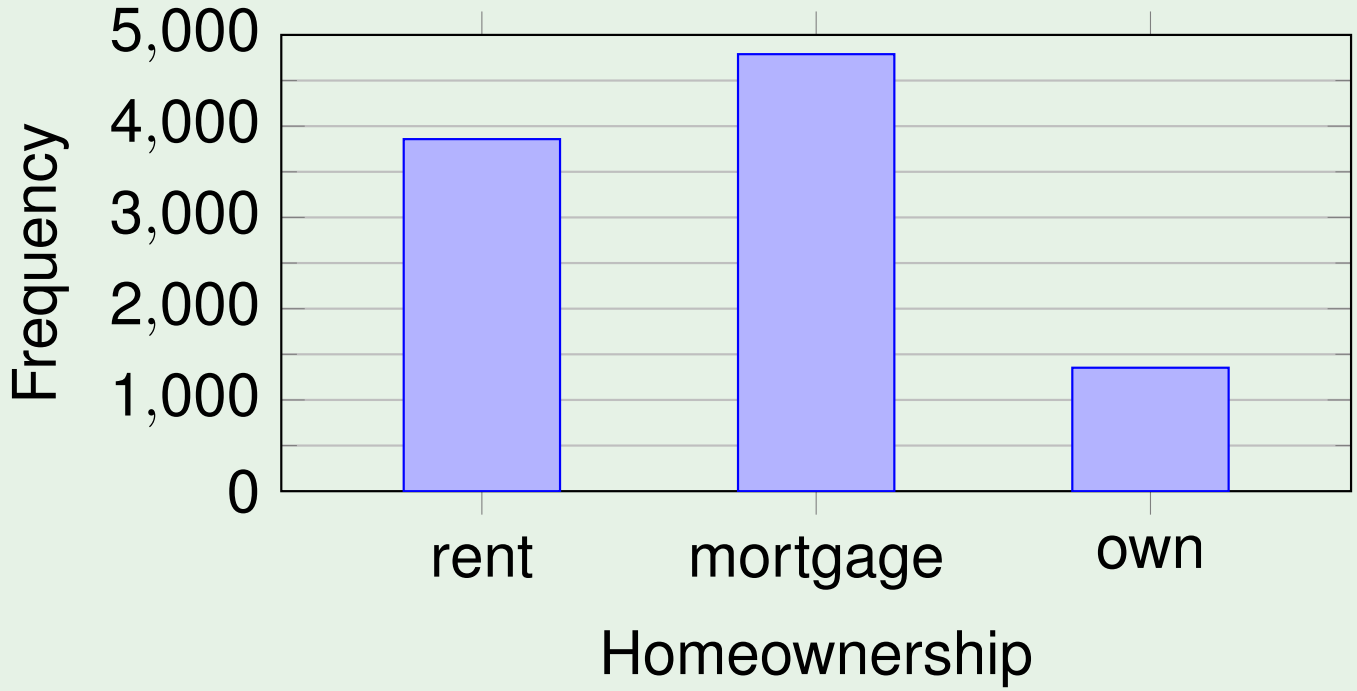
Example 3



Note

A histogram has no gaps between the bars, where as bar plot does.

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Instead of using frequencies, we could instead use proportions.

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Example 4

To find the proportion, divide each frequency by the total count.

`homeownership`	Frequency	Proportion
rent	3858	
mortgage	4789	
own	1353	
Total	10000	

Note

Instead of using frequencies, we could instead use proportions.

Example 4

To find the proportion, divide each frequency by the total count.

`homeownership`	Frequency	Proportion
rent	3858	$\frac{3858}{10000} = 0.3858$
mortgage	4789	
own	1353	
Total	10000	

Note

Instead of using frequencies, we could instead use proportions.

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To find the proportion, divide each frequency by the total count.

`homeownership`	Frequency	Proportion
rent	3858	$\frac{3858}{10000} = 0.3858$
mortgage	4789	$\frac{4789}{10000} = 0.4789$
own	1353	
Total	10000	

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`homeownership`	Frequency	Proportion
rent	3858	$\frac{3858}{10000} = 0.3858$
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Total	10000	

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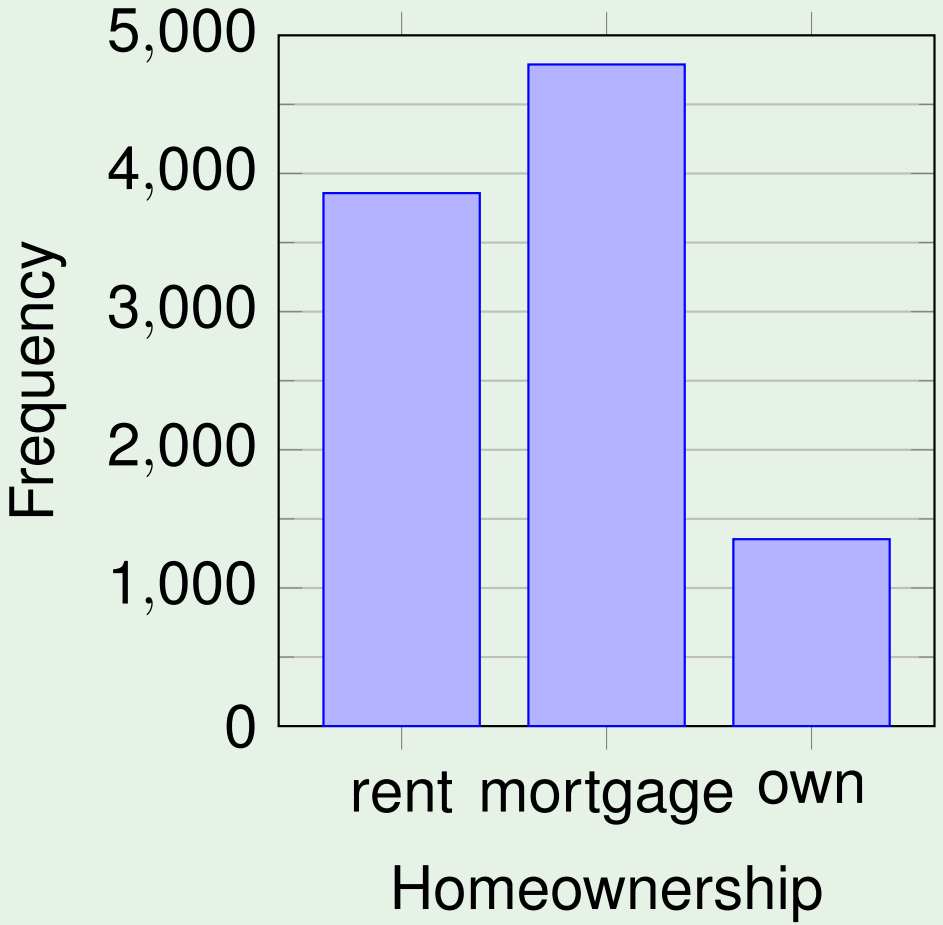
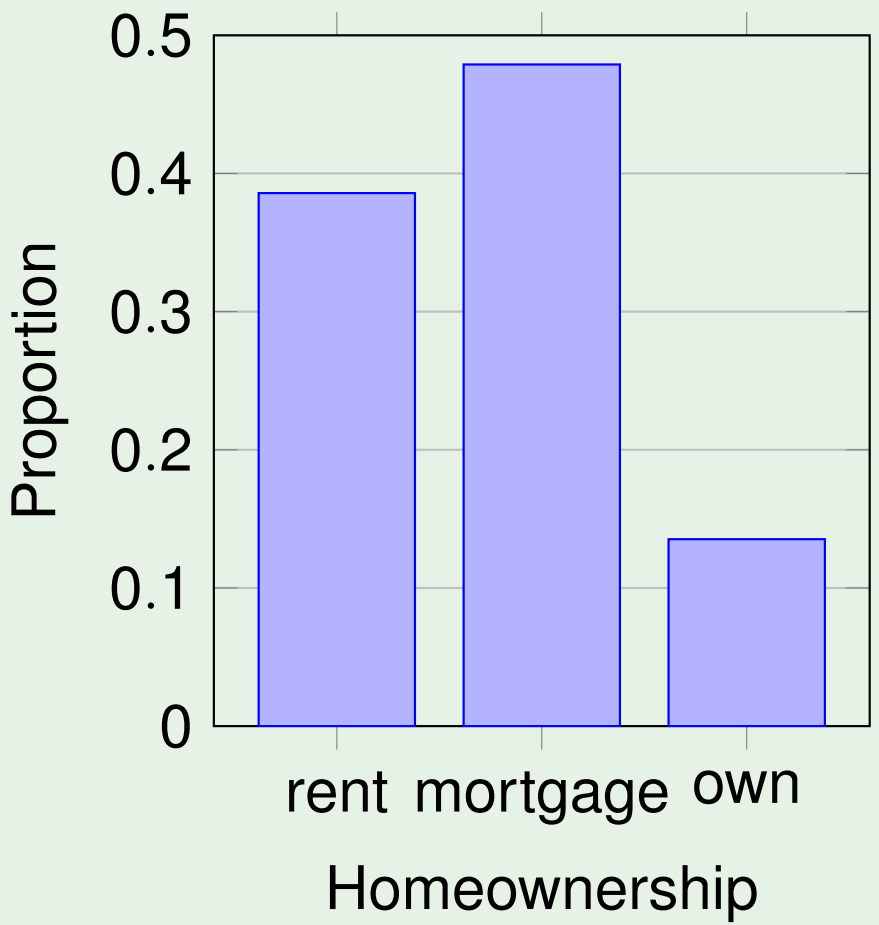
To find the proportion, divide each frequency by the total count.

`homeownership`	Frequency	Proportion
rent	3858	$\frac{3858}{10000} = 0.3858$
mortgage	4789	$\frac{4789}{10000} = 0.4789$
own	1353	$\frac{1353}{10000} = 0.1353$
Total	10000	1.0000

Example 5

Here are both the frequency and proportion for `homeownership`.





Example 6

Here, we use the **row proportions** for the contingency table from Example 1. Where we divide each number by the row total.

		homeownership			
		rent	mortgage	own	Total
app_type	individual	3496	3839	1170	8505
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		homeownership			
		rent	mortgage	own	Total
app_type	individual	0.4111	0.4514	0.1376	1.0000
	joint	0.2421	0.6355	0.1224	1.0000
	Total	0.3858	0.4789	0.1353	1.0000

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What does the number 0.4111 represent?

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	Total	0.3858	0.4789	0.1353	1.0000

What does the number 0.4111 represent?

That 41.11% of those that applied as individuals are renters.

Example 7

Here, we use the **column proportions** for the contingency table from Example 1. Where we divide each number by the column total.

		homeownership			
		rent	mortgage	own	Total
app_type	individual	3496	3839	1170	8505
	joint	362	950	183	1495
	Total	3858	4789	1353	10000

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		homeownership			
		rent	mortgage	own	Total
app_type	individual	0.9062	0.8016	0.8647	0.8505
	joint	0.0946	0.1984	0.1353	0.1495
	Total	1.0000	1.0000	1.0000	1.0000

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What does the number 0.9062 represent?

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What does the number 0.9062 represent?

That 90.62% of renters applied as individuals.

Do Associations next.

Note

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