

IS4 in R: Displaying and Describing Categorical Data (Chapter 2)

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Introduction and Background

This document is intended to help describe how to undertake analyses introduced as examples in the Fourth Edition of *Intro Stats* (2013) by De Veaux, Velleman, and Bock. More information about the book can be found at http://wps.aw.com/aw_deveaux_stats_series. This file as well as the associated R Markdown reproducible analysis source file used to create it can be found at <https://nhorton.people.amherst.edu/is4>.

This work leverages initiatives undertaken by Project MOSAIC (<http://www.mosaic-web.org>), an NSF-funded effort to improve the teaching of statistics, calculus, science and computing in the undergraduate curriculum. In particular, we utilize the `mosaic` package, which was written to simplify the use of R for introductory statistics courses. A short summary of the R needed to teach introductory statistics can be found in the `mosaic` package vignettes (<http://cran.r-project.org/web/packages/mosaic>). A paper describing the `mosaic` approach was published in the *R Journal*: <https://journal.r-project.org/archive/2017/RJ-2017-024>.

Chapter 2: Displaying and Describing Categorical Data

Section 2.1: Summarizing and Displaying a Single Categorical Variable

See displays on page 17.

```
library(mosaic)
library(readr)
library(ggformula)
options(digits = 3)
Titanic <- read_delim("https://nhorton.people.amherst.edu/sdm4/data/Titanic.txt",
                     delim = "\t")
```

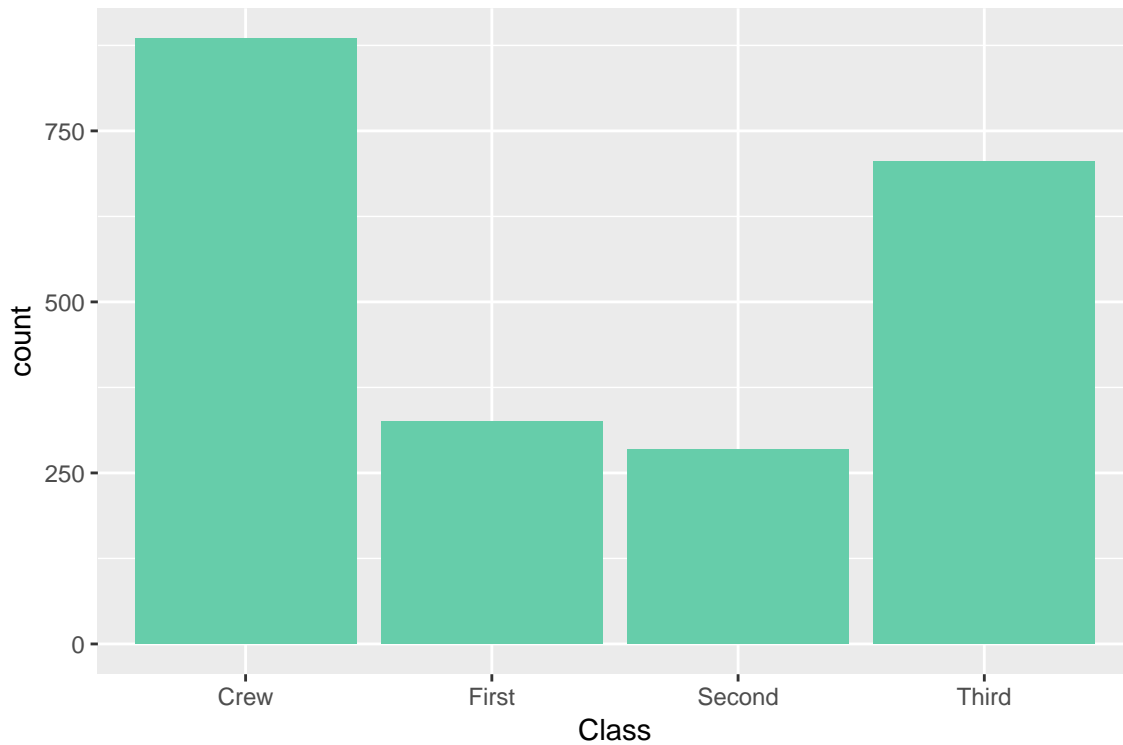
```
tally(~ Class, data = Titanic)
```

```
## Class
##   Crew First Second  Third
##   885   325   285   706
```

```
tally(~ Class, format = "percent", data = Titanic)
```

```
## Class
##   Crew First Second  Third
##  40.2  14.8  12.9  32.1
```

```
gf_bar(~ Class, data = Titanic, stat = "count", fill = "aquamarine3")
```



Section 2.2: Exploring the Relationship Between Two Categorical Variables

See display on page 19.

```
tally(~ Survived + Class, margin = TRUE, data = Titanic)
```

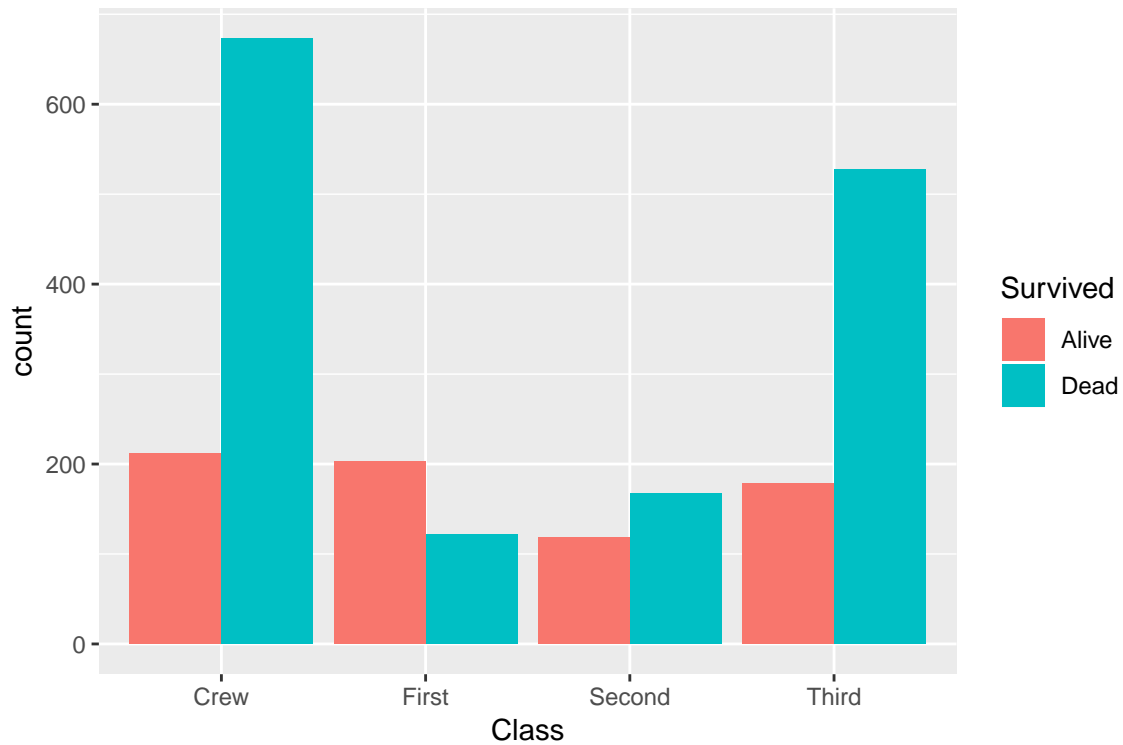
```
##           Class
## Survived Crew First Second Third Total
##   Alive  212   203   118   178   711
##   Dead   673   122   167   528  1490
##   Total   885   325   285   706  2201
```

```
tally(~ Survived | Class, format = "percent", data = Titanic)
```

```
##           Class
## Survived Crew First Second Third
##   Alive  24.0  62.5  41.4  25.2
##   Dead   76.0  37.5  58.6  74.8
```

See display on page 22.

```
gf_bar( ~ Class, fill = ~ Survived, data = Titanic,
        position = position_dodge())
```



```
vcd::mosaic(tally(~ Survived + Class, data = Titanic),
  main = "Mosaic plot of Class by Survival", shade = TRUE)
```

Mosaic plot of Class by Survival

