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

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July 17, 2017

Introduction and Background

This document is intended to help describe how to undertake analyses introduced as examples in the Fourth Edition of *Intro Stats* (2014) 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 http://www.amherst.edu/~nhorton/sdm4.

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 19-20.

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

```
## Parsed with column specification:
## cols(
##   Survived = col_character(),
##   Age = col_character(),
##   Sex = col_character(),
##   Class = col_character()
## )
```

```
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 21.

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

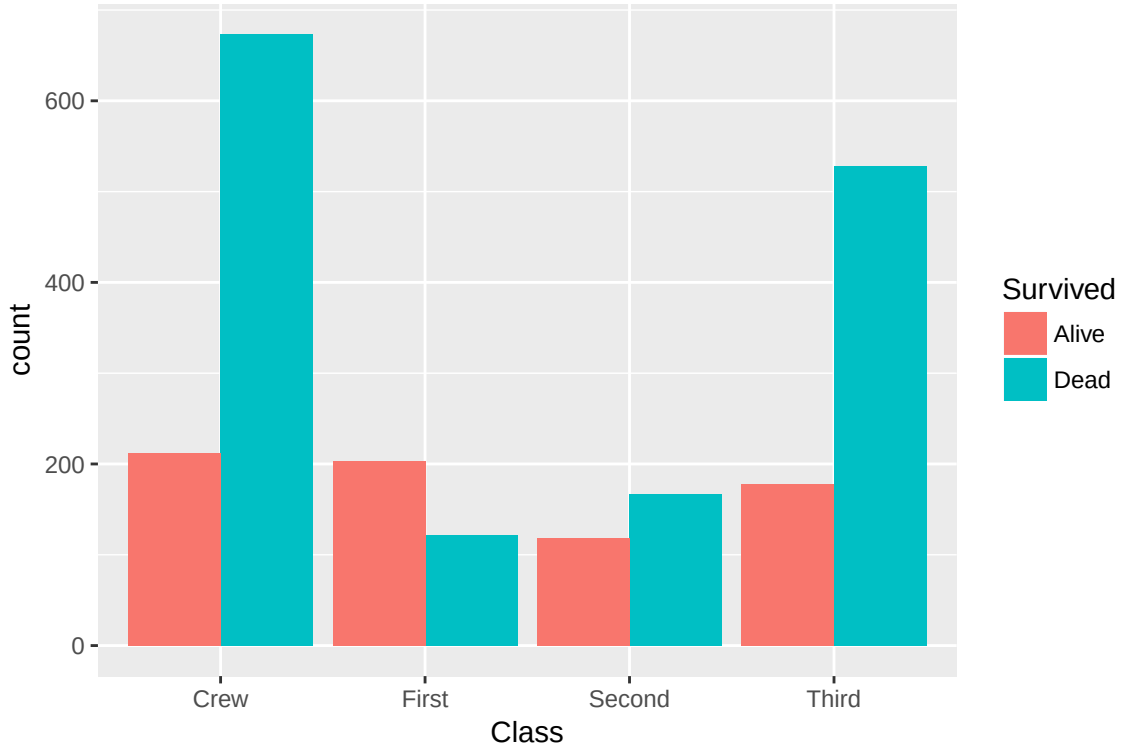
```
##          Class
## Survived Crew First Second Third Total
##    Alive  212   203    118   178   711
##    Dead   673   122    167   528  1490
##    Total  885   325    285   706  2201
```

```
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 24.

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




```
mosaicplot(tally(~ Survived + Class, data=Titanic),
main="Mosaic plot of Class by Survival",
col= c("lightskyblue","lightslateblue","lightskyblue3", "lightseagreen"))
```