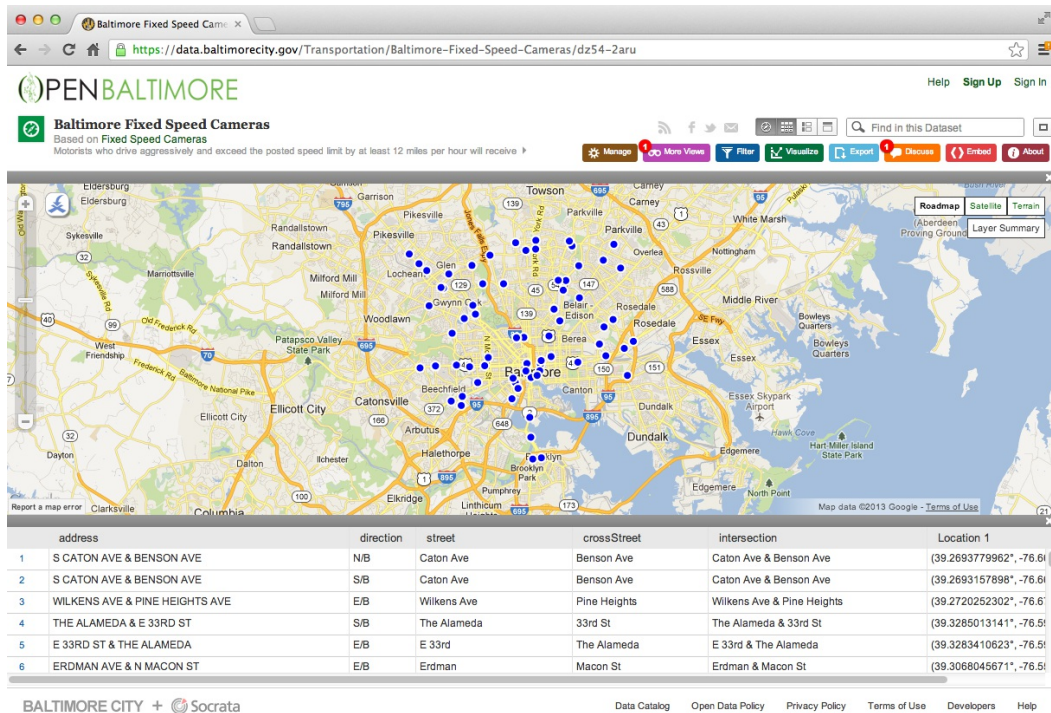




Editing text variables

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Example - Baltimore camera data



<https://data.baltimorecity.gov/Transportation/Baltimore-Fixed-Speed-Cameras/dz54-2aru>

Fixing character vectors - tolower(), toupper()

```
if(!file.exists("./data")){dir.create("./data")}  
fileUrl <- "https://data.baltimorecity.gov/api/views/dz54-2aru/rows.csv?accessType=DOWNLOAD"  
download.file(fileUrl,destfile="./data/cameras.csv",method="curl")  
cameraData <- read.csv("./data/cameras.csv")  
names(cameraData)
```

```
[1] "address"      "direction"    "street"       "crossStreet"  "intersection" "Location.1"
```

```
tolower(names(cameraData))
```

```
[1] "address"      "direction"    "street"       "crossstreet"  "intersection" "location.1"
```

Fixing character vectors - strsplit()

- Good for automatically splitting variable names
- Important parameters: *x*, *split*

```
splitNames = strsplit(names(cameraData), "\\.")  
splitNames[[5]]
```

```
[1] "intersection"
```

```
splitNames[[6]]
```

```
[1] "Location" "1"
```

Quick aside - lists

```
mylist <- list(letters = c("A", "b", "c"), numbers = 1:3, matrix(1:25, ncol = 5))  
head(mylist)
```

```
$letters
```

```
[1] "A" "b" "c"
```

```
$numbers
```

```
[1] 1 2 3
```

```
[[3]]
```

	[,1]	[,2]	[,3]	[,4]	[,5]
[1,]	1	6	11	16	21
[2,]	2	7	12	17	22
[3,]	3	8	13	18	23
[4,]	4	9	14	19	24
[5,]	5	10	15	20	25

Quick aside - lists

```
mylist[1]
```

```
$letters  
[1] "A" "b" "c"
```

```
mylist$letters
```

```
[1] "A" "b" "c"
```

```
mylist[[1]]
```

```
[1] "A" "b" "c"
```

Fixing character vectors - sapply()

- Applies a function to each element in a vector or list
- Important parameters: *X*, *FUN*

```
splitNames[[6]][1]
```

```
[1] "Location"
```

```
firstElement <- function(x){x[1]}  
sapply(splitNames,firstElement)
```

```
[1] "address"      "direction"    "street"       "crossStreet"  "intersection" "Location"
```

Peer review experiment data

The screenshot shows a web browser displaying a PLOS ONE article. The browser's address bar shows the URL: www.plosone.org/article/info:doi/10.1371/journal.pone.0026895. The page features a header with the PLOS ONE logo and navigation links: Articles, For Authors, About Us, and a Search bar. A banner at the top reads "Simplify your research with automatic and continuous dosing" with an image of medical syringes and pills. Below the header, a statistics bar shows: 6,497 VIEWS, 2 CITATIONS, 61 ACADEMIC BOOKMARKS, and 108 SOCIAL SHARES. The article title is "Cooperation between Referees and Authors Increases Peer Review Accuracy" by Jeffrey T. Leek, Margaret A. Taub, and Fernando J. Pineda. The article is categorized as "RESEARCH ARTICLE" and is marked as "OPEN ACCESS" and "PEER-REVIEWED". Below the title, there are tabs for "Article", "About the Authors", "Metrics", "Comments", and "Related Content". The "Article" tab is active, showing a diagram of the peer review process and a series of line graphs. To the right of the article content, there are buttons for "Download", "Print", and "Share", and a "Comments" section with a link to "Media Coverage of This Article" and a post by "PLOS_ONE_Group".

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Cooperation between Referees and Authors Increases Peer Review Accuracy

Jeffrey T. Leek, Margaret A. Taub, Fernando J. Pineda

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<http://www.plosone.org/article/info:doi/10.1371/journal.pone.0026895>

Peer review data

```
fileUrl1 <- "https://dl.dropboxusercontent.com/u/7710864/data/reviews-apr29.csv"
fileUrl2 <- "https://dl.dropboxusercontent.com/u/7710864/data/solutions-apr29.csv"
download.file(fileUrl1,destfile="./data/reviews.csv",method="curl")
download.file(fileUrl2,destfile="./data/solutions.csv",method="curl")
reviews <- read.csv("./data/reviews.csv"); solutions <- read.csv("./data/solutions.csv")
head(reviews,2)
```

	id	solution_id	reviewer_id	start	stop	time_left	accept
1	1	3	27	1304095698	1304095758	1754	1
2	2	4	22	1304095188	1304095206	2306	1

```
head(solutions,2)
```

	id	problem_id	subject_id	start	stop	time_left	answer
1	1	156	29	1304095119	1304095169	2343	B
2	2	269	25	1304095119	1304095183	2329	C

Fixing character vectors - sub()

- Important parameters: *pattern*, *replacement*, *x*

```
names(reviews)
```

```
[1] "id"          "solution_id" "reviewer_id" "start"       "stop"        "time_left"  
[7] "accept"
```

```
sub("_", "", names(reviews),)
```

```
[1] "id"          "solutionid"  "reviewerid"  "start"       "stop"        "timeleft"    "accept"
```

Fixing character vectors - gsub()

```
testName <- "this_is_a_test"  
sub("_", "", testName)
```

```
[1] "thisis_a_test"
```

```
gsub("_", "", testName)
```

```
[1] "thisisatest"
```

Finding values - grep(),grepl()

```
grep("Alameda",cameraData$intersection)
```

```
[1]  4  5 36
```

```
table(grepl("Alameda",cameraData$intersection))
```

```
FALSE  TRUE  
   77     3
```

```
cameraData2 <- cameraData[!grepl("Alameda",cameraData$intersection),]
```



More on grep()

```
grep("Alameda", cameraData$intersection, value=TRUE)
```



```
[1] "The Alameda & 33rd St" "E 33rd & The Alameda" "Harford \n & The Alameda"
```

```
grep("JeffStreet", cameraData$intersection)
```

```
integer(0)
```

```
length(grep("JeffStreet", cameraData$intersection))
```

```
[1] 0
```

More useful string functions

```
library(stringr)  
nchar("Jeffrey Leek")
```

```
[1] 12
```

```
substr("Jeffrey Leek",1,7)
```



```
[1] "Jeffrey"
```

```
paste("Jeffrey","Leek")
```

```
[1] "Jeffrey Leek"
```



More useful string functions

```
paste0("Jeffrey", "Leek")
```

```
[1] "JeffreyLeek"
```

```
str_trim("Jeff    ")
```



```
[1] "Jeff"
```

Important points about text in data sets

- Names of variables should be
 - All lower case when possible
 - Descriptive (Diagnosis versus Dx)
 - Not duplicated
 - Not have underscores or dots or white spaces
- Variables with character values
 - Should usually be made into factor variables (depends on application)
 - Should be descriptive (use TRUE/FALSE instead of 0/1 and Male/Female versus 0/1 or M/F)