

# Analyzing Storm Data

## Librarys used for analysis

```
library(R.utils)
```

```
## Warning: package 'R.utils' was built under R version 3.5.1
```

```
## Loading required package: R.oo
```

```
## Loading required package: R.methodsS3
```

```
## R.methodsS3 v1.7.1 (2016-02-15) successfully loaded. See ?R.methodsS3 for help.
```

```
## R.oo v1.22.0 (2018-04-21) successfully loaded. See ?R.oo for help.
```

```
##  
## Attaching package: 'R.oo'
```

```
## The following objects are masked from 'package:methods':  
##  
##   getClasses, getMethods
```

```
## The following objects are masked from 'package:base':  
##  
##   attach, detach, gc, load, save
```

```
## R.utils v2.6.0 (2017-11-04) successfully loaded. See ?R.utils for help.
```

```
##  
## Attaching package: 'R.utils'
```

```
## The following object is masked from 'package:utils':  
##  
##   timestamp
```

```
## The following objects are masked from 'package:base':  
##  
##      cat, commandArgs, getOption, inherits, isOpen, parse, warnings
```

```
library(memoise)
```

```
## Warning: package 'memoise' was built under R version 3.5.1
```

## Downloading file

I copied the url from the course website

```
flocation <- "https://d396qusza40orc.cloudfront.net/repdata%2Fdata%2FStormData.csv.bz2"  
filename <- "stormdata.bz2"  
if(!file.exists("stormdata.bz2")){  
  download.file(flocation,filename,mode="wb")  
  paste("File was downloaded on",Sys.time())  
}
```

## Extracting file

```
if(!file.exists("stormdata.csv")){  
  bunzip2("stormdata.bz2","stormdata.csv",remove=FALSE)  
}
```

## Reading file

```
sdata <- read.csv("stormdata.csv")  
data = subset(sdata, select=c(EVTYPE,FATALITIES,INJURIES,PROPDMG,PROPDMGEXP,CROPDMG,CROPDMGEXP))
```

# Property damage multiplier in column “PROPDMGEXP”

```
data$PROPEXP[data$PROPDMGEXP == "K"] <- 1000
data$PROPEXP[data$PROPDMGEXP == "M"] <- 1e+06
data$PROPEXP[data$PROPDMGEXP == ""] <- 1
data$PROPEXP[data$PROPDMGEXP == "B"] <- 1e+09
data$PROPEXP[data$PROPDMGEXP == "m"] <- 1e+06
data$PROPEXP[data$PROPDMGEXP == "0"] <- 1
data$PROPEXP[data$PROPDMGEXP == "5"] <- 1e+05
data$PROPEXP[data$PROPDMGEXP == "6"] <- 1e+06
data$PROPEXP[data$PROPDMGEXP == "4"] <- 10000
data$PROPEXP[data$PROPDMGEXP == "2"] <- 100
data$PROPEXP[data$PROPDMGEXP == "3"] <- 1000
data$PROPEXP[data$PROPDMGEXP == "h"] <- 100
data$PROPEXP[data$PROPDMGEXP == "7"] <- 1e+07
data$PROPEXP[data$PROPDMGEXP == "H"] <- 100
data$PROPEXP[data$PROPDMGEXP == "1"] <- 10
data$PROPEXP[data$PROPDMGEXP == "8"] <- 1e+08
# give 0 to invalid exponent data, so they not count in
data$PROPEXP[data$PROPDMGEXP == "+"] <- 0
data$PROPEXP[data$PROPDMGEXP == "-"] <- 0
data$PROPEXP[data$PROPDMGEXP == "?"] <- 0
# compute the property damage value
data$PROPDMGVAL <- data$PROPDMG * data$PROPEXP
```

# Crop damage multiplier in column “CROPDMGEXP”

```
# Sorting the property exponent data
data$CROPEXP[data$CROPDMGEXP == "M"] <- 1e+06
data$CROPEXP[data$CROPDMGEXP == "K"] <- 1000
data$CROPEXP[data$CROPDMGEXP == "m"] <- 1e+06
data$CROPEXP[data$CROPDMGEXP == "B"] <- 1e+09
data$CROPEXP[data$CROPDMGEXP == "0"] <- 1
data$CROPEXP[data$CROPDMGEXP == "k"] <- 1000
data$CROPEXP[data$CROPDMGEXP == "2"] <- 100
data$CROPEXP[data$CROPDMGEXP == ""] <- 1
# give 0 to invalid exponent data, so they not count in
data$CROPEXP[data$CROPDMGEXP == "?"] <- 0
# compute the crop damage value
data$CROPDMGVAL <- data$CROPDMG * data$CROPEXP
```

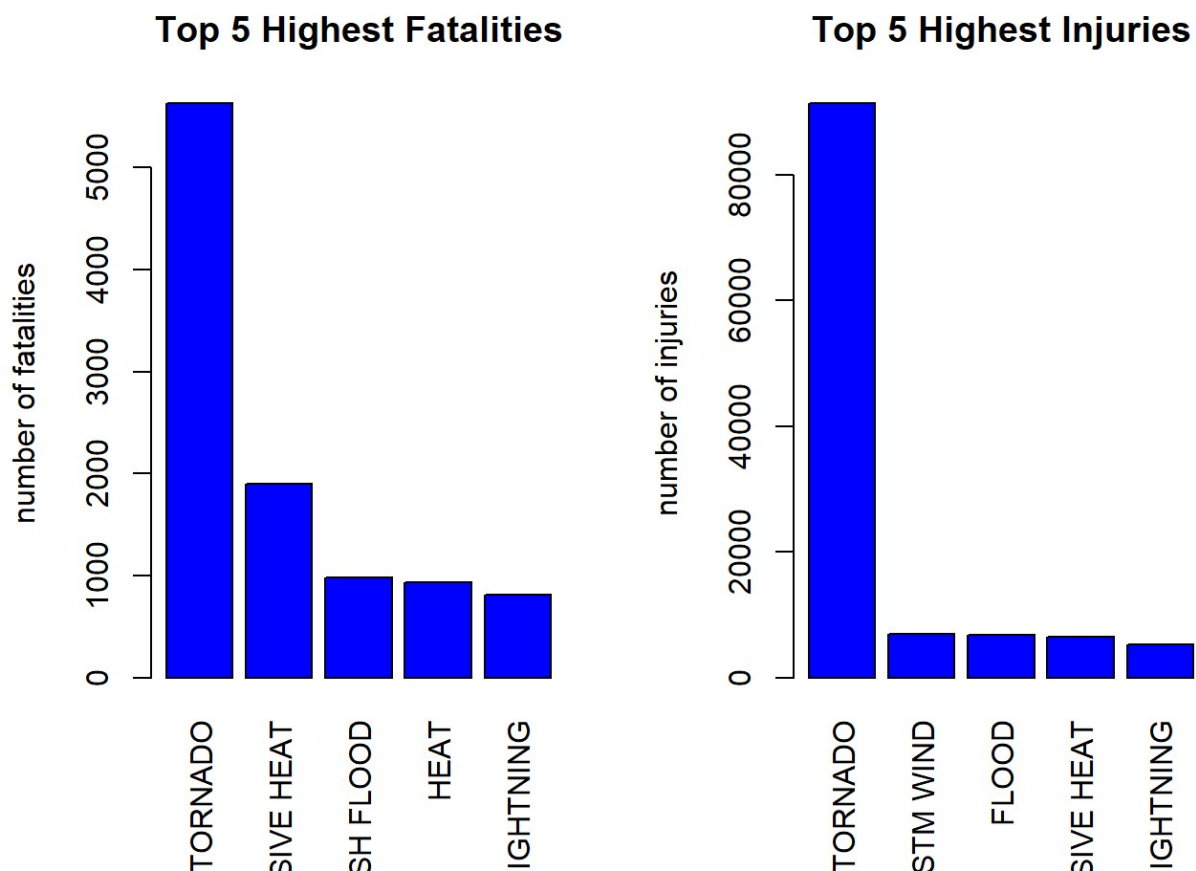
```
# Total of all property damage by events
fat <- aggregate(FATALITIES ~ EVTYPE, data = data, FUN = sum)
inj <- aggregate(INJURIES ~ EVTYPE, data = data, FUN = sum)
pdmg <- aggregate(PROPDMGVAL ~ EVTYPE, data = data, FUN = sum)
cdmg <- aggregate(CROPDMGVAL ~ EVTYPE, data = data, FUN = sum)
```

## RESULTS

### Damage to HUMAN due to natural events

```
orderf <- fat[order(-fat$FATALITIES), ][1:5, ]
orderi <- inj[order(-inj$INJURIES), ][1:5, ]
par(mfrow = c(1, 2))
barplot(orderf$FATALITIES, las = 3, names.arg = orderf$EVTYPE, main = "Top 5 Highest F
atalities", ylab = "number of fatalities", col = "blue")

barplot(orderi$INJURIES, las = 3, names.arg = orderi$EVTYPE, main = "Top 5 Highest Inj
uries", ylab = "number of injuries", col = "blue")
```



#Damage to property due to natural events

```

propdmg <- pdmg[order(-pdmg$PROPDMGVAL), ][1:5, ]
croprdmg <- cdmg[order(-cdmg$CROPDMGVAL), ][1:5, ]
par(mfrow = c(1, 2))
barplot(propdmg$PROPDMGVAL/(10^9), las = 3, names.arg = propdmg$EVTYPE,
        main = "Top 5 Greatest Property Damages", ylab = "Cost of damage ($ billions)",
        col = "red")
barplot(croprdmg$CROPDMGVAL/(10^9), las = 3, names.arg = croprdmg$EVTYPE,
        main = "Top 5 Greatest Crop Damages", ylab = "Cost of damage ($ billions)",
        col = "red")

```

