BIMM143_Lab4_Introduction_to_R.R

zhang

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```
# EXTRA CREDIT LAB 4
source("http://thegrantlab.org/misc/cdc.R")

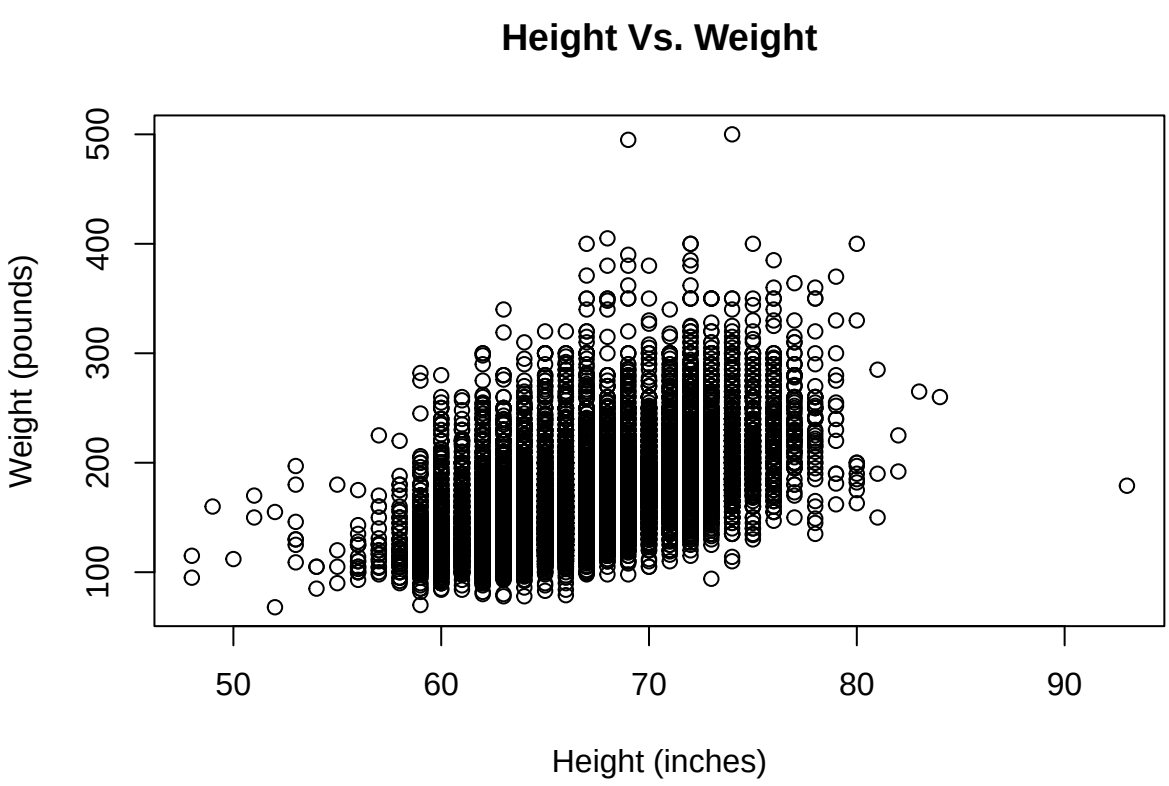
View(cdc)
head(cdc$genhlth)
```

```
## [1] good      good      good      good      very good very good
## Levels: excellent very good good fair poor
```

```
tail(cdc$smoke100, 20)
```

```
##  [1] 1 1 1 1 1 1 1 0 1 0 0 1 0 1 1 0 0 0 0 1
```

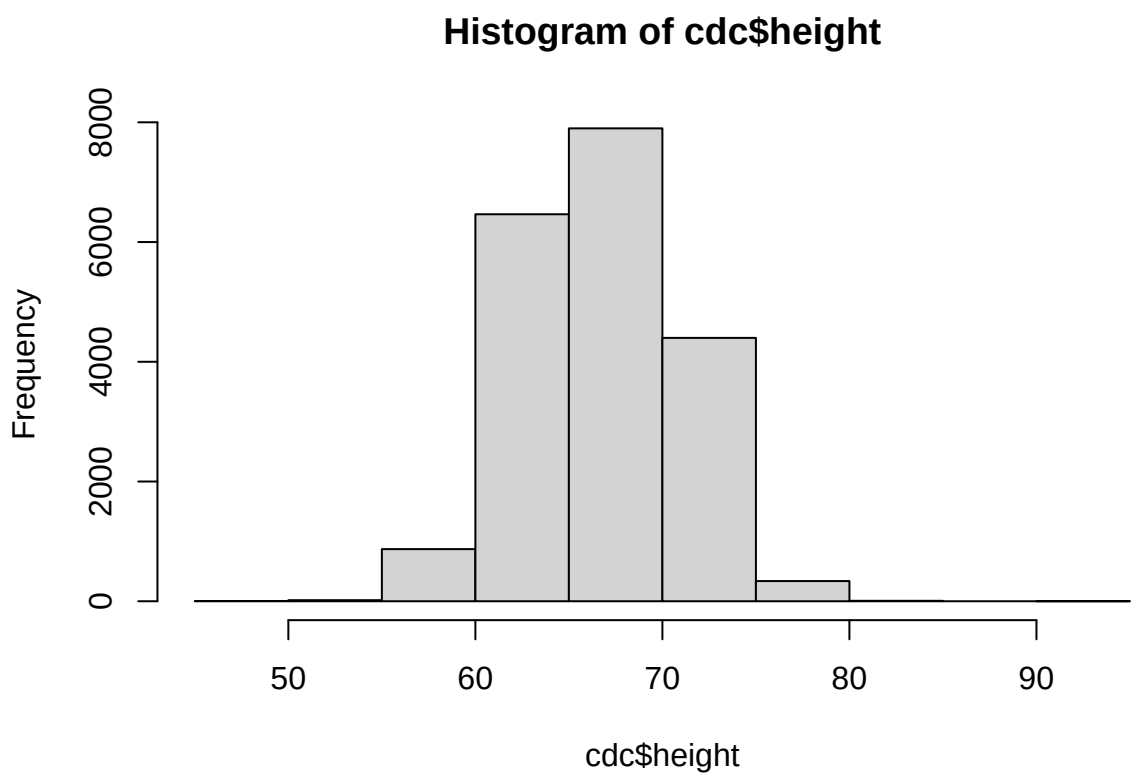
```
plot(cdc$height,cdc$weight,
     main="Height Vs. Weight",
     xlab="Height (inches)",
     ylab="Weight (pounds)")
```



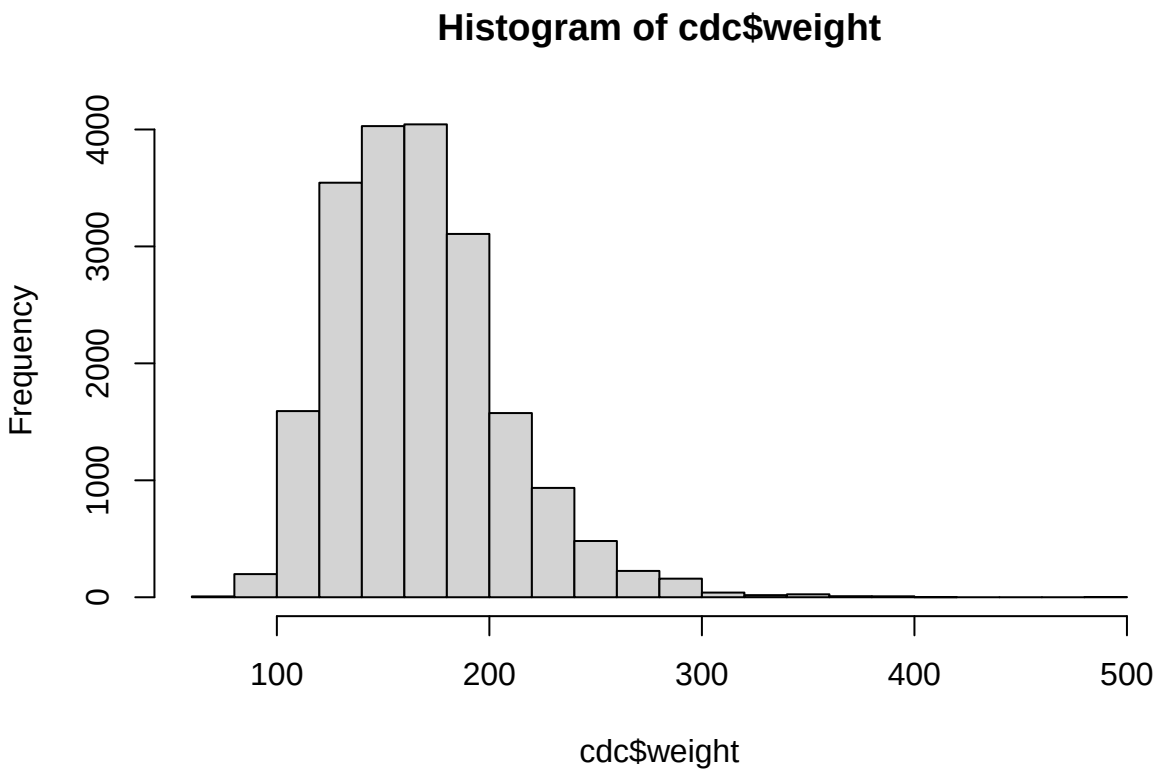

```
cor(cdc$weight, cdc$height)
```

```
## [1] 0.5553222
```

```
hist(cdc$height)
```




```
hist(cdc$weight)
```

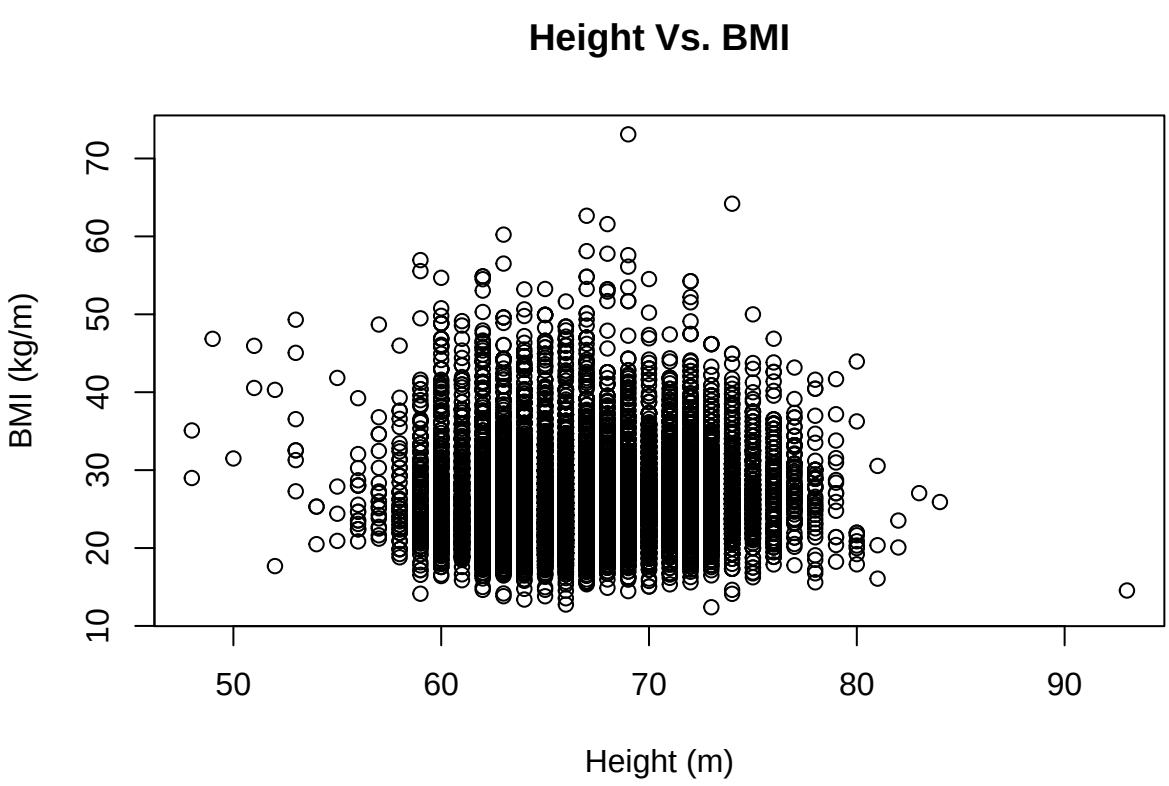



```
# create height.m

height_m <- cdc$height * .0254
weight_kg <- cdc$weight * .453592

BMI <- (weight_kg)/(height_m^2)

plot(cdc$height, BMI,
     main="Height Vs. BMI",
     xlab="Height (m)",
     ylab="BMI (kg/m)")
```




```
cor(cdc$height, BMI)
```

```
## [1] 0.03251694
```

```
# Note that I only have patience to print out the first 100 entries here
head(BMI >= 30, 100)
```

```
##   [1] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
##  [13] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
##  [25] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE
##  [37] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE
##  [49] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE
##  [61] FALSE FALSE  TRUE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
##  [73] FALSE FALSE  TRUE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
##  [85] FALSE FALSE FALSE FALSE  TRUE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE
##  [97]  TRUE FALSE FALSE FALSE
```

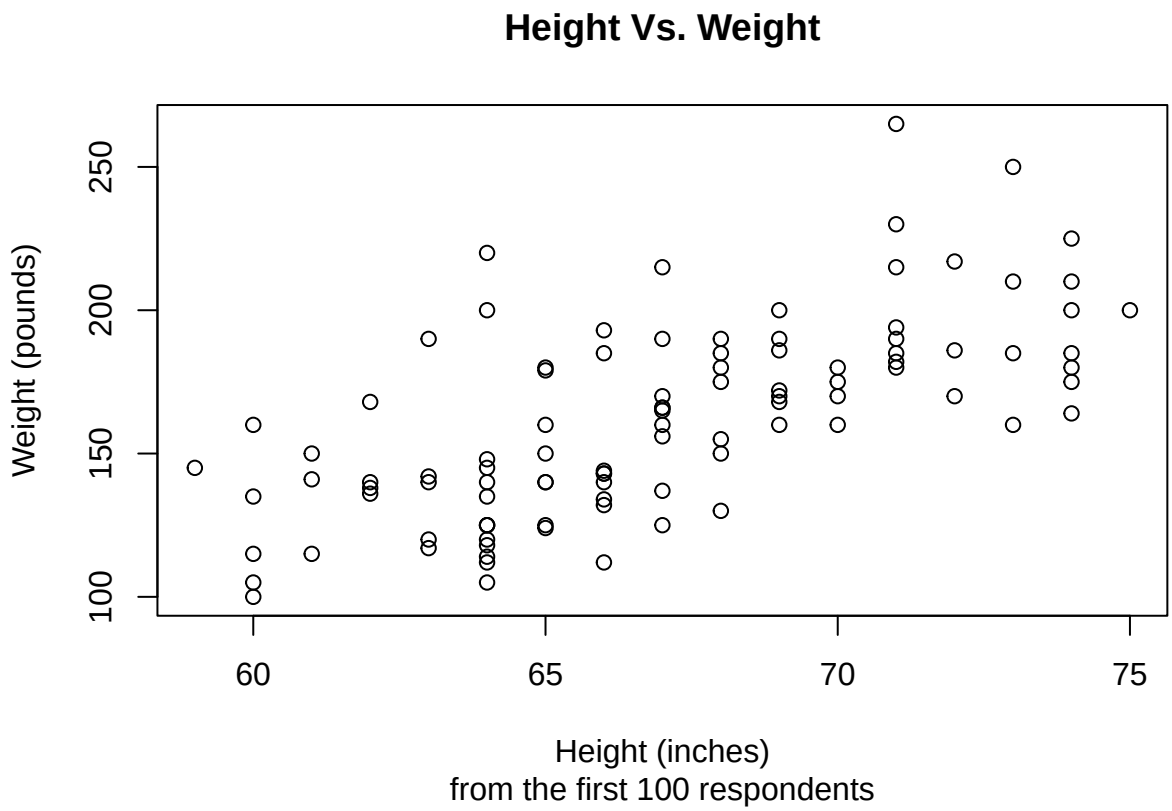
```
sum(BMI >= 30)
```

```
## [1] 3856
```

```
length(BMI)
```

```
## [1] 20000
```

```
plot(cdc[1:100,]$height,cdc[1:100,]$weight,
     main="Height Vs. Weight",
     sub = "from the first 100 respondents",
     xlab="Height (inches)",
     ylab="Weight (pounds)")
```




```
table(cdc$gender)
```

```
##
##     m     f
##  9569 10431
```

```
cdc$gender[(BMI >= 30)]
```

```
##    [1] f f f m f m m f m m m m m f m f f f m m m f f m f m m m m m f f m
##   [38] m f m m f m m m m f m m m f m f f m f f f f f f f f f f m m f f f m f
##   [75] m m m m m m f f m m f m f f f m m f f m f f m m m f f f f f m m f m f m f
##  [112] f f m f f f f f f m m m f f f m m f m f f m f m m m m f m f m f m f m m m
##  [149] f m f f f f f f f m f m f m m f f f m m m f m f m f f f f m f m f m m f m
##  [186] f m f m m f m m f m m f f m f m m m m f f f f m m m f m f f f m f m f m f
##  [223] f m f f f m f m f m f f f m f m f m f f m m m m f f f f f m m m m f m f
##  [260] f m f f m m f f f f f f f f m m m f f f m m m m f m m f m f m m f m m f m
##  [297] m f f f m f f m m f f m f f f m f m m m m m f f m m m f m f m f m m f f m m
##  [334] f m m f f f f f f m m f f m m m m f m m f f m f f f m f f f f m f m m m m m
```

```
##  [371] m f f m m f m m m m f m m f m m f f m m f m m f m m m f f m m f m m f f m
##  [408] m m m m m f f f m m m f m m f f f m f m f f f f m m m m f f m m f m m m f
##  [445] f f f f f f m f m m m m m f m f m f m m m m f f f f f f f f f m m f f m f
##  [482] f m f m m m m f m f f m f f f m f m f f f f m f m m m f m f m m f f m m m
##  [519] m m m f f m m f m m f f m m f f f m m m f m f m m f m f f f m m f f f f f
##  [556] f f m m f m f m f f f f f m f m m m m m f m f f f m m f m m m m m f m m m m
##  [593] m f m m m m m m m m m f m f f m m m f f f f m f f m f f m f f f m f m m f
##  [630] f f m m m f f m m f f f f f m m f f m f f m m m m m f m f f m f m m m f f
##  [667] f m f m m f m f f f f m f f f f f f m f m f m m m f m f m m m m f f f m f
##  [704] f m m m m f m f f m f m m m m f m f f m f m f m f f f f f f m m m m m f m f
##  [741] f f m m f m f m m f m f f f f f f m m m f f m f m f m m m f m f f f f f m f m f
##  [778] f m f m m f f m m f m m f f f m m f m m m f f f m m f m m m f m m f m m f
##  [815] f m m m m m m f f m m m m f f f f m m m m f f f f f m f m f f f m m m m f
##  [852] f f m m m m m f m f m m m m m m m f m m f m m f m m m f f f m f m m f f f
##  [889] m m f f m f m m f m m m m f m m m f f f m m m m f f m f m m m f m m m m m
##  [926] f m f f f f m f m m f m m f m f m m f f f f m m f f f f f m m m f f f f f
##  [963] f m m m m m f m m m m m f m f f m f f f m m f m f m f f f m f m f m f f f m
## [1000] f m m m f m f f f f m f m f m f m f m m f m f f f f m m m m m m f f m f f
## [1037] f f f f f m f f f m m m f m m m m f m m f m f f f m f f m m m f f m f m m
## [1074] f f m m m f m f m f m f f f f f f m m f m f f m m f m m m m m f m f f f m
## [1111] m f m m f f m m m m f m m m m m f f f m f f f f f f f f f m f f f m m f f m
## [1148] m m m f m f m f m m f m f m f m m m m f m m m f m m f f m f f m m m m m m
## [1185] f f f f f m f f m m m f m f f m f m m f f m m m m m m m m f f f m m f f f
## [1222] f f f f f f f m m m m m m m f f m f f m m m m f m m f f f f f f f f m m f
## [1259] m f m m m m f f m m f f m m m m m m f f m m f f f f m m m f f m m f m f m
## [1296] f m f f f m f f f m f f m f f m m m f m m m f m m f m m f f m f f m m m
## [1333] m f f f m m f f m m m f m f m f f m f f m f m f m f f f m m f m f m f f f m f
## [1370] m f f m m f m m f m m m f f f m f f f f f f f f f m m m m f m m f f f f m f
## [1407] m f m f m f m m m m m f m m m m m m m f m f f m m f f m f m m m m m m m m
## [1444] f m f m m m f f f f f m m m m m m m m m m f f f f m m m f m f m m m f m m
## [1481] f m m f f m m f f m f f m f f f m f m f m f f m f m m m m m f m m f m f f
## [1518] m f f m m m f m m m f f f f f f m m m f f m f m m m m m f m f f m m f f f
## [1555] m m f f m m m m m f m f f f m m m f m m f m f m f f m f f m f f f f m m f
## [1592] f f f f f f f m f f m f m f f f m f f f f f f m m f f m f m f f m f f f m f f
## [1629] m f f m f f f m m m m m f m f m m m f f f f f f m f m f f f f m f m f f f m
## [1666] m m f f f m f f f m f f f m f m m f f f f f f f m f m m m f m m f f m f m m
## [1703] m m m m m m f m m f m m f m f f f m m m f f m f m f m m m f m m m f m f m m f
## [1740] f f m m m f m m f f m m f m m f f m m m f f m f m f m m f m f m m m m f m
## [1777] f f f f m f m m m f f m f m f f f m m m f m f f f m m m m f f m m m f m f
## [1814] f f m m m m f m m m f f f m m m f m m m m m m f f m m f f f m f m f m f m
## [1851] f f m f f m m f m m m f m f f f m m m m f f m m m f m f f f f m m m m f m
## [1888] f f f m m m f f f m f m m m f m m f m f f f m m m f m f f f m m m m f m f
## [1925] m m f f f f m m f m m f f m f m m m m m m f f f f m f m m m f m f f m m f
## [1962] m m m f m f f m m m m f f m m m f f m m f m m m f m m f f f m m m f m m f
## [1999] m f m f m m f f m f f f m m f m m f f f m m m m m f m m m f f f f f f f m
## [2036] m f f m f f m m m f f m f f f f m m f f f m m m m m f f f f m f m m m m m
## [2073] f m f f f m f m m m m f m f m f m f f f m m f f f f f f m f m f f f f f m f
## [2110] m f m m m f f f f m m f m f f f m m m f f f m m m m m f f f f m
## [2147] f m f f m m m m m f f f f m f m f m f m f f f m f m m m f f f f f f f f m
## [2184] f f f f f m f m m f m m f f m m f f f f f m f f f m m f f f m m f m m m f f m m
## [2221] m m f f m m f m f m f m m f m f f f m f f f m m m m m f f m m f m f f f m
## [2258] f m m m f f m m f m m m f m m f m m f f f f m m m m f m f f f f m f f f f
## [2295] m f f f m f m m f m m m m f f f m m m f m f f f m m f f m f f f m m f m f
## [2332] f m m f f m f m m f m f f f f f f m m f m f m f f m f f m f m f m m f f f m
```

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## [2369] m m m f f f m f m f m f f m m m m f f m m m f m f m m m f m m f f m f m f
## [2406] f m f f f f m f f m f f m f m m m m m f m m f m f m m m f f f m f m m m m
## [2443] m m m m m f m m m m f m f m f m m f f m f m f f f m m m m f m m f f f m f
## [2480] f f f f m m m f m m m f f m f m f m m m m f f f f f m f f m f f m f m m m
## [2517] f f f m f f m f f f f f f f f f f f m f m f m m m m m f f f f m f m f m m
## [2554] f f m f m f m m f f f f m m m f f m m f m m f m m f m m m m m f f f f f f m
## [2591] m f m m f f m f f f m f f f m m m f f f f f f m f f m f m f m f m f m m f
## [2628] m m m m f m f m f f f f m f m m f m m m m f f m m f f m m m f f m f
## [2665] f f m f f m f m f m m f f m m f m f f f f f f m m f m m f f m m f m m m f
## [2702] m m f f m m m m f m m f f f f m f m m f f f f f f f f f m m m f m m f m f
## [2739] m f m m f m m f f f m f f m f f m f m f f f m m f f m m f f m f m m m f m
## [2776] f f f f f f m f m m m m f m m m m m f m f m m m m m f f m m m f f m f m f
## [2813] m f f m m f f m f f m f m f m m f f m f m f m m m m f f f m f f f f m f m m
## [2850] f f f m m m f m m f m f m f f f f f f f f f f f f m f f f m m m f f m f f f
## [2887] f m m m m m f m m f m f m f m m f f f f f f m m f m f m f f f f f f m m f m f m
## [2924] m f m f f m m f m f f f m m f f f f m f m m f m m m f f m f f m f m f f f
## [2961] f m m m m f f f m m m f f m f f f f f m m f f f f f m m f m m f m m m f f f
## [2998] f f f m f m m f m f m m m m f f m m f m m m m f m m m m f f f f m m f f f m
## [3035] m f f m m f f f m f m m m f m m f m m f f f m m f f f m f m f m m f m f m
## [3072] f m m m m m m f m m f f f m m m m m m m f m f m m m f f f m f f f f f f m f
## [3109] f m m m m m m f f f f m f m f f m f m m f f f f f f f f m m f f m f m f m f m f
## [3146] m m f f f m m m m m f f m f f m f m f m m f f f f f f m f m f m m m f m m f
## [3183] m f m f m f m f m m f f m m f m m m f f f m f f m f f f m f m m f m f m f
## [3220] m f f m m f f m f f f f f m f m m f f m f m f f m f m m m m f m f m m m m m
## [3257] m m f f m f m f f f m m f m f m f m f m m m f m f f f f m m m m f f m f m
## [3294] m f f f f f f f m f f m f m f m m m m f m f m f f f f f f m f m m f m m m f
## [3331] f m f m f m m m f m m f m f m m m f m f m m m m f m f f m f f m m f f m f m f
## [3368] f f m m f m f f m f m m f m f m m f m m f f m f f f m m f m m f f m f f m
## [3405] f f m m m f m m f m m f m m f m f m f f m f m m m m f m m m f m f m m f m
## [3442] m f m f f f f m f f f m f f f f f f m f f f m m f f m f m f m f m m f m f f
## [3479] f m m m f f m m f m f m m f f f f m m m m f m m m m m m f m f f f f f m m
## [3516] f f f f m m f m f m m f f m f m m m f m f m m f m f m m f m f f m f m f f
## [3553] m m m f f m f f f m m m f f f m m f f f m m m m m f m m m f f m f f m f f
## [3590] f m f m m m m m f m f f m f m m m m m f f m m f f f f m f m m f m m f m m
## [3627] f m m f f f m f m f m f f f m m m f m f m f f f f f f m m f f m m m f f f f
## [3664] f m m m f m f f f m f f f f f m m f f m f f f f f f m m m f m m m f f f f m m m
## [3701] f m f f m f f m m f f f m f f m f f f m m f f f m m f m f m f f m m f m f f m
## [3738] f f f f m f f m f m m m m f m m m m f m m m f m f f m f m m m f f f f f m
## [3775] m m m f m f f m m m f m f m f f m f f f m f m m f m m f f f f m f m f m f
## [3812] m m f m m m m m f m f f f f f f m f f f f m f f f f f f f m f f m m m f f f f
## [3849] m f m f m m f f
## Levels: m f
```

```
length(cdc$gender[(BMI >= 30)])
```

```
## [1] 3856
```

```
table(cdc$gender[(BMI >= 30)])
```

```
##
##    m    f
## 1925 1931
```

```r
# LE4

test1 <- c("CHIHYING", "SHUAIZE", "RUNQI", "YI", "RENNY")
test2 <- c(TRUE, TRUE, FALSE, FALSE, TRUE)

test1[test2]
```

```
## [1] "CHIHYING" "SHUAIZE"  "RENNY"
```

```r
# test names() function

age <- c(40, 30, 20, 20, 25)
names(age) <- test1

df <- data.frame(age, test1)
df$age
```

```
## [1] 40 30 20 20 25
```

```r
test3 <- c("CHIHYING", "SHUAIZE", "RUNQI", "YI", "RENNY")
test4 <- c(T, T, F, F, T)

test3[test4]
```

```
## [1] "CHIHYING" "SHUAIZE"  "RENNY"
```

```r
test5 <- c("CHIHYING", "SHUAIZE", "RUNQI", "YI", "RENNY")
test6 <- c(1, 1, 0, 0, 1)
test5[test6]
```

```
## [1] "CHIHYING" "CHIHYING" "CHIHYING"
```

```r
table(df)
```

```
##     test1
## age  CHIHYING RENNY RUNQI SHUAIZE YI
##   20        0     0     1       0  1
##   25        0     1     0       0  0
##   30        0     0     0       1  0
##   40        1     0     0       0  0
```

```r
df <- data.frame(num=1:5, char=letters[1:5], logic=c(T,T,T,F,F))

table(df)
```

```
## , , logic = FALSE
##
##    char
## num a b c d e
##   1 0 0 0 0 0
```

```
##   2 0 0 0 0 0
##   3 0 0 0 0 0
##   4 0 0 0 1 0
##   5 0 0 0 0 1
##
## , , logic = TRUE
##
##    char
## num a b c d e
##   1 1 0 0 0 0
##   2 0 1 0 0 0
##   3 0 0 1 0 0
##   4 0 0 0 0 0
##   5 0 0 0 0 0
```

```
df
```

```
##   num char logic
## 1   1    a  TRUE
## 2   2    b  TRUE
## 3   3    c  TRUE
## 4   4    d FALSE
## 5   5    e FALSE
```

```
df[-2]
```

```
##   num logic
## 1   1  TRUE
## 2   2  TRUE
## 3   3  TRUE
## 4   4 FALSE
## 5   5 FALSE
```

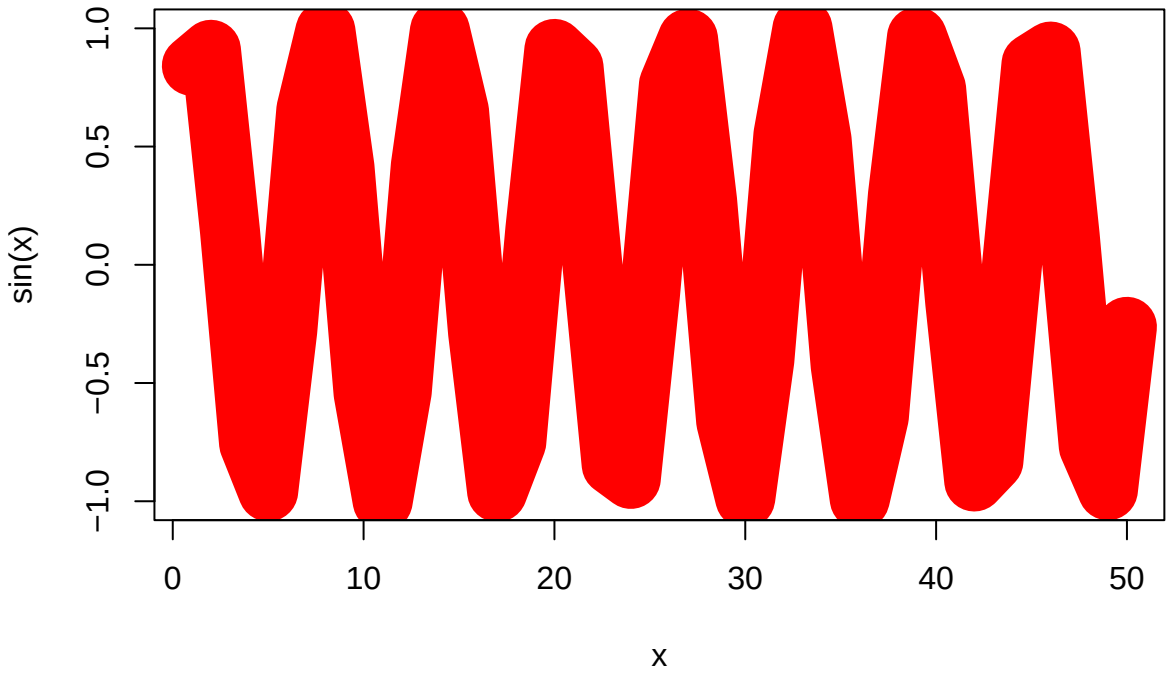
```
df[-2,]
```

```
##   num char logic
## 1   1    a  TRUE
## 3   3    c  TRUE
## 4   4    d FALSE
## 5   5    e FALSE
```

```
df[df$num >= 3,]
```

```
##   num char logic
## 3   3    c  TRUE
## 4   4    d FALSE
## 5   5    e FALSE
```

```
x <- 1:50
plot(x, sin(x), typ="l", col="red", lwd=30)
```


sin(x)
1.0
0.5
0.0
−0.5
−1.0
0
10
20
30
40
50
x