

MTHSTAT 869

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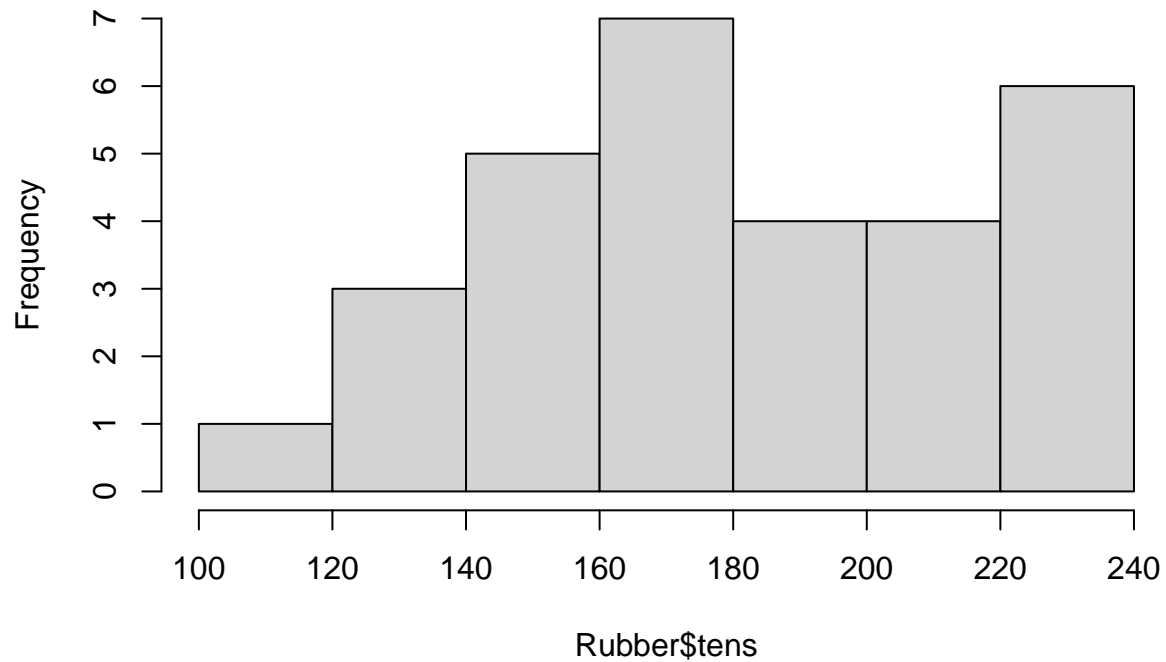
```
require(MASS)
```

```
## Loading required package: MASS
```

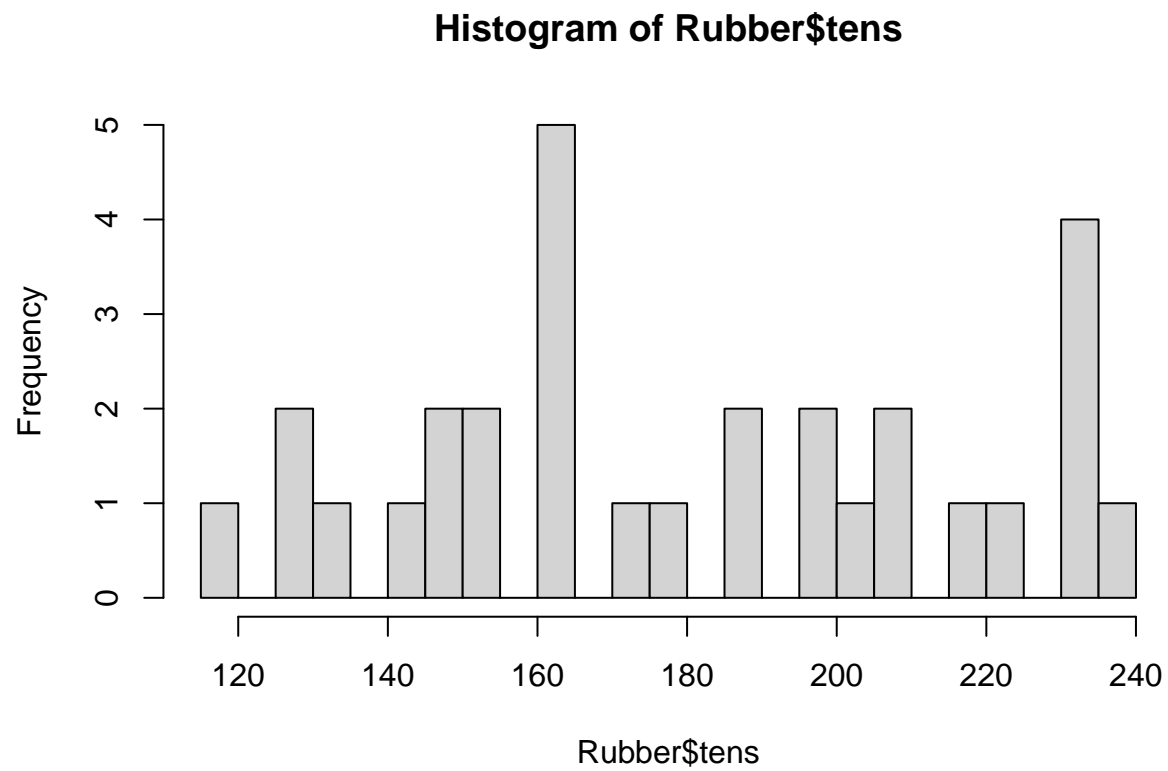
```
library(MASS)  
data()
```

```
data(Rubber)  
hist(Rubber$tens)  
hist(Rubber$tens, breaks = 5)
```

Histogram of Rubber\$tens

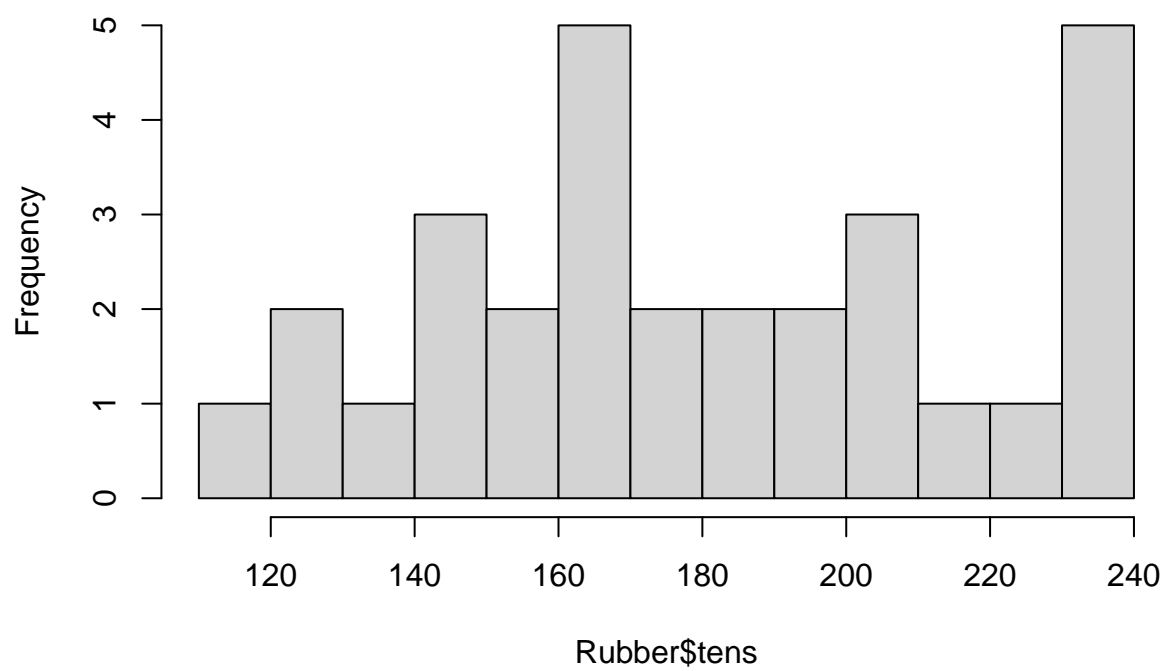


```
hist(Rubber$tens, breaks = 20)
```



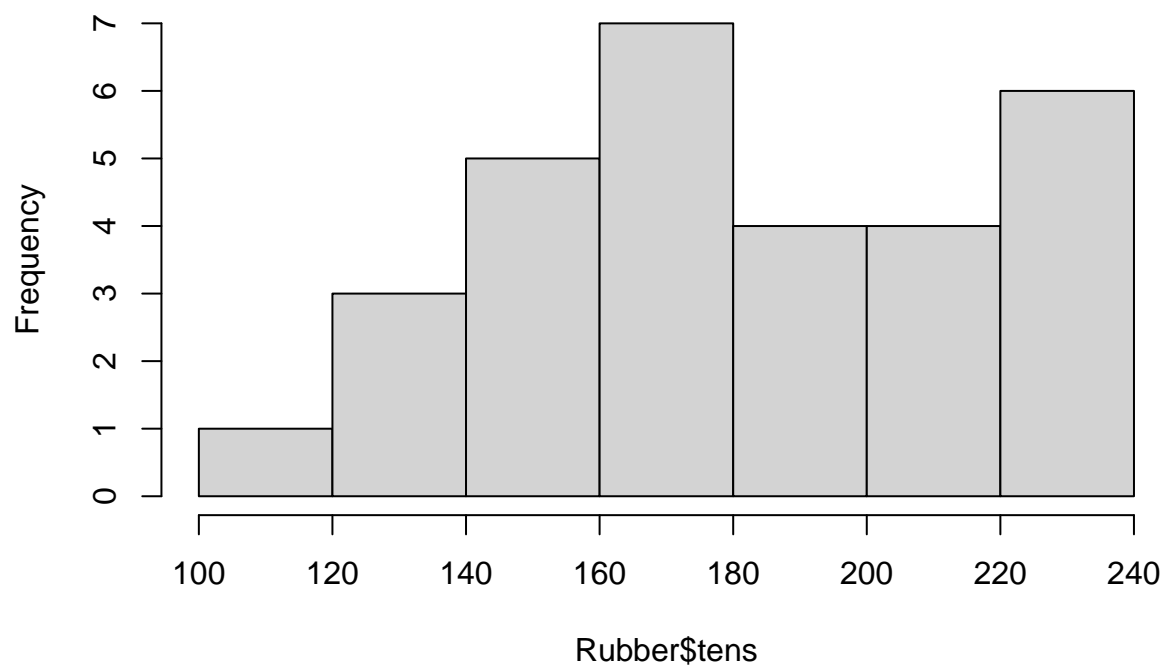
```
hist(Rubber$tens, breaks = 10)
```

Histogram of Rubber\$tens



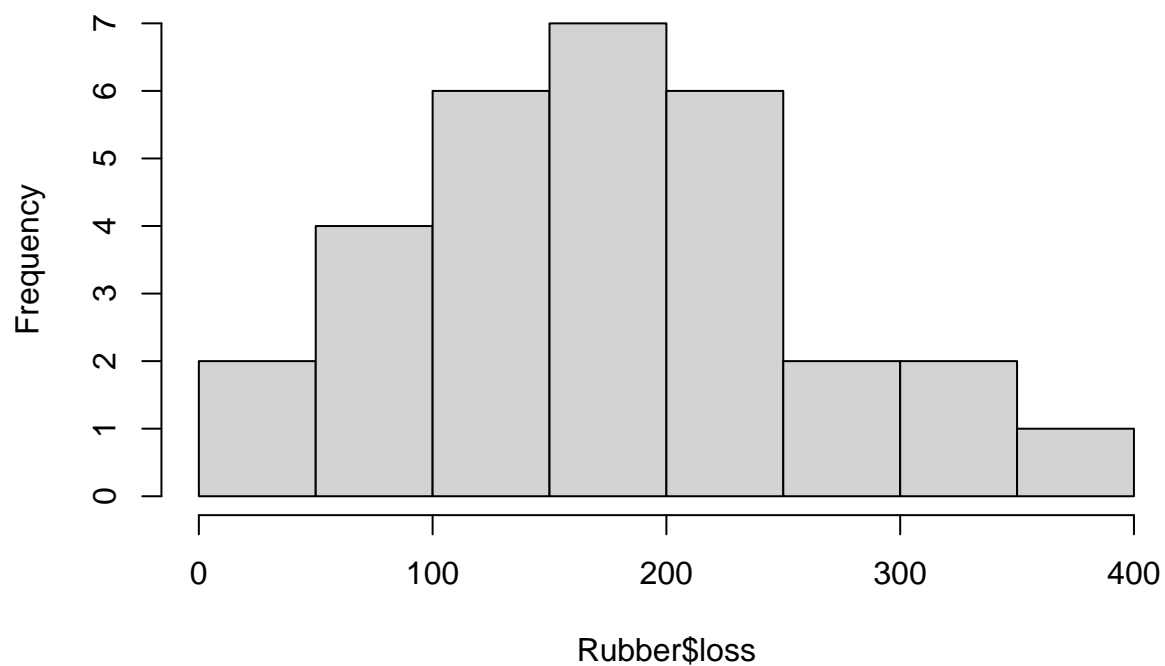
```
hist(Rubber$tens, breaks = 5)
```

Histogram of Rubber\$tens



```
hist(Rubber$loss)
```

Histogram of Rubber\$loss



```
mean(Rubber$loss)
```

```
## [1] 175.4333
```

```
var(Rubber$loss)
```

```
## [1] 7759.013
```

```
sd(Rubber$loss)
```

```
## [1] 88.08526
```

```
x <- qnorm(p = seq(.2, .8, by = .2), mean = 175, sd = 90)
sum(Rubber$loss <= x[1])
```

```
## [1] 6
```

```
sum((Rubber$loss > x[1]) & (Rubber$loss <= x[2]))
```

```
## [1] 6
```

```
sum((Rubber$loss > x[2]) & (Rubber$loss <= x[3]))
```

```
## [1] 7
```

```
sum((Rubber$loss > x[3]) & (Rubber$loss <= x[4]))
```

```
## [1] 6
```

```
sum((Rubber$loss > x[4]))
```

```
## [1] 5
```

```
y <- cut(Rubber$loss,breaks=c(-Inf,x,Inf))
y
```

```
## [1] (251, Inf] (198,251] (152,198] (152,198] (99.3,152] (99.3,152]
## [7] (-Inf,99.3] (-Inf,99.3] (198,251] (152,198] (152,198] (99.3,152]
## [13] (-Inf,99.3] (-Inf,99.3] (198,251] (152,198] (99.3,152] (-Inf,99.3]
## [19] (-Inf,99.3] (198,251] (198,251] (152,198] (152,198] (99.3,152]
## [25] (251, Inf] (251, Inf] (251, Inf] (251, Inf] (198,251] (99.3,152]
## Levels: (-Inf,99.3] (99.3,152] (152,198] (198,251] (251, Inf]
```

```
Rubber$loss
```

```
## [1] 372 206 175 154 136 112 55 45 221 166 164 113 82 32 228 196 128 97 64
## [20] 249 219 186 155 114 341 340 283 267 215 148
```

```
N <- table(y)
N
```

```
## y
## (-Inf,99.3] (99.3,152] (152,198] (198,251] (251, Inf]
##           6           6           7           6           5
```

```
chisq.test(N)
```

```
##
## Chi-squared test for given probabilities
##
## data: N
## X-squared = 0.33333, df = 4, p-value = 0.9876
```

```
out <- chisq.test(N)
summary(out)
```

```
##           Length Class Mode
## statistic 1      -none- numeric
## parameter 1      -none- numeric
```

```
## p.value 1 -none- numeric
## method 1 -none- character
## data.name 1 -none- character
## observed 5 table numeric
## expected 5 -none- numeric
## residuals 5 table numeric
## stdres 5 table numeric
```

```
out$expected
```

```
## (-Inf,99.3] (99.3,152] (152,198] (198,251] (251, Inf]
##          6          6          6          6          6
```

```
x <- qnorm(p=seq(.2,.8,by=.2),mean=200,sd=90)
y <- cut(Rubber$loss,breaks=c(-Inf,x,Inf))
N <- table(y)
chisq.test(N)
```

```
##
## Chi-squared test for given probabilities
##
## data: N
## X-squared = 4.3333, df = 4, p-value = 0.3628
```

```
x <- qnorm(p=seq(.2,.8,by=.2),mean=250,sd=90)
y <- cut(Rubber$loss,breaks=c(-Inf,x,Inf))
N <- table(y)
chisq.test(N)
```

```
##
## Chi-squared test for given probabilities
##
## data: N
## X-squared = 24, df = 4, p-value = 7.987e-05
```