

Statistik in R

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6. Februar 2016

Deskriptive Statistik

Daten laden

```
atlant <- read.csv(  
  "../data/AtlantData1.csv",  
  sep = "\\t",  
  header = TRUE)
```

```
head(atlant)
```

##	site	X	Y	archont	feature	object	class	sherd	qty	
## 1	A	472564	3939619	Atlas	surface		K	G	1	5
## 2	A	472564	3939619	Atlas	1	2	K	G	1	20
## 3	A	472564	3939619	Atlas	1	-1,2:2	K	R	1	
## 4	A	472564	3939619	Atlas	1	3, -1-3-1:3	K	R	1	6
## 5	A	472564	3939619	Atlas	1	2, -1:2	K	G	1	9
## 6	A	472564	3939619	Atlas	1	-1:4, -2:4	K	G	1	19
##	size	wall	muendungsD	muendungsH	minD	minD_H	maxD	maxD_H	bodenD	
## 1	200	NA	17.0	9.0	NA	NA	16	2.5	0	
## 2	500	6	27.5	21.0	23.5	17.0	27	8.5	0	
## 3	120	7	21.0	13.0	18.5	11.5	19	11.0	NA	
## 4	500	8	29.0	16.0	23.5	11.0	25	8.0	NA	3
## 5	500	8	23.5	8.5	NA	NA	24	3.0	0	

```
min(atlant$muendungsD)
```

```
## [1] NA
```

Bei Variablen mit NaN muss dies R mitgeteilt werden!

```
min(atlant$muendungsD, na.rm = TRUE)
```

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

```
max(atlant$muendungsD, na.rm = TRUE)
```

```
## [1] 35
```

```
mean(atlant$wt)
```

```
## [1] 395.3333
```

```
median(atlant$wt)
```

```
## [1] 153.5
```

Eine wichtige Eigenschaft des Medians ist Robustheit gegenüber Ausreißern!

```
summary(atlant$wt)
```

##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
##	6.0	44.0	153.5	395.3	501.5	4500.0

Spannweite

```
max(atlant$wt) - min(atlant$wt)
```

```
## [1] 4494
```

Varianz

```
var(atlant$wt)
```

```
## [1] 392716.4
```

Standardabweichung

```
sd(atlant$wt)
```

```
## [1] 626.6709
```

!!! R Funktionen beruhen auf der korrigierten Stichprobenvarianz !!!

```
var(atlant$wt)
```

```
## [1] 392716.4
```

empirische Varianz

$$var(x) = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n}$$

```
(sum( (atlant$wt - mean(atlant$wt) ) ^2 ))/(length(atlant$wt) )
```

```
## [1] 389870.6
```

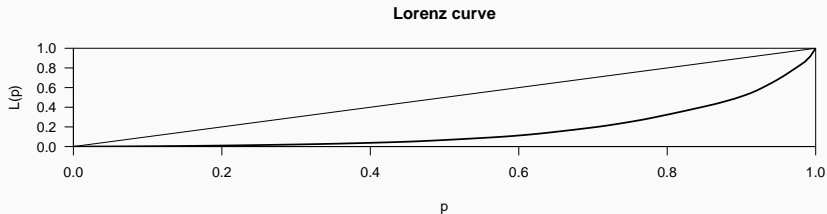
Gini-Koeffizient aus der Lorenz-Kurve (Paket: ineq)

```
ineq(atlant$wt,type="Gini")
```

```
## [1] 0.6580198
```

0 = gleichmäßigen Verteilung, 1 = maximaler Ungleichverteilung

```
plot(Lc(atlant$wt))
```



Schließende Statistik

```
t.test(atlant$wt)

##
##  One Sample t-test
##
## data:  atlant$wt
## t = 7.4108, df = 137, p-value = 1.171e-11
## alternative hypothesis: true mean is not equal to 0
## 95 percent confidence interval:
##  289.8458 500.8209
## sample estimates:
## mean of x
##  395.3333
```

```
head(a, n = 3)
```

```
##      30 70 120 200 500
```

```
## A    0  0   1   2   5
```

```
## B    0  0   0   2   2
```

```
## C    0  1   2   0   1
```

```
chisq.test(a)
```

```
## Warning in chisq.test(a): Chi-squared approximation may be incorrect
```

```
##
```

```
## Pearson's Chi-squared test
```

```
##
```

```
## data:  a
```

```
## X-squared = 58.35, df = 28, p-value = 0.0006588
```