

Task p. 38 / Anwendung S. 38

FK

automatic

Working directory

```
> setwd("D:/kronthafranz/Documents/01Lehre/06Quantitative Forschungsmethoden  
dt en")
```

Load data

```
> load("D:/kronthafranz/Documents/01Lehre/06Quantitative Forschungsmethoden  
dt en/04Parametric and nonparametric testing/energy.RData")
```

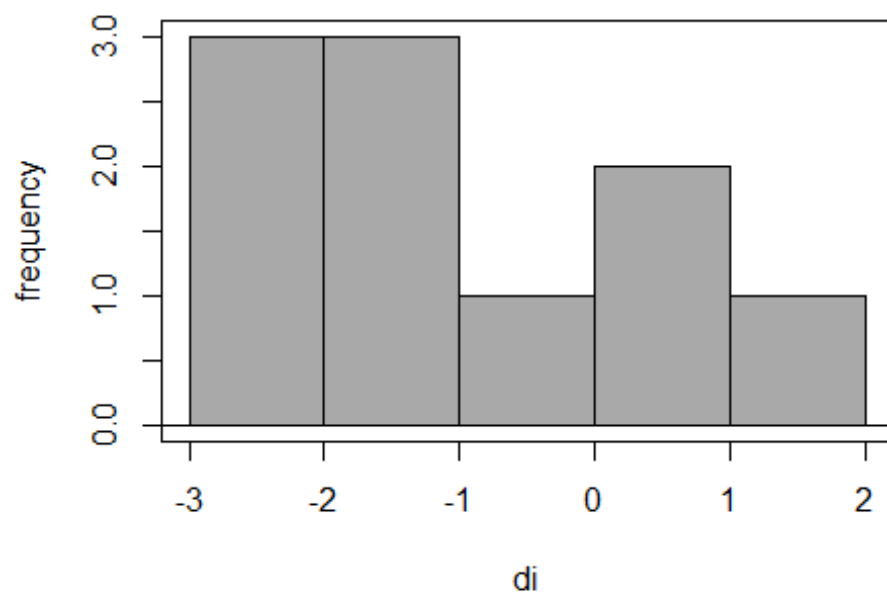
Descriptive statistics

```
> numSummary(energy[,c("di", "with", "without"), drop=FALSE],  
statistics=c("mean", "sd",  
+ "quantiles", "skewness", "kurtosis"), quantiles=c(0,.25,.5,.75,1),  
type="2")
```

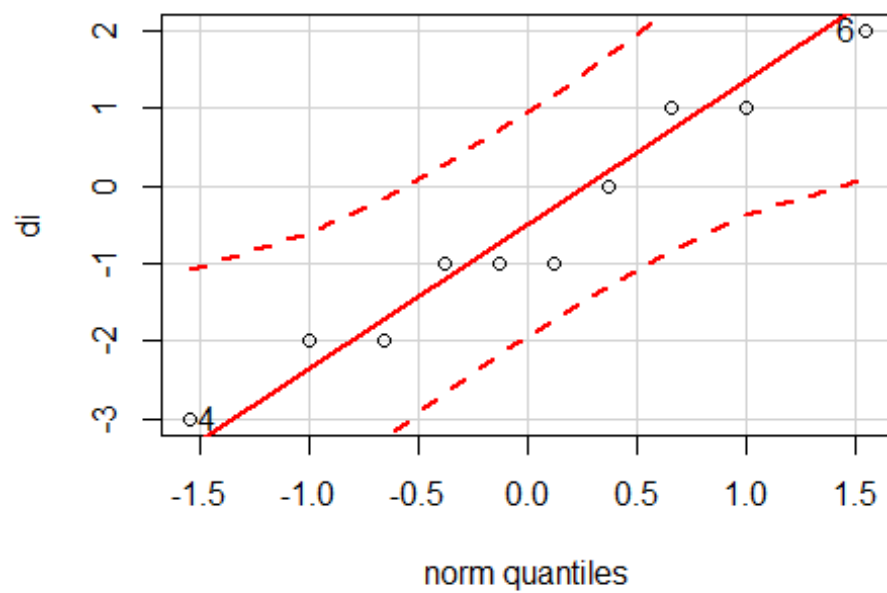
	mean	sd	skewness	kurtosis	0%	25%	50%	75%	100%	n
di	-0.6	1.577621	0.2292104	-0.8204833	-3	-1.75	-1.0	0.75	2	10
with	16.2	4.638007	1.0186897	1.0179729	11	13.25	15.5	17.75	26	10
without	15.6	5.146736	0.5630890	-0.3767069	9	12.00	15.5	17.75	25	10

Normal distribution

```
> with(energy, Hist(di, scale="frequency", breaks="Sturges", col="darkgray"))
```



```
> with(energy, qqPlot(di, dist="norm", id.method="y", id.n=2,
labels=rownames(energy)))
```



```
6 4
10 1
```

```
> normalityTest(~di, test="shapiro.test", data=energy)
```

Shapiro-Wilk normality test

data: di

W = 0.95342, p-value = 0.709

t-Test dependent samples

```
> with(energy, (t.test(without, with, alternative='less', conf.level=.95,  
paired=TRUE)))
```

Paired t-test

data: without and with

t = -1.2027, df = 9, p-value = 0.1299

alternative hypothesis: true difference in means is less than 0

95 percent confidence interval:

-Inf 0.3145174

sample estimates:

mean of the differences

-0.6

Interpretation:

Do not reject H0, energy drinks do not help to increase performance