

```
#Blatt 3, Aufgabe 2
```

```
data = read.table("C:/Users/Bjoern/Desktop/Eigene Dateien/Lehre/2015 SS/Oekonometrie/Blatt
3/autos.txt", header=TRUE, sep=" ")
print(summary(lm(data$Autos~1+data$Einkommen+data$Benzinpreis)))
```

```
#Ausgabe:
```

```
Call:
```

```
lm(formula = data$Autos ~ 1 + data$Einkommen + data$Benzinpreis)
```

```
Residuals:
```

```
      Min       1Q   Median       3Q      Max
-6.7940 -1.0424 -0.0683  1.3797  6.6491
```

```
Coefficients:
```

```
              Estimate Std. Error t value Pr(>|t|)
(Intercept)    20.72552     6.36068   3.258 0.013895 *
data$Einkommen  1.02430     0.17517   5.847 0.000632 ***
data$Benzinpreis -0.15297     0.04626  -3.307 0.012994 *
---
```

```
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
Residual standard error: 4.092 on 7 degrees of freedom
```

```
Multiple R-squared:  0.8518, Adjusted R-squared:  0.8094
```

```
F-statistic: 20.11 on 2 and 7 DF, p-value: 0.001254
```

```
#Blatt 3, AUfgabe 3
```

```
#a)
```

```
data = read.table("C:/Users/Bjoern/Desktop/Eigene Dateien/Lehre/2015 SS/Oekonometrie/Blatt
3/produktion.txt", header=TRUE, sep=";")
```

```
n = length(data$Arbeit)
```

```
X = matrix(1,n,3)
```

```
X[,2] = log(data$Kapital)
```

```
X[,3] = log(data$Arbeit)
```

```
Y = log(data$Produktion)
```

```
XtX_inv = solve(t(X)%*%X)
```

```
beta = XtX_inv%*%t(X)%*%Y
```

```
print(beta)
```

```
print("")
```

```
#b)
```

```
prod = exp(beta[1])*data$Kapital^beta[2]*data$Arbeit^beta[3]
```

```
plot(data$Jahr, data$Produktion, type="l")
```

```
points(data$Jahr, prod, type="b")
```

```
#c)
```

```
Y_hat = X%*%beta
```

```
s = sqrt(sum((Y-Y_hat)^2)/(n-3))
```

```
KI_l = beta[2] - s*sqrt(XtX_inv[2,2])*qt(0.975,n-3)
```

```
KI_u = beta[2] + s*sqrt(XtX_inv[2,2])*qt(0.975,n-3)
```

```
print(paste("KI beta1: [", KI_l, ", ", KI_u, "]"))
```

```
#d)
t = (beta[3]-2)/(s*sqrt(XtX_inv[3,3]))
print(t)
if(t < -qt(0.99, n-3)){
  print("H0 wird verworfen")
}else{
  print("H0 wird nicht verworfen")
}

#Ausgabe:
      [,1]
[1,] -7.0316410
[2,]  1.6075567
[3,]  0.5864118
[1] ""
[1] "KI beta1: [ 0.50737577747468 , 2.70773766086262 ]"
[1] -4.033152
[1] "H0 wird verworfen"
```

```
#Blatt 3, Aufgabe 4
```

```
#b)
library(lmtest)
data = read.table("C:/Users/Bjoern/Desktop/Eigene Dateien/Lehre/2015 SS/Oekonometrie/Blatt
3/autos.txt", header=TRUE, sep=" ")
print(resettest(data$Autos~1+data$Einkommen+data$Benzinpreis, power=2:3, type="fitted"))

#Ausgabe:

RESET test

data:  data$Autos ~ 1 + data$Einkommen + data$Benzinpreis
RESET = 1.7867, df1 = 2, df2 = 5, p-value = 0.2597
```

