

Task p. 40-2 / Anwendung S. 40-2

FK

automatic

Working directory

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

Load data

```
> load("D:/kronthafranz/Documents/01Lehre/06Quantitative Forschungsmethoden  
dt en/06Regression/abortion.RData")
```

Regression function

$$\hat{y} = b_0 + b_1 \times religion + b_2 \times price + b_3 \times laws + b_4 \times funds + b_5 \times educ + b_6 \times income + b_7 \times picket$$

or

$$y = \beta_0 + \beta_1 \times religion + \beta_2 \times price + \beta_3 \times laws + \beta_4 \times funds + \beta_5 \times educ + \beta_6 \times income + \beta_7 \times picket + u$$

Regression function

Descriptive statistics

```
> summary(abortion)
```

State	Abortion	Religion	Price
ALABAMA : 1	Min. : 4.30	Min. : 9.80	Min. : 228.0
ALASKA : 1	1st Qu.: 13.43	1st Qu.: 23.80	1st Qu.: 271.2
ARIZONA : 1	Median : 18.40	Median : 29.65	Median : 294.5
ARKANSAS : 1	Mean : 20.58	Mean : 32.65	Mean : 305.1
CALIFORNIA: 1	3rd Qu.: 25.35	3rd Qu.: 38.67	3rd Qu.: 329.8
COLORADO : 1	Max. : 46.20	Max. : 76.70	Max. : 461.0
(Other) : 44			
Laws	Funds	Educ	Income
Min. : 0.00	Min. : 0.00	Min. : 64.30	Min. : 14082
1st Qu.: 0.00	1st Qu.: 0.00	1st Qu.: 72.03	1st Qu.: 17086
Median : 0.00	Median : 0.00	Median : 76.70	Median : 18881
Mean : 0.36	Mean : 0.24	Mean : 75.93	Mean : 19216
3rd Qu.: 1.00	3rd Qu.: 0.00	3rd Qu.: 80.10	3rd Qu.: 20843
Max. : 1.00	Max. : 1.00	Max. : 86.60	Max. : 27150

```

Picket
Min.   : 0.00
1st Qu.: 39.25
Median : 50.00
Mean   : 52.34
3rd Qu.: 67.00
Max.   :100.00

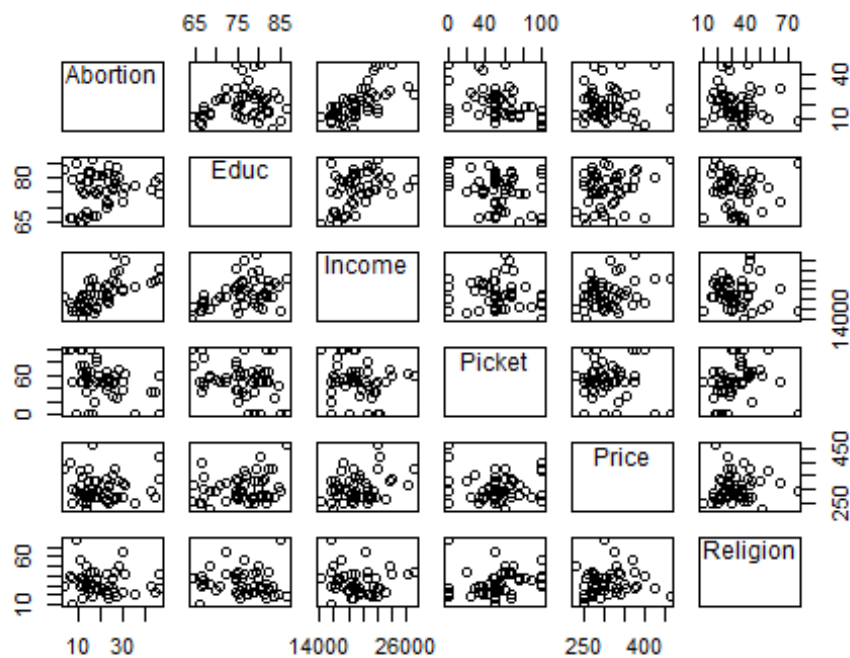
```

Scatterplot

```

> scatterplotMatrix(~Abortion+Educ+Income+Picket+Price+Religion,
+   reg.line=FALSE, smooth=FALSE, spread=FALSE, span=0.5, ellipse=FALSE,
+   levels=c(.5, .9), id.n=0, diagonal = 'none', data=abortion)

```



Correlation coefficients

```

> cor(abortion[,c("Abortion", "Educ", "Income", "Picket", "Price", "Religion")],
+   use="complete")

```

	Abortion	Educ	Income	Picket	Price
Abortion	1.000000000	0.19487479	0.64720351	-0.37742264	0.003097758
Educ	0.194874794	1.00000000	0.44139524	-0.30962113	0.248312375
Income	0.647203508	0.44139524	1.00000000	-0.16067340	0.302700617
Picket	-0.377422643	-0.30962113	-0.16067340	1.00000000	-0.070030556
Price	0.003097758	0.24831237	0.30270062	-0.07003056	1.00000000
Religion	-0.125183848	-0.07988469	-0.07117385	0.20730929	0.086685910

	Religion
Abortion	-0.12518385
Educ	-0.07988469
Income	-0.07117385
Picket	0.20730929
Price	0.08668591
Religion	1.00000000

Regression analysis

```
> RegModel.1 <- lm(Abortion~Educ+Funds+Income+Laws+Picket+Price+Religion,
+ data=abortion)

> summary(RegModel.1)
```

Call:

```
lm(formula = Abortion ~ Educ + Funds + Income + Laws + Picket +
    Price + Religion, data = abortion)
```

Residuals:

Min	1Q	Median	3Q	Max
-11.6110	-4.6493	-0.6696	4.5253	15.9514

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	14.2839573	15.0776294	0.947	0.3489
Educ	-0.2872551	0.1995545	-1.439	0.1574
Funds	2.8200030	2.7834747	1.013	0.3168
Income	0.0024007	0.0004552	5.274	0.00000435 ***
Laws	-0.8731018	2.3765662	-0.367	0.7152
Picket	-0.1168712	0.0421799	-2.771	0.0083 **
Price	-0.0423631	0.0222232	-1.906	0.0635 .
Religion	0.0200709	0.0863805	0.232	0.8174

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

Residual standard error: 7.063 on 42 degrees of freedom

Multiple R-squared: 0.5774, Adjusted R-squared: 0.507

F-statistic: 8.199 on 7 and 42 DF, p-value: 0.000002847