

Korrelasjonstabell

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> cor(cbind(VERBAL, SØVN.C, ABSTRAKT, SØVN.CxABSTRAKT, ALDER, FYSISK, SOSIAL, HODEOMKRETS))
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	VERBAL	SØVN.C	ABSTRAKT	SØVN.CxABSTRAKT	ALDER	FYSISK	SOSIAL	HODE
VERBAL	1.000	0.150	-0.835	0.138	-0.116	0.218	-0.055	0.023
SØVN.C	0.150	1.000	0.073	0.649	-0.388	-0.032	0.011	0.095
ABSTRAKT	-0.835	0.073	1.000	0.056	-0.112	-0.057	0.050	0.054
SØVN.CxABSTRAKT	0.138	0.649	0.056	1.000	-0.223	-0.074	-0.009	0.063
ALDER	-0.116	-0.388	-0.112	-0.223	1.000	-0.019	0.085	-0.033
FYSISK	0.218	-0.032	-0.057	-0.074	-0.019	1.000	-0.064	0.047
SOSIAL	-0.055	0.011	0.050	-0.009	0.085	-0.064	1.000	0.064
HODEOMKRETS	0.023	0.095	0.054	0.063	-0.033	0.047	0.064	1.000

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# =====
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Oppgave 1: Modell 1

Call:

```
lm(formula = VERBAL ~ SØVN.C)
```

Residuals:

Min	1Q	Median	3Q	Max
-24.2402	-7.2911	0.0269	7.5716	16.4986

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	67.81278	0.42459	159.715	< 2e-16 ***
SØVN.C	0.09694	0.03205	3.025	0.00265 **

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

Residual standard error: 8.492 on 398 degrees of freedom

Multiple R-squared: 0.02247, Adjusted R-squared: 0.02001

F-statistic: 9.149 on 1 and 398 DF, p-value: 0.00265

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# =====
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Oppgave 1: Modell 2

Call:

```
lm(formula = VERBAL ~ SØVN.C + ABSTRAKT + SØVN.CxABSTRAKT)
```

Residuals:

Min	1Q	Median	3Q	Max
-17.038	-2.948	0.006	2.985	16.399

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	75.06080	0.30804	243.673	< 2e-16 ***
SØVN.C	0.10176	0.02158	4.715	3.36e-06 ***
ABSTRAKT	-14.57721	0.43583	-33.447	< 2e-16 ***
SØVN.CxABSTRAKT	0.08406	0.03333	2.522	0.0121 *

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

Residual standard error: 4.346 on 396 degrees of freedom

Multiple R-squared: 0.7452, Adjusted R-squared: 0.7433

F-statistic: 386.1 on 3 and 396 DF, p-value: < 2.2e-16

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# =====  
# Oppgave 1: Modell 3
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```
Call:  
lm(formula = VERBAL ~ SØVN.C + ABSTRAKT + SØVN.CxABSTRAKT + ALDER)
```

```
Residuals:  
      Min       1Q   Median       3Q      Max  
-18.7410  -2.5965   0.0891   2.8372  13.9980
```

```
Coefficients:  
              Estimate Std. Error t value Pr(>|t|)  
(Intercept)  107.63898   5.55012  19.394 < 2e-16 ***  
SØVN.C        0.05992   0.02191   2.734 0.00653 **  
ABSTRAKT     -14.80293   0.42022 -35.227 < 2e-16 ***  
SØVN.CxABSTRAKT 0.09202   0.03203   2.873 0.00429 **  
ALDER        -0.46398   0.07893  -5.878 8.83e-09 ***
```

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

```
Residual standard error: 4.173 on 395 degrees of freedom  
Multiple R-squared:  0.7657, Adjusted R-squared:  0.7633  
F-statistic: 322.7 on 4 and 395 DF, p-value: < 2.2e-16
```

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# =====  
# Oppgave 1: Modell 4
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```
Call:  
lm(formula = VERBAL ~ SØVN.C + ABSTRAKT + SØVN.CxABSTRAKT + ALDER +  
    FYSISK + SOSIAL + HODEOMKRETS)
```

```
Residuals:  
      Min       1Q   Median       3Q      Max  
-14.9701  -2.5632   0.0008   2.6500  11.7625
```

```
Coefficients:  
              Estimate Std. Error t value Pr(>|t|)  
(Intercept)  98.013062   5.858633  16.730 < 2e-16 ***  
SØVN.C        0.055305   [REDACTED] [REDACTED] 0.007157 **  
ABSTRAKT     -14.672794   [REDACTED] -37.375 [REDACTED]  
SØVN.CxABSTRAKT 0.108071   0.029880 [REDACTED] [REDACTED]  
ALDER        -0.447532   [REDACTED] [REDACTED] [REDACTED]  
FYSISK        0.012860   [REDACTED] [REDACTED] [REDACTED]  
SOSIAL        0.016303   [REDACTED] 0.416 [REDACTED]  
HODEOMKRETS  0.086030   [REDACTED] [REDACTED] [REDACTED]
```

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

```
Residual standard error: 3.882 on 392 degrees of freedom  
Multiple R-squared:  0.7988, Adjusted R-squared:  0.7952  
F-statistic: 222.3 on 7 and 392 DF, p-value: < 2.2e-16
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[Se mer utskrift fra modell 4 på neste side]

Standardized Coefficients Modell 4:

> lm.beta(M4)

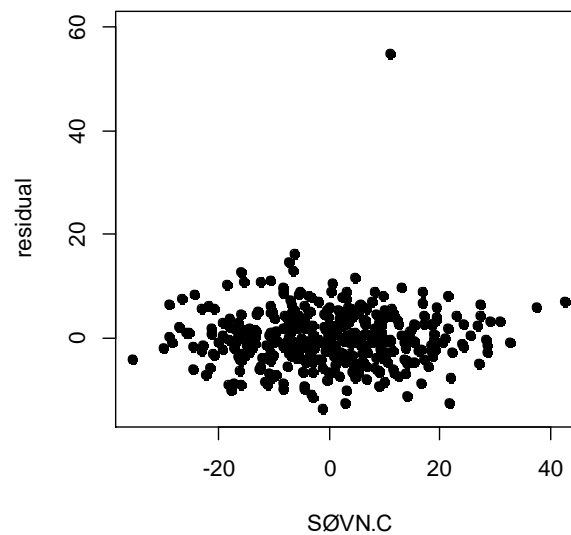
(Intercept)	0.000
SØVN.C	0.086
ABSTRAKT	-0.856
SØVN.CxABSTRAKT	0.108
ALDER	-0.151
FYSISK	0.176
SOSIAL	0.010
HODEOMKRETS	0.041

Konfidensinteraller fra modell 4

> confint(M4)

	2.5 %	97.5 %
(Intercept)	86.4948	109.531
SØVN.C	0.0151	0.096
ABSTRAKT		
SØVN.CxABSTRAKT		
ALDER		-0.302
FYSISK	0.0096	
SOSIAL		
HODEOMKRETS	-0.0084	0.180

Plot for oppgave 1e



Formelark for PSY2014

Gjennomsnitt: $\bar{X} = \frac{1}{n} \sum_{i=1}^n X_i$

Varians: $s_X^2 = \frac{\sum_{i=1}^n (X_i - \bar{X})^2}{n - 1}$

Standardavvik: $s_X = \sqrt{s_X^2}$

Kovarians: $s_{XY} = \frac{\sum_{i=1}^n (X_i - \bar{X})(Y_i - \bar{Y})}{n - 1}$

Pearson Korrelasjon: $r = \frac{s_{XY}}{s_X s_Y}$

Minste kvadraters estimater i bivariat regresjon. $\hat{b}_0 = \bar{Y} - \hat{b}_1 \cdot \bar{X}$ $\hat{b}_1 = \frac{\sum_{i=1}^n (X_i - \bar{X}) \cdot (Y_i - \bar{Y})}{\sum_{i=1}^n (X_i - \bar{X})^2} = \frac{s_{XY}}{s_X^2}$

Standardfeilen til estimatet av b_1 i en bivariat regresjon. $SE(\hat{b}_1) = \frac{s}{\sqrt{\sum (X_i - \bar{X})^2}}$ $s = \sqrt{\frac{\sum (Y - \hat{Y})^2}{n - p - 1}}$

Standardisert regresjonskoeffisient $\beta_i = b_i \frac{s_X}{s_Y}$

Sums of squares: $\sum (Y_i - \bar{Y})^2 = \sum (\hat{Y}_i - \bar{Y})^2 + \sum (Y_i - \hat{Y}_i)^2$

r^2 : $r^2 = 1 - \frac{SSE}{TSS}$ *Justert* $r^2 = 1 - \frac{(n-1)(1-r^2)}{n-p-1}$

Z-skåre: $Z = \frac{X - \bar{X}}{s_X}$

F-ratio: $F = \frac{MSM}{MSE}$, er i en multipel regresjonsanalyse fordelt $F(df_1=p, df_2=n-p-1)$ under H_0 .

T-test: $t = \frac{\hat{b}_i}{SE(\hat{b}_i)}$, er i en multipel regresjonsanalyse fordelt $t(df=n-p-1)$ under H_0 .

Kji-kvadrat: $\chi^2 = \sum \frac{(O-E)^2}{E}$, fordelt $\chi^2(df = (Rader - 1)(Kol - 1))$ under H_0 $E_{kol i,radj} = \frac{R_j \times C_i}{n}$

Enveis Anova (mellom-gruppe design):

$SS_{between}$: $SS_b = \sum_{j=1}^g \sum_{i=1}^{n_j} (\bar{y}_j - \bar{y})^2 = \sum_{j=1}^g n_j (\bar{y}_j - \bar{y})^2$ $df_b = g - 1$

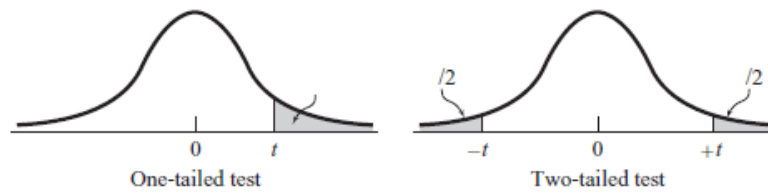
SS_{within} : $SS_w = \sum_{j=1}^g \sum_{i=1}^{n_j} (y_{ij} - \bar{y}_j)^2$ $df_w = n - g$

For "standardfeilen" (SE) til en differanse mellom to gjennomsnitt bruker vi:

$SE_{diff} = \sqrt{\frac{2 \cdot MSS_w}{n}}$ (der n er antall personer innad i hver gruppe).

$t = \frac{x_1 - x_2}{SE_{diff}}$, med frihetsgrader (df) fra MSSw

Appendix t: Percentage Points of the t Distribution



		Level of Significance for One-Tailed Test								
		0.25	0.20	0.15	0.10	0.05	0.025	0.01	0.005	0.0005
		Level of Significance for Two-Tailed Test								
df		0.50	0.40	0.30	0.20	0.10	0.05	0.02	0.01	0.001
1		1.000	1.376	1.963	3.078	6.314	12.706	31.821	63.657	636.620
2		0.816	1.061	1.386	1.886	2.920	4.303	6.965	9.925	31.599
3		0.765	0.978	1.250	1.638	2.353	3.182	4.541	5.841	12.924
4		0.741	0.941	1.190	1.533	2.132	2.776	3.747	4.604	8.610
5		0.727	0.920	1.156	1.476	2.015	2.571	3.365	4.032	6.869
6		0.718	0.906	1.134	1.440	1.943	2.447	3.143	3.707	5.959
7		0.711	0.896	1.119	1.415	1.895	2.365	2.998	3.499	5.408
8		0.706	0.889	1.108	1.397	1.860	2.306	2.896	3.355	5.041
9		0.703	0.883	1.100	1.383	1.833	2.262	2.821	3.250	4.781
10		0.700	0.879	1.093	1.372	1.812	2.228	2.764	3.169	4.587
11		0.697	0.876	1.088	1.363	1.796	2.201	2.718	3.106	4.437
12		0.695	0.873	1.083	1.356	1.782	2.179	2.681	3.055	4.318
13		0.694	0.870	1.079	1.350	1.771	2.160	2.650	3.012	4.221
14		0.692	0.868	1.076	1.345	1.761	2.145	2.624	2.977	4.140
15		0.691	0.866	1.074	1.341	1.753	2.131	2.602	2.947	4.073
16		0.690	0.865	1.071	1.337	1.746	2.120	2.583	2.921	4.015
17		0.689	0.863	1.069	1.333	1.740	2.110	2.567	2.898	3.965
18		0.688	0.862	1.067	1.330	1.734	2.101	2.552	2.878	3.922
19		0.688	0.861	1.066	1.328	1.729	2.093	2.539	2.861	3.883
20		0.687	0.860	1.064	1.325	1.725	2.086	2.528	2.845	3.850
21		0.686	0.859	1.063	1.323	1.721	2.080	2.518	2.831	3.819
22		0.686	0.858	1.061	1.321	1.717	2.074	2.508	2.819	3.792
23		0.685	0.858	1.060	1.319	1.714	2.069	2.500	2.807	3.768
24		0.685	0.857	1.059	1.318	1.711	2.064	2.492	2.797	3.745
25		0.684	0.856	1.058	1.316	1.708	2.060	2.485	2.787	3.725
26		0.684	0.856	1.058	1.315	1.706	2.056	2.479	2.779	3.707
27		0.684	0.855	1.057	1.314	1.703	2.052	2.473	2.771	3.690
28		0.683	0.855	1.056	1.313	1.701	2.048	2.467	2.763	3.674
29		0.683	0.854	1.055	1.311	1.699	2.045	2.462	2.756	3.659
30		0.683	0.854	1.055	1.310	1.697	2.042	2.457	2.750	3.646
40		0.681	0.851	1.050	1.303	1.684	2.021	2.423	2.704	3.551
50		0.679	0.849	1.047	1.299	1.676	2.009	2.403	2.678	3.496
100		0.677	0.845	1.042	1.290	1.660	1.984	2.364	2.626	3.390
∞		0.674	0.842	1.036	1.282	1.645	1.960	2.326	2.576	3.291

Source: The entries in this table were computed by the author.