

```

View(MultReg_22_1)
> library(readr)
> MultReg_22_1 <- read_csv("MultReg_22_1.csv")
Parsed with column specification:
cols(
  .default = col_double(),
  cyclingrate = col_integer()
)
See spec(...) for full column specifications.
> View(MultReg_22_1)
> attach(MultReg_22_1)
The following objects are masked from MultReg_F1:

    ALG_15to65, bldgofdev, busstops_1km, culturalsocial_1km, cyclingrate,
    fahrradstrasse_dev, med_parkdist,
    med_ubahndist, tertiary_dev, trunkprimary_dev

>
> corset_f1 <- cor(MultReg_22_1[,2:23])
> write.csv((corset_f1), file = "FurtherReg_CollCheck.csv")
> library(readr)
> FurtherReg_NoModColl <- read_csv("FurtherReg_NoModColl.csv")
Parsed with column specification:
cols(
  cyclingrate = col_integer(),
  culturalsocial_1km = col_double(),
  ALG_15to65 = col_double(),
  emp_density.dev = col_double(),
  bldgofdev = col_double(),
  tertiary_dev = col_double(),
  trunkprimary_dev = col_double(),
  sidestreets_dev = col_double(),
  fahrradstrasse_dev = col_double(),
  job_density.dev = col_double(),
  med_parkdist = col_double(),
  pedway_dev = col_double(),
  med_sbahndist = col_double()
)
> View(FurtherReg_NoModColl)
> MultReg_F1 <- FurtherReg_NoModColl
> View(MultReg_F1)
> fit_f1 <- lm(cyclingrate~., data = MultReg_F1)
> summary(fit_f1)

```

Call:
lm(formula = cyclingrate ~ ., data = MultReg_F1)

Residuals:

Min	1Q	Median	3Q	Max
-3.957	-1.472	-0.099	1.077	5.993

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-8.963e+00	1.348e+01	-0.665	0.5188
culturalsocial_1km	2.750e-01	1.796e-01	1.531	0.1517
ALG_15to65	-5.721e-01	7.497e-01	-0.763	0.4601
emp_density.dev	5.233e-04	5.967e-04	0.877	0.3977
bldgofdev	3.609e+01	1.767e+01	2.043	0.0637
tertiary_dev	3.085e+00	2.525e+00	1.222	0.2451
trunkprimary_dev	4.029e-04	1.075e-03	0.375	0.7143
sidestreets_dev	-4.355e-01	6.577e-01	-0.662	0.5204
fahrradstrasse_dev	2.777e-06	1.547e-04	0.018	0.9860

	job_density.dev	med_parkdist	pedway_dev	med_sbahndist
	-1.592e-04	-5.791e-03	-1.547e-01	1.520e-03
	3.101e-04	2.588e-02	2.899e-01	9.655e-04
	-0.513	-0.224	-0.534	1.575
	0.6171	0.8267	0.6033	0.1413

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

Residual standard error: 3.041 on 12 degrees of freedom
 Multiple R-squared: 0.7396, Adjusted R-squared: 0.4792
 F-statistic: 2.84 on 12 and 12 DF, p-value: 0.04149

```
> MultReg_F2 <- subset(MultReg_F1, select=-c(fahrradstrasse_dev))
> View(MultReg_F2)
> fit_f2 <- lm(cyclingrate~., data = MultReg_F2)
> summary(fit_f2)
```

Call:
 lm(formula = cyclingrate ~ ., data = MultReg_F2)

Residuals:

Min	1Q	Median	3Q	Max
-3.9570	-1.4821	-0.0739	1.0850	6.0052

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-8.8732504	12.0227213	-0.738	0.4736
culturalsocial_1km	0.2738460	0.1614717	1.696	0.1137
ALG_15to65	-0.5795549	0.6012769	-0.964	0.3527
emp_density.dev	0.0005285	0.0005016	1.053	0.3113
bldgofdev	36.0078540	16.3495784	2.202	0.0463 *
tertiary_dev	3.0820807	2.4191214	1.274	0.2250
trunkprimary_dev	0.0004056	0.0010226	0.397	0.6981
sidestreets_dev	-0.4351044	0.6315873	-0.689	0.5030
job_density.dev	-0.0001581	0.0002925	-0.541	0.5979
med_parkdist	-0.0057826	0.0248630	-0.233	0.8197
pedway_dev	-0.1544578	0.2781855	-0.555	0.5882
med_sbahndist	0.0015177	0.0009158	1.657	0.1214

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

Residual standard error: 2.922 on 13 degrees of freedom
 Multiple R-squared: 0.7396, Adjusted R-squared: 0.5192
 F-statistic: 3.356 on 11 and 13 DF, p-value: 0.02078

```
> MultReg_F3 <- subset(MultReg_F2, select=-c(med_parkdist))
> View(MultReg_F3)
> fit_f3 <- lm(cyclingrate~., data = MultReg_F3)
> summary(fit_f3)
```

Call:
 lm(formula = cyclingrate ~ ., data = MultReg_F3)

Residuals:

Min	1Q	Median	3Q	Max
-3.8099	-1.3589	-0.1017	1.2762	6.1379

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-1.049e+01	9.468e+00	-1.108	0.2865
culturalsocial_1km	2.664e-01	1.528e-01	1.743	0.1032
ALG_15to65	-6.232e-01	5.516e-01	-1.130	0.2776
emp_density.dev	5.114e-04	4.792e-04	1.067	0.3039

```

bldgofdev      3.638e+01  1.571e+01  2.316  0.0362 *
tertiary_dev    3.211e+00  2.274e+00  1.412  0.1798
trunkprimary_dev 4.836e-04  9.327e-04  0.519  0.6122
sidestreets_dev -4.218e-01  6.074e-01 -0.694  0.4988
job_density.dev -1.488e-04  2.798e-04 -0.532  0.6032
pedway_dev      -1.240e-01  2.370e-01 -0.523  0.6090
med_sbahndist    1.513e-03  8.841e-04  1.711  0.1091
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

Residual standard error: 2.822 on 14 degrees of freedom
Multiple R-squared: 0.7385, Adjusted R-squared: 0.5517
F-statistic: 3.954 on 10 and 14 DF, p-value: 0.009844

```

> MultReg_F4 <- subset(MultReg_F3, select=-c(trunkprimary_dev))
> View(MultReg_F4)
> fit_f4 <- lm(cyclingrate~., data = MultReg_F4)
> summary(fit_f4)

```

Call:
lm(formula = cyclingrate ~ ., data = MultReg_F4)

Residuals:

	Min	1Q	Median	3Q	Max
	-3.7441	-1.6386	0.2595	1.2347	5.9430

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-9.992e+00	9.186e+00	-1.088	0.2939
culturalsocial_1km	2.158e-01	1.147e-01	1.881	0.0795 .
ALG_15to65	-6.655e-01	5.321e-01	-1.251	0.2302
emp_density.dev	5.986e-04	4.377e-04	1.368	0.1916
bldgofdev	3.259e+01	1.356e+01	2.403	0.0296 *
tertiary_dev	3.693e+00	2.024e+00	1.824	0.0881 .
sidestreets_dev	-2.818e-01	5.306e-01	-0.531	0.6032
job_density.dev	-6.993e-05	2.290e-04	-0.305	0.7643
pedway_dev	-5.930e-02	1.965e-01	-0.302	0.7670
med_sbahndist	1.459e-03	8.563e-04	1.704	0.1091

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

Residual standard error: 2.752 on 15 degrees of freedom
Multiple R-squared: 0.7335, Adjusted R-squared: 0.5736
F-statistic: 4.587 on 9 and 15 DF, p-value: 0.004746

```

> MultReg_F5 <- subset(MultReg_F4, select=-c(pedway_dev))
> View(MultReg_F5)
> fit_f5 <- lm(cyclingrate~., data = MultReg_F5)
> summary(fit_f5)

```

Call:
lm(formula = cyclingrate ~ ., data = MultReg_F5)

Residuals:

	Min	1Q	Median	3Q	Max
	-3.7832	-1.4562	0.2264	1.1950	5.8173

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-1.050e+01	8.771e+00	-1.197	0.2487
culturalsocial_1km	1.960e-01	9.131e-02	2.146	0.0475 *
ALG_15to65	-7.457e-01	4.477e-01	-1.666	0.1153

emp_density.dev	5.511e-04	3.966e-04	1.389	0.1837
bldgofdev	3.178e+01	1.291e+01	2.462	0.0256 *
tertiary_dev	4.075e+00	1.533e+00	2.658	0.0172 *
sidestreets_dev	-2.317e-01	4.895e-01	-0.473	0.6423
job_density.dev	-4.329e-05	2.052e-04	-0.211	0.8356
med_sbahndist	1.399e-03	8.087e-04	1.729	0.1030

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

Residual standard error: 2.673 on 16 degrees of freedom
Multiple R-squared: 0.7319, Adjusted R-squared: 0.5978
F-statistic: 5.459 on 8 and 16 DF, p-value: 0.001955

```
> MultReg_F6 <- subset(MultReg_F5, select=-c(job_density.dev))
> View(MultReg_F6)
> fit_f6 <- lm(cyclingrate~., data = MultReg_F6)
> summary(fit_f6)
```

Call:
lm(formula = cyclingrate ~ ., data = MultReg_F6)

Residuals:

	Min	1Q	Median	3Q	Max
	-3.6787	-1.5091	0.1729	1.2098	5.7529

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-9.9617763	8.1522074	-1.222	0.2384
culturalsocial_1km	0.1848077	0.0723164	2.556	0.0205 *
ALG_15to65	-0.7837845	0.3980293	-1.969	0.0655 .
emp_density.dev	0.0005713	0.0003739	1.528	0.1450
bldgofdev	30.4056092	10.8265121	2.808	0.0121 *
tertiary_dev	4.1264609	1.4707171	2.806	0.0122 *
sidestreets_dev	-0.1799836	0.4115403	-0.437	0.6674
med_sbahndist	0.0013582	0.0007634	1.779	0.0931 .

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

Residual standard error: 2.596 on 17 degrees of freedom
Multiple R-squared: 0.7311, Adjusted R-squared: 0.6204
F-statistic: 6.604 on 7 and 17 DF, p-value: 0.0007184

```
> MultReg_F7 <- subset(MultReg_F6, select=-c(sidestreets_dev))
> View(MultReg_F7)
> fit_f7 <- lm(cyclingrate~., data = MultReg_F7)
> summary(fit_f7)
```

Call:
lm(formula = cyclingrate ~ ., data = MultReg_F7)

Residuals:

	Min	1Q	Median	3Q	Max
	-3.5357	-1.4502	0.2255	1.0161	5.3358

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-1.054e+01	7.861e+00	-1.341	0.19662
culturalsocial_1km	1.823e-01	7.045e-02	2.588	0.01858 *
ALG_15to65	-7.614e-01	3.858e-01	-1.974	0.06396 .
emp_density.dev	5.624e-04	3.649e-04	1.541	0.14067
bldgofdev	2.841e+01	9.599e+00	2.960	0.00838 **
tertiary_dev	4.325e+00	1.367e+00	3.162	0.00539 **

```
med_sbahndist      1.434e-03  7.267e-04  1.973  0.06407 .
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
Residual standard error: 2.537 on 18 degrees of freedom
Multiple R-squared:  0.7281, Adjusted R-squared:  0.6375
F-statistic: 8.033 on 6 and 18 DF, p-value: 0.0002552
```

```
> fit_f8 <- lm(cyclingrate~-1+., data = MultReg_F7)
> summary(fit_f8)
```

```
Call:
lm(formula = cyclingrate ~ -1 + ., data = MultReg_F7)
```

```
Residuals:
    Min       1Q   Median       3Q      Max
-3.7946 -1.9052  0.0381  1.3644  5.3454
```

```
Coefficients:
                Estimate Std. Error t value Pr(>|t|)
culturalsocial_1km  0.1424591  0.0652087   2.185  0.041647 *
ALG_15to65         -1.0498322  0.3268764  -3.212  0.004592 **
emp_density.dev      0.0005209  0.0003711   1.403  0.176630
bldgofdev           16.3508120  3.4176571   4.784  0.000129 ***
tertiary_dev         4.0472576  1.3798214   2.933  0.008533 **
med_sbahndist        0.0013816  0.0007408   1.865  0.077685 .
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
Residual standard error: 2.59 on 19 degrees of freedom
Multiple R-squared:  0.9745, Adjusted R-squared:  0.9664
F-statistic: 120.9 on 6 and 19 DF, p-value: 4.219e-14
```

```
> MultReg_F9 <- subset(MultReg_F7, select=-c(emp_density.dev))
> View(MultReg_F9)
> fit_f9 <- lm(cyclingrate~., data = MultReg_F9)
> summary(fit_f9)
```

```
Call:
lm(formula = cyclingrate ~ ., data = MultReg_F9)
```

```
Residuals:
    Min       1Q   Median       3Q      Max
-4.4151 -1.4198  0.3388  0.9051  4.7704
```

```
Coefficients:
                Estimate Std. Error t value Pr(>|t|)
(Intercept)    -9.5132808  8.1112596  -1.173  0.25535
culturalsocial_1km  0.2298158  0.0655914   3.504  0.00238 **
ALG_15to65       -0.6929028  0.3968123  -1.746  0.09693 .
bldgofdev        27.8650839  9.9335394   2.805  0.01130 *
tertiary_dev      4.6983755  1.3936147   3.371  0.00321 **
med_sbahndist     0.0015401  0.0007492   2.056  0.05381 .
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
Residual standard error: 2.628 on 19 degrees of freedom
Multiple R-squared:  0.6922, Adjusted R-squared:  0.6112
F-statistic: 8.546 on 5 and 19 DF, p-value: 0.0002234
```

```
> MultReg_F9 <- subset(MultReg_F7, select=-c(emp_density.dev))
> View(MultReg_F9)
```

```

> fit_f9 <- lm(cyclingrate~-1+., data = MultReg_F9)
> summary(fit_f9)

Call:
lm(formula = cyclingrate ~ -1 + ., data = MultReg_F9)

Residuals:
    Min       1Q   Median       3Q      Max
-4.6904 -1.3926 -0.2587  1.0767  4.8171

Coefficients:
                Estimate Std. Error t value Pr(>|t|)
culturalsocial_1km  0.1904220  0.0568654   3.349  0.00320 **
ALG_15to65         -0.9596915  0.3281804  -2.924  0.00839 **
bldgofdev          16.9359675  3.4733740   4.876 9.15e-05 ***
tertiary_dev        4.4212356  1.3862715   3.189  0.00461 **
med_sbahndist       0.0014857  0.0007547   1.969  0.06303 .
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 2.652 on 20 degrees of freedom
Multiple R-squared:  0.9718, Adjusted R-squared:  0.9648
F-statistic: 138 on 5 and 20 DF, p-value: 8.557e-15

> MultReg_F10 <- subset(MultReg_F9, select=-c(med_sbahndist))
> View(MultReg_F10)
> fit_f10 <- lm(cyclingrate~-1+., data = MultReg_F10)
> summary(fit_f10)

Call:
lm(formula = cyclingrate ~ -1 + ., data = MultReg_F10)

Residuals:
    Min       1Q   Median       3Q      Max
-5.4976 -1.7877  0.1493  1.3636  4.5941

Coefficients:
                Estimate Std. Error t value Pr(>|t|)
culturalsocial_1km  0.16659    0.05924   2.812  0.0104 *
ALG_15to65         -0.84964    0.34481  -2.464  0.0225 *
bldgofdev          20.80216    3.05460   6.810 9.83e-07 ***
tertiary_dev        3.24859    1.33469   2.434  0.0239 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 2.828 on 21 degrees of freedom
Multiple R-squared:  0.9664, Adjusted R-squared:  0.96
F-statistic: 150.9 on 4 and 21 DF, p-value: 3.767e-15

```