

# Ford Galaxy Prisutvikling

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## Settings

```
# options(error = recover)

rm(list=ls())

getwd()
setwd("C:/repos2/coursera")
dir()
```

## Data

```
# Packages
library(PerformanceAnalytics)

## Loading required package: xts
## Loading required package: zoo
##
## Attaching package: 'zoo'
##
## The following objects are masked from 'package:base':
##
##      as.Date, as.Date.numeric
##
##
## Attaching package: 'PerformanceAnalytics'
##
## The following object is masked from 'package:graphics':
##
##      legend

library(zoo)
library(tseries)
library(mvtnorm)
library(data.table)

##
## Attaching package: 'data.table'
##
## The following object is masked from 'package:xts':
##
##      last
```

```

# Input data
setwd("C:/repos/research/r_misc/bil/data")
df1 <- read.table("bildata.txt", sep = ",", header = TRUE)
names(df1)
length(names(df1))

# Transform dataframe to datatable and fix date
dt1 <- data.table(df1)
df1$dato
dt1$dato <- gsub(".", "-", dt1$dato, fixed = T)
dt1$dato <- as.Date(dt1$dato, "%d-%m-%Y")

```

## Analysis 1 - Price versus alder

```

# Analysis01_Model01
# pris ~ a + km
A01M01 <- lm(pris~alder_mnd, data = dt1)
summary(A01M01)

coef_A01M01 <- coefficients(A01M01)

M01_fitted <- fitted(A01M01)
dt2 <- data.table(dt1, M01_fitted)

```

```

# Analysis01_Model02
# pris ~ a + km
# A01M02 <- lm(pris)

```

```

# Analysis01_Plot01
# dt2 <- data.table(dt2)

```

```
library(ggplot2)
```

```

# Plot foundation an theme
p1 <- ggplot(dt1, aes(x=alder_mnd, y=pris))
p1 <- p1 + mt01
p1 <- p1 + geom_point(color = "blue")

```

```
# A01M01 Regression line
```

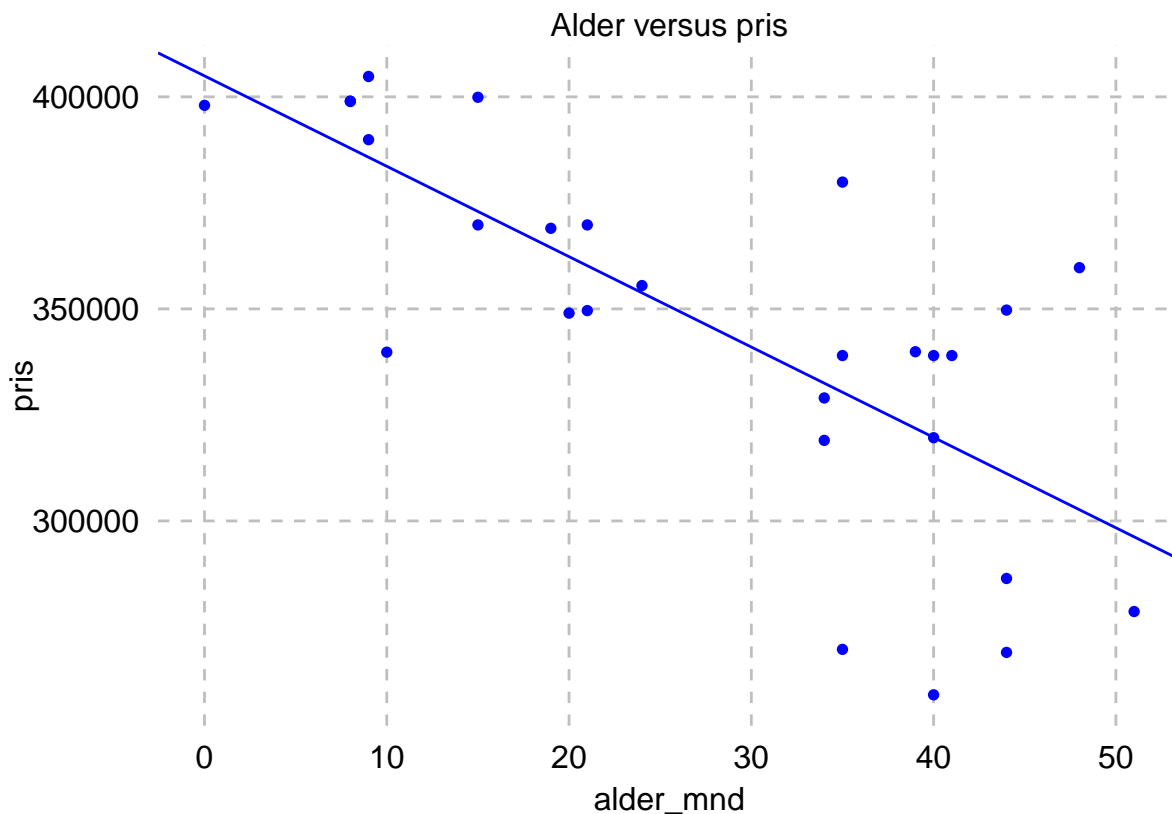
```
p1 <- p1 + geom_abline(intercept = coef_A01M01[1], slope = coef_A01M01[2], colour = "blue", size = 0.5)
```

```
# Formatting
```

```

p1 <- p1 + ggtitle("Alder versus pris")
plot(p1)

```



## Analysis 2 - Pris versus km

```
# Analysis01_Model01
# pris ~ a + km

km_tusen <- dt2$km / 1000
dt3 <- data.table(dt2, km_tusen)
dt3$skinn[4] <- 0

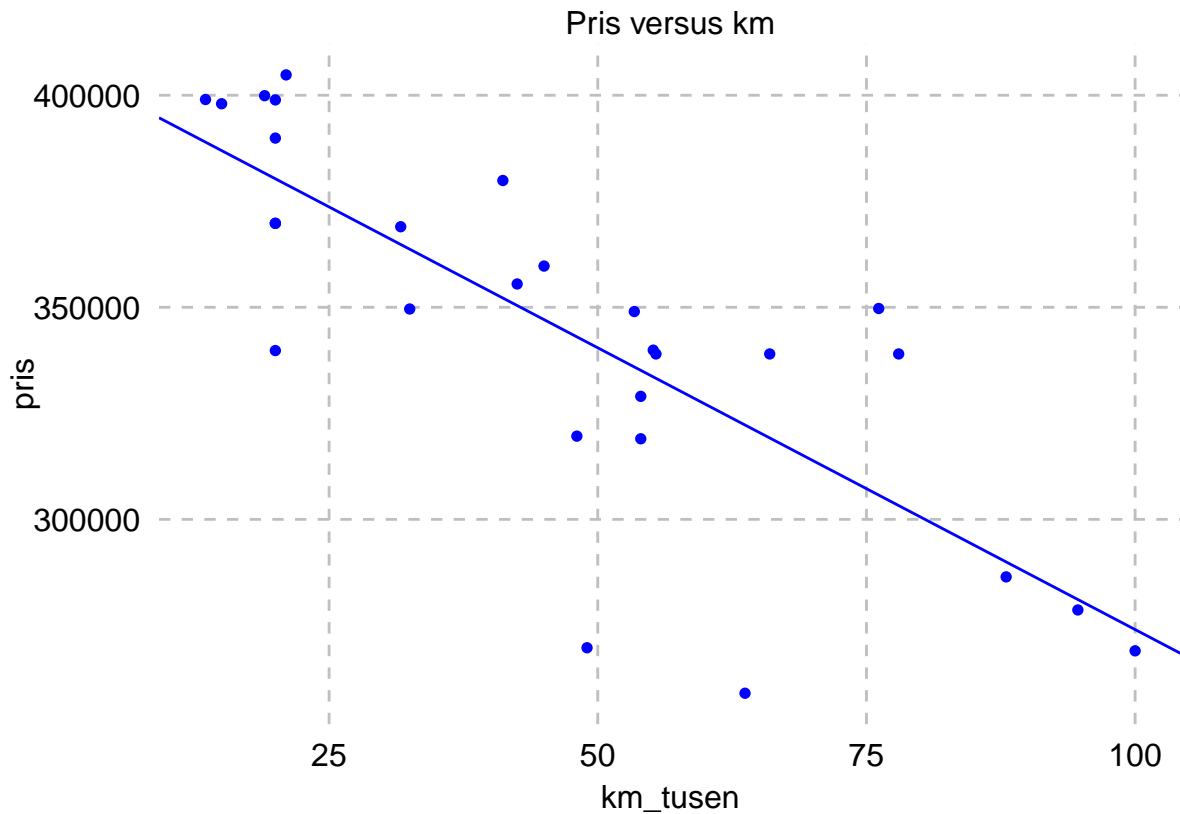
A02M01 <- lm(pris~(km_tusen), data = dt3)
summary(A02M01)
coef_A02M01 <- coefficients(A02M01)
```

## # Analysis01\_Plot01

```
library(ggplot2)
px2 <- ggplot(dt3, aes(x=km_tusen, y=pris))
px2 <- px2 + mt01
px2 <- px2 + geom_point(color = "blue")
# px2 <- px2 + geom_point(aes(y=d12), color="blue")
# px2 <- px2 + geom_point(aes(y=d11), color="red")
# px2 <- px2 + xlab("Weight") + ylab("Miles per gallon")
px2 <- px2 + geom_abline(intercept = coef_A02M01[1], slope = coef_A02M01[2], colour = "blue", size = 0.5)
# px2 <- px2 + geom_abline(intercept = coef_auto[1], slope = coef_auto[2], colour = "red", size = 0.5)
```

```
px2 <- px2 + ggtitle("Pris versus km")
# px2 <- px2 + geom_abline(intercept = 15, slope = 1)

plot(px2)
```



Analysis 3 -  $\text{Pris} \sim a + \text{km} + \text{motor} [+ \text{effekt} + \text{skinn} + \text{panorama} + \text{xenon} + \text{kamera} + \text{rutevarmer} + \text{krok}]$

```
library(ggplot2)
```

```
# Analysis01_Model01
```

```
A03M01 <- lm(pris ~ km_tusen + effekt, data = dt1)
```

```
summary(A03M01)
```

```
A03M01_fitted <- fitted(A03M01)
```

```
dt3 <- data.table(dt3, A03M01_fitted)
```

```
pris ~ a + km_tusen + effekt
```

```
# Analysis01_Model02
```

```
A03M02 <- lm(pris ~ km_tusen + alder_mnd + effekt, data = dt3)
```

```
summary(A03M02)
```

```
A03M02_fitted <- fitted(A03M02)
```

```
length(A03M02_fitted)
```

```
pris ~ a + km_tusen + alder_mnd + effekt
```

```

# Analysis01_Model03                                pris ~ a + km_tusen + alder_mnd + effek
A03M03 <- lm(pris ~ km_tusen*alder_mnd + effekt + skinn + panorama + xenon + kamera + rutevarmer + moto
summary(A03M03)
A03M03_fitted <- fitted(A03M03)
length(A03M03_fitted)

dt4 <- data.table(dt3, A03M02_fitted, A03M03_fitted)

# Analysis03_Plot01

library(ggplot2)

# Plots y = pris, x = km_tusen

px3 <- ggplot(dt3, aes(x=km_tusen, y=pris))
px3 <- px3 + mt01
px3 <- px3 + geom_point(color = "blue")
# px3 <- px3 + xlab("Weight") + ylab("Miles per gallon")
px3 <- px3 + geom_abline(intercept = coef_A02M01[1], slope = coef_A02M01[2], colour = "blue", size = 0.5)
px3 <- px3 + ggtitle("Pris versus km")

# Adds labels for y = pris, text = forhandler

# Lable Option 1 - Lables with company names
# pxx_labels <- paste(dt3$id, dt3$forhandler, sep = " - ")

# Lables Option 2 - Lables with index number only
pxx_labels <- dt3$id

px3 <- px3 + annotate("text", label = pxx_labels,
                     x = dt3$km_tusen,
                     y = jitter(dt3$pris, factor = 250),
                     size = 4, colour = "black", hjust = 0, vjust = 0)

# Labels, forhandler on pris estimated by A03M01_fitted

# Adds lines and points for A03M01_fitted
px3 <- px3 + ggtitle("Pris versus km + effekt")
px3 <- px3 + geom_line(aes(y=A03M01_fitted), color = "green")
px3 <- px3 + geom_point(aes(y=A03M01_fitted), color = "magenta")
# px4 <- px3 + annotate("text", label = dt3$forhandler,
#                       x = dt3$km_tusen,
#                       y = jitter(A03M01_fitted, factor = 0),
#                       size = 4, colour = "black", hjust = 0, vjust = 0)

# Adds lines and points for A03M02_fitted
px3 <- px3 + ggtitle("Pris versus km + alder_mnd + effekt")
px3 <- px3 + geom_line(aes(y=A03M02_fitted), color = "grey")
px3 <- px3 + geom_point(aes(y=A03M02_fitted), color = "orange")

```

```

# px4 <- px3 + annotate("text", label = dt3$forhandler,
#                       x = dt3$km_tusen ,
#                       y = jitter(A03M02_fitted, factor = 0),
#                       size = 4, colour = "black", hjust = 0, vjust = 0)

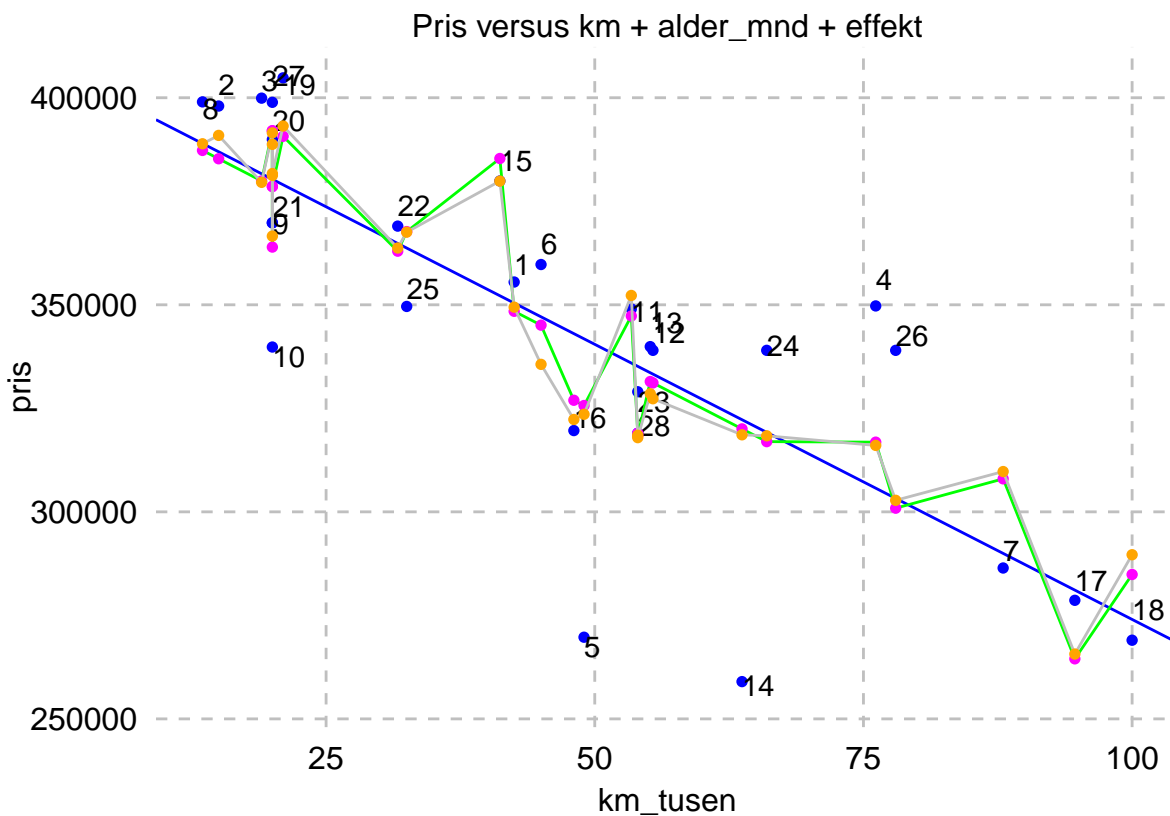
# Adds lines and points for A03M03_fitted

px4 <- px3 + ggtitle("Pris versus km + alder_mnd + effekt")
px4 <- px4 + geom_line(aes(y=A03M03_fitted), color = "grey")
px4 <- px4 + geom_point(aes(y=A03M03_fitted), color = "orange")
# px4 <- px4 + annotate("text", label = px4_labels,
#                       x = dt3$km_tusen ,
#                       y = jitter(A03M02_fitted, factor = 250),
#                       size = 4, colour = "black", hjust = 0, vjust = 0)

# Format chart area
px4 <- px4 + xlim(0,125) + ylim(250000, 425000)

# Write plot
plot(px3)

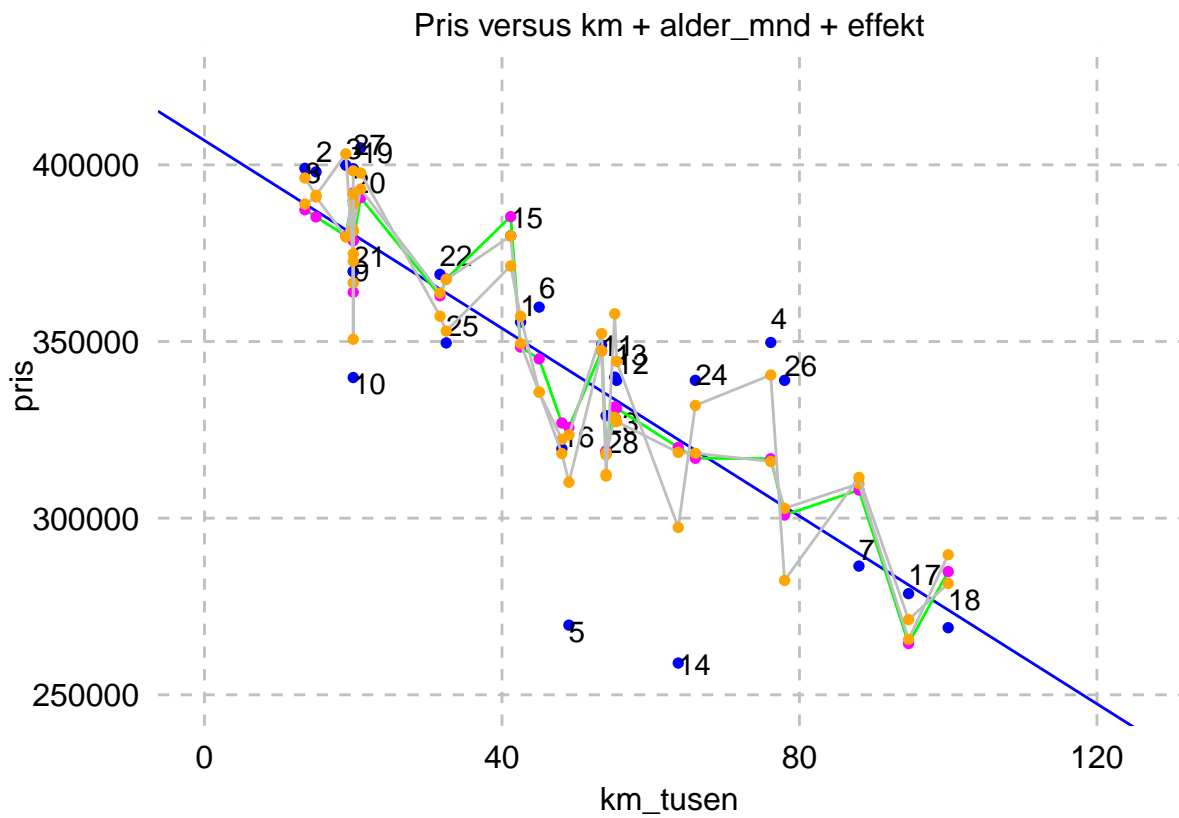
```



```

setwd("C:/repos/research/r_misc/bil/figure")
plot(px4)

```



```
ggsave("bil.png")
```

```
## Saving 6.5 x 4.5 in image
```

```
dev.off()
```

```
# library(Rcmdr)
# attach(dt3) # tror ikke denne trengs så lenge du viser til data.table i referansene under.
# scatter3d(dt3$km_tusen, dt3$pris, dt3$alder_mnd)
```