

MPG Outlier HW

```
library(fpp)

## Loading required package: forecast

## Registered S3 method overwritten by 'quantmod':
##   method           from
##   as.zoo.data.frame zoo

## Loading required package: fma

## Loading required package: expsmooth

## Loading required package: lmtest

## Loading required package: zoo

##
## Attaching package: 'zoo'

## The following objects are masked from 'package:base':
##   as.Date, as.Date.numeric

## Loading required package: tseries

library(fpp2)

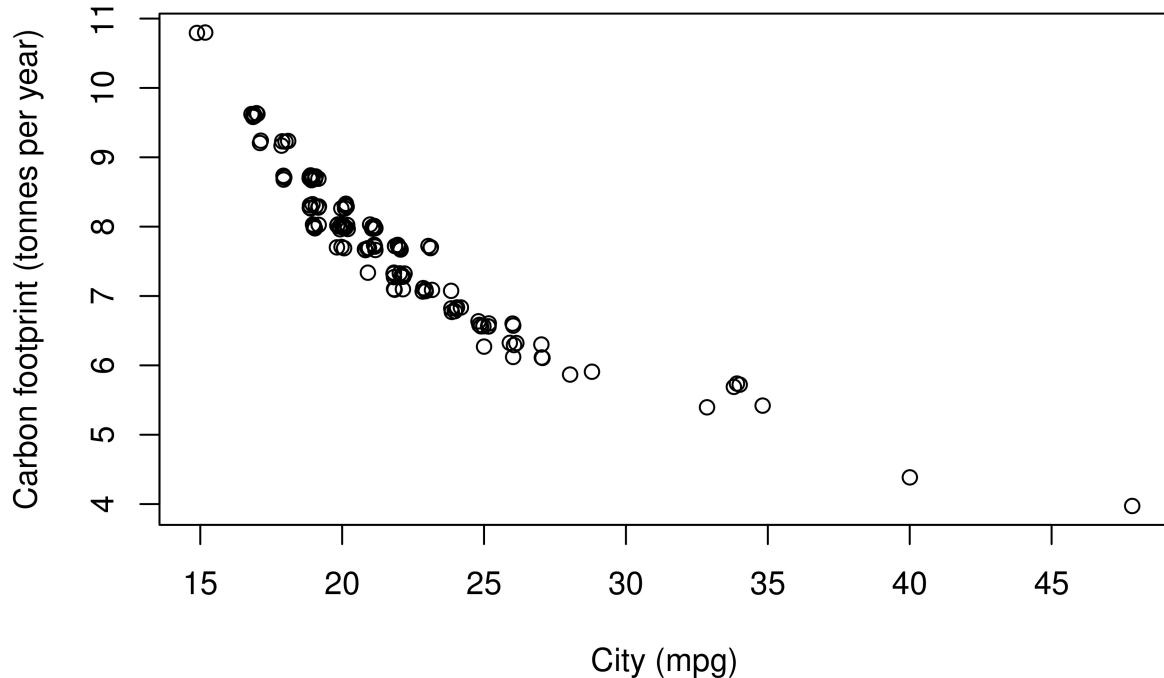
## -- Attaching packages ----- fpp2 2.4 --
## v ggplot2 3.3.5

##
## Attaching package: 'fpp2'

## The following objects are masked from 'package:fpp':
##   ausair, ausbeer, austaa, austourists, debitcards, departures,
##   elecequip, euretail, guinearice, oil, sunspotarea, usmelec
```

```
View(mpg)
```

```
plot(jitter(Carbon) ~ jitter(City), xlab="City (mpg)",  
ylab="Carbon footprint (tonnes per year)", data=fuel)
```



```
View(mpg)
```

Simple Linear Regression

```
fit <- lm(Carbon ~ City, data=fuel)
```

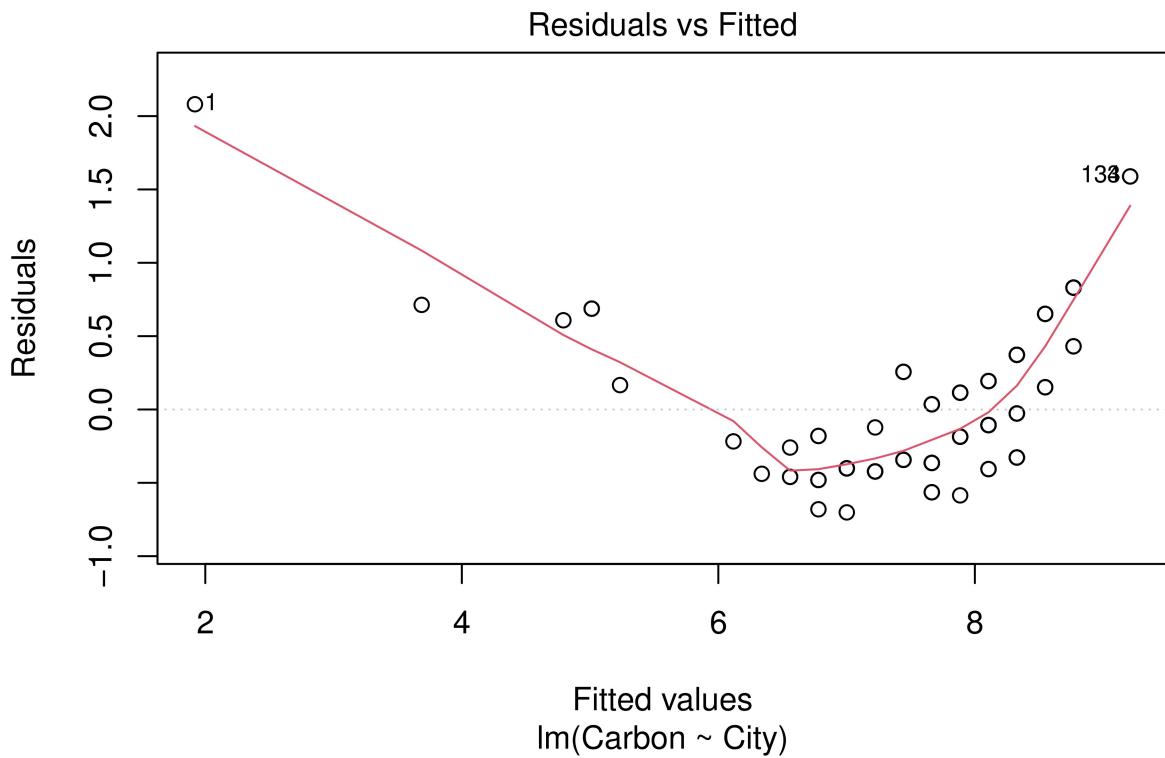
```
# Simple Linear Regression  
fit <- lm(Carbon ~ City, data=fuel)
```

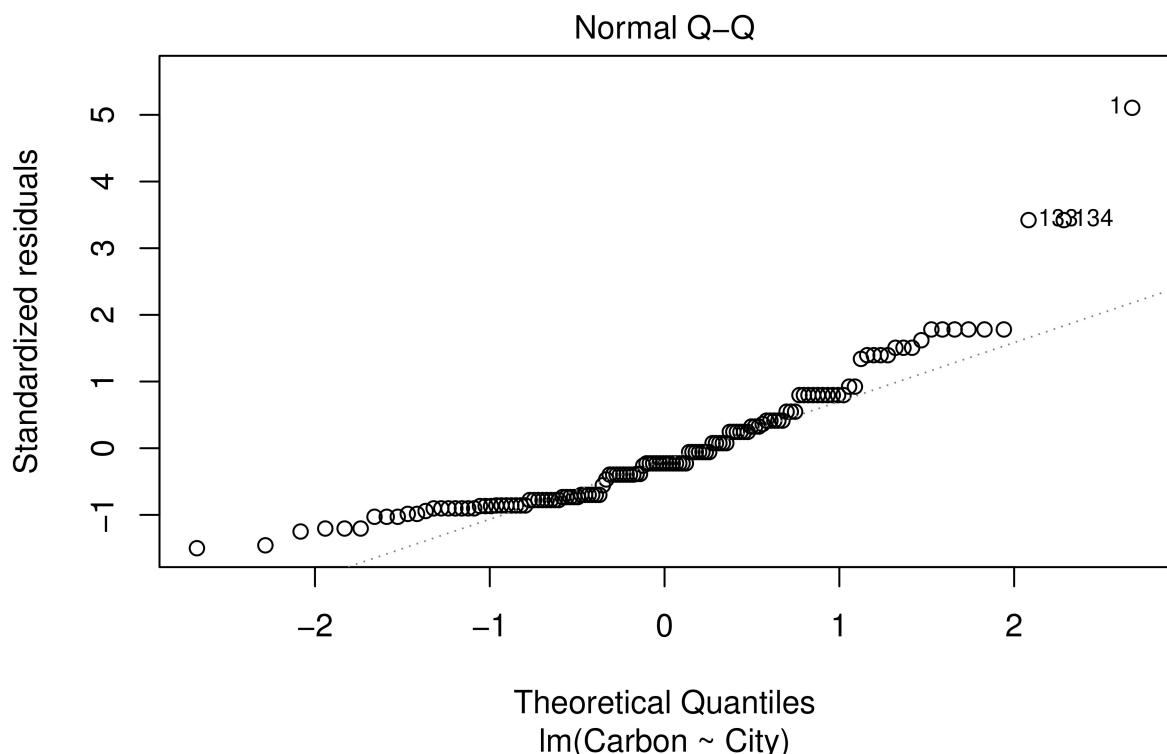
```
res <- residuals(fit)
```

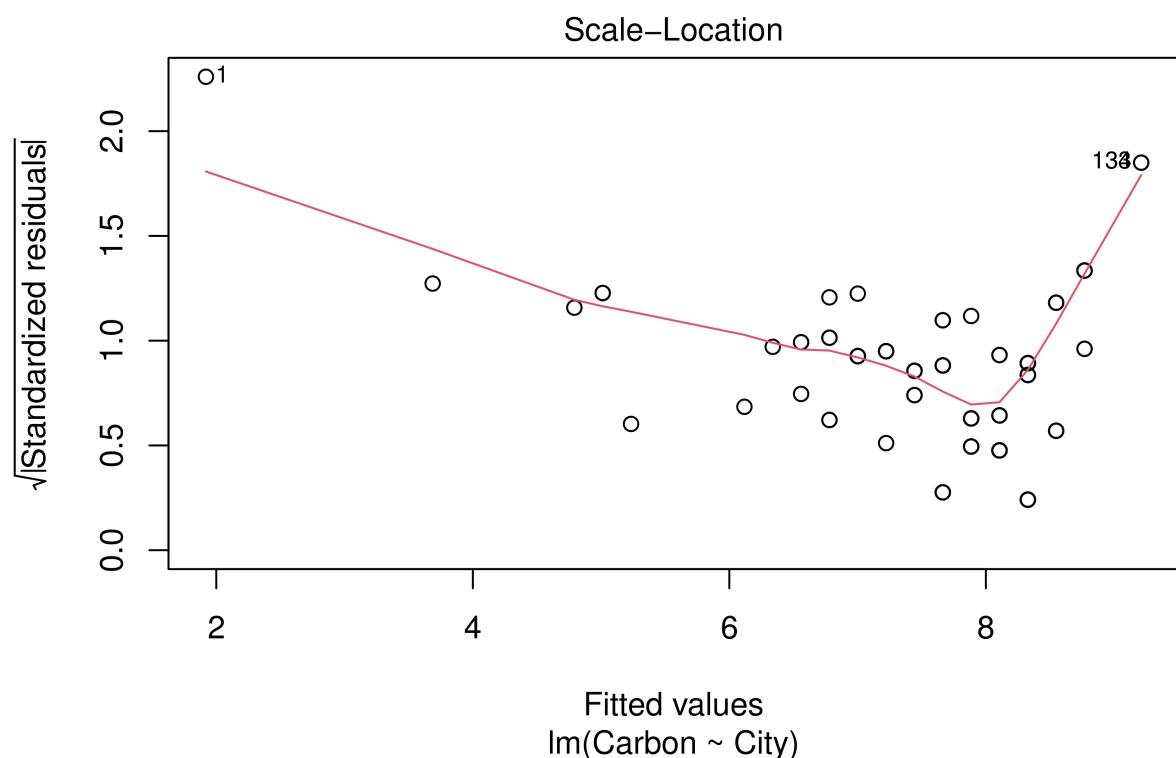
```
# to see the output from regression  
fitted(fit)[1]
```

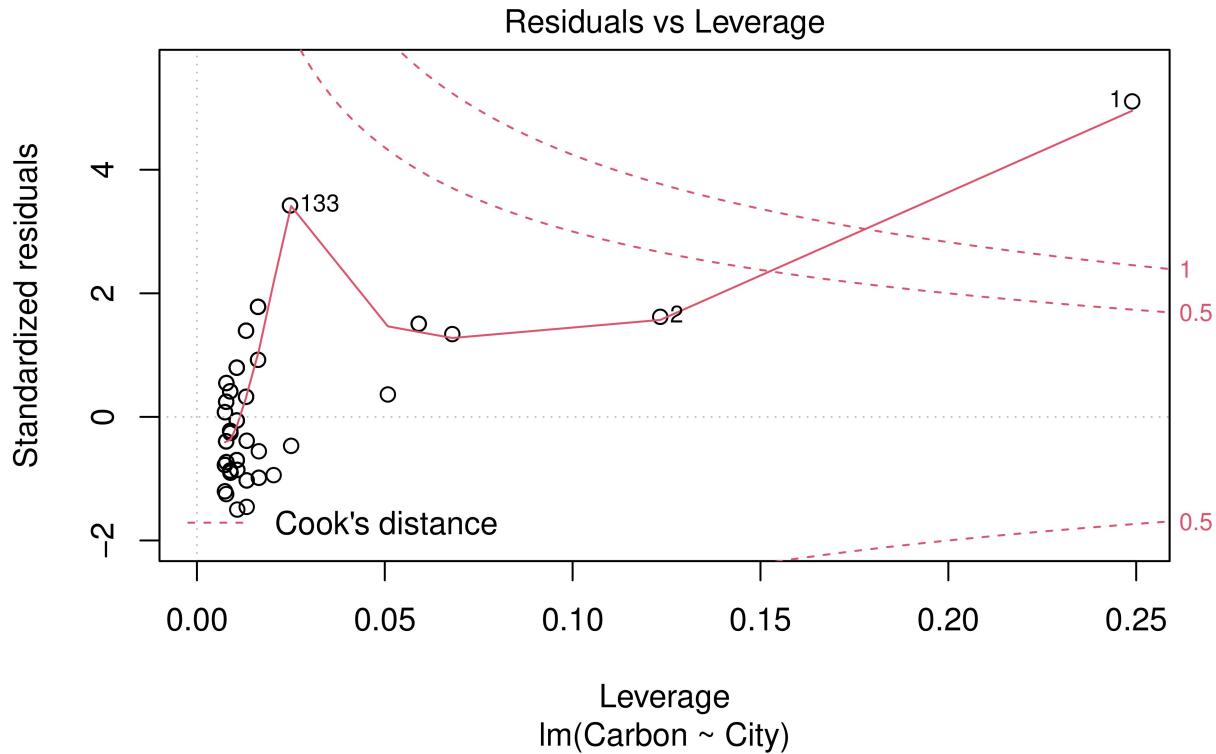
```
##      20  
## 7.001388
```

```
# ask to do a forecast for predictor = 30  
fcast <- forecast(fit, newdata=data.frame(City=30))  
  
plot(fit)
```









```

# Lets do a transformation of response and predictors to get a better fit.
# Split the plotting output area into 2 columns and 1 row.
par(mfrow=c(1,2))

# Do a Regression on log of the data.
fit2 <- lm(log(Carbon) ~ log(City), data=fuel)

lm(fit2)

##
## Call:
## lm(formula = fit2)
##
## Coefficients:
## (Intercept)    log(City)
##        4.5858     -0.8332

plot(fit2)

```

