



**AKADEMIA GÓRNICZO-HUTNICZA
IM. STANISŁAWA STASZICA W KRAKOWIE**

**Wydział Geodezji Górniczej i Inżynierii Środowiska
Katedra Geodezji Inżynierskiej i Budownictwa**

Biblioteka 'car' w programie R

Autor: Przemysław Grabias

Kraków, 21.12.2015 r.

Title Companion to Applied Regression

Description Functions and Datasets to Accompany J. Fox and S. Weisberg,
An R Companion to Applied Regression, Second Edition, Sage, 2011.

Instalacja biblioteki:

- `install.packages("car",dependencies=TRUE)`
- `library(car)`

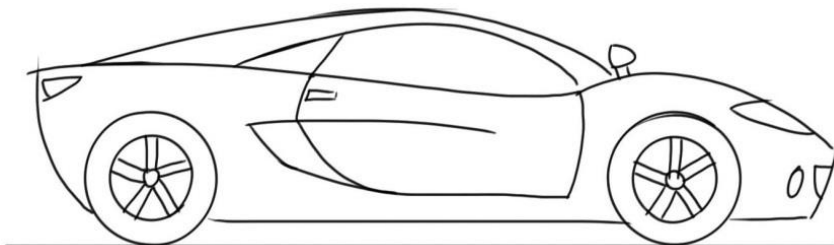
Using `car` Functions in Other Functions

John Fox* & Sanford Weisberg[†]

August 31, 2015

Abstract

The `car` package (Fox and Weisberg, 2011) provides many functions that are applied to a fitted regression model, perform additional calculations on the model or possibly compute a different model, and then return values and graphs. In some cases, users may wish to write functions that call functions in `car` for a particular purpose. Because of the scoping rules used in R, several functions in `car` that work when called from the command prompt may fail when called inside another function. We discuss how users can modify their programs to avoid this problem.





1. Funkcja 'recode'

Opis:

- Recodes a numeric vector, character vector, or factor according to simple recode specifications.

Usage

```
recode(var, recodes, as.factor.result, as.numeric.result=TRUE, levels)  
Recode(...)
```

- **Przykład:** Wyróżnienie elementów o przekroczonych wartościach odchyłek.

```
> x=rep(1:4,4)  
> x  
[1] 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4  
> recode(x,"c(1,2,3)='ok';  
+ else='odch.przekroczona'")  
[1] "ok" "ok" "ok" "odch.przekroczona"  
[5] "ok" "ok" "ok" "odch.przekroczona"  
[9] "ok" "ok" "ok" "odch.przekroczona"  
[13] "ok" "ok" "ok" "odch.przekroczona"
```

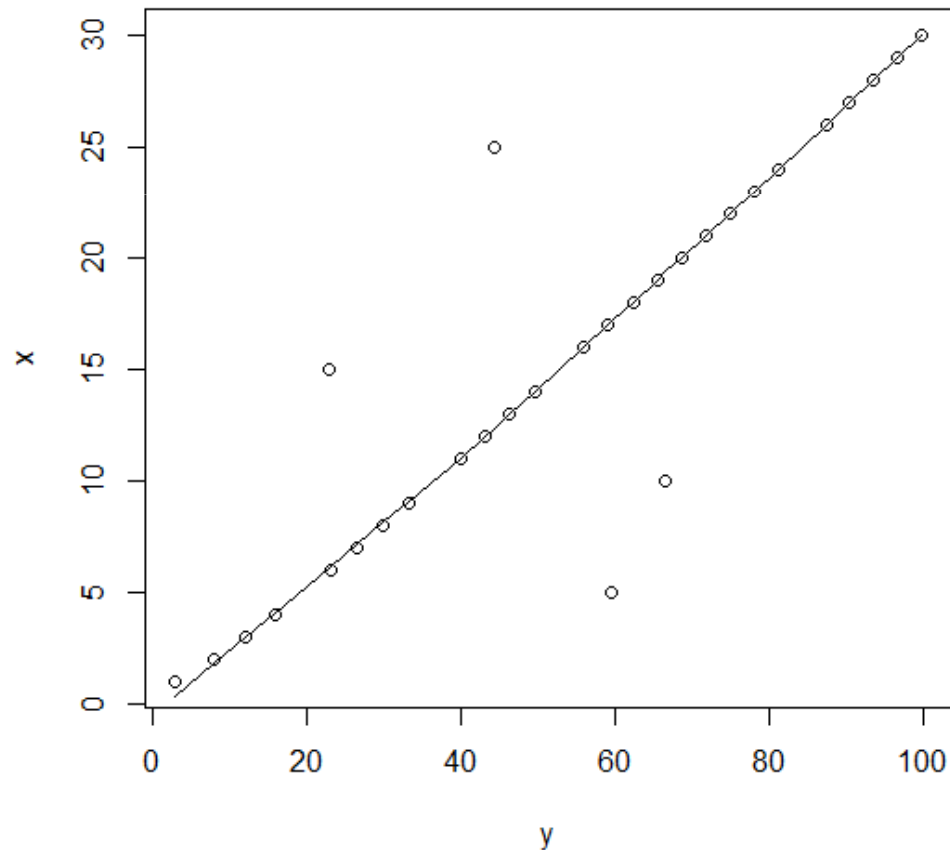
2. Funkcja 'influencePlot' – Dane

Opis:

- This function creates a “bubble” plot of Studentized residuals by hat values, with the areas of the circles representing the observations proportional to Cook's distances.

```
> library(car)
> x=scan(file="DaneX.txt")
Read 30 items
> y=scan(file="DaneY.txt")
Read 30 items
> plot (y~x)
>
> ds3=data.frame(x=x,y=y)
> m.lm=lm(y~x,data=ds3)
> summary(m.lm)

> layout(1)
> plot(x~y)
> lines(lowess(y,x))
```

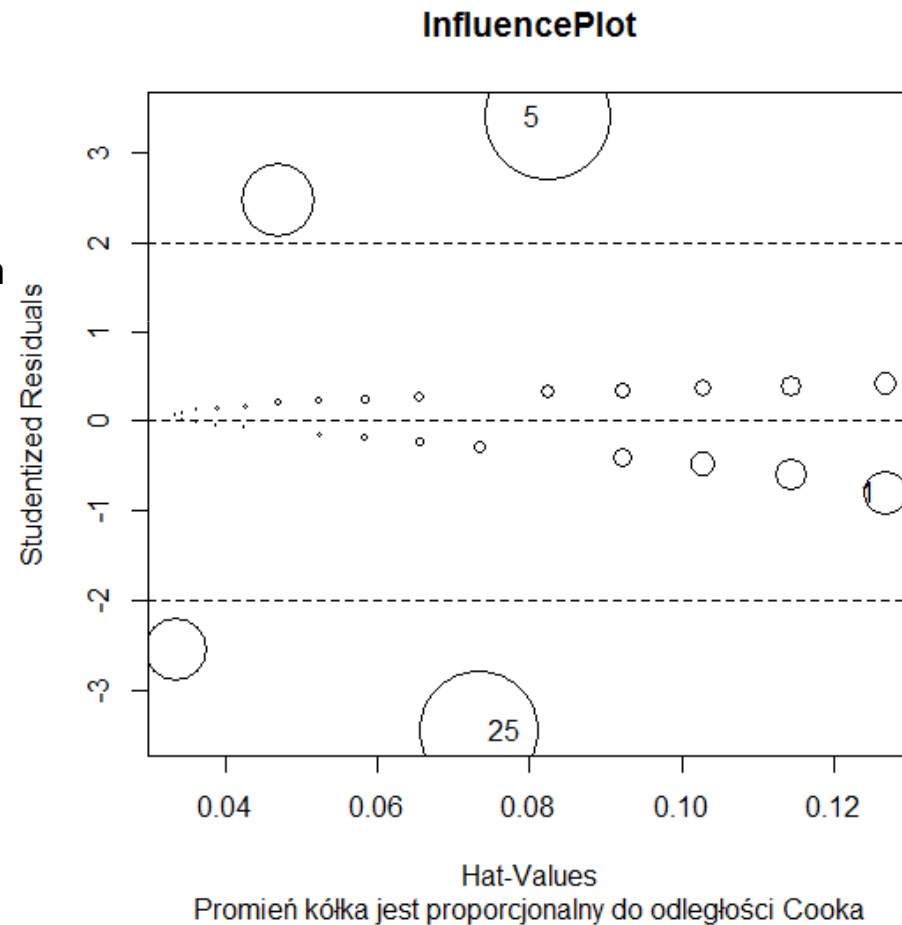


2. Funkcja 'influencePlot' - Zastosowanie

```
> library(car)
> influencePlot(lm(y~x), main="InfluencePlot", sub="Promień kółka jest proporcjonalny do odległości Cooka")
```

	StudRes	Hat	CookD
1	-0.7891457	0.12688172	0.2141661
5	3.3829023	0.08238784	0.6117036
25	-3.4400661	0.07348906	0.5817153

- **Odległość Cooka** - jest to miara stopnia zmiany współczynników regresji, gdyby dany przypadek pominąć w obliczeniach współczynników.
- Przyjmuje ona duże wartości dla obserwacji obarczonych błędami grubymi.



3. Funkcja 'outlierTest'

Opis:

- Reports the Bonferroni p-values for Studentized residuals in linear and generalized linear models, based on a t-test for linear models and normal-distribution test for generalized linear models.

Usage

```
outlierTest(model, ...)  
  
## S3 method for class 'lm':  
outlierTest((model, cutoff=0.05, n.max=10, order=TRUE,  
            labels=names(rstudent), ...))  
  
## S3 method for class 'outlierTest':  
print((x, digits=5, ...))
```

```
> outlierTest(m.lm)
```

```
No Studentized residuals with Bonferonni p < 0.05  
Largest |rstudent|:  
      rstudent unadjusted p-value Bonferonni p  
25 -3.44066          0.001905      0.057149
```

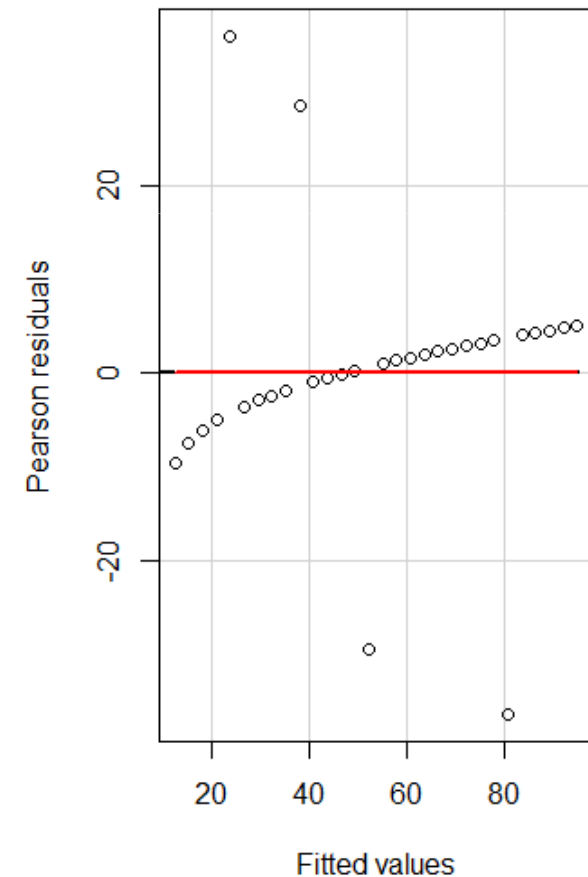
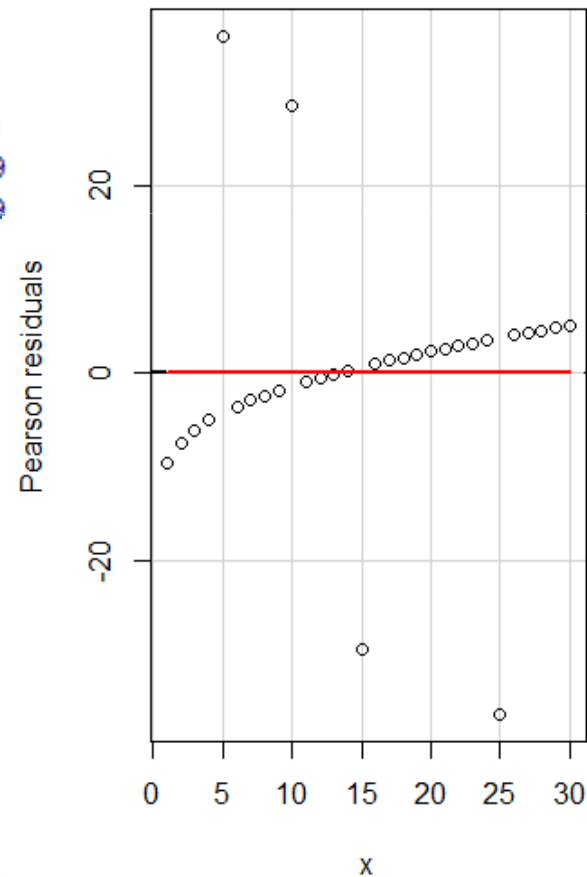


Opis:

4. Funkcja 'residualPlots'

- Plots the residuals versus each term in a mean function and versus fitted values. Also computes a curvature test for each of the plots by adding a quadratic term and testing the quadratic to be zero. This is Tukey's test for nonadditivity when plotting against fitted values.

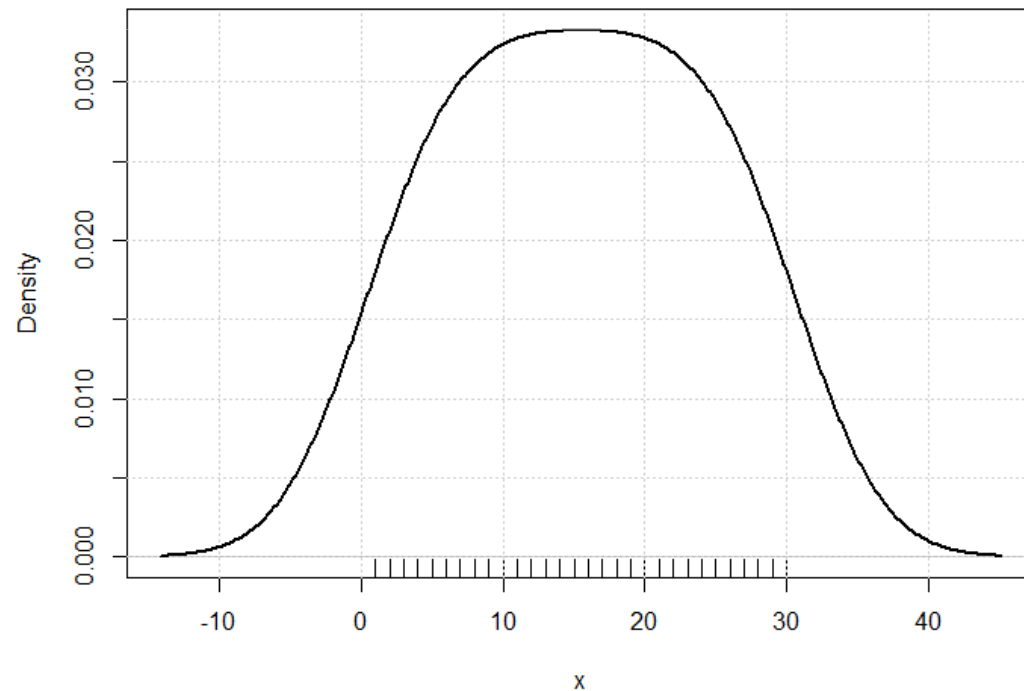
```
> residualPlots(m.lm)
      Test stat Pr(>|t|)
x          0.014  0.989
Tukey test  0.014  0.989
```



5. Funkcja 'densityPlot'

- constructs and graphs nonparametric density estimates, possibly conditioned on a factor. It is a wrapper for the standard R **density** function.
- Zbiór X obejmuje liczby całkowite z przedziału $\langle 1;30 \rangle$

```
> densityPlot(x)
```



5. Funkcja 'densityPlot'

Opis:

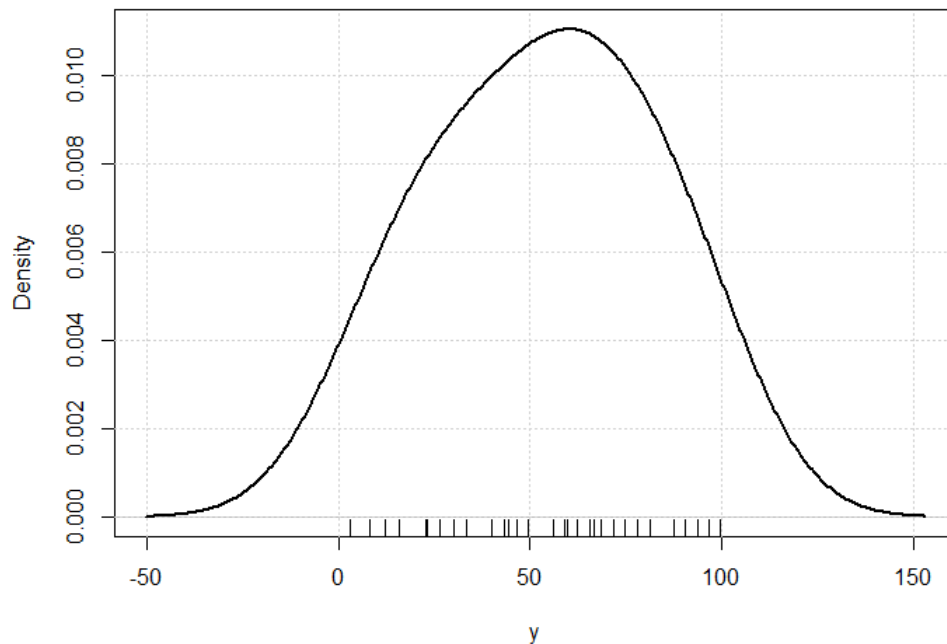
- constructs and graphs nonparametric density estimates, possibly conditioned on a factor. It is a wrapper for the standard R **density** function.

- Wybrana funkcja $y = f(x)$:

$$y = 3 \cdot x + \log_2(x^2)$$

```
> densityPlot(y)
```

- Dodatkowo funkcja została zaburzona celowo dla 4 punktów





Dziękuję za uwagę