

Prediction (and intervals)

Your Name

2016-05-18

```
> setwd("C:/Users/parlar/Documents/1R/1ZLC/S2/1.Sales.vs.Advert")
```

```
> Dataset <-  
+ read.table("C:/Users/parlar/Documents/1R/1ZLC/S2/1.Sales.vs.Advert/Table3  
+ header=TRUE, sep=",", na.strings="NA", dec=".", strip.white=TRUE)
```

```
> summary(Dataset)
```

SALES	ADVT
Min. : 88.5	Min. : 8.40
1st Qu.: 121.3	1st Qu.: 9.40
Median : 128.3	Median : 10.10
Mean : 128.3	Mean : 10.16
3rd Qu.: 137.0	3rd Qu.: 11.20
Max. : 159.3	Max. : 11.90

```
> RegModel.1 <- lm(SALES~ADVT, data=Dataset)  
> summary(RegModel.1)
```

```

Call:
lm(formula = SALES ~ ADVT, data = Dataset)

Residuals:
    Min       1Q   Median       3Q      Max
-31.0945  -9.9708   0.4255   9.6146  21.7419

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   51.849     27.990   1.852   0.0768 .
ADVT           7.527      2.741   2.746   0.0115 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 14.51 on 23 degrees of freedom
Multiple R-squared:  0.2469,    Adjusted R-squared:  0.2142
F-statistic: 7.54 on 1 and 23 DF,  p-value: 0.01151

```

```
> confint(RegModel.1)
```

```

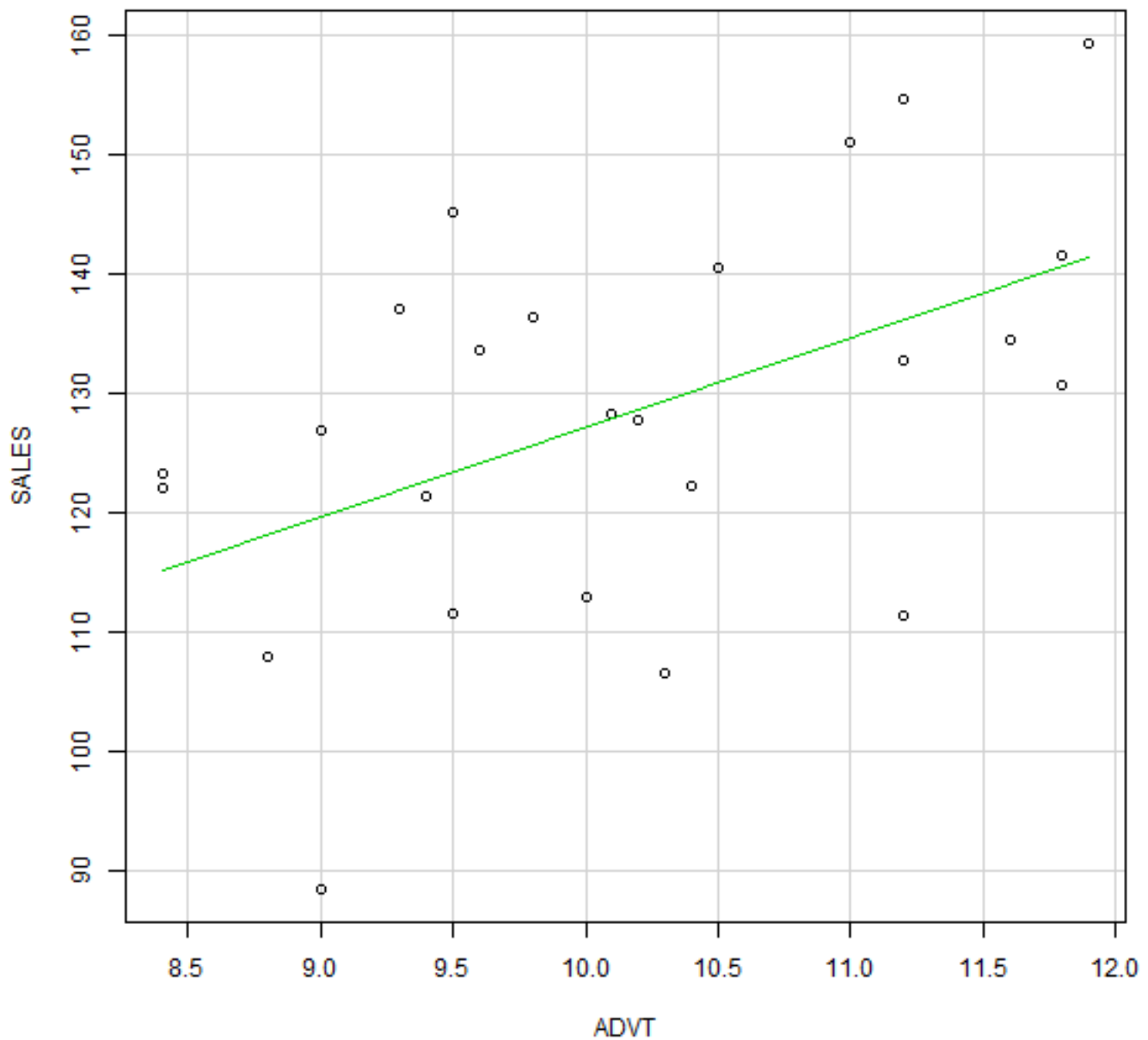
                2.5 %    97.5 %
(Intercept) -6.053463 109.75195
ADVT         1.856648  13.19785

```

```

> scatterplot(SALES~ADVT, reg.line=lm, smooth=FALSE, spread=FALSE,
+   boxplots=FALSE, span=0.5, ellipse=FALSE, levels=c(.5, .9), data=Dataset)

```



```
> library(MASS, pos=14)
> library(HistData, pos=14)
> library(lattice, pos=14)
> library(survival, pos=14)
> library(Formula, pos=14)
> library(ggplot2, pos=14)
> library(Hmisc, pos=14)
> library(UsingR, pos=14)
```

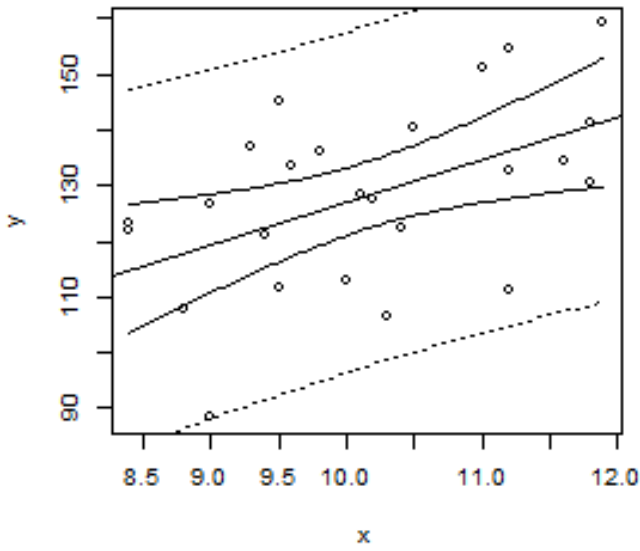


```
> simple.lm(Dataset$ADVT, Dataset$SALES, show.residuals=TRUE, show.ci=TRUE, pred=
```

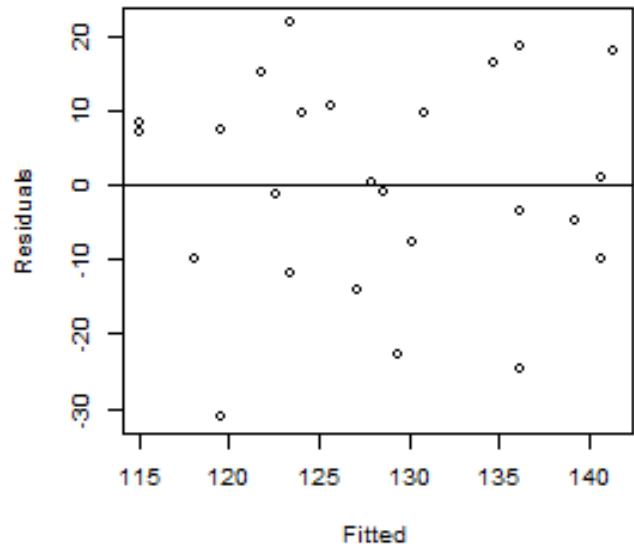


Warning in if (pred) {: the condition has length > 1 and only the first element will be used

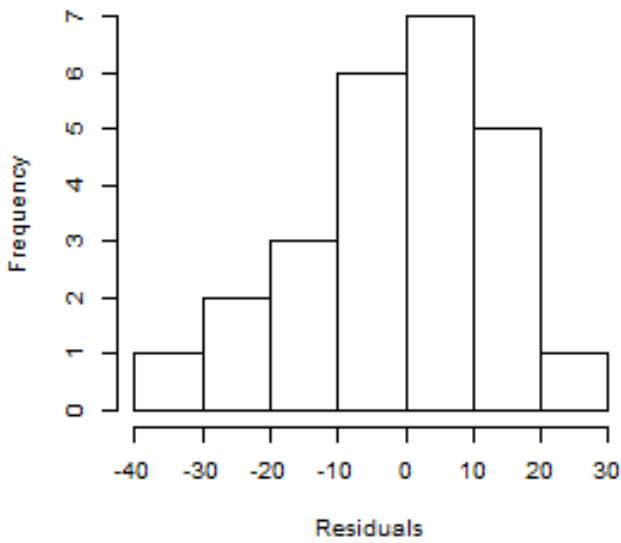
$$y = 7.53x + 51.85$$



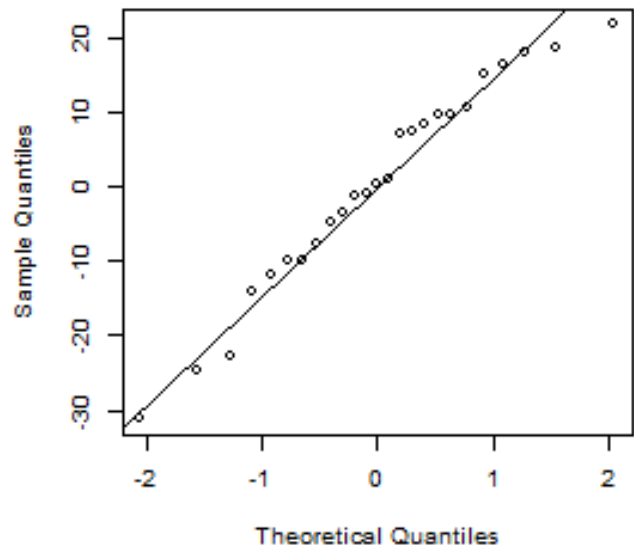
Residuals vs. fitted



hist of residuals



normal plot of residuals



1	2	3
142.1762	149.7035	164.7580

```
Call:
lm(formula = y ~ x)
```

```
Coefficients:
(Intercept)          x
   51.849         7.527
```

```
> newPoint <- data.frame(ADVT=10.25); newPoint
```

```
  ADVT
1 10.25
```

```
> predict(RegModel.1,newPoint,interval="prediction")
```

```
      fit      lwr      upr
1 129.0036 98.38688 159.6202
```

```
> newData <- data.frame(ADVT=seq(8,13,0.5)); newData
```

```
  ADVT
1  8.0
2  8.5
3  9.0
4  9.5
5 10.0
6 10.5
7 11.0
8 11.5
9 12.0
10 12.5
11 13.0
```

```
> predict(RegModel.1,newData,interval="prediction")
```

	fit	lwr	upr
1	112.0672	79.10412	145.0304
2	115.8309	83.81090	147.8509
3	119.5945	88.28846	150.9005
4	123.3581	92.52089	154.1954
5	127.1217	96.49693	157.7466
6	130.8854	100.21124	161.5595
7	134.6490	103.66509	165.6329
8	138.4126	106.86613	169.9591
9	142.1762	109.82756	174.5249
10	145.9399	112.56666	179.3131
11	149.7035	115.10316	184.3038

```
> predict(RegModel.1, newData, interval="confidence")
```

	fit	lwr	upr
1	112.0672	98.44694	125.6876
2	115.8309	104.68529	126.9765
3	119.5945	110.70557	128.4834
4	123.3581	116.29555	130.4207
5	127.1217	121.05341	133.1901
6	130.8854	124.57290	137.1979
7	134.6490	126.97125	142.3268
8	138.4126	128.71076	148.1145
9	142.1762	130.11878	154.2337
10	145.9399	131.35507	160.5247
11	149.7035	132.49511	166.9119