

```
# Math 3080 - 1   Treibergs Feb. 17, 2010
#
# from Walpole, Myers, Myers, Ye
# Probability & Statistics for Engineers and Scientists 7th ed p397
#
# A study at VPI analyzed woodchucks at the Department of Veterinary
# medicine. The variables
# x = heart weight (grams)
# y = body weight (grams)
#
"y" "x"
4.050000000e+003 1.120000000e+001
2.465000000e+003 1.240000000e+001
3.120000000e+003 1.050000000e+001
5.700000000e+003 1.320000000e+001
2.595000000e+003 9.800000000e+000
3.640000000e+003 1.100000000e+001
2.050000000e+003 1.080000000e+001
4.235000000e+003 1.040000000e+001
2.935000000e+003 1.220000000e+001
4.975000000e+003 1.120000000e+001
3.690000000e+003 1.080000000e+001
2.800000000e+003 1.420000000e+001
2.775000000e+003 1.220000000e+001
2.170000000e+003 1.000000000e+001
2.370000000e+003 1.230000000e+001
2.055000000e+003 1.250000000e+001
2.025000000e+003 1.180000000e+001
2.645000000e+003 1.600000000e+001
2.675000000e+003 1.380000000e+001
```

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```

> wd <- read.table("M3081DataWoodchuck.txt", header=TRUE)
> wd
      y      x
1 4050 11.2
2 2465 12.4
3 3120 10.5
4 5700 13.2
5 2595  9.8
6 3640 11.0
7 2050 10.8
8 4235 10.4
9 2935 12.2
10 4975 11.2
11 3690 10.8
12 2800 14.2
13 2775 12.2
14 2170 10.0
15 2370 12.3
16 2055 12.5
17 2025 11.8
18 2645 16.0
19 2675 13.8

```

```

> attach(wd)
> f <- lm(y ~ x); summary(f); anova(f)

```

```

Call:
lm(formula = y ~ x)

```

```

Residuals:
    Min       1Q   Median       3Q      Max
-1106.2  -665.4  -265.1   513.5  2657.3

```

```

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) 3667.40    1897.98   1.932  0.0702 .
x           -47.33     158.05  -0.299  0.7682
---

```

```

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

```

```

Residual standard error: 1058 on 17 degrees of freedom
Multiple R-squared:  0.005248, Adjusted R-squared: -0.05327
F-statistic: 0.08968 on 1 and 17 DF,  p-value: 0.7682

```

#### Analysis of Variance Table

```

Response: y
      Df  Sum Sq Mean Sq F value Pr(>F)
x       1  100349   100349  0.0897 0.7682
Residuals 17 19022544  1118973

```

```
> plot(y~x); abline(f)
```

```
> cor.test(x,y)
```

Pearson's product-moment correlation

data: x and y

t = -0.2995, df = 17, p-value = 0.7682

alternative hypothesis: true correlation is not equal to 0

95 percent confidence interval:

-0.5098730 0.3947579

sample estimates:

cor

-0.07244006

```
> cor.test(x,y,alternative="less")
```

Pearson's product-moment correlation

data: x and y

t = -0.2995, df = 17, p-value = 0.3841

alternative hypothesis: true correlation is less than 0

95 percent confidence interval:

-1.0000000 0.3262683

sample estimates:

cor

-0.07244006

```
> cor.test(x,y,alternative="less", conf.level=.90)
```

Pearson's product-moment correlation

data: x and y

t = -0.2995, df = 17, p-value = 0.3841

alternative hypothesis: true correlation is less than 0

90 percent confidence interval:

-1.0000000 0.242869

sample estimates:

cor

-0.07244006

```
> e <- residuals(f)
```

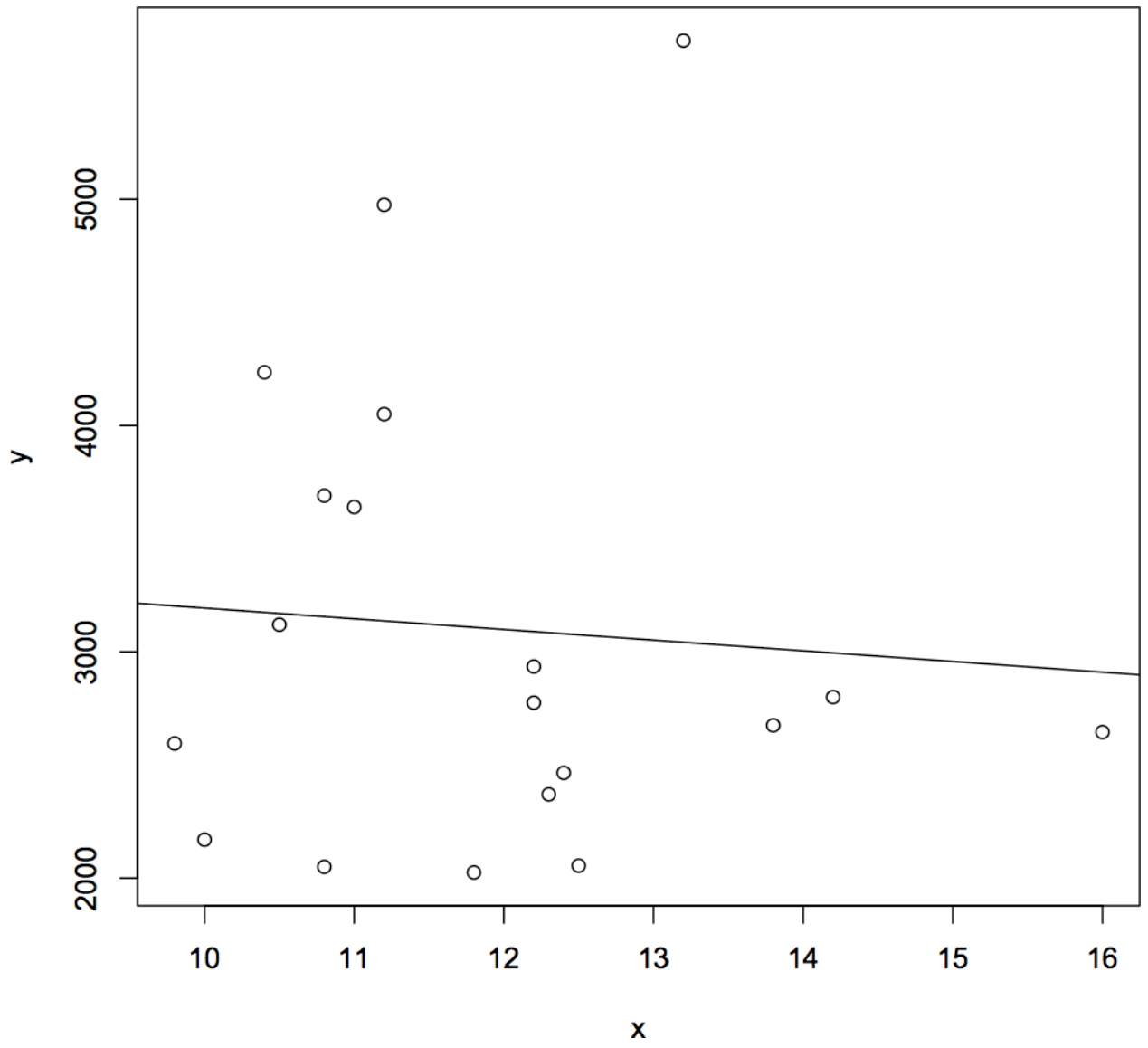
```
> qqnorm(e,ylab="Residual Quantiles"); qqline(e)
```

```
> shapiro.test(e)
```

Shapiro-Wilk normality test

data: e

W = 0.883, p-value = 0.02418



Normal Q-Q Plot

