

36401_HW5

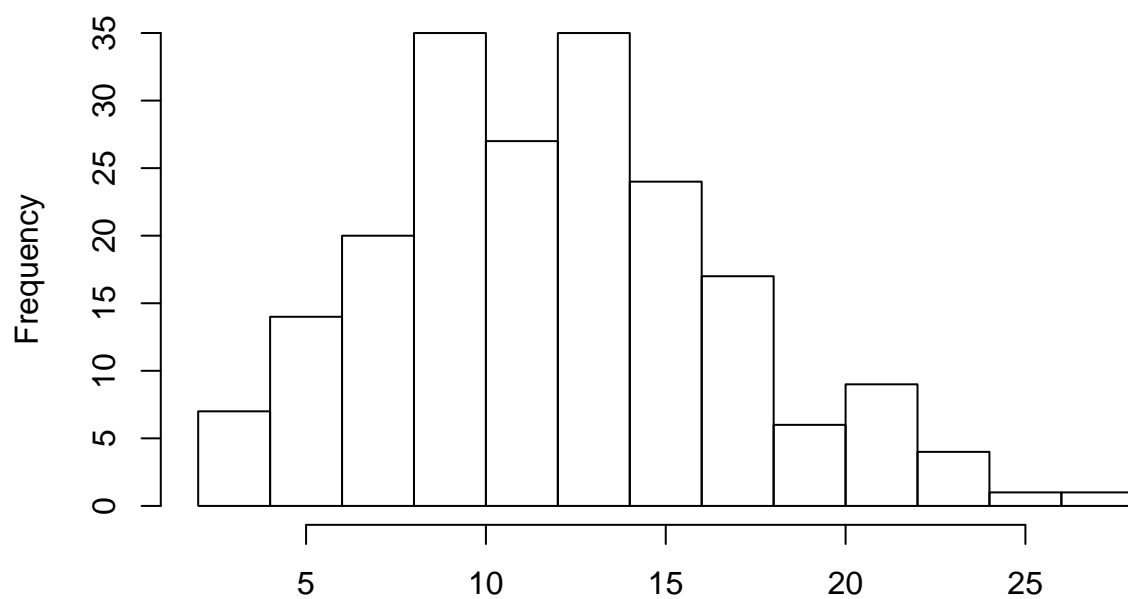
Sylvia

10/8/2019

```
Homicide <- read.table("Homicide_sample.txt", header = TRUE)
```

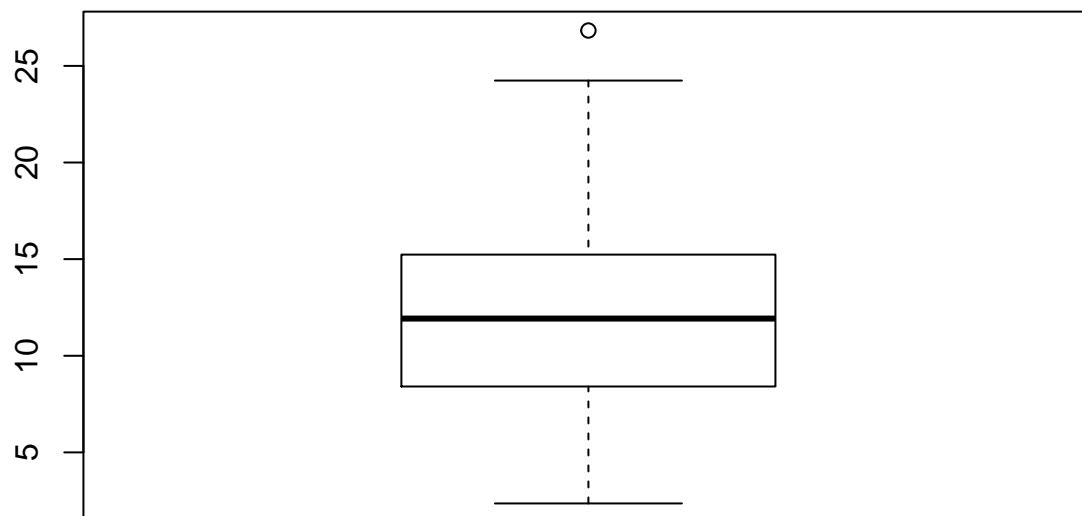
```
hist(Homicide$family.pov)
```

Histogram of Homicide\$family.pov



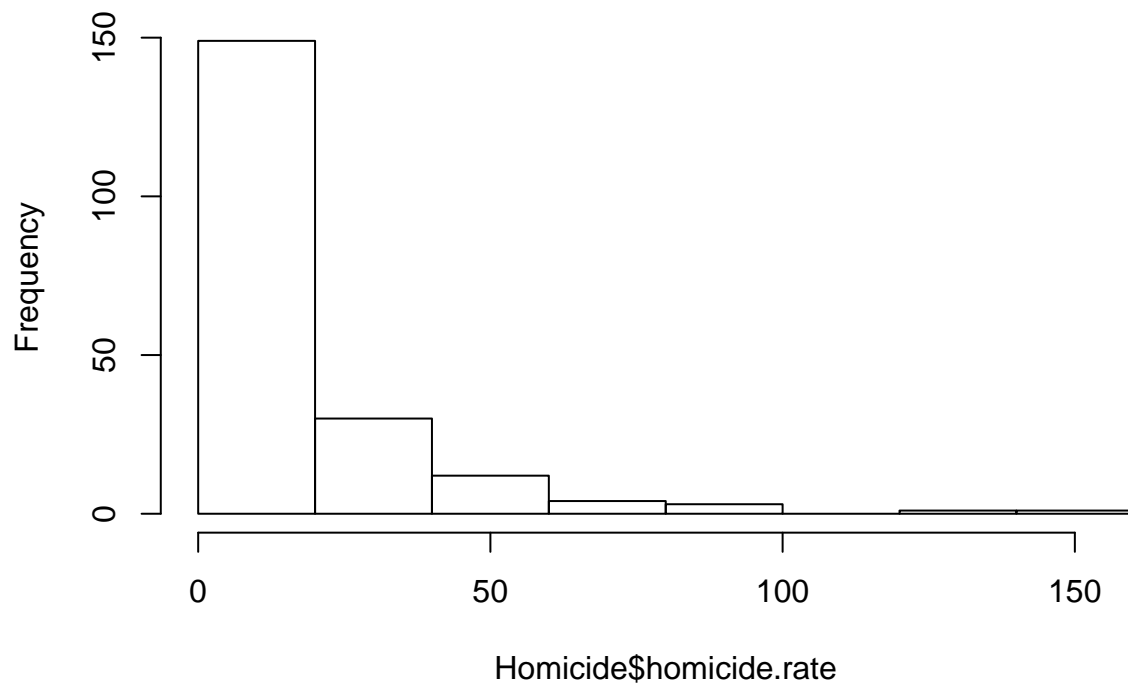
Homicide\$family.pov

```
boxplot(Homicide$family.pov)
```

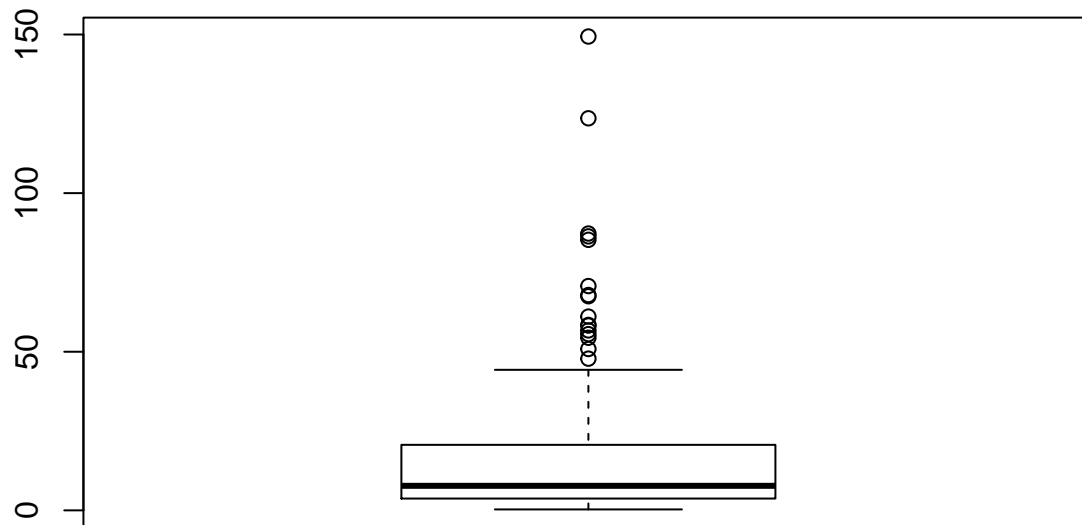


```
hist(Homicide$homicide.rate)
```

Histogram of Homicide\$homicide.rate

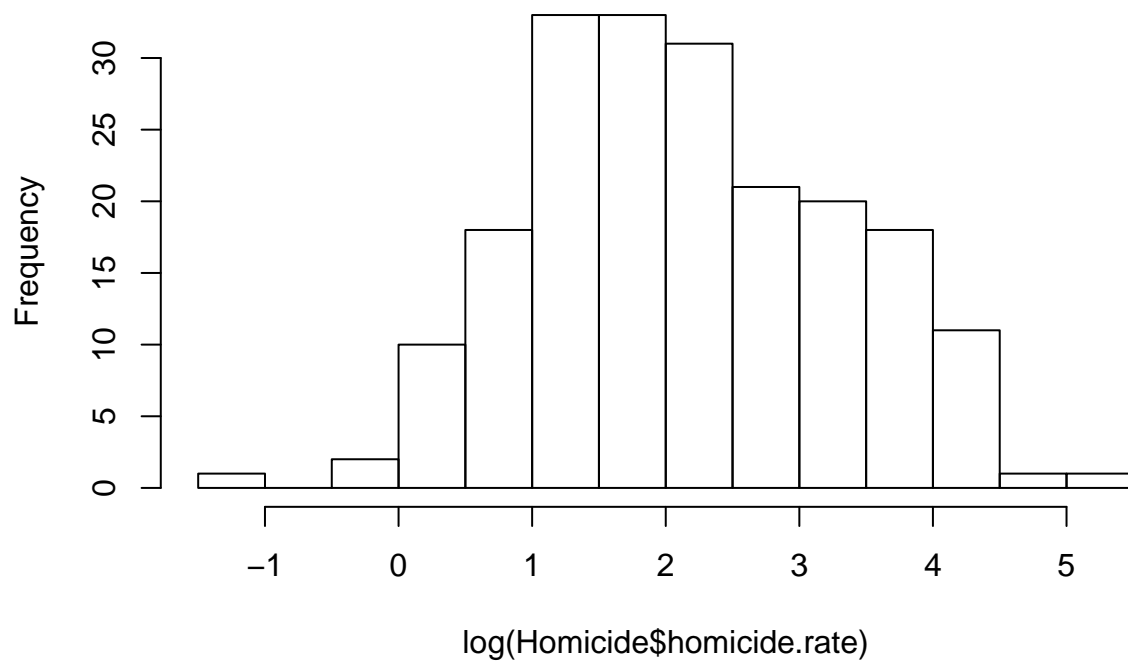


```
boxplot(Homicide$homicide.rate)
```

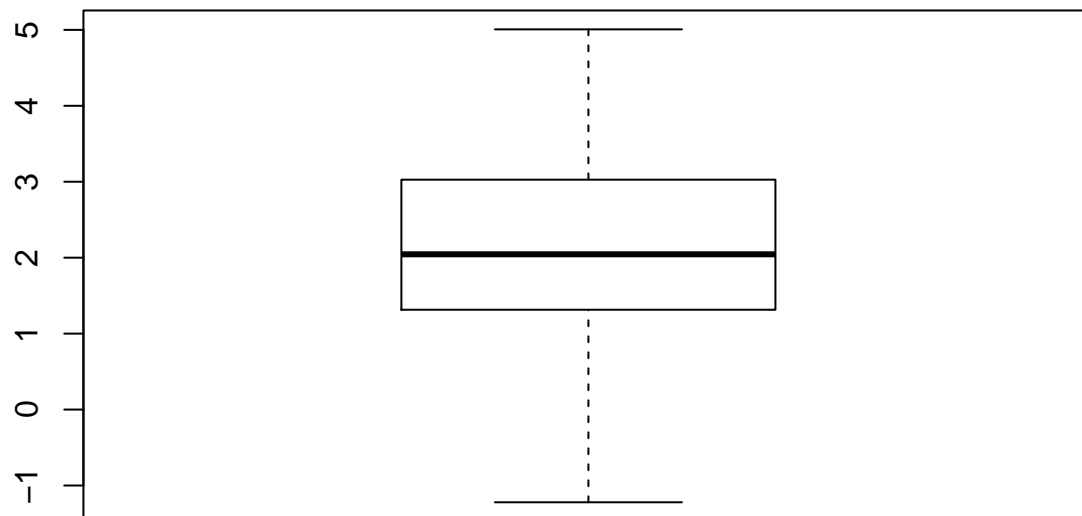


```
hist(log(Homicide$homicide.rate))
```

Histogram of $\log(\text{Homicide}\$homicide.rate)$



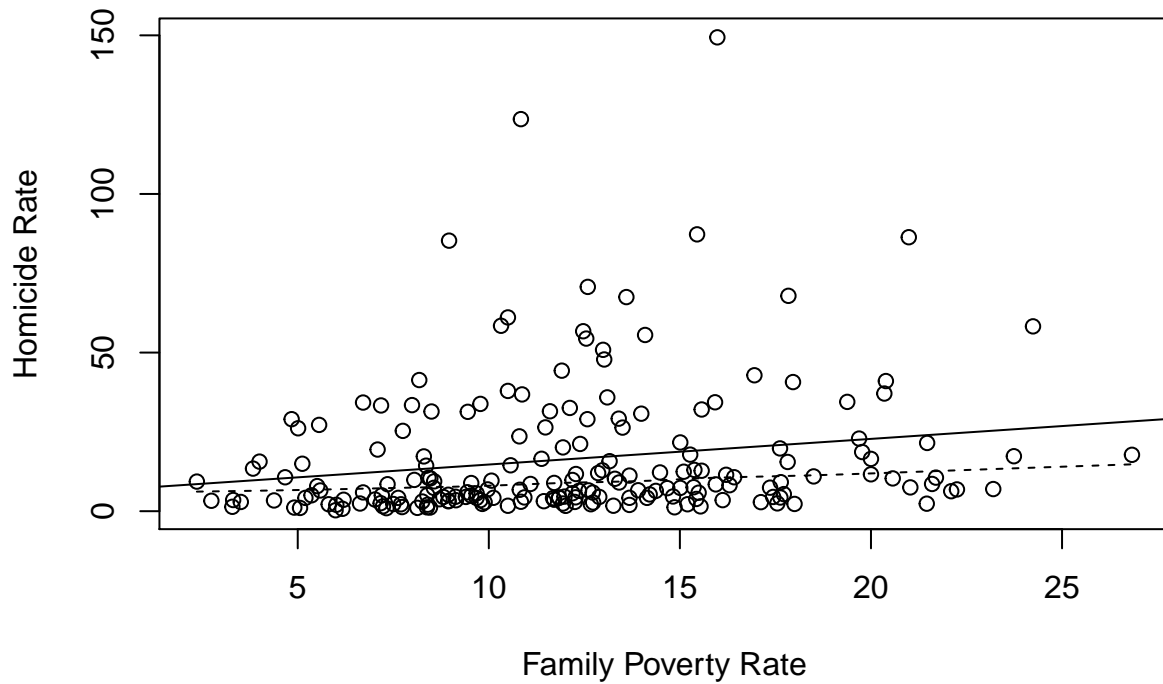
```
boxplot(log(Homicide$homicide.rate))
```



#Original

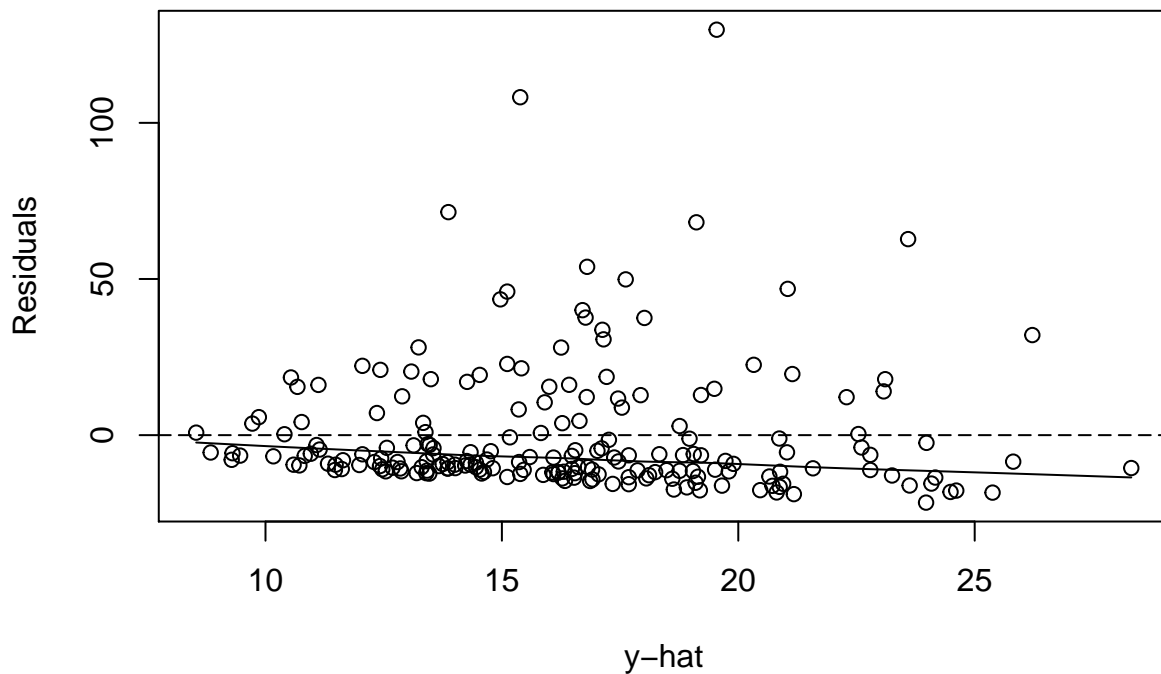
```
plot(Homicide$homicide.rate~Homicide$family.pov, main = "Loess plot: Family Poverty Rate vs Homicide Rate",  
lines(lowess(Homicide$homicide.rate~Homicide$family.pov, f = 8/10), lty = 2)  
abline(lm(Homicide$homicide.rate~Homicide$family.pov), lty = 1)
```

Loess plot: Family Poverty Rate vs Homicide Rate



```
y.hat1 <- fitted(lm(Homicide$homicide.rate~Homicide$family.pov))
ep.hat1 <- resid(lm(Homicide$homicide.rate~Homicide$family.pov))
plot(y.hat1, ep.hat1, main = "Residual Plot", ylab = "Residuals", xlab = "y-hat")
abline(h=0, lty = 5)
lines(lowess(ep.hat1~y.hat1, f = 8/10, iter = 3), lty = 1)
```

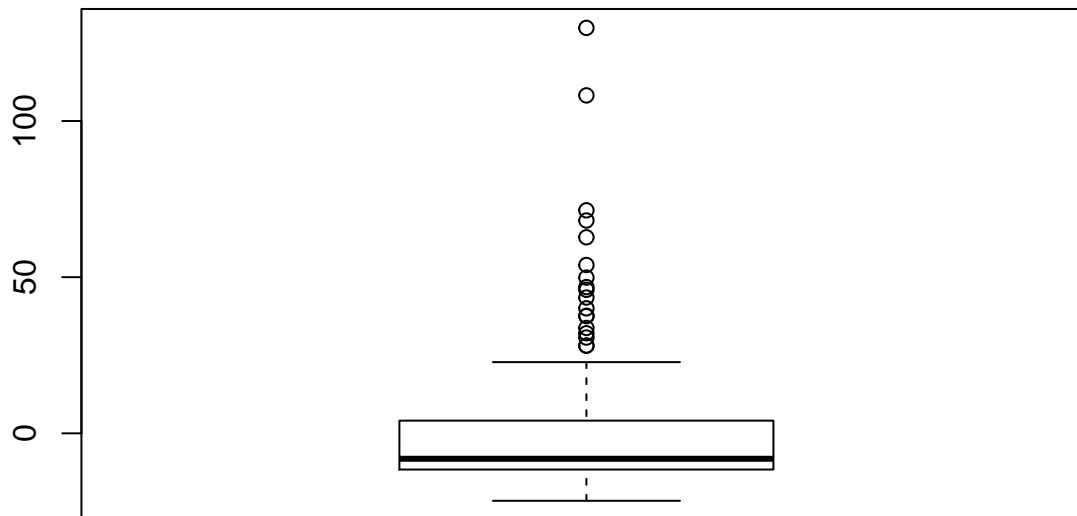
Residual Plot



```
summary(lm(Homicide$homicide.rate~Homicide$family.pov))

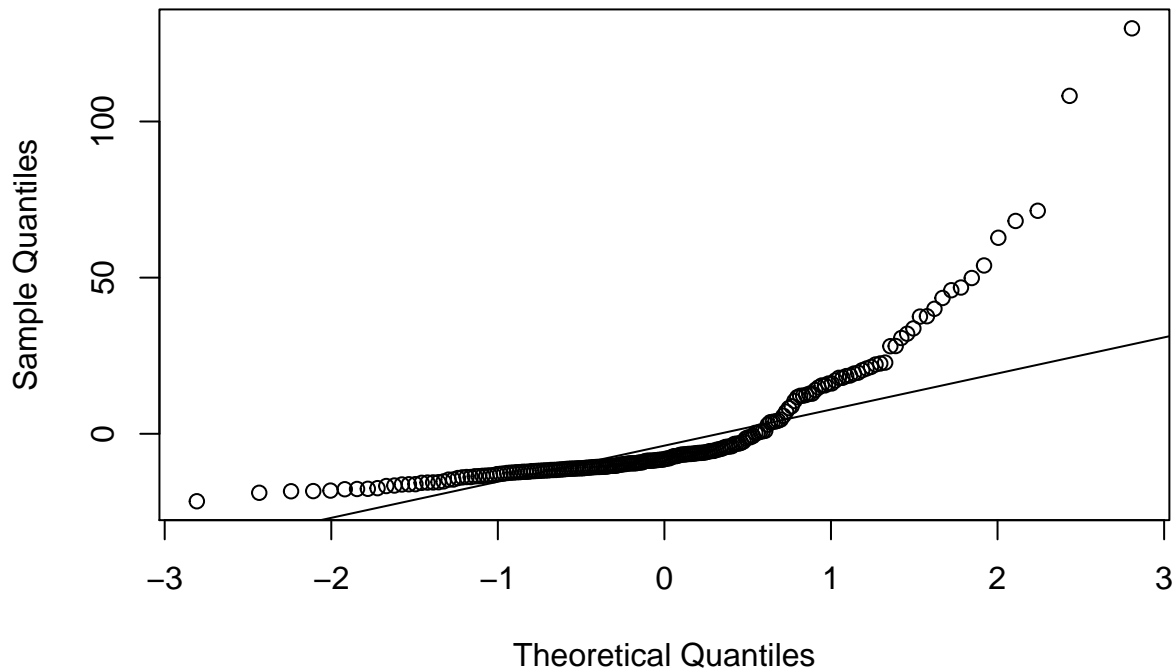
##
## Call:
## lm(formula = Homicide$homicide.rate ~ Homicide$family.pov)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -21.603 -11.593  -8.145   3.997 129.822
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      6.6262     3.9888   1.661  0.09825 .
## Homicide$family.pov  0.8083     0.3071   2.632  0.00915 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 21.09 on 198 degrees of freedom
## Multiple R-squared:  0.03381,    Adjusted R-squared:  0.02893
## F-statistic:  6.93 on 1 and 198 DF,  p-value: 0.009147
boxplot(ep.hat1, main = "Boxplot: Residuals")
```

Boxplot: Residuals



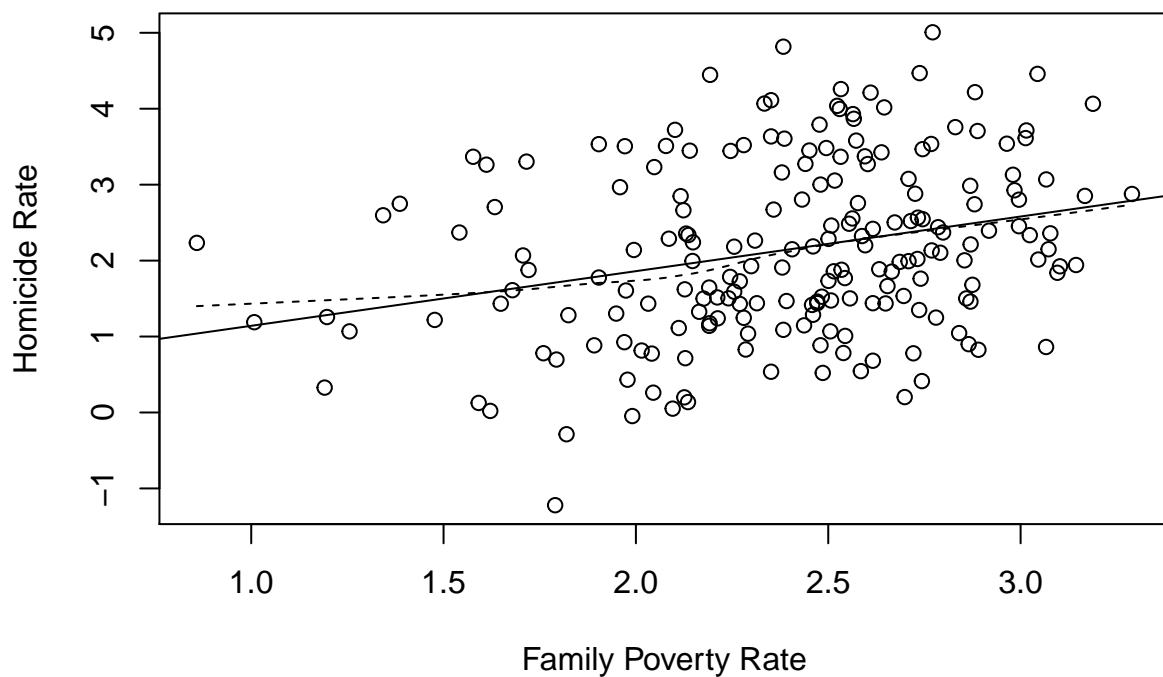
```
qqnorm(ep.hat1, main = "Normal Q-Q plot for residuals")
qqline(ep.hat1)
```

Nomral Q–Q plot for residuals



```
#log both
plot(log(Homicide$homicide.rate)~log(Homicide$family.pov), main = "Loess plot: Family Poverty Rate vs Homicide Rate",
lines(lowess(log(Homicide$homicide.rate)~log(Homicide$family.pov), f = 8/10), lty = 2)
abline(lm(log(Homicide$homicide.rate)~log(Homicide$family.pov)), lty = 1)
```

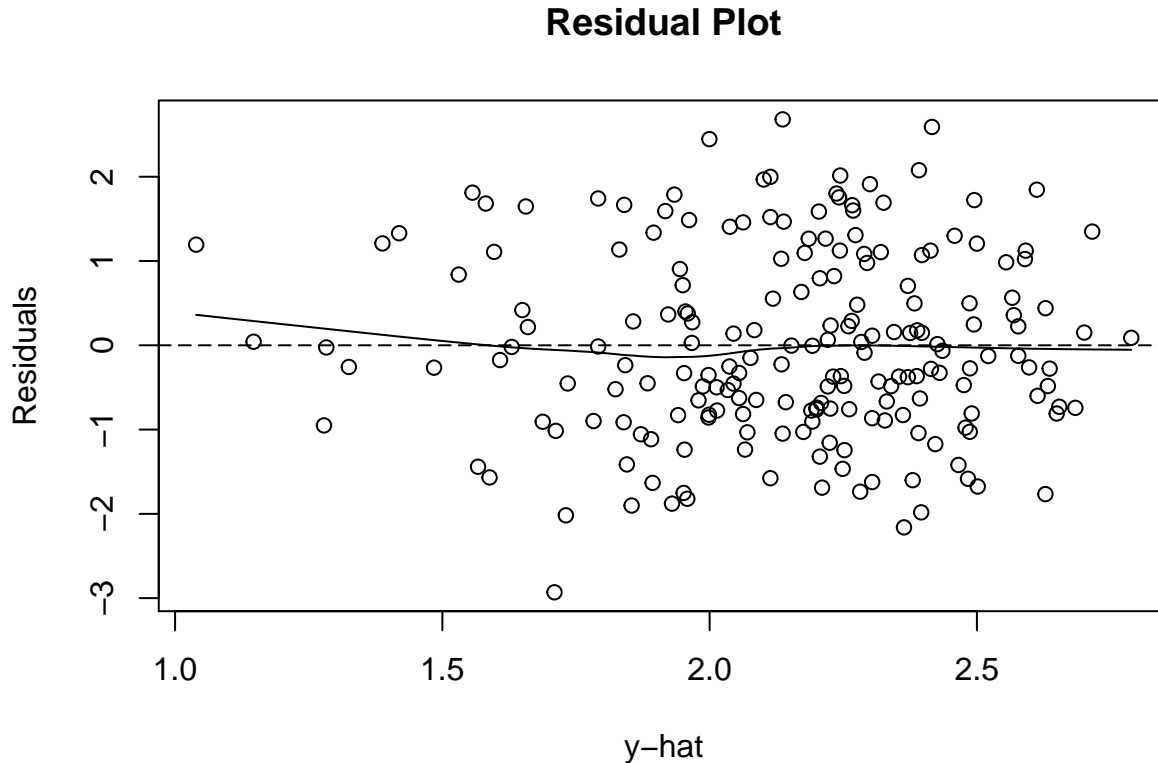
Loess plot: Family Poverty Rate vs Homicide Rate



```

y.hat2 <- fitted(lm(log(Homicide$homicide.rate)~log(Homicide$family.pov)))
ep.hat2 <- resid(lm(log(Homicide$homicide.rate)~log(Homicide$family.pov)))
plot(y.hat2, ep.hat2, main = "Residual Plot", ylab = "Residuals", xlab = "y-hat")
abline(h=0, lty = 5)
lines(lowess(ep.hat2~y.hat2, f = 8/10, iter = 3), lty = 1)

```



```
summary(lm(log(Homicide$homicide.rate)~log(Homicide$family.pov)))
```

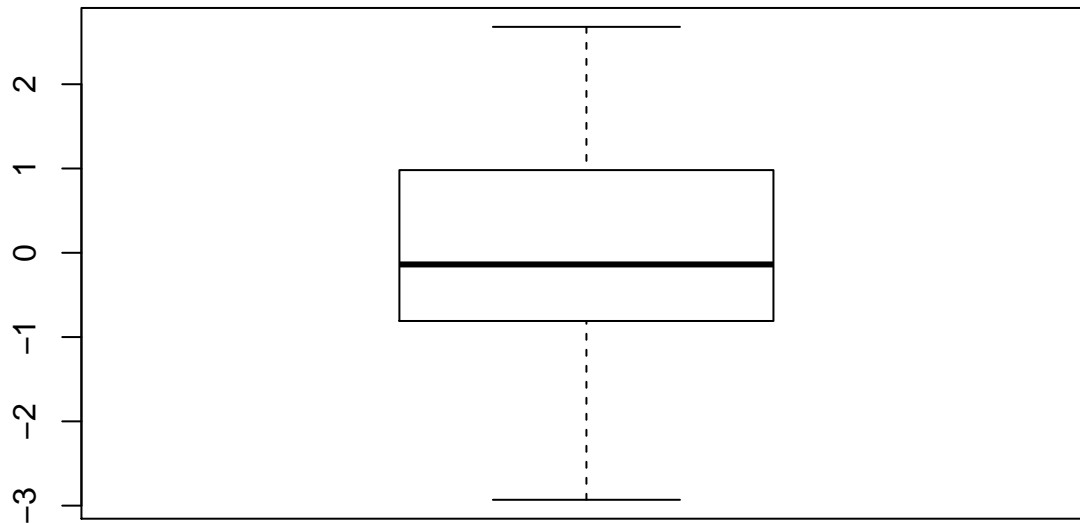
```

##
## Call:
## lm(formula = log(Homicide$homicide.rate) ~ log(Homicide$family.pov))
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -2.9305 -0.8088 -0.1384  0.9790  2.6804
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.4215     0.4261   0.989   0.324
## log(Homicide$family.pov)  0.7196     0.1747   4.120 5.57e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.113 on 198 degrees of freedom
## Multiple R-squared:  0.07895,    Adjusted R-squared:  0.07429
## F-statistic: 16.97 on 1 and 198 DF,  p-value: 5.575e-05

```

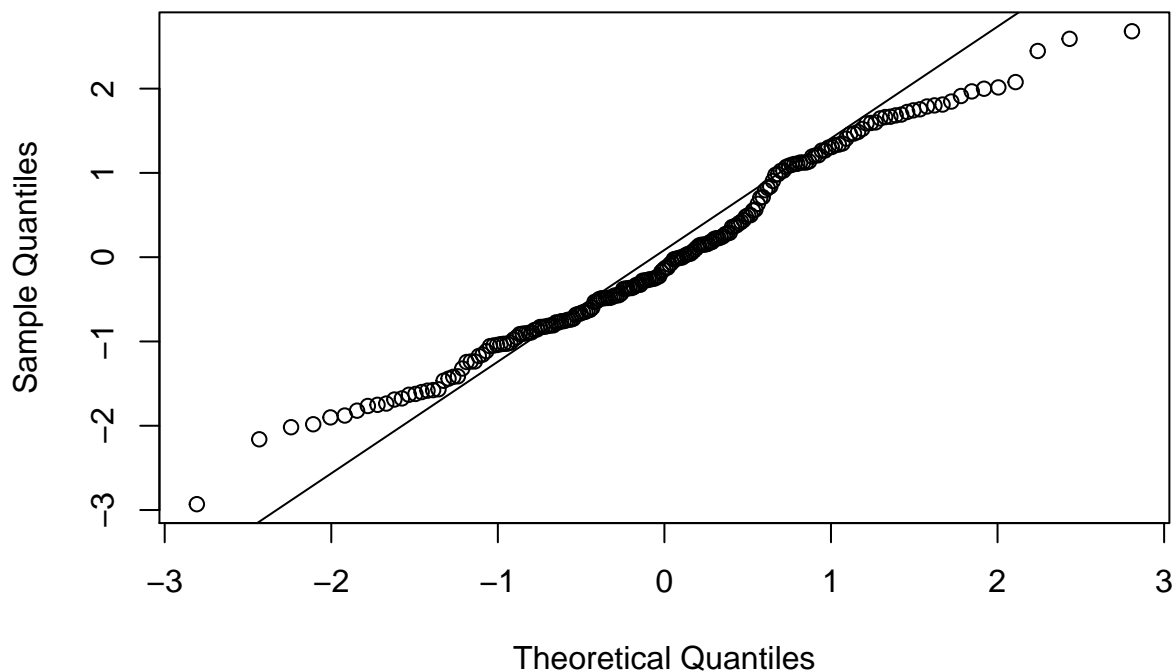
```
boxplot(ep.hat2, main = "Boxplot: Residuals")
```

Boxplot: Residuals



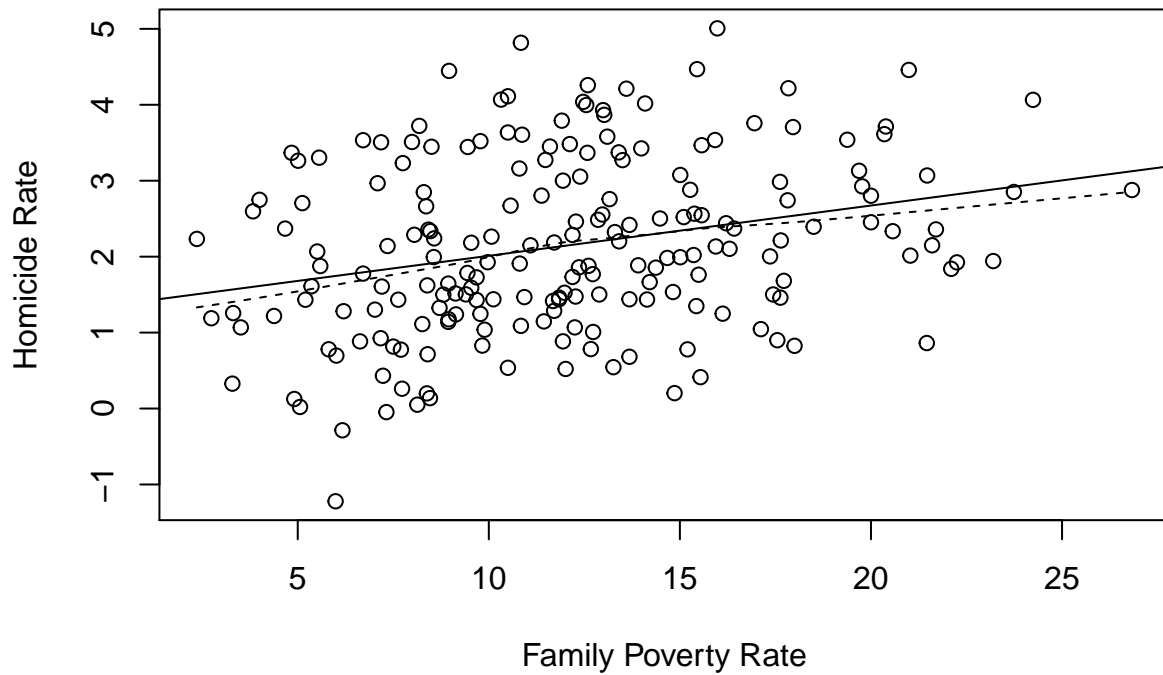
```
qqnorm(ep.hat2, main = "Nomral Q-Q plot for residuals")
qqline(ep.hat2)
```

Nomral Q-Q plot for residuals



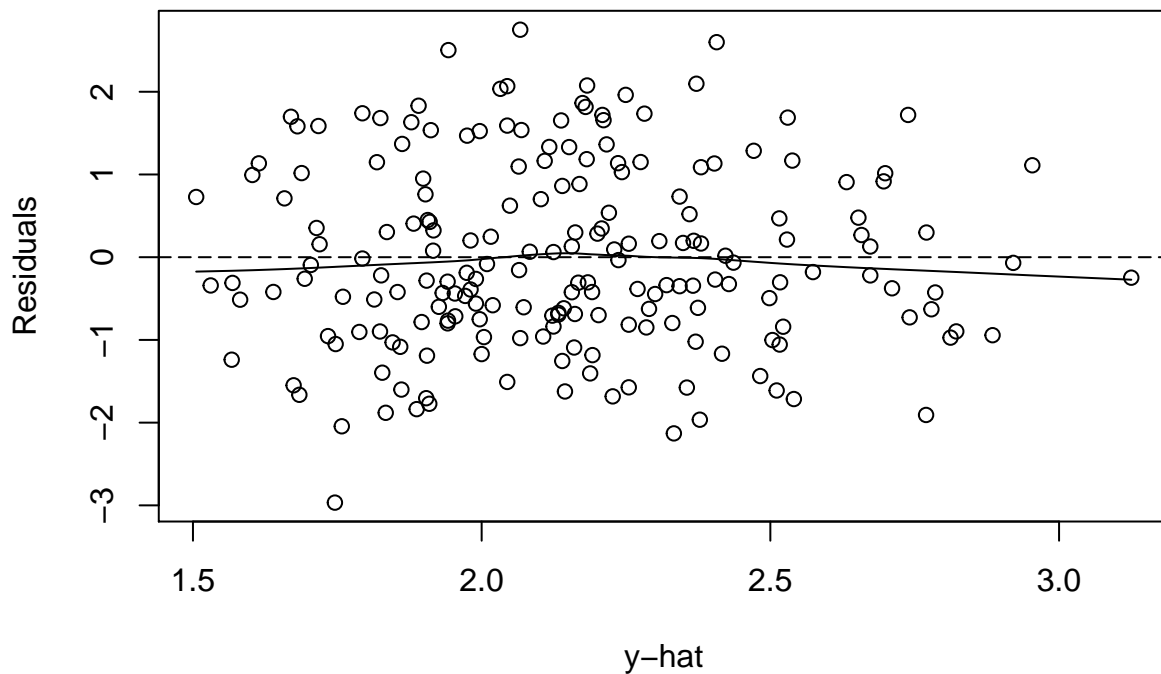
```
plot(log(Homicide$homicide.rate)~Homicide$family.pov, main = "Loess plot: Family Poverty Rate vs Homicide Rate",
lines(lowess(log(Homicide$homicide.rate)~Homicide$family.pov, f = 8/10), lty = 2)
abline(lm(log(Homicide$homicide.rate)~Homicide$family.pov), lty = 1)
```


Loess plot: Family Poverty Rate vs Homicide Rate



```
y.hat3 <- fitted(lm(log(Homicide$homicide.rate)~Homicide$family.pov))
ep.hat3 <- resid(lm(log(Homicide$homicide.rate)~Homicide$family.pov))
plot(y.hat3, ep.hat3, main = "Residual Plot", ylab = "Residuals", xlab = "y-hat")
abline(h=0, lty = 5)
lines(lowess(ep.hat3~y.hat3, f = 8/10, iter = 3), lty = 1)
```

Residual Plot

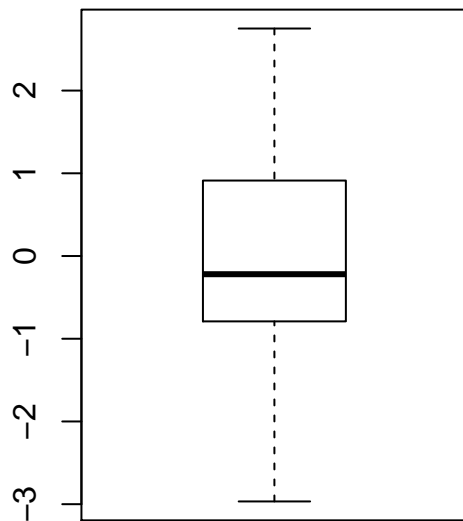


```
summary(lm(log(Homicide$homicide.rate)~Homicide$family.pov))

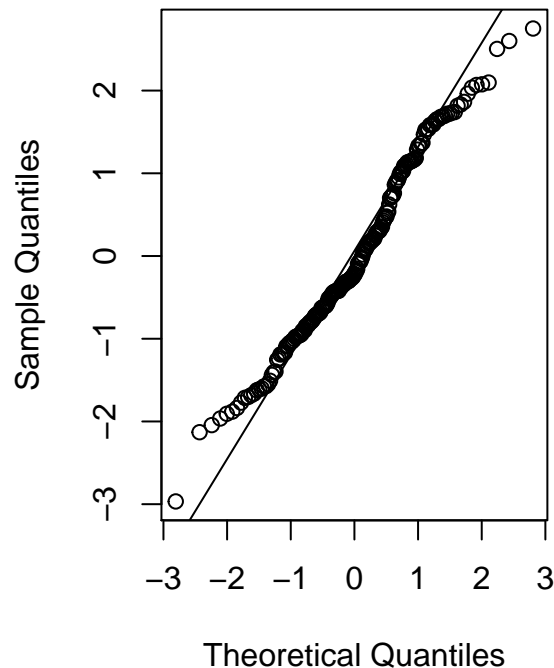
##
## Call:
## lm(formula = log(Homicide$homicide.rate) ~ Homicide$family.pov)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -2.9666 -0.7869 -0.2199  0.9099  2.7501
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      1.34939    0.21059   6.408 1.06e-09 ***
## Homicide$family.pov  0.06618    0.01621   4.083 6.46e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.113 on 198 degrees of freedom
## Multiple R-squared:  0.07765,    Adjusted R-squared:  0.07299
## F-statistic: 16.67 on 1 and 198 DF,  p-value: 6.457e-05

par(mfrow = c(1,2))
boxplot(ep.hat3, main = "Boxplot: Residuals")
qqnorm(ep.hat3, main = "Nomral Q-Q plot for residuals")
qqline(ep.hat3)
```

Boxplot: Residuals



Nomral Q-Q plot for residuals



Including Plots

You can also embed plots, for example:



Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.