HW5 KEY

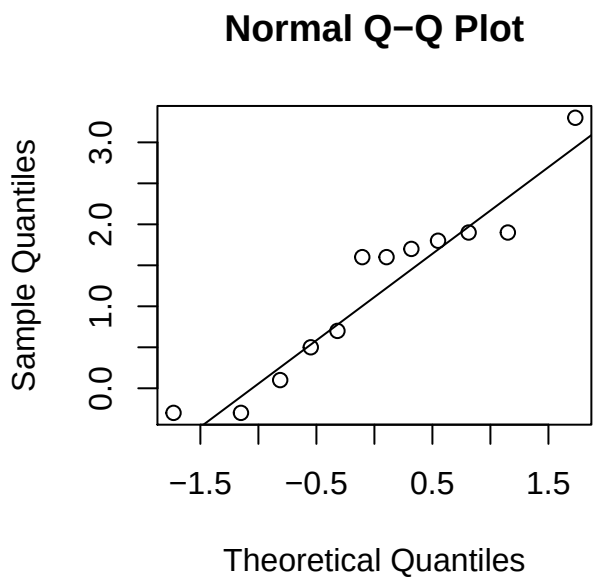
20 points total, 2 points per problem part unless otherwise noted.

Q1 Paired Ozone

```
Ozone <- read.csv("C:/hess/STAT511_FA11/ASCII-comma/CH06/ex6-42.txt", quote=" ' ")
#1B
Ozone$Diffs <- Ozone$After - Ozone$Before
#S-W test Not Required
shapiro.test(Ozone$Diffs)
```

```
##
##  Shapiro-Wilk normality test
##
## data:  Ozone$Diffs
## W = 0.91788, p-value = 0.2689
```

```
qqnorm(Ozone$Diffs);qqline(Ozone$Diffs)
```




```
#1C
TestC <- t.test(Ozone$After, Ozone$Before, paired = TRUE)
#1D
library(coin)
TestD <- wilcoxsign_test(After ~ Before, data = Ozone, distribution = "exact")
```

1A. Before mean = 8.45, sd = 0.516
After mean = 9.658, sd = 0.988

1B. QQplot looks OK (but not great) so assume differences are normally distributed.

1C. **(4pts)**
H0: $\mu_D = 0$ vs HA: $\mu_D \neq 0$
or H0: $\mu_A - \mu_B = 0$ vs HA: $\mu_A - \mu_B \neq 0$
t = 3.8850127
p-value = 0.0025413
Reject H0, conclude that ozone exposure is associated with change in average lung capacity.

1D. p-value = 0.004883, Reject H0.

Q2 Baseball Single Standard Deviation

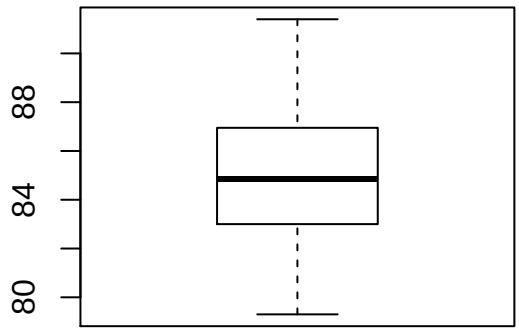
```
BB <- read.csv("C:/hess/STAT511_FA11/ASCII-comma/CH07/exp07-9.txt", quote=" ' ")
mean(BB$coefficient)
```

```
## [1] 84.7975
```

```
s <- sd(BB$coefficient)
s
```

```
## [1] 2.683997
```

```
#2A
boxplot(BB)
```




```
#2B
Test2B <- t.test(BB$coefficient, mu = 85, alternative = "less")
#2C
LB = sqrt ( (39*s^2)/qchisq(0.995,39) )
UB = sqrt ( (39*s^2)/qchisq(0.005,39) )
```

```r
#2D
TS = 39*(s/2)^2
TV = qchisq(0.99, df=39)
```

2A. Boxplot (see above)

2B. One-sided p-value = 0.3179522
Fail to Reject H0.

2C. 99%CI = ((2.071, 3.748))

2D. **(4pts)**
TS = χ^2 = 70.2374375
Reject H0 if $\chi^2 >$ 62.428121
Conclusion: Reject H0 and conclude $\sigma > 2$.