R Notebook

This is an R Markdown Notebook. When you execute code within the notebook, the results appear beneath the code.

Try executing this chunk by clicking the *Run* button within the chunk or by placing your cursor inside it and pressing *Ctrl+Shift+Enter*.

Male Egypt BPL

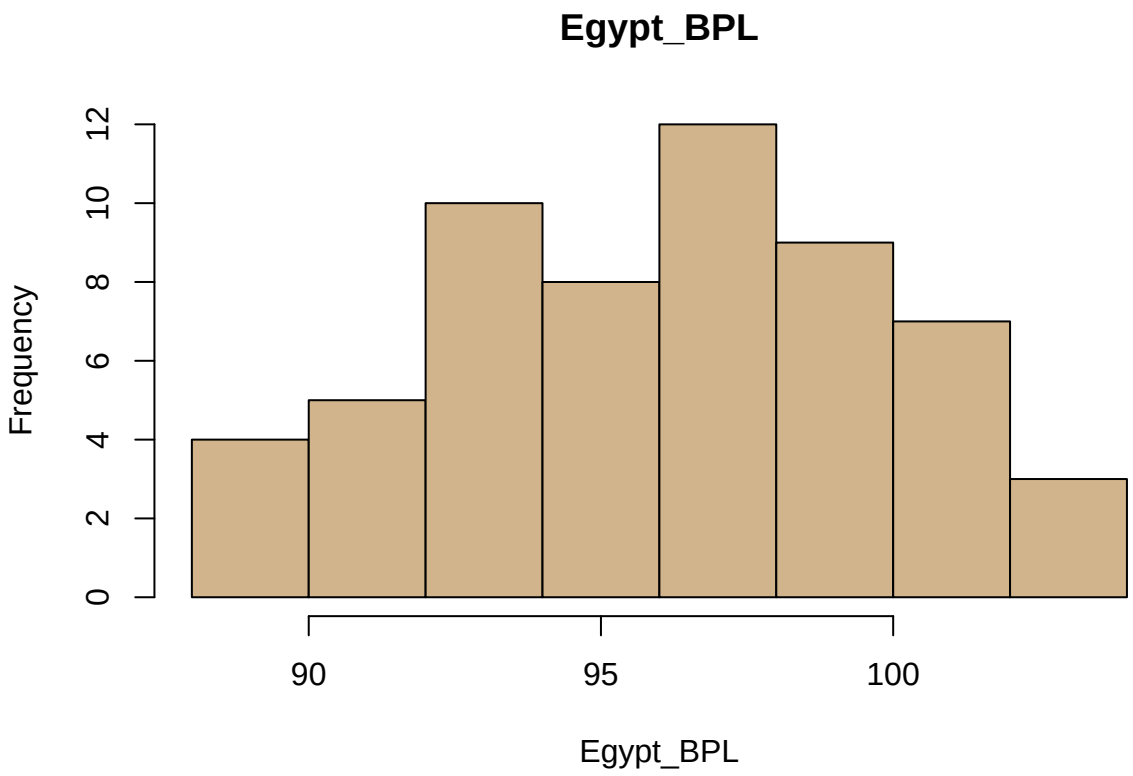
```
Men=read.csv("Project Data.csv")
Egypt_BPL=Men$BPL[Men$Population=="EGYPT"]
summary(Egypt_BPL)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   88.00   94.00   97.00   96.52   99.00  103.00
```

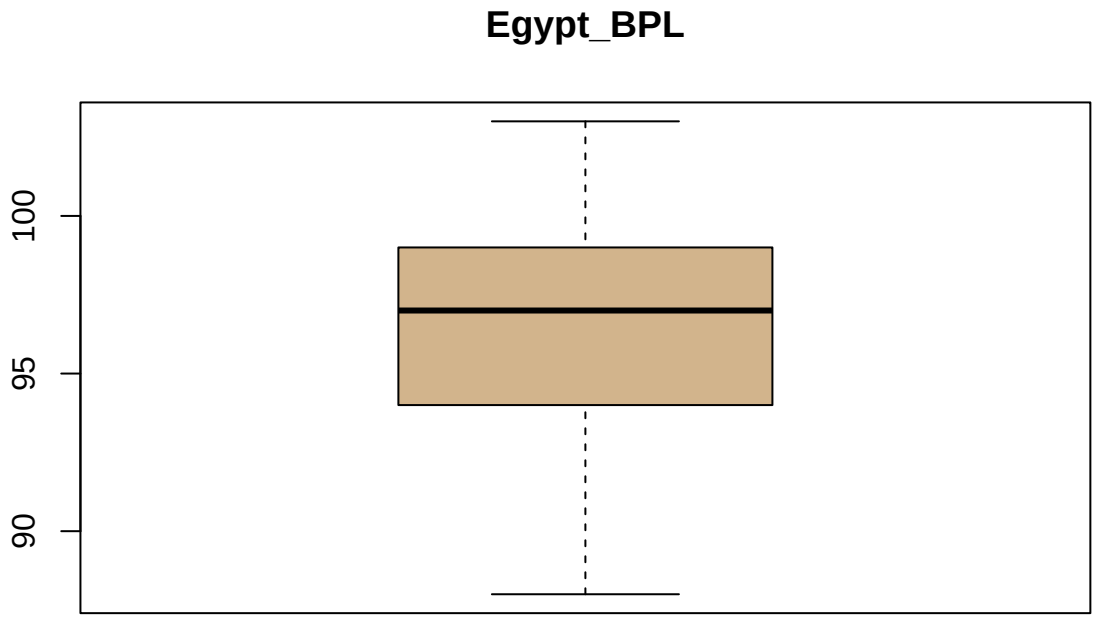
```
sd(Egypt_BPL)
```

```
## [1] 3.780102
```

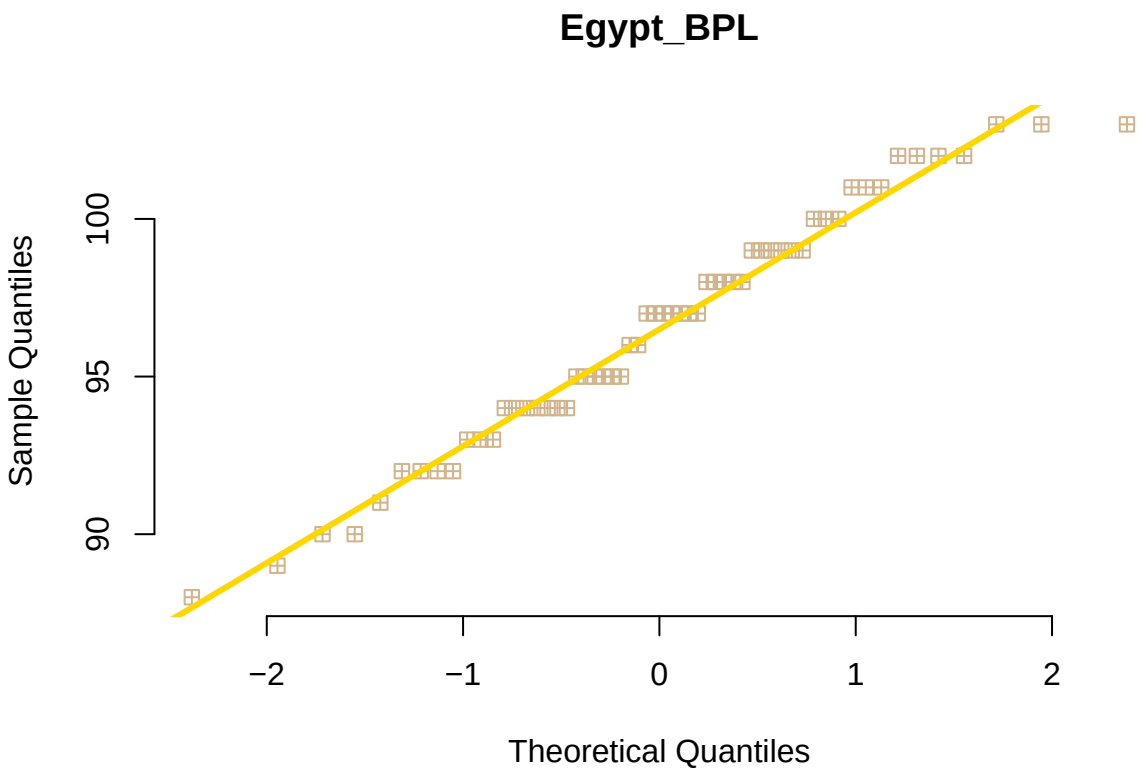
```
hist(Egypt_BPL,main = "Egypt_BPL",col="tan")
```




```
boxplot(Egypt_BPL,main="Egypt_BPL",col="tan")
```




```
qqnorm(Egypt_BPL,pch =12,main="Egypt_BPL",col="tan",frame=FALSE)
qqline(Egypt_BPL,col="gold",lwd=3)
```



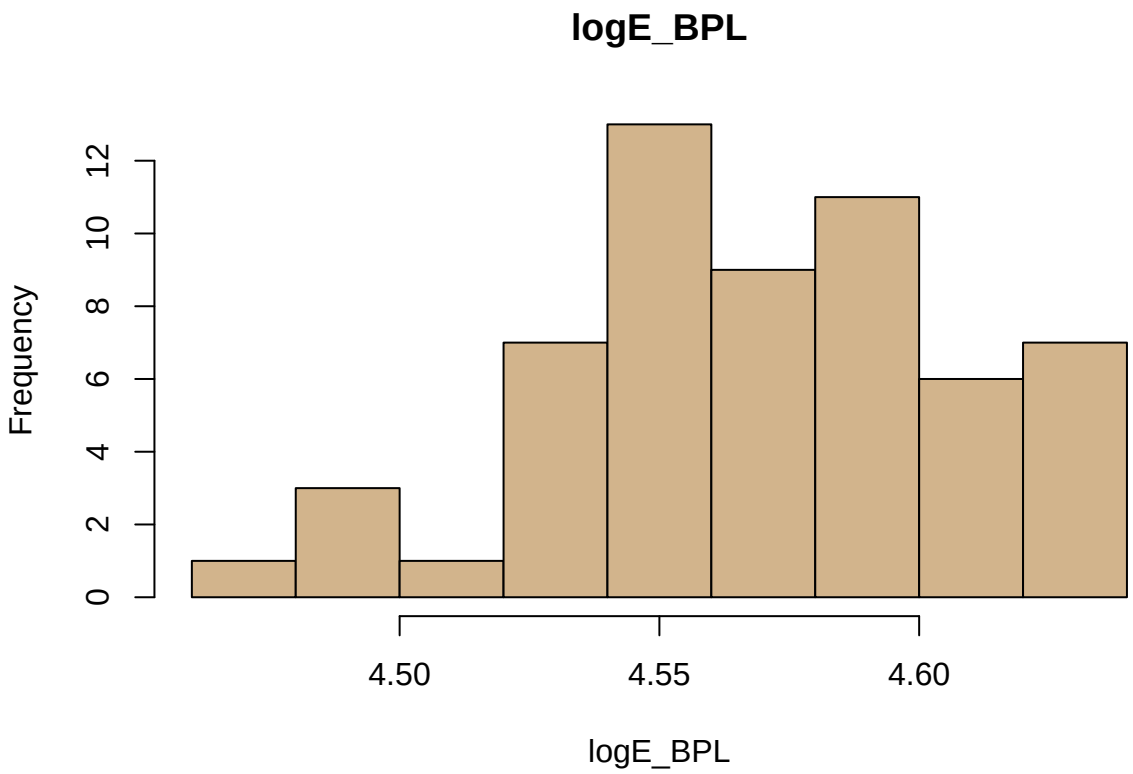

```
Men=read.csv("Project Data.csv")
Egypt_BPL=Men$BPL[Men$Population=="EGYPT"]
logE_BPL=log(Egypt_BPL)
summary(logE_BPL)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   4.477   4.543   4.575   4.569   4.595   4.635
```

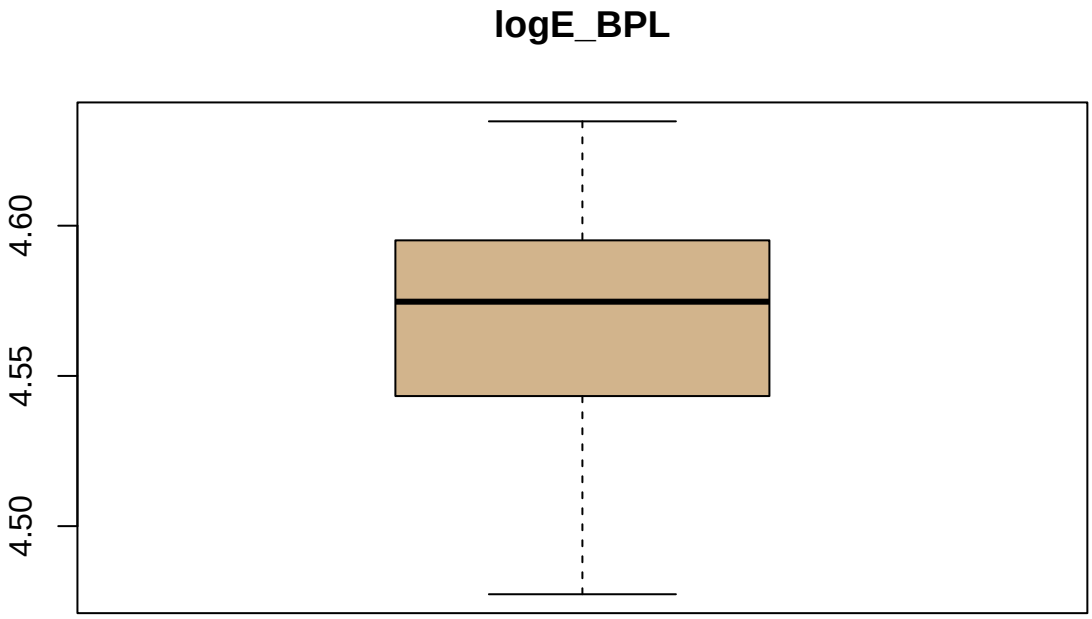
```
sd(logE_BPL)
```

```
## [1] 0.03932373
```

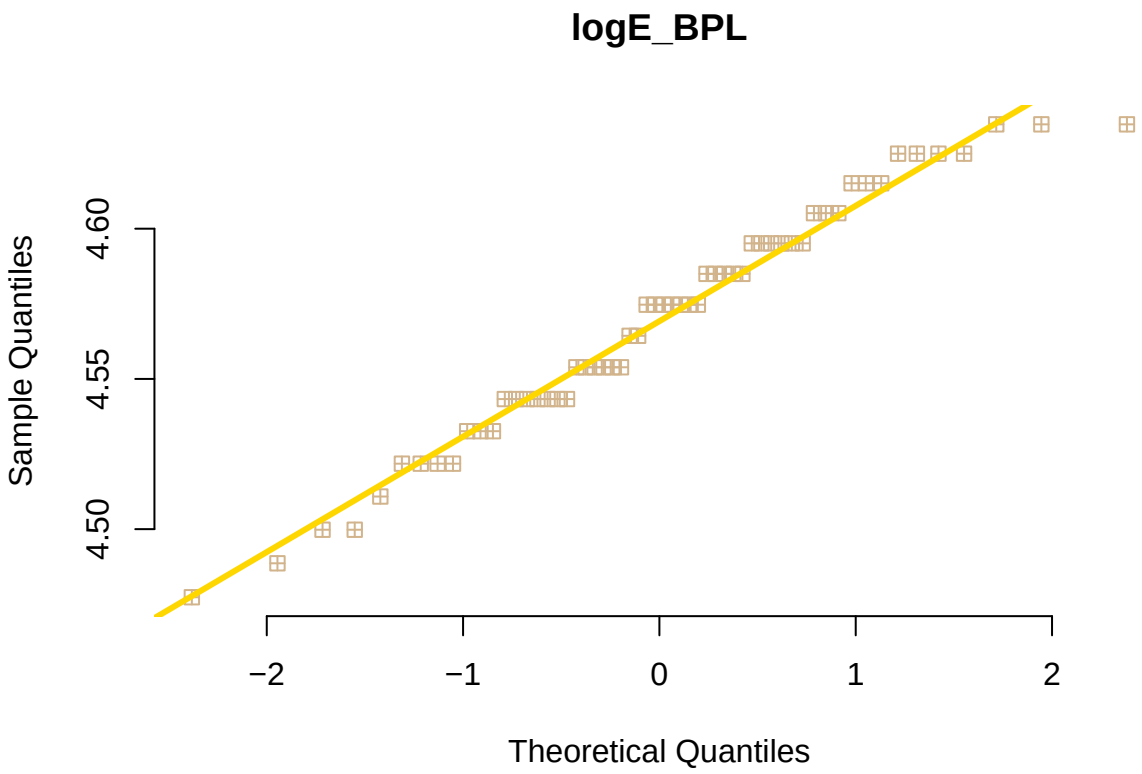
```
hist(logE_BPL,main = "logE_BPL",col="tan")
```




```
boxplot(logE_BPL,main="logE_BPL",col="tan")
```




```
qqnorm(logE_BPL,pch =12,main="logE_BPL",col="tan",frame=FALSE)
qqline(logE_BPL,col="gold",lwd=3)
```



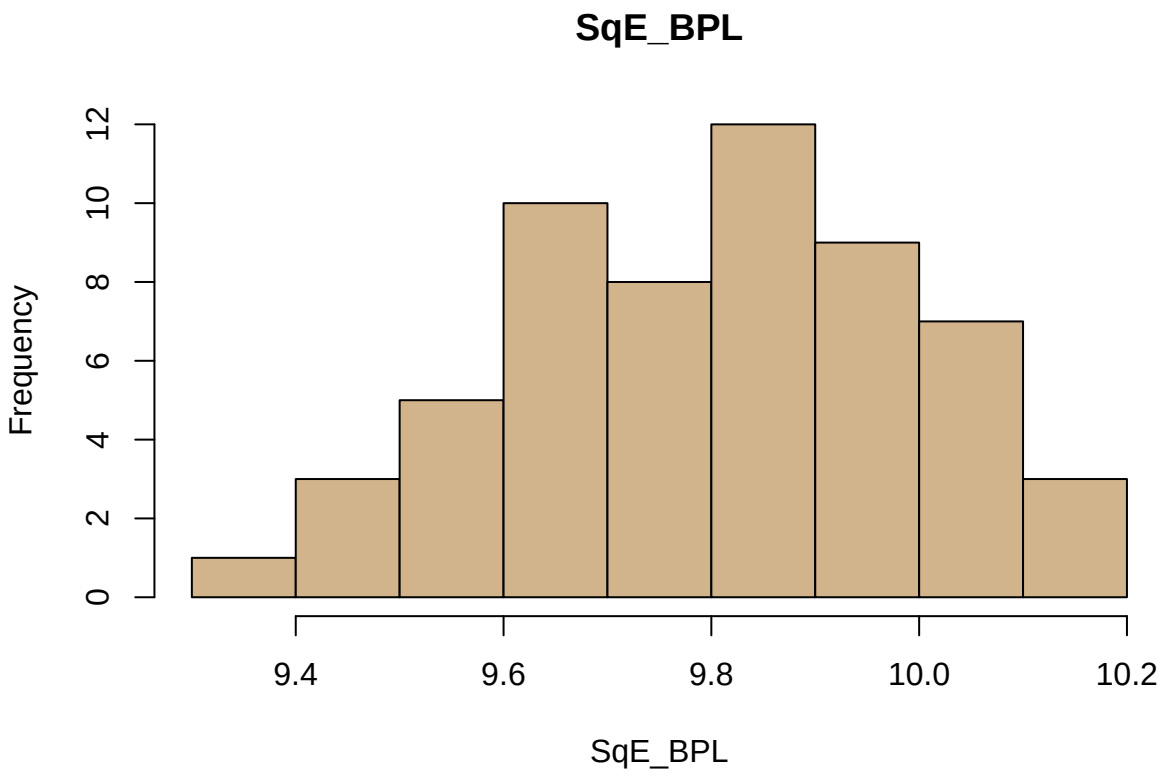

```
Men=read.csv("Project Data.csv")
Egypt_BPL=Men$BPL[Men$Population=="EGYPT"]
SqE_BPL=sqrt(Egypt_BPL)
summary(SqE_BPL)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   9.381   9.695   9.849   9.822   9.950  10.149
```

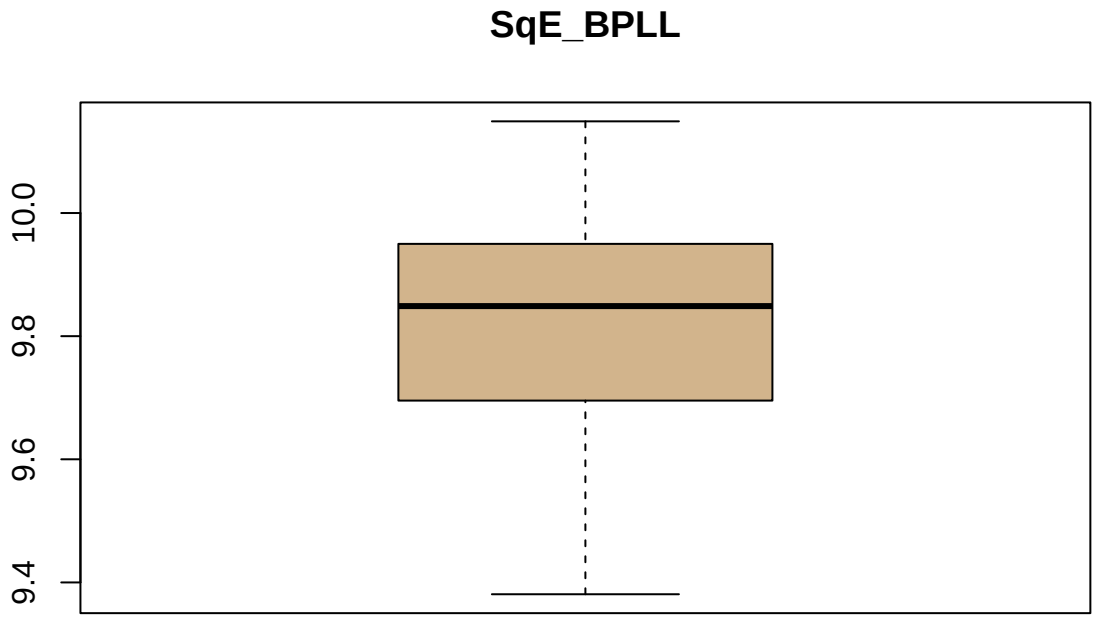
```
sd(SqE_BPL)
```

```
## [1] 0.1927343
```

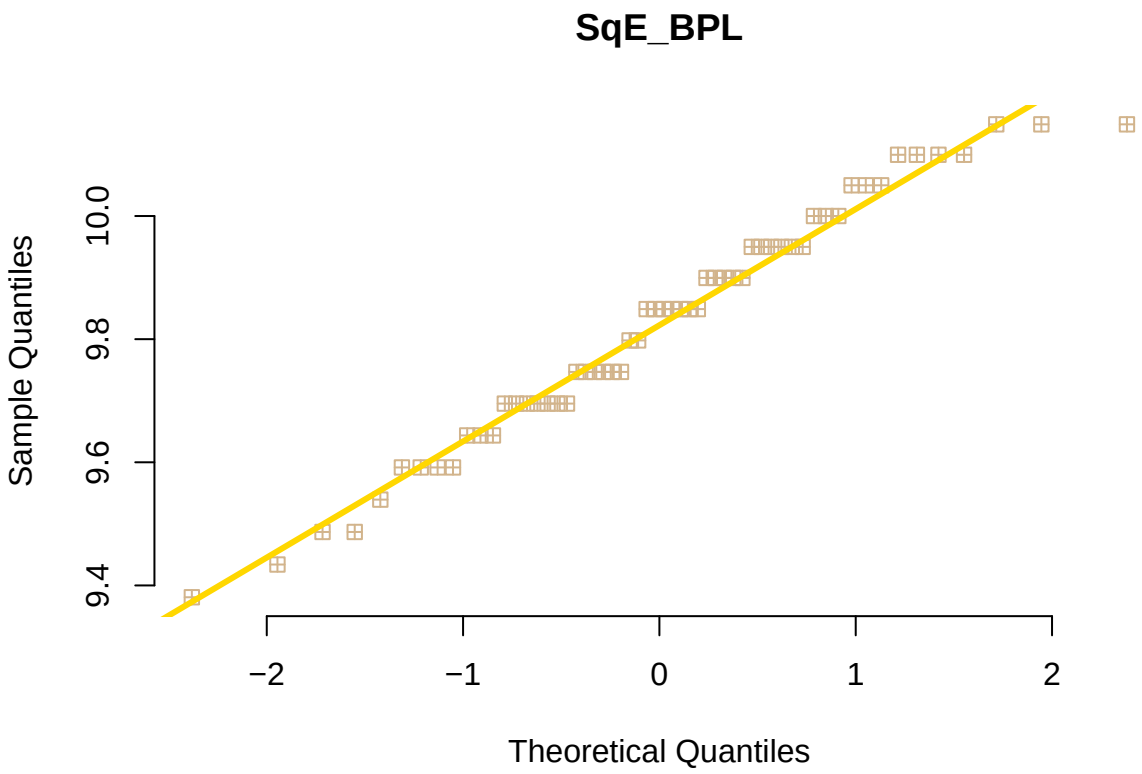
```
hist(SqE_BPL,main = "SqE_BPL",col="tan")
```




```
boxplot(SqE_BPL,main="SqE_BPLL",col="tan")
```




```
qqnorm(SqE_BPL,pch =12,main="SqE_BPL",col="tan",frame=FALSE)
qqline(SqE_BPL,col="gold",lwd=3)
```



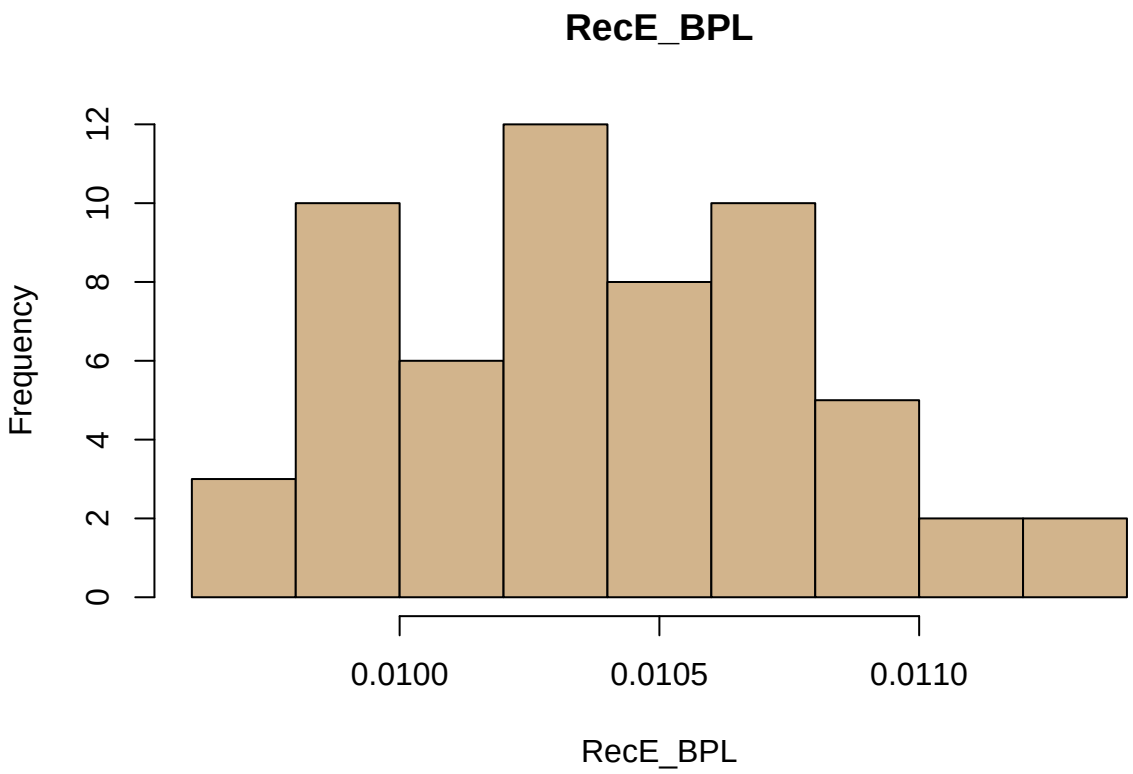

```
Men=read.csv("Project Data.csv")
Egypt_BPL=Men$BPL[Men$Population=="EGYPT"]
RecE_BPL=1/Egypt_BPL
summary(RecE_BPL)
```

```
##     Min.  1st Qu.   Median     Mean  3rd Qu.     Max.
## 0.009709 0.010101 0.010309 0.010377 0.010638 0.011364
```

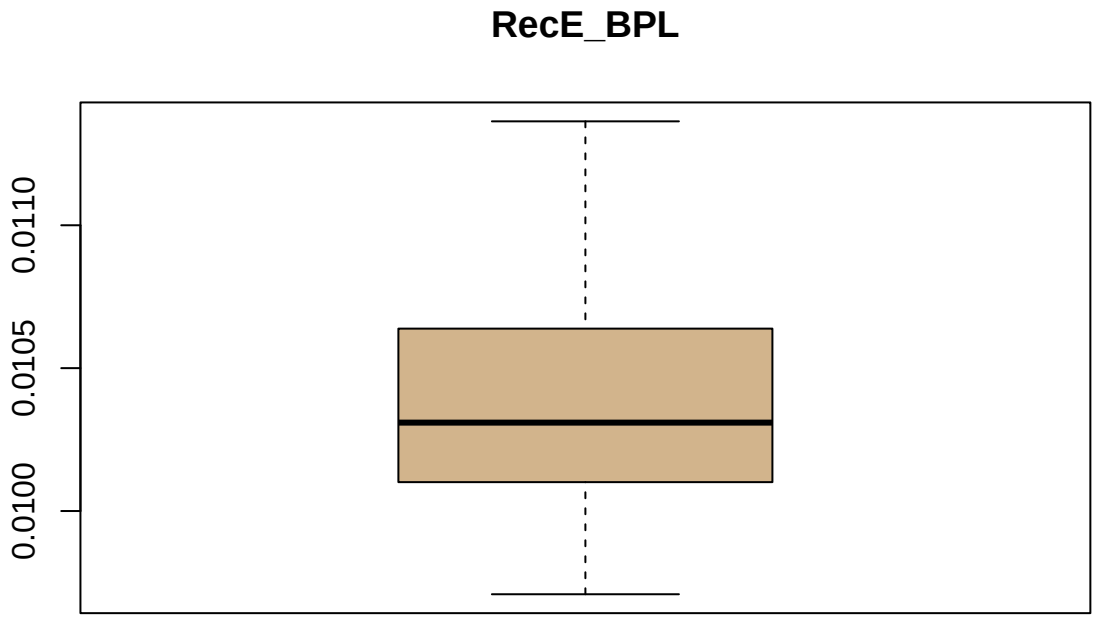
```
sd(RecE_BPL)
```

```
## [1] 0.0004097619
```

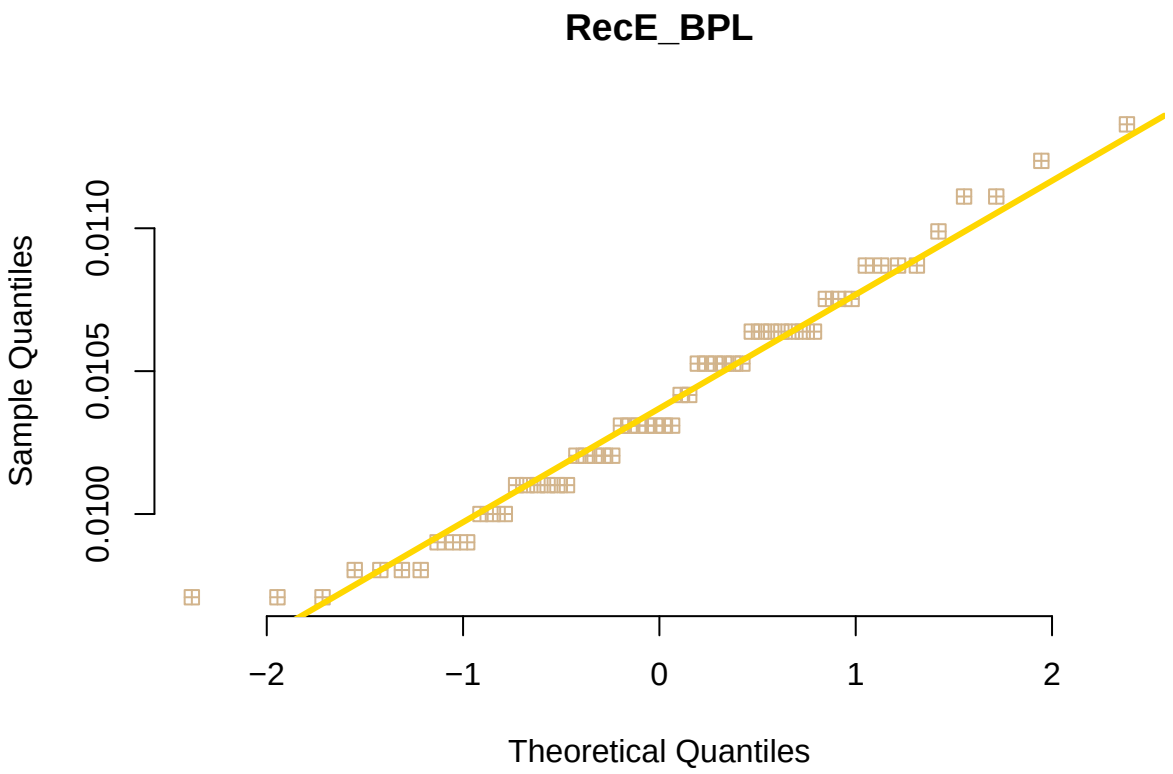
```
hist(RecE_BPL,main = "RecE_BPL",col="tan")
```




```
boxplot(RecE_BPL,main="RecE_BPL",col="tan")
```




```
qqnorm(RecE_BPL,pch =12,main="RecE_BPL",col="tan",frame=FALSE)
qqline(RecE_BPL,col="gold",lwd=3)
```



Male Egypt NPH

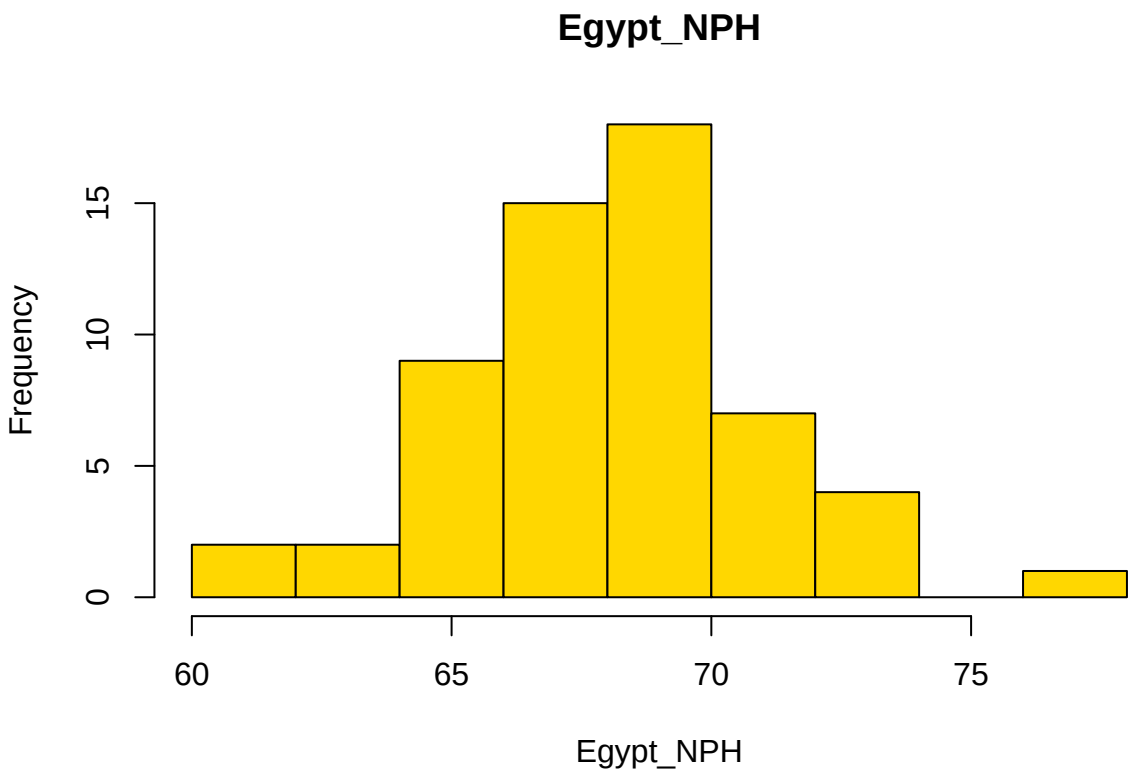
```
Men=read.csv("Project Data.csv")
Egypt_NPH=Men$NPH[Men$Population=="EGYPT"]
summary(Egypt_NPH)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   60.00   67.00   69.00   68.43   70.00   77.00
```

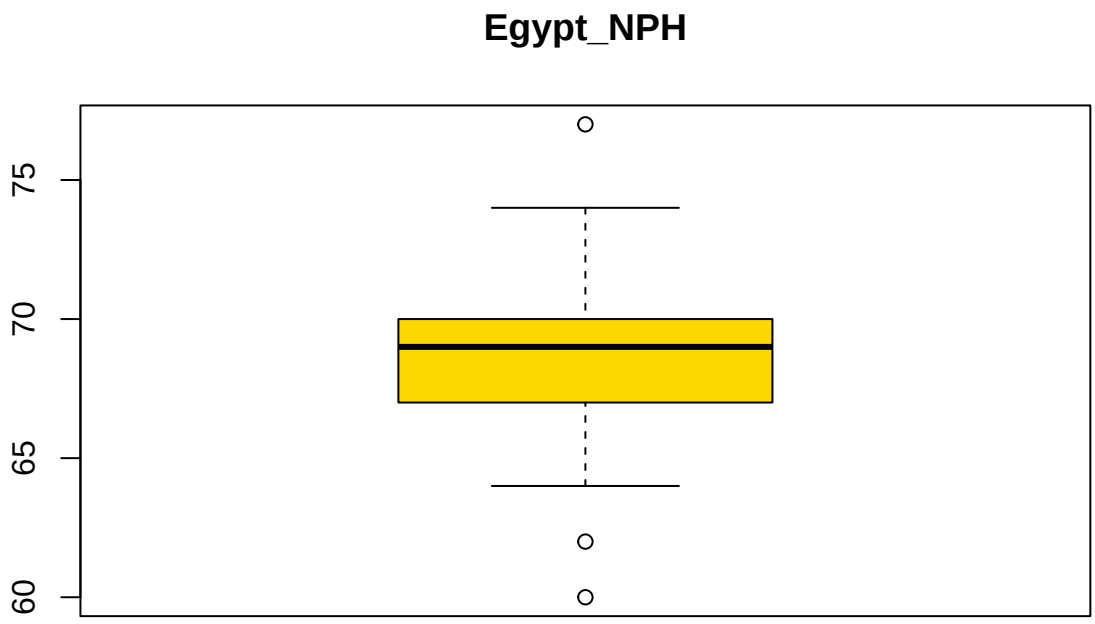
```
sd(Egypt_NPH)
```

```
## [1] 3.003577
```

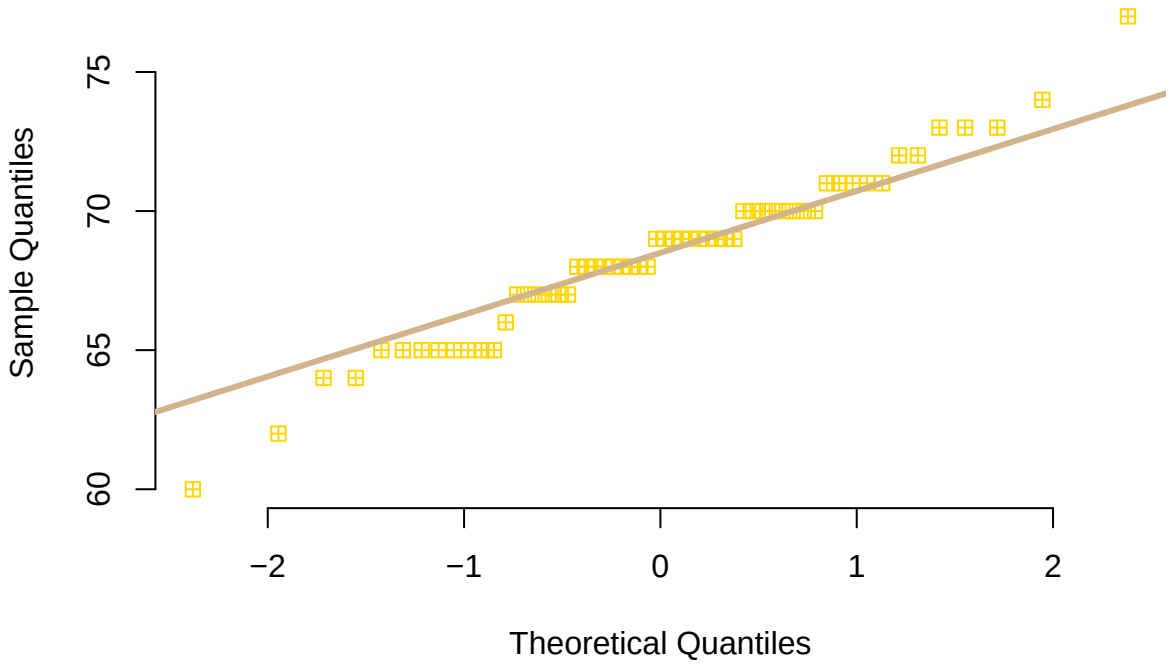
```
hist(Egypt_NPH,main = "Egypt_NPH",col="gold")
```




```
boxplot(Egypt_NPH,main="Egypt_NPH",col="gold")
```




```
qqnorm(Egypt_NPH,pch =12,main="Egypt_NPH",col="gold",frame=FALSE)
qqline(Egypt_NPH,col="tan",lwd=3)
```



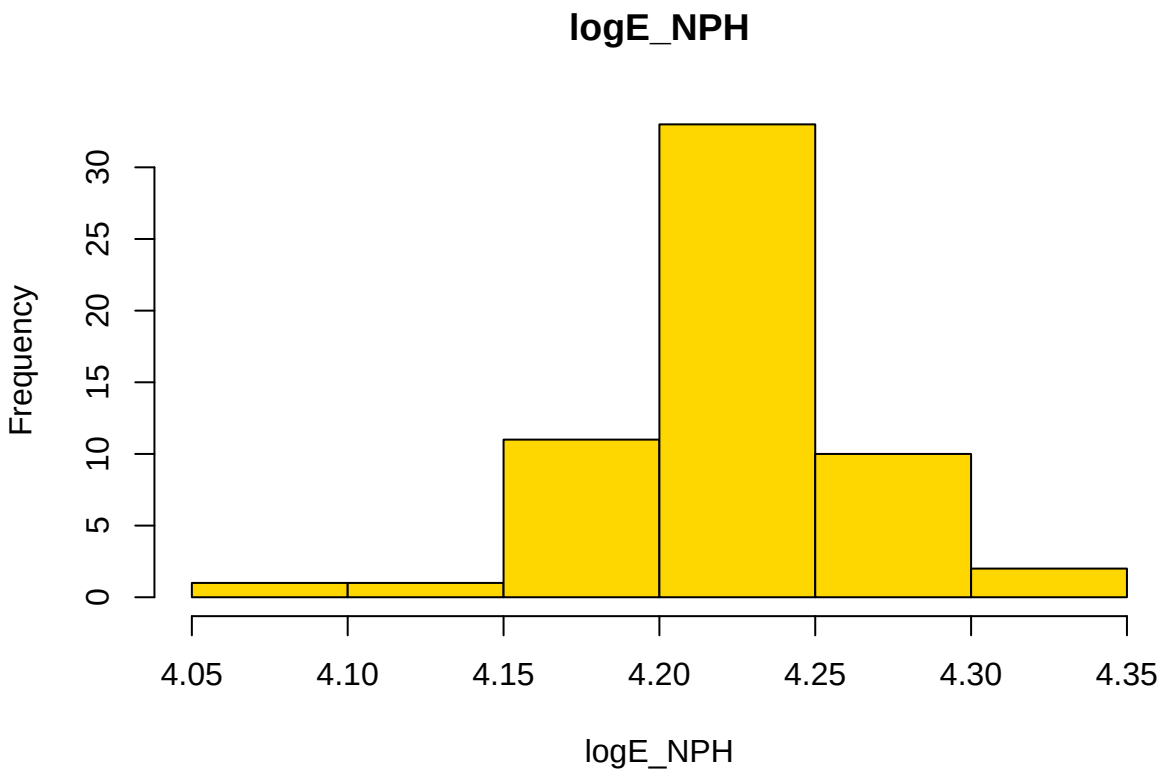

```
Men=read.csv("Project Data.csv")
Egypt_NPH=Men$NPH[Men$Population=="EGYPT"]
logE_NPH=log(Egypt_NPH)
summary(logE_NPH)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   4.094   4.205   4.234   4.225   4.248   4.344
```

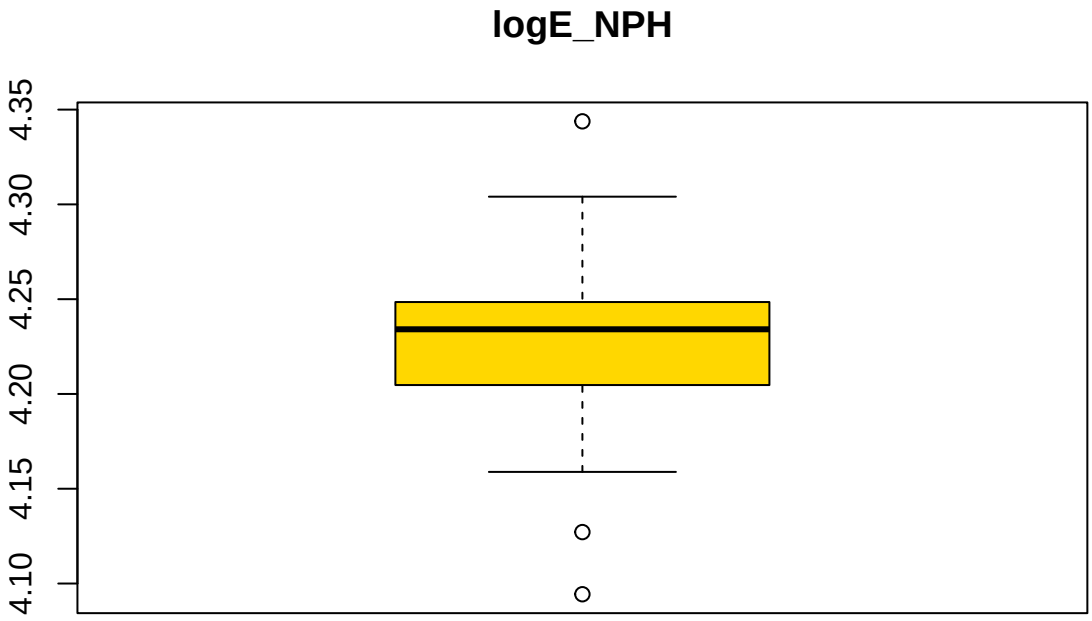
```
sd(logE_NPH)
```

```
## [1] 0.0440858
```

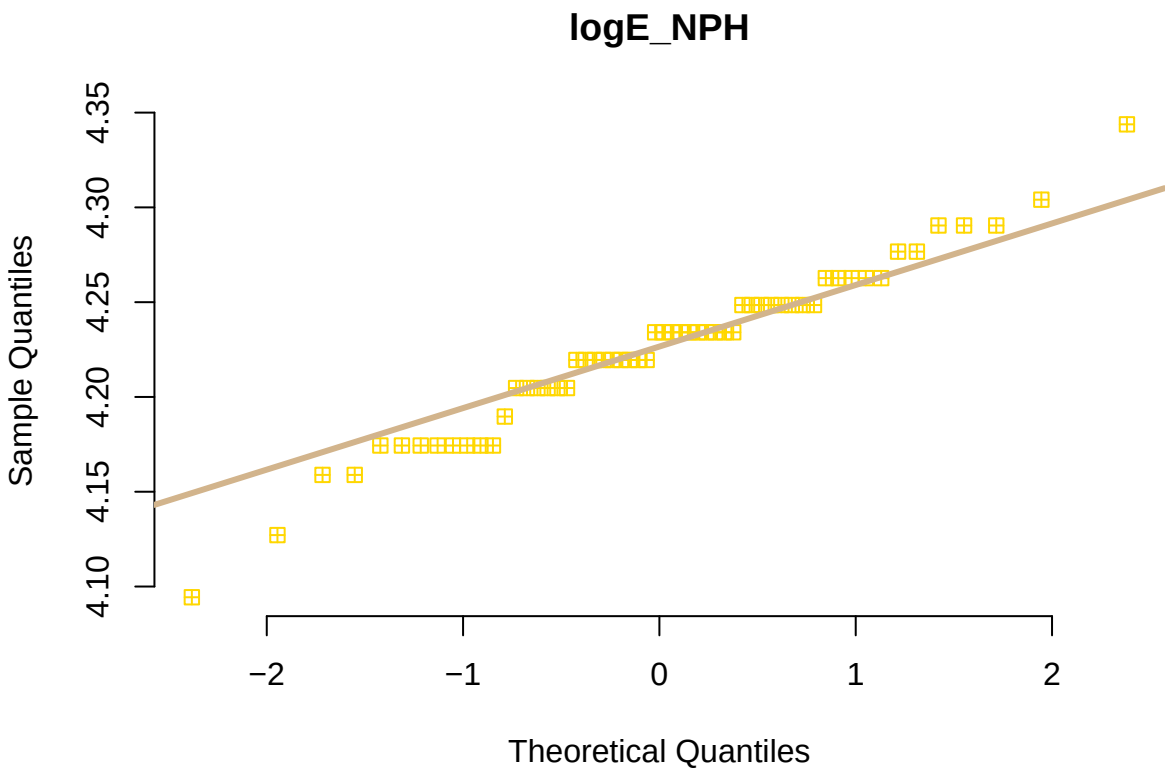
```
hist(logE_NPH,main = "logE_NPH",col="gold")
```




```
boxplot(logE_NPH,main="logE_NPH",col="gold")
```




```
qqnorm(logE_NPH,pch =12,main="logE_NPH",col="gold",frame=FALSE)
qqline(logE_NPH,col="tan",lwd=3)
```



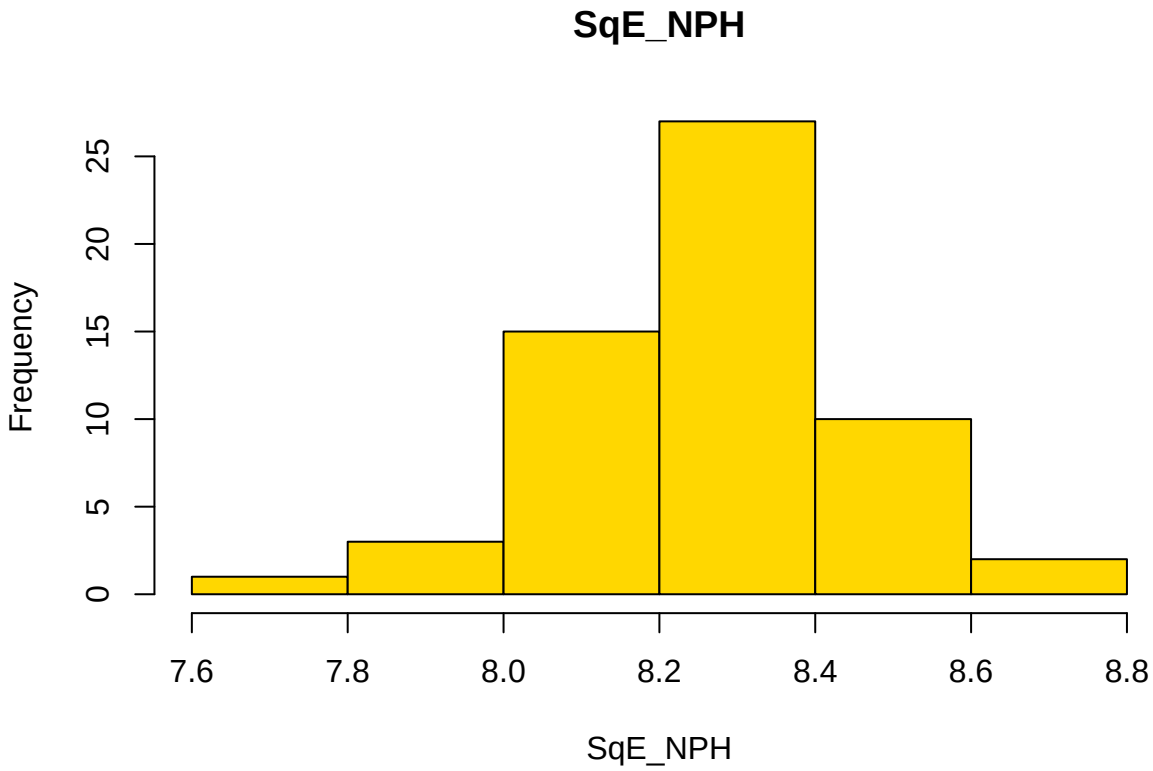

```
Men=read.csv("Project Data.csv")
Egypt_NPH=Men$NPH[Men$Population=="EGYPT"]
SqE_NPH=sqrt(Egypt_NPH)
summary(SqE_NPH)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   7.746   8.185   8.307   8.270   8.367   8.775
```

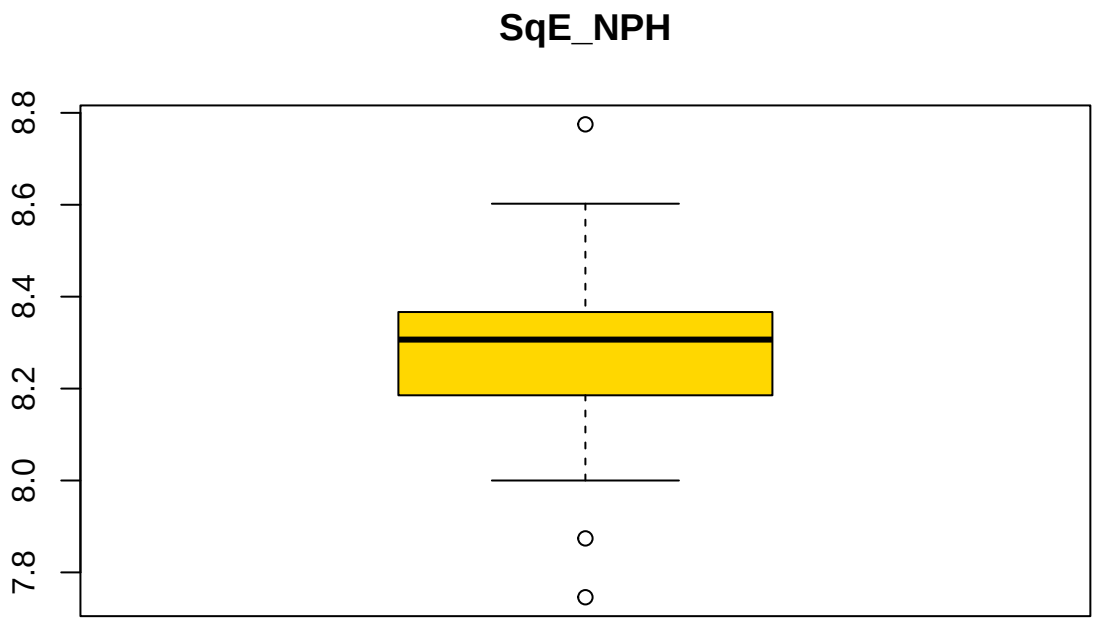
```
sd(SqE_NPH)
```

```
## [1] 0.1818614
```

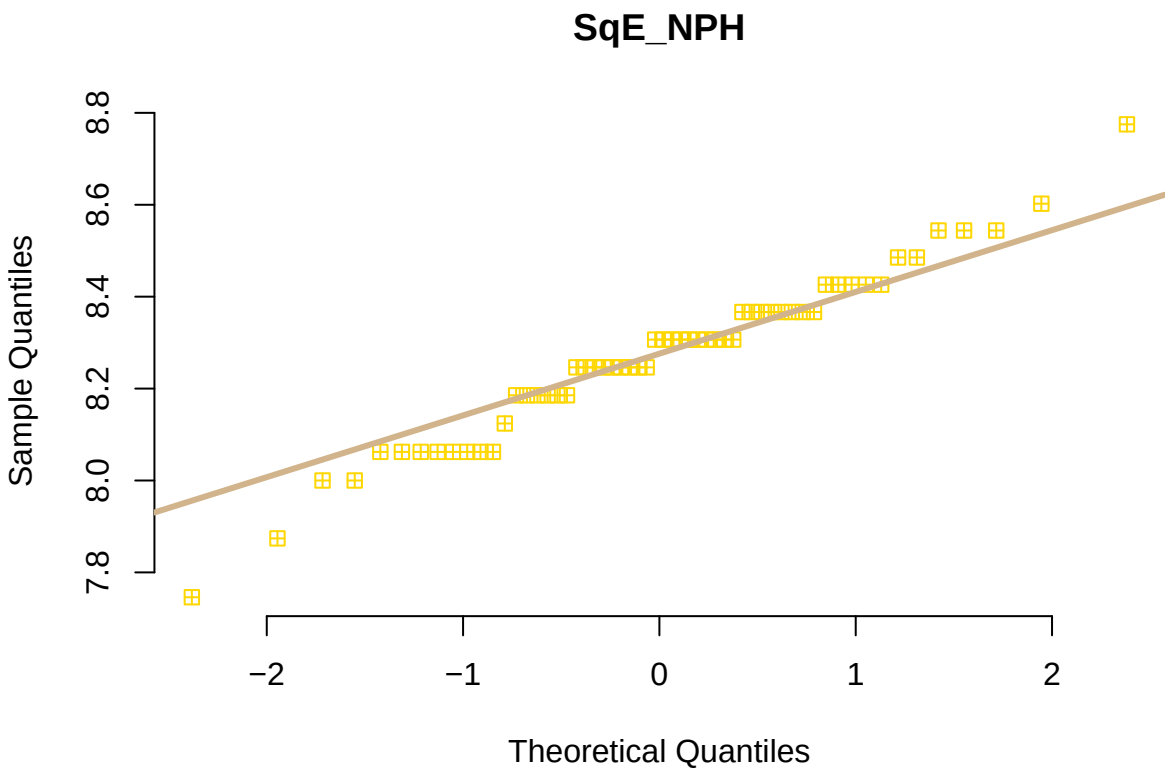
```
hist(SqE_NPH,main = "SqE_NPH",col="gold")
```




```
boxplot(SqE_NPH,main="SqE_NPH",col="gold")
```




```
qqnorm(SqE_NPH,pch =12,main="SqE_NPH",col="gold",frame=FALSE)
qqline(SqE_NPH,col="tan",lwd=3)
```



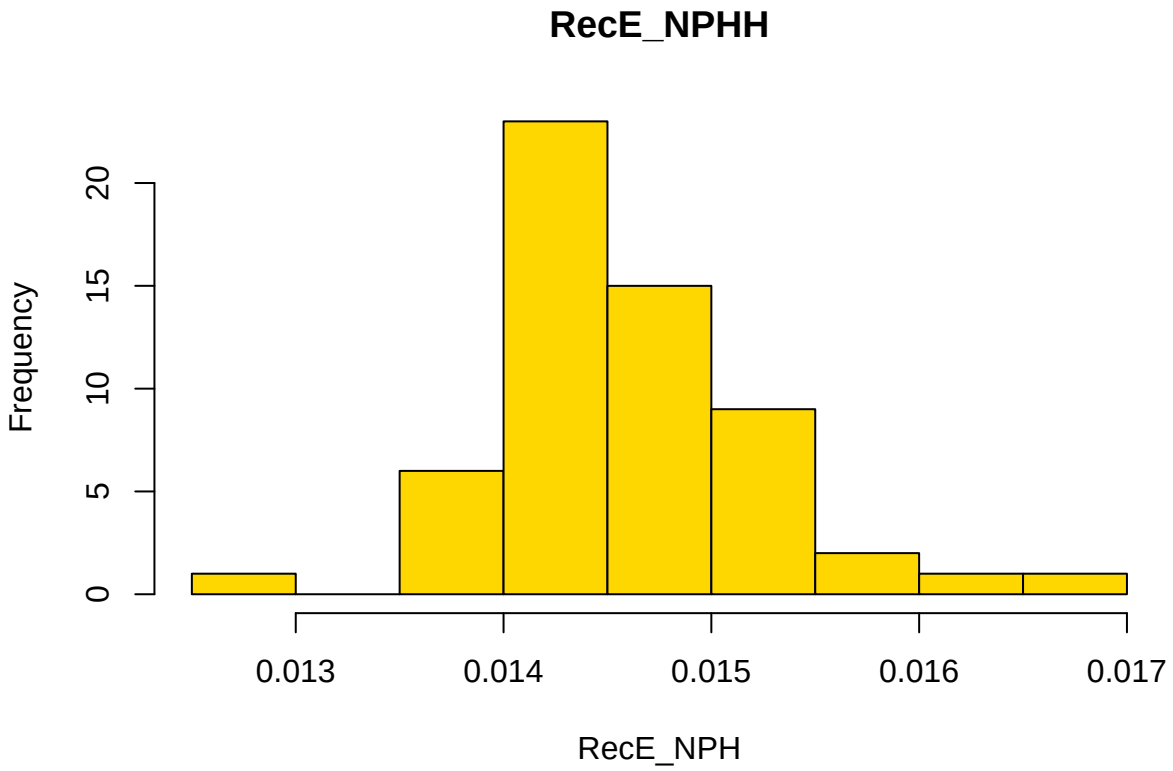

```
Men=read.csv("Project Data.csv")
Egypt_NPH=Men$NPH[Men$Population=="EGYPT"]
RecE_NPH=1/Egypt_NPH
summary(RecE_NPH)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## 0.01299 0.01429 0.01449 0.01464 0.01493 0.01667
```

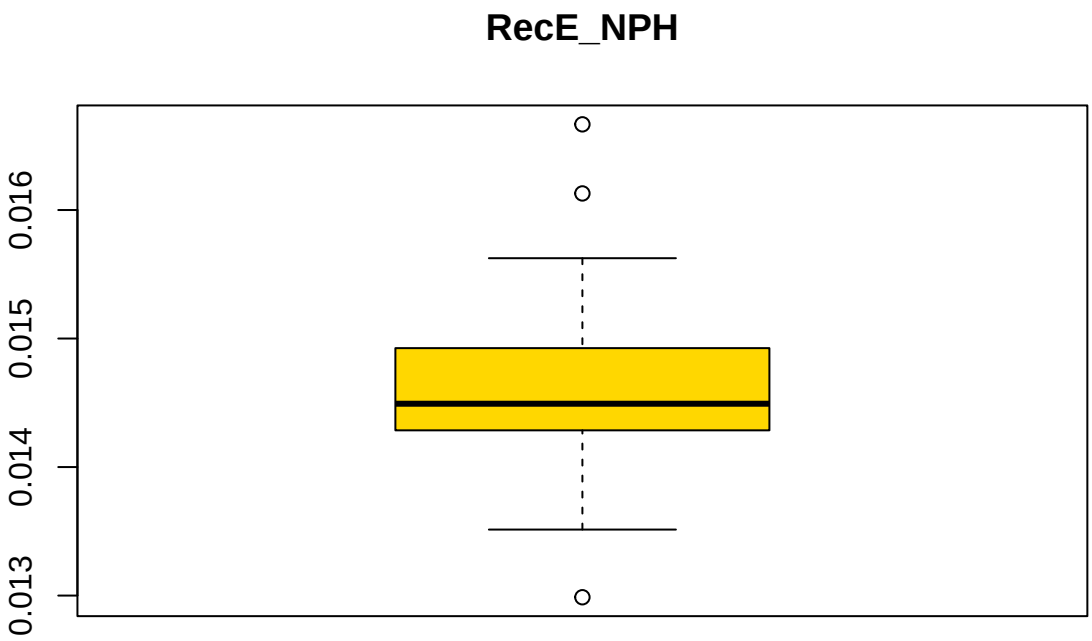
```
sd(RecE_NPH)
```

```
## [1] 0.0006494525
```

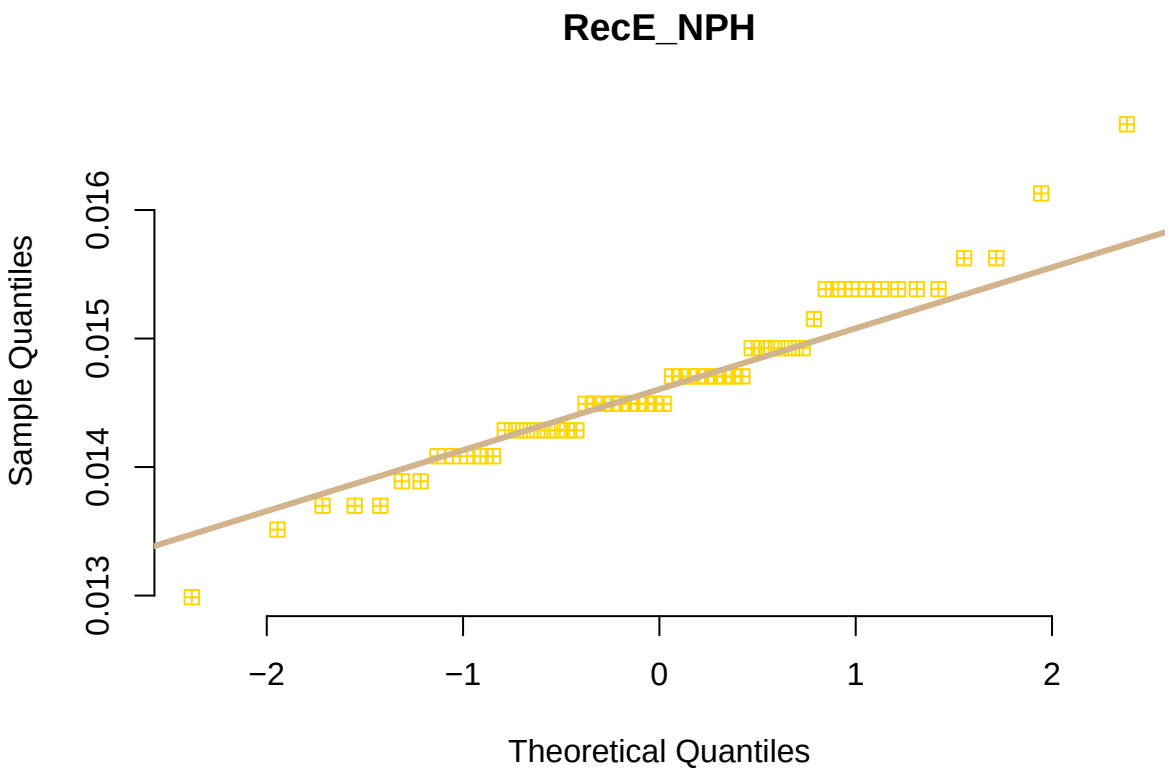
```
hist(RecE_NPH,main = "RecE_NPHH",col="gold")
```




```
boxplot(RecE_NPH,main="RecE_NPH",col="gold")
```




```
qqnorm(RecE_NPH,pch =12,main="RecE_NPH",col="gold",frame=FALSE)
qqline(RecE_NPH,col="tan",lwd=3)
```



Male Egypt BPL vs NPH-Welch Two Sample t-test

```
Men=read.csv("Project Data.csv")
t.test(Egypt_BPL,SqE_NPH,conf.level = .95)
```

```
##
##  Welch Two Sample t-test
##
## data:  Egypt_BPL and SqE_NPH
## t = 177.59, df = 57.264, p-value < 2.2e-16
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##  87.25192 89.24188
## sample estimates:
## mean of x mean of y
##  96.51724   8.27034
```

Male Inuit BPL

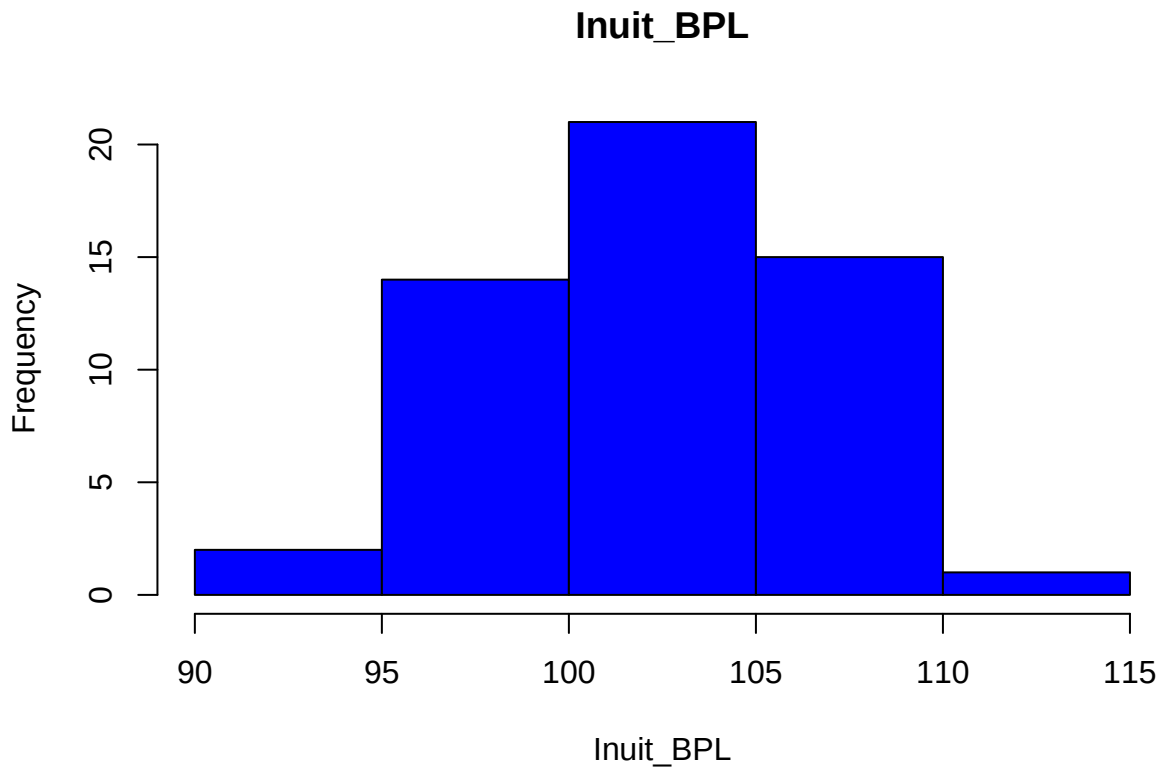
```r
Men=read.csv("Project Data.csv")
Inuit_BPL=Men$BPL[Men$Population=="ESKIMO"]
summary(Inuit_BPL)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    92.0   100.0   103.0   103.1   107.0   114.0
```

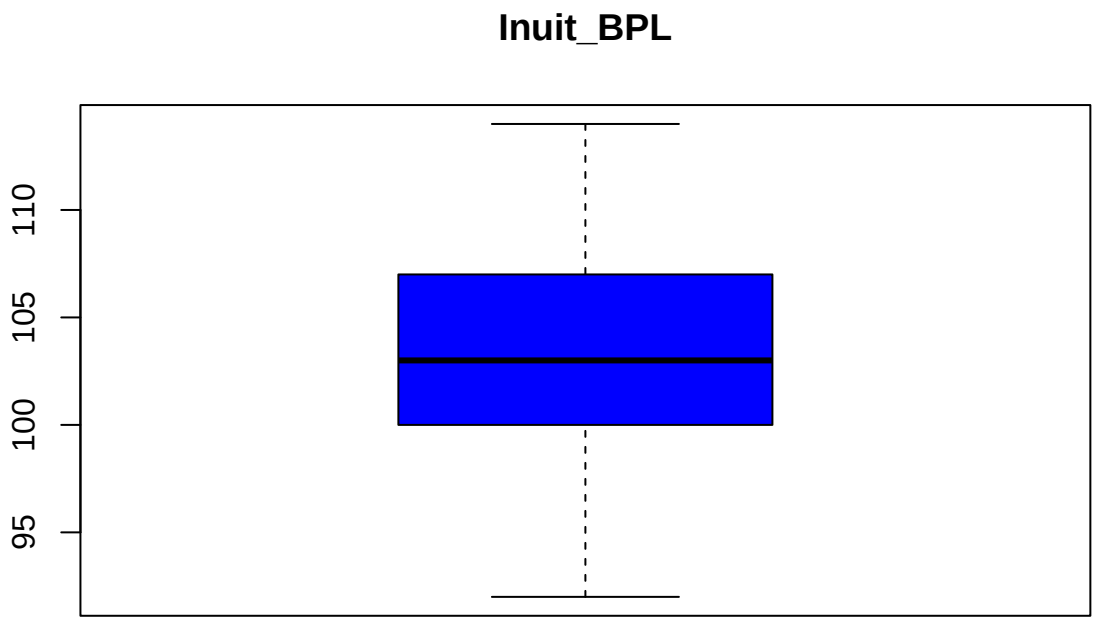
```r
sd(Inuit_BPL)
```

```
## [1] 4.584317
```

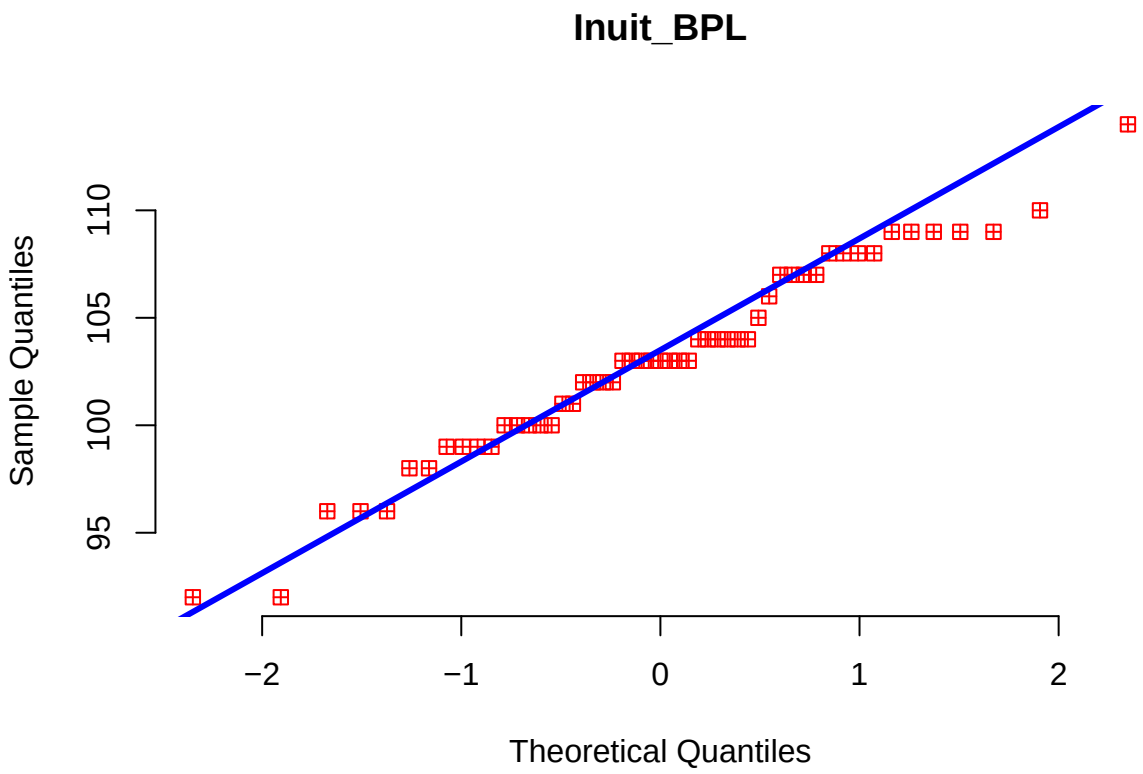
```r
hist(Inuit_BPL,main = "Inuit_BPL",col="blue")
```



```
boxplot(Inuit_BPL,main="Inuit_BPL",col="blue")
```




```
qqnorm(Inuit_BPL,pch =12,main="Inuit_BPL",col="red",frame=FALSE)
qqline(Inuit_BPL,col="blue",lwd=3)
```



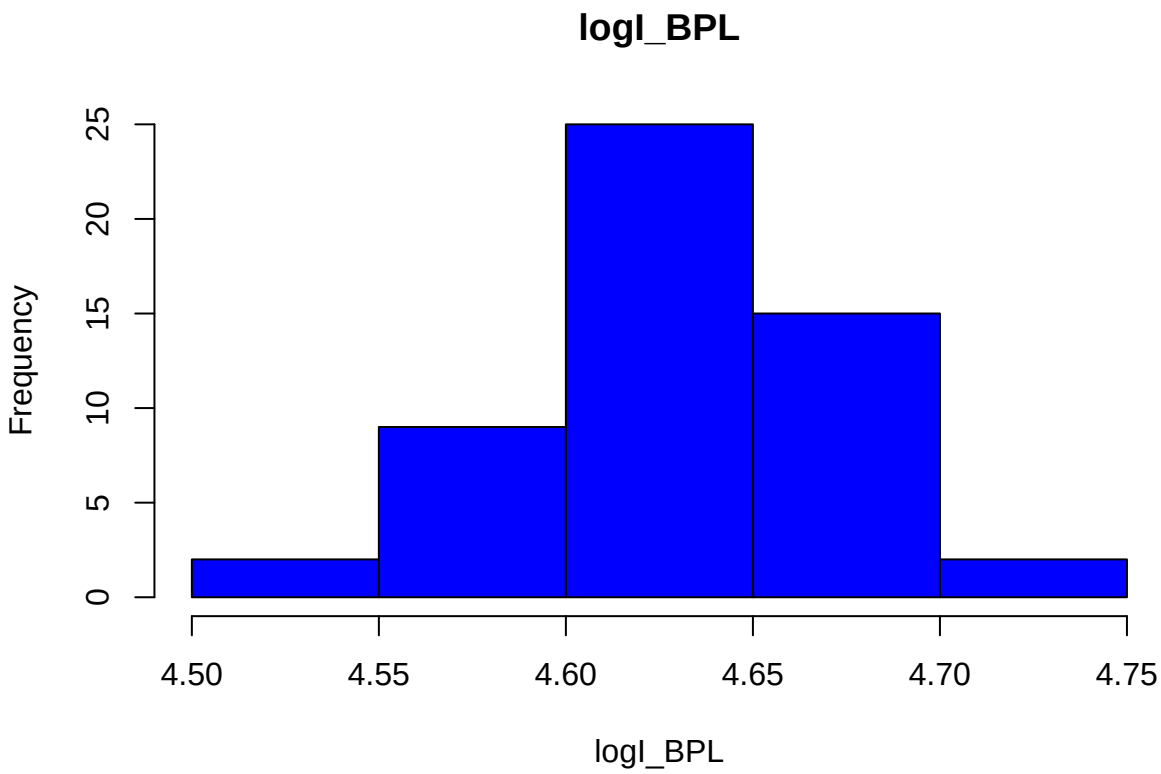

```
Men=read.csv("Project Data.csv")
Inuit_BPL=Men$BPL[Men$Population=="ESKIMO"]
logI_BPL=log(Inuit_BPL)
summary(logI_BPL)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   4.522   4.605   4.635   4.634   4.673   4.736
```

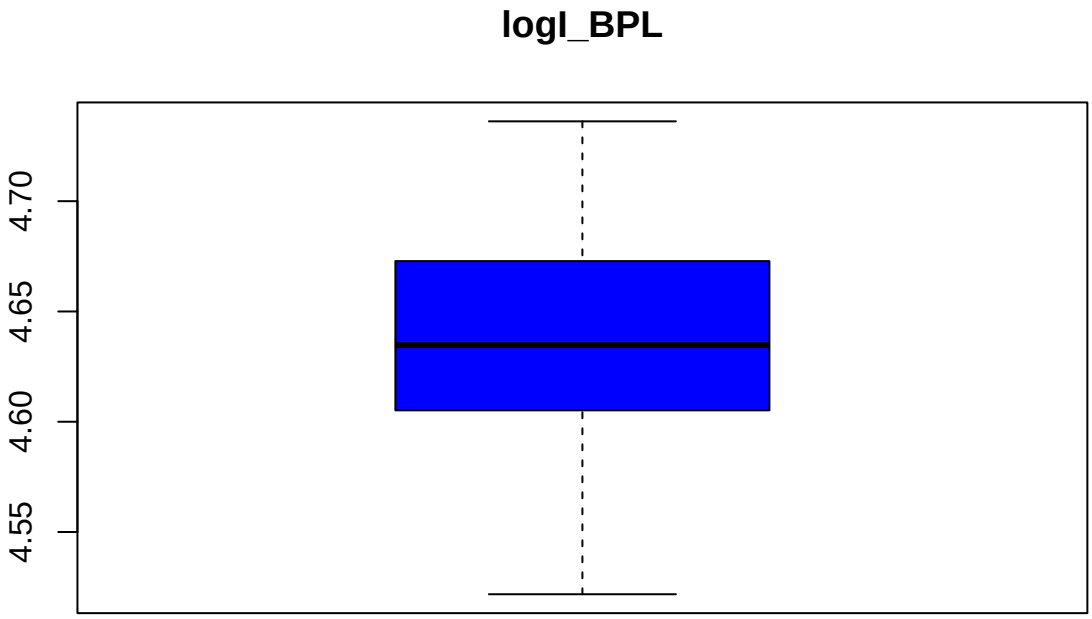
```
sd(logI_BPL)
```

```
## [1] 0.04478672
```

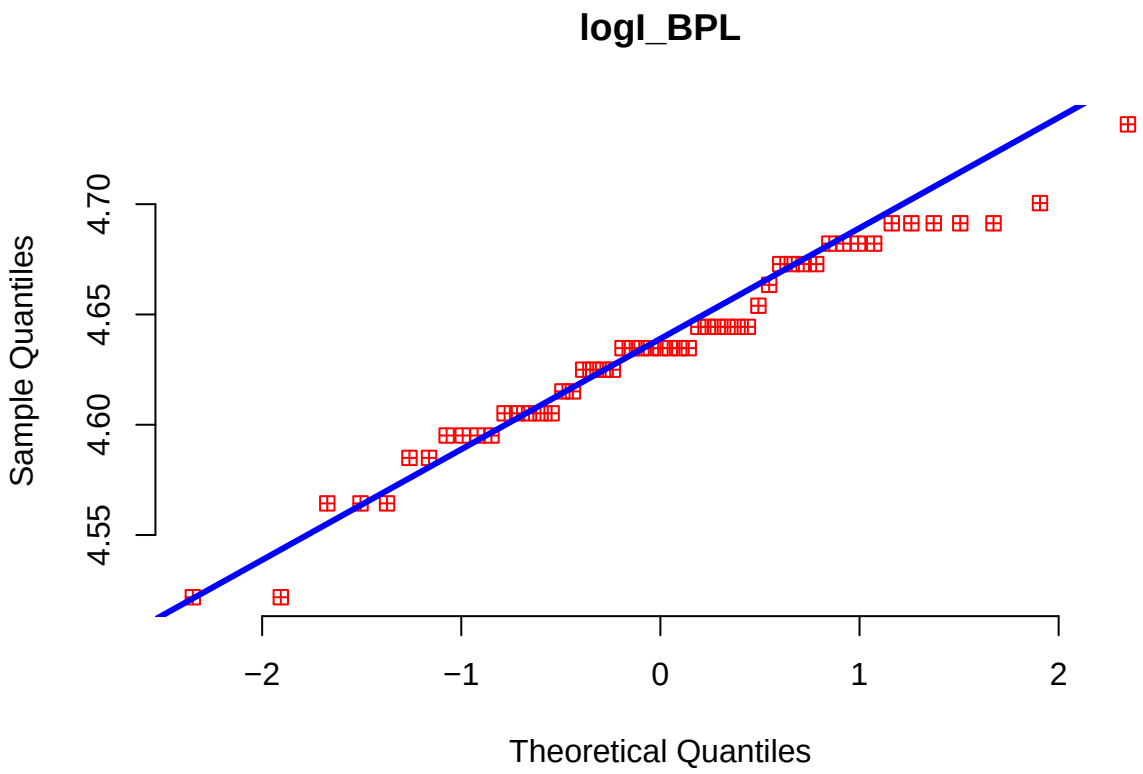
```
hist(logI_BPL,main = "logI_BPL",col="blue")
```




```
boxplot(logI_BPL,main="logI_BPL",col="blue")
```




```
qqnorm(logI_BPL,pch =12,main="logI_BPL",col="red",frame=FALSE)
qqline(logI_BPL,col="blue",lwd=3)
```



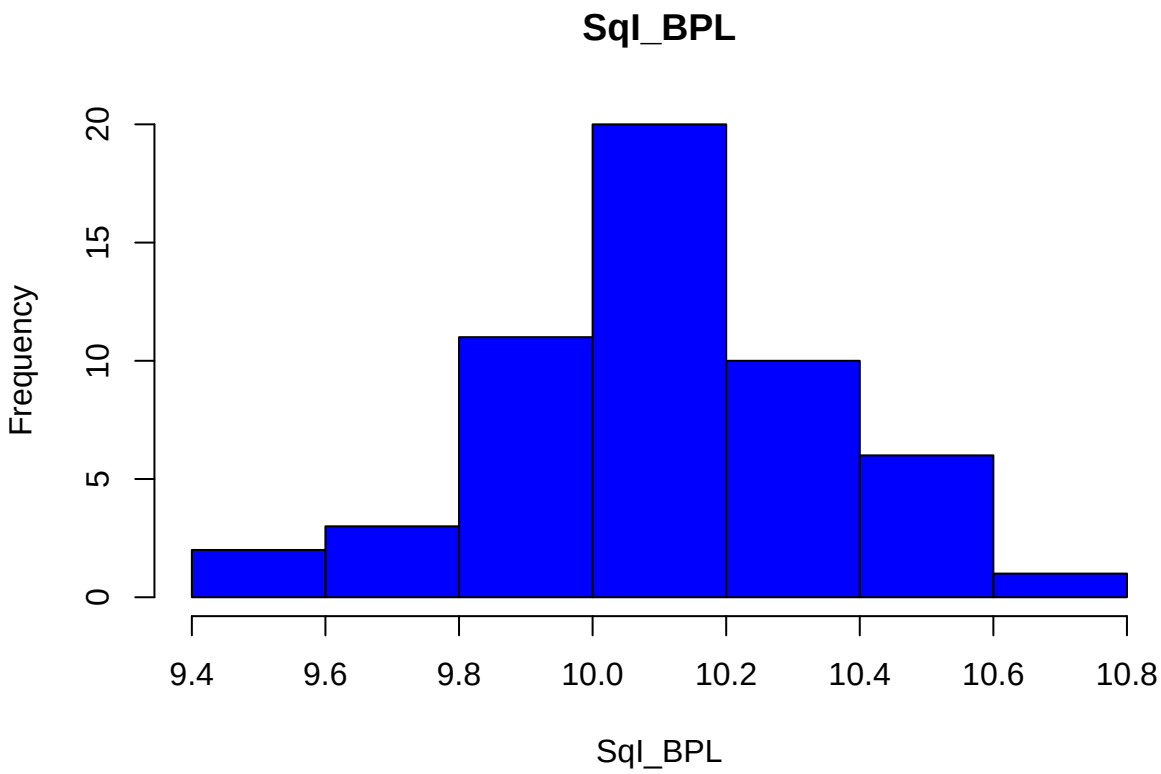

```
Men=read.csv("Project Data.csv")
Inuit_BPL=Men$BPL[Men$Population=="ESKIMO"]
SqI_BPL=sqrt(Inuit_BPL)
summary(SqI_BPL)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   9.592  10.000  10.149  10.149  10.344  10.677
```

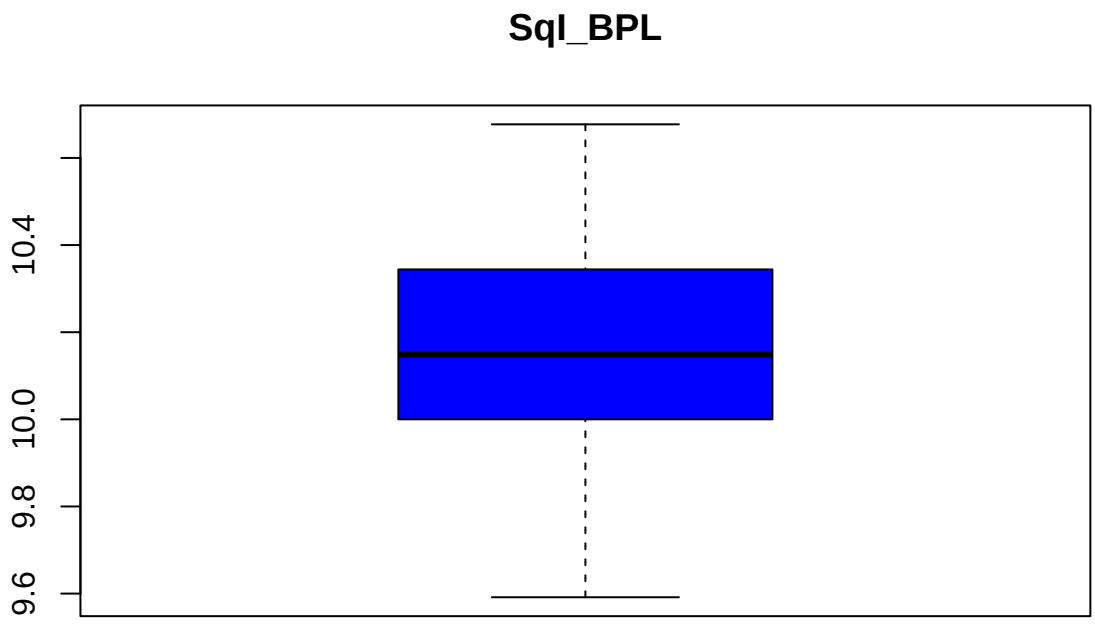
```
sd(SqI_BPL)
```

```
## [1] 0.2264774
```

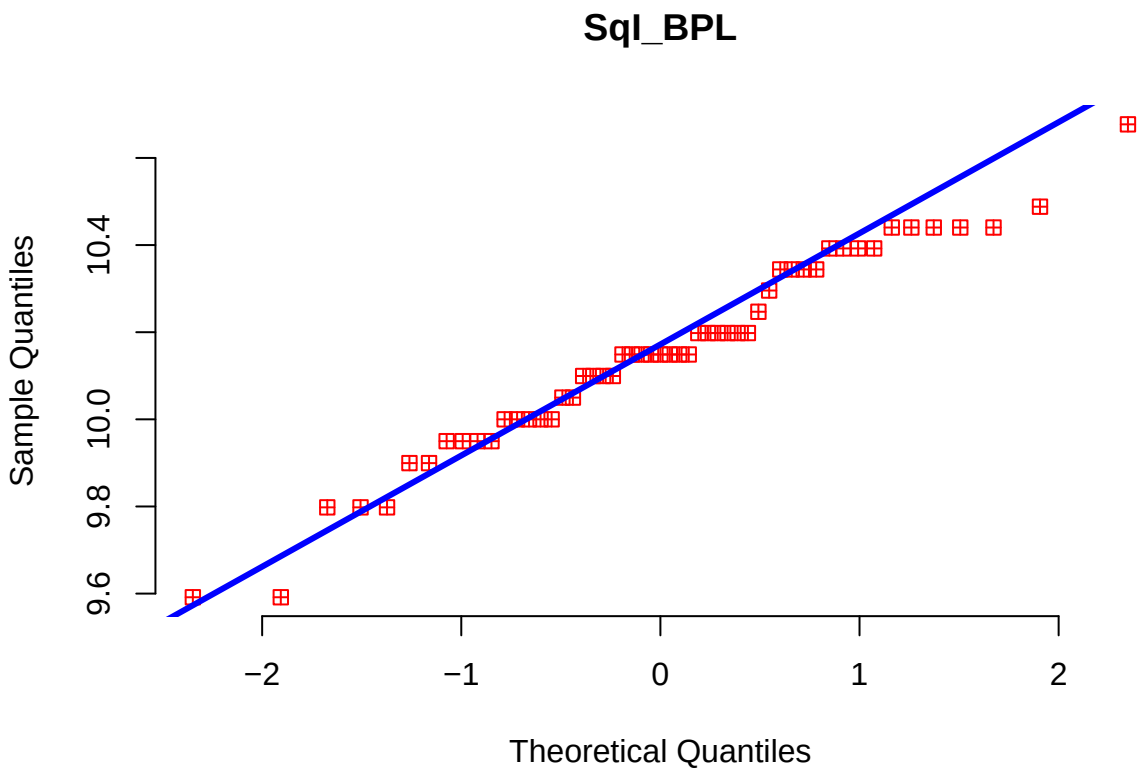
```
hist(SqI_BPL,main = "SqI_BPL",col="blue")
```




```
boxplot(SqI_BPL,main="SqI_BPL",col="blue")
```




```
qqnorm(SqI_BPL,pch =12,main="SqI_BPL",col="red",frame=FALSE)
qqline(SqI_BPL,col="blue",lwd=3)
```



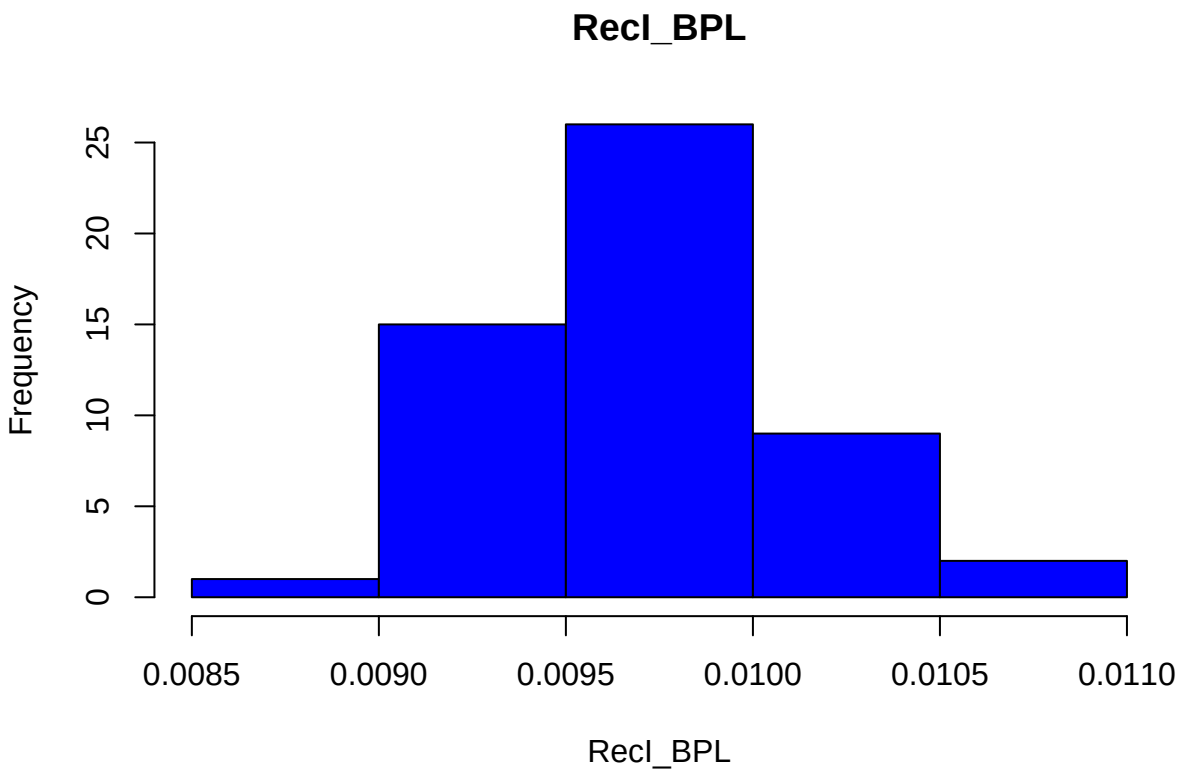

```
Men=read.csv("Project Data.csv")
Inuit_BPL=Men$BPL[Men$Population=="ESKIMO"]
RecI_BPL=1/Inuit_BPL
summary(RecI_BPL)
```

```
##     Min.  1st Qu.   Median     Mean  3rd Qu.     Max.
## 0.008772 0.009346 0.009709 0.009723 0.010000 0.010870
```

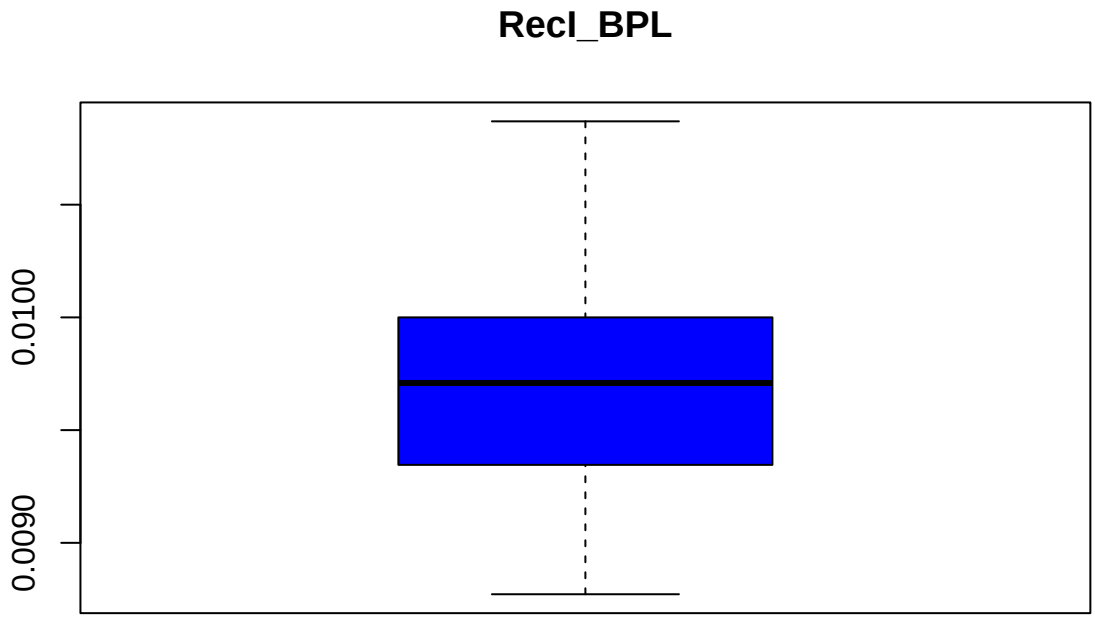
```
sd(RecI_BPL)
```

```
## [1] 0.0004388235
```

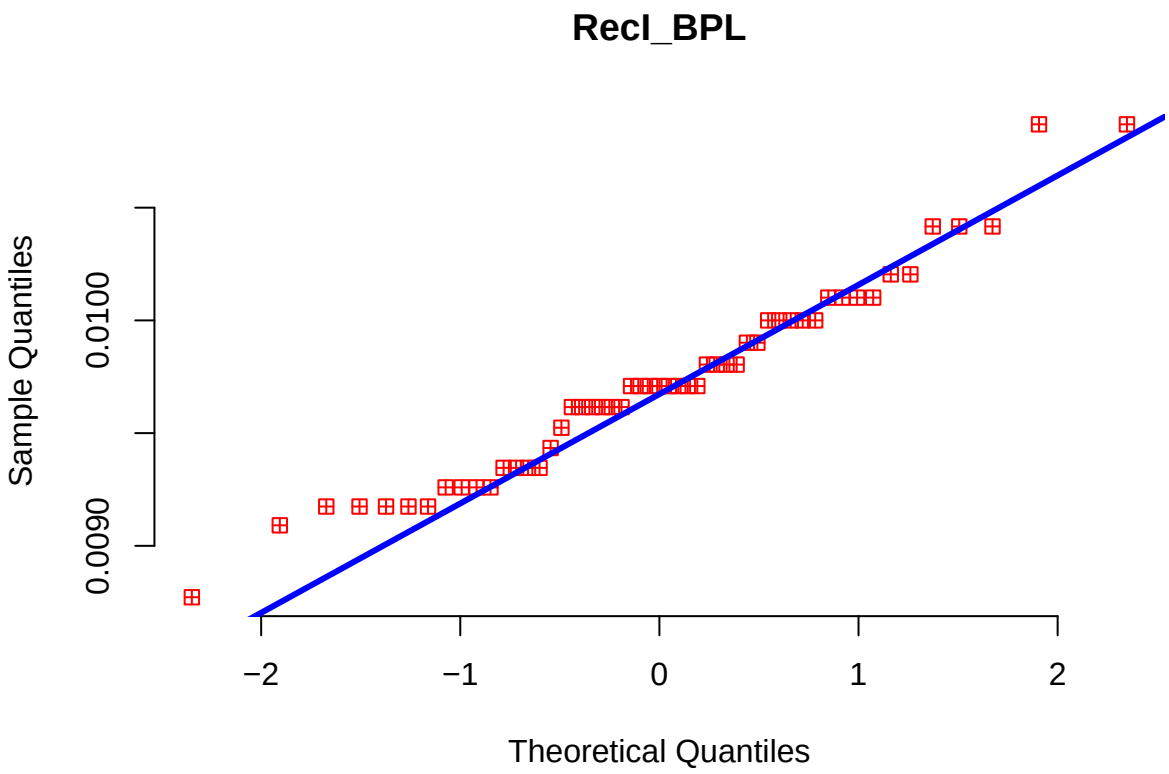
```
hist(RecI_BPL,main = "RecI_BPL",col="blue")
```




```
boxplot(RecI_BPL,main="RecI_BPL",col="blue")
```




```
qqnorm(RecI_BPL,pch =12,main="RecI_BPL",col="red",frame=FALSE)
qqline(RecI_BPL,col="blue",lwd=3)
```



Male Inuit NPH

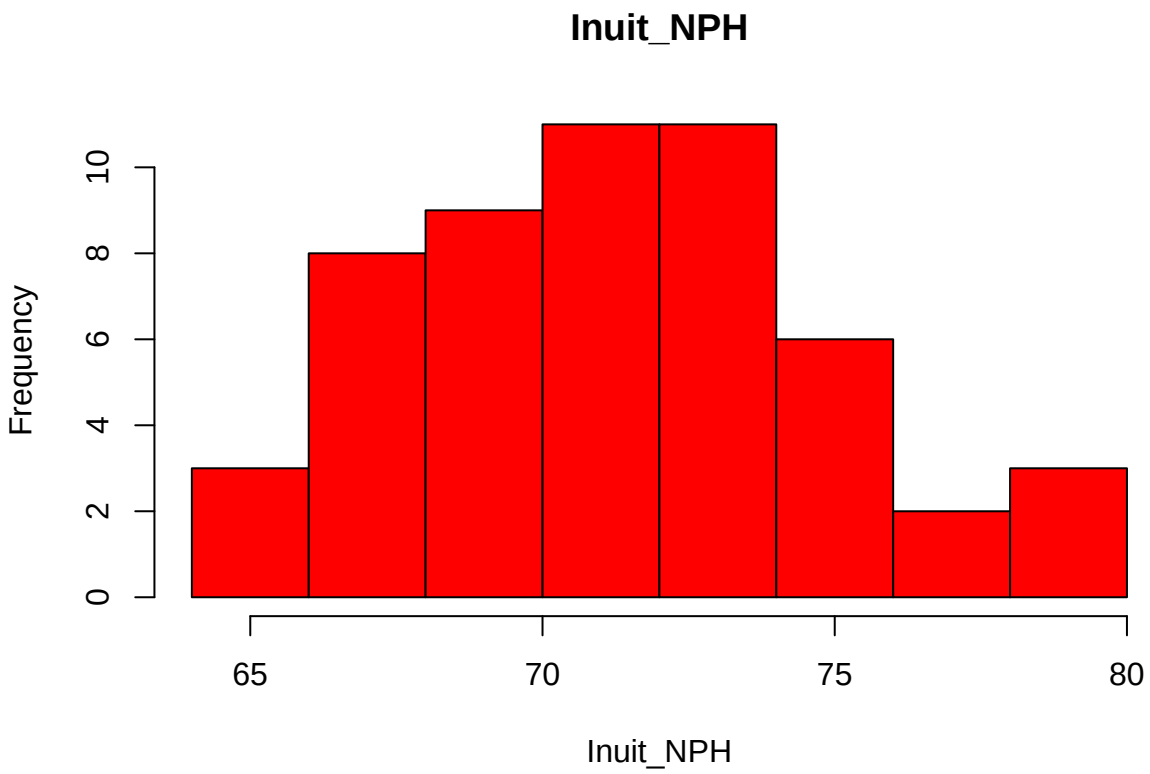
```
Men=read.csv("Project Data.csv")
Inuit_NPH=Men$NPH[Men$Population=="ESKIMO"]
summary(Inuit_NPH)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   64.00   69.00   72.00   71.74   74.00   80.00
```

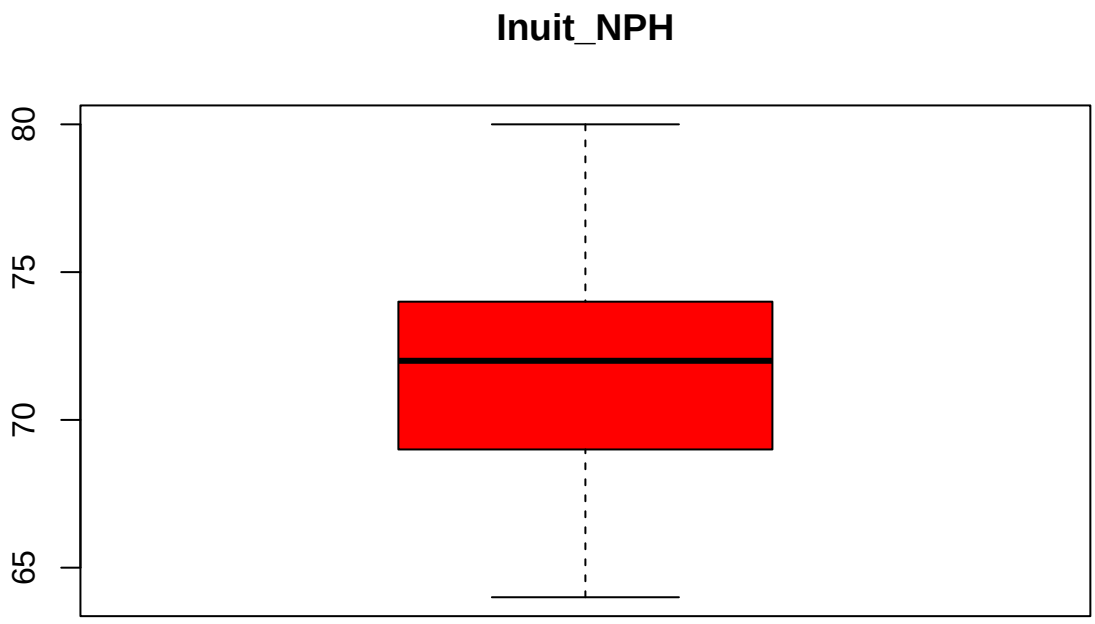
```
sd(Inuit_NPH)
```

```
## [1] 3.654033
```

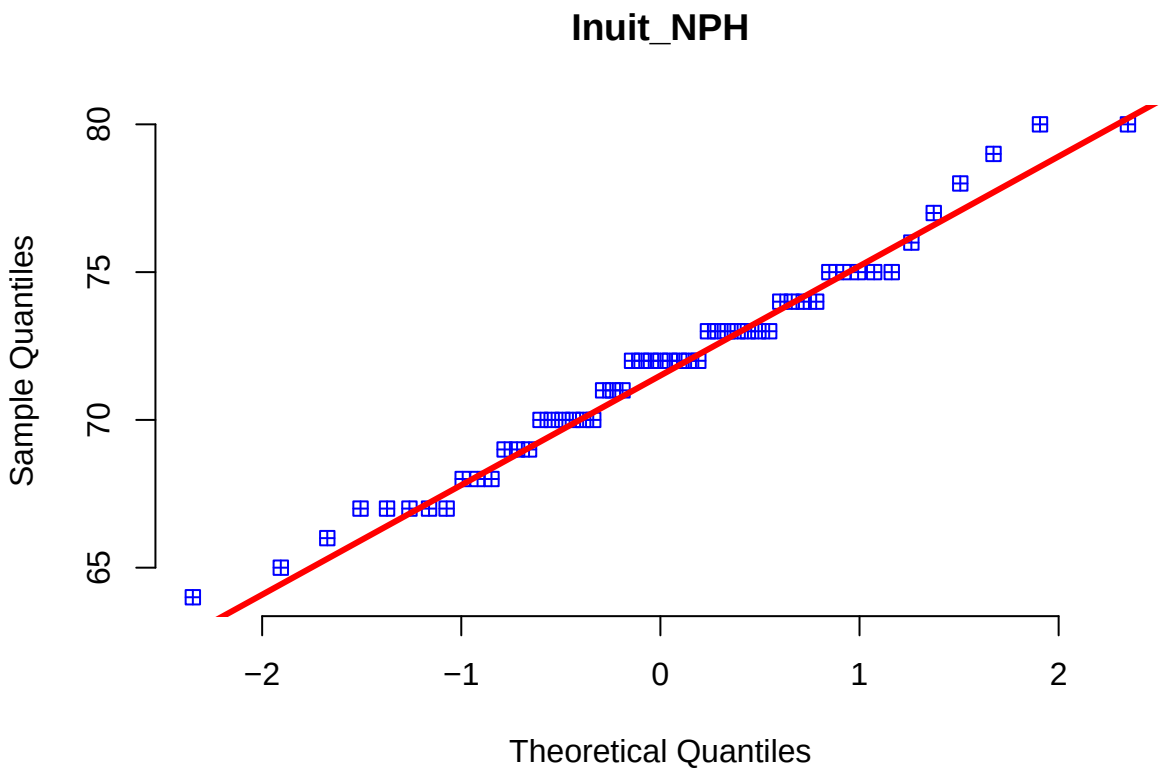
```
hist(Inuit_NPH,main = "Inuit_NPH",col="red")
```




```
boxplot(Inuit_NPH,main="Inuit_NPH",col="red")
```




```
qqnorm(Inuit_NPH,pch =12,main="Inuit_NPH",col="blue",frame=FALSE)
qqline(Inuit_NPH,col="red",lwd=3)
```



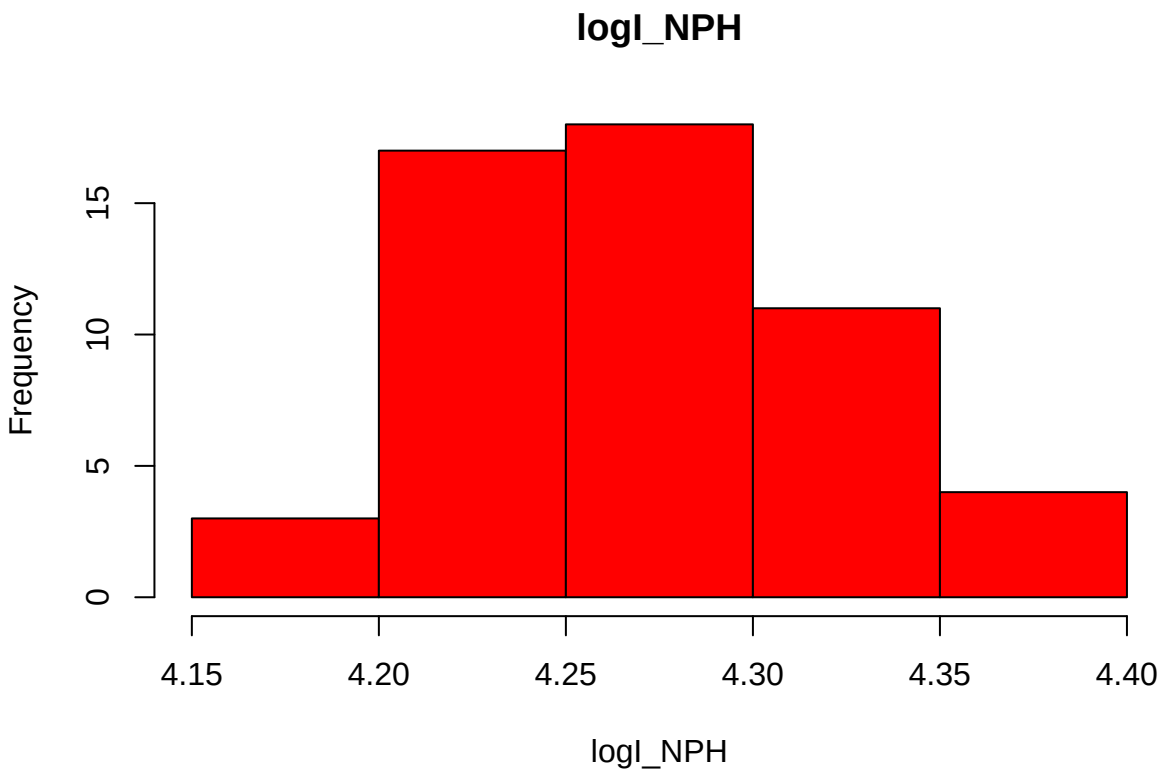

```
Men=read.csv("Project Data.csv")
Inuit_NPH=Men$NPH[Men$Population=="ESKIMO"]
logI_NPH=log(Inuit_NPH)
summary(logI_NPH)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   4.159   4.234   4.277   4.272   4.304   4.382
```

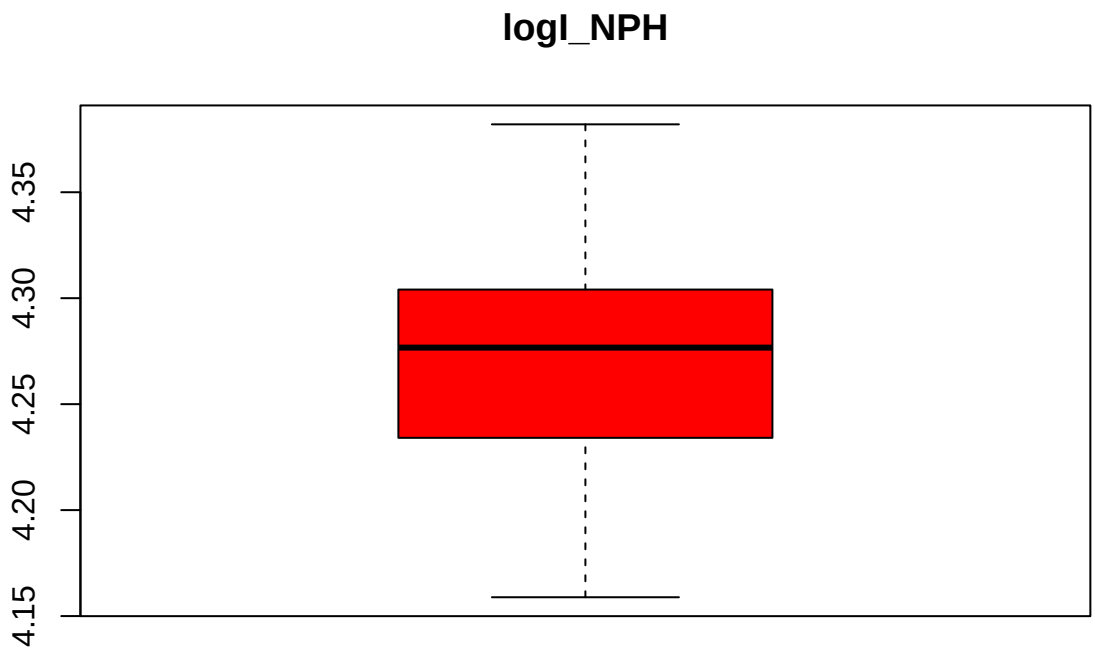
```
sd(logI_NPH)
```

```
## [1] 0.05084067
```

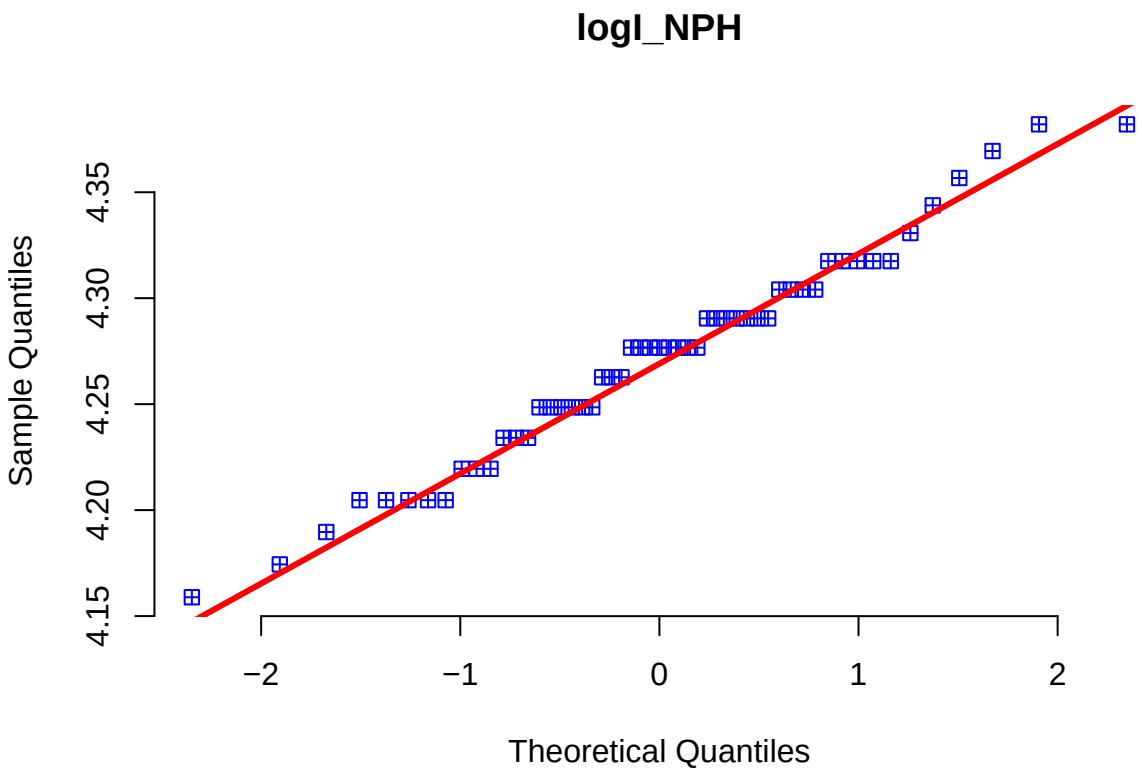
```
hist(logI_NPH,main = "logI_NPH",col="red")
```




```
boxplot(logI_NPH,main="logI_NPH",col="red")
```




```
qqnorm(logI_NPH,pch =12,main="logI_NPH",col="blue",frame=FALSE)
qqline(logI_NPH,col="red",lwd=3)
```



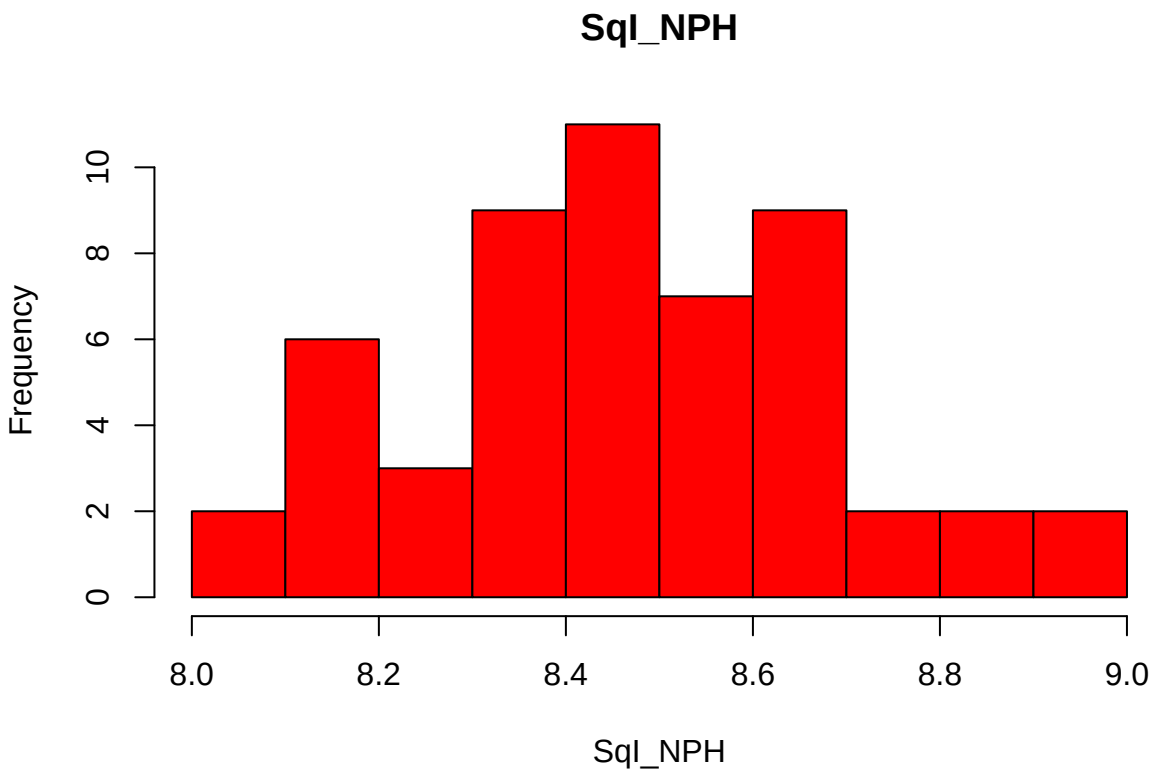

```
Men=read.csv("Project Data.csv")
Inuit_NPH=Men$NPH[Men$Population=="ESKIMO"]
SqI_NPH=sqrt(Inuit_NPH)
summary(SqI_NPH)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   8.000   8.307   8.485   8.467   8.602   8.944
```

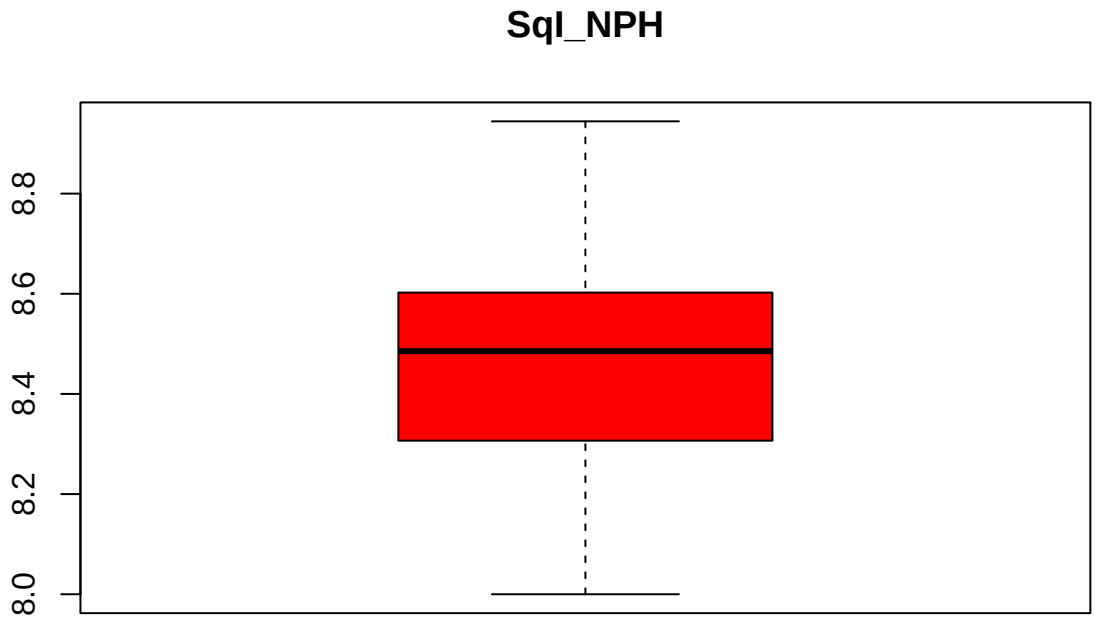
```
sd(SqI_NPH)
```

```
## [1] 0.2154149
```

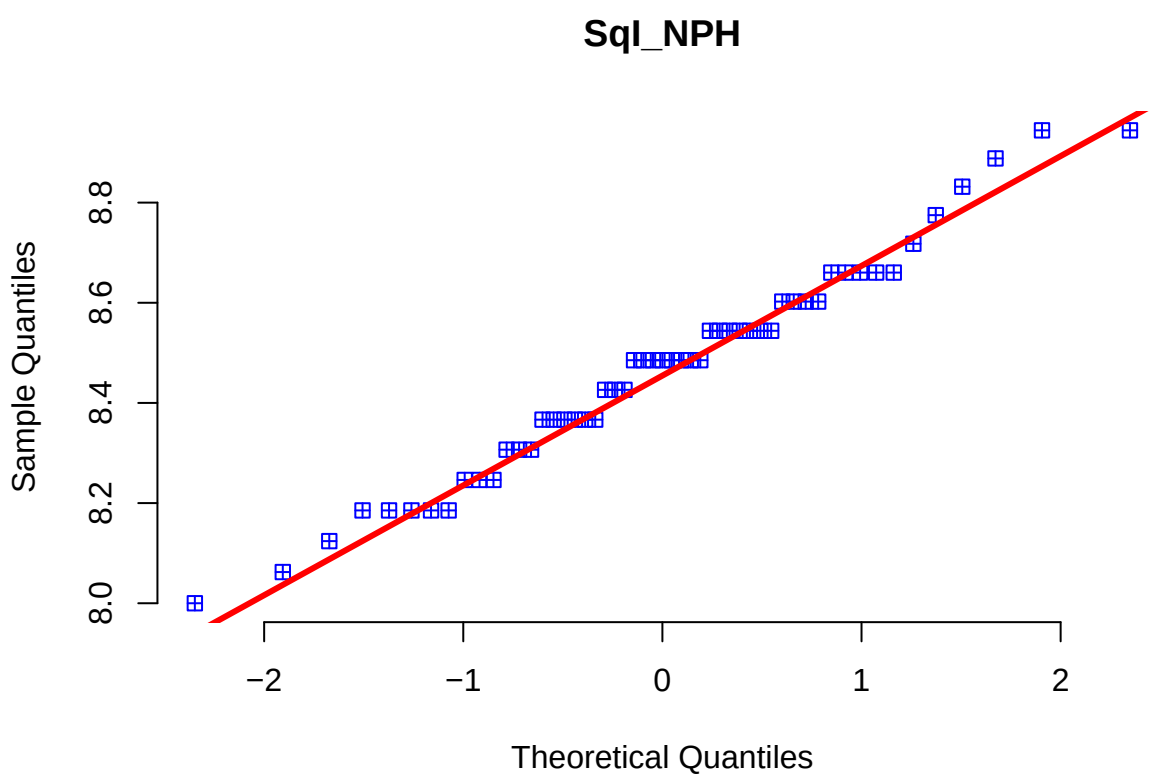
```
hist(SqI_NPH,main = "SqI_NPH",col="red")
```




```
boxplot(SqI_NPH,main="SqI_NPH",col="red")
```




```
qqnorm(SqI_NPH,pch =12,main="SqI_NPH",col="blue",frame=FALSE)
qqline(SqI_NPH,col="red",lwd=3)
```



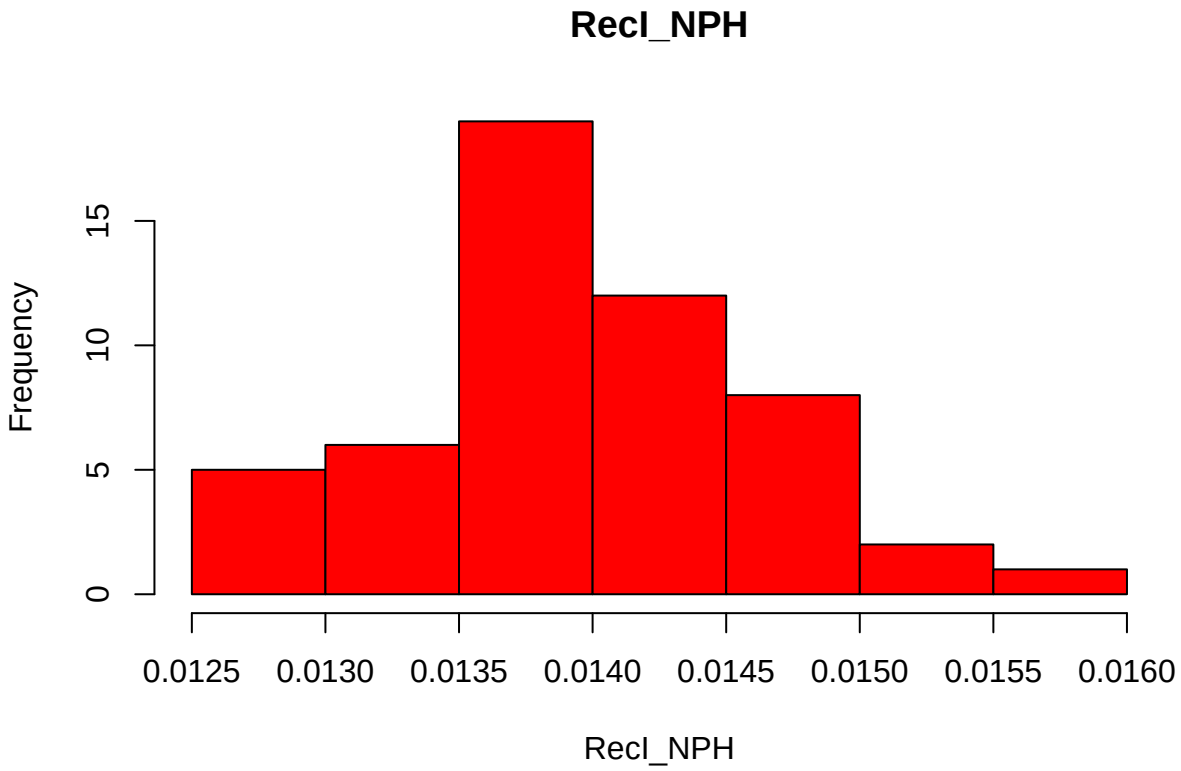

```
Men=read.csv("Project Data.csv")
Inuit_NPH=Men$NPH[Men$Population=="ESKIMO"]
RecI_NPH=1/Inuit_NPH
summary(RecI_NPH)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## 0.01250 0.01351 0.01389 0.01398 0.01449 0.01562
```

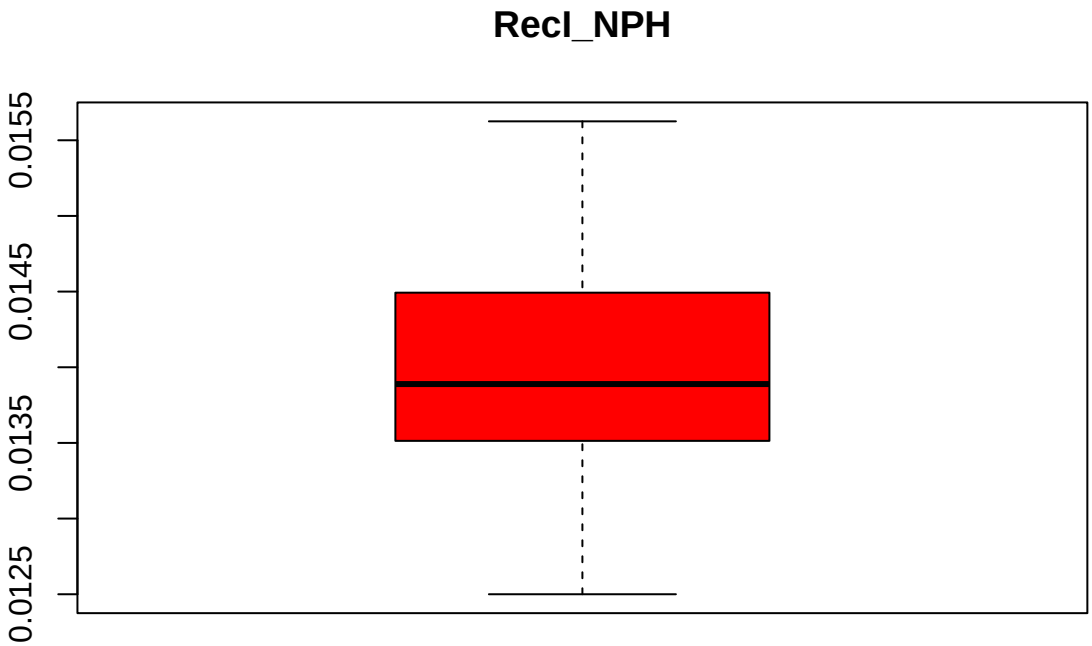
```
sd(RecI_NPH)
```

```
## [1] 0.0007097948
```

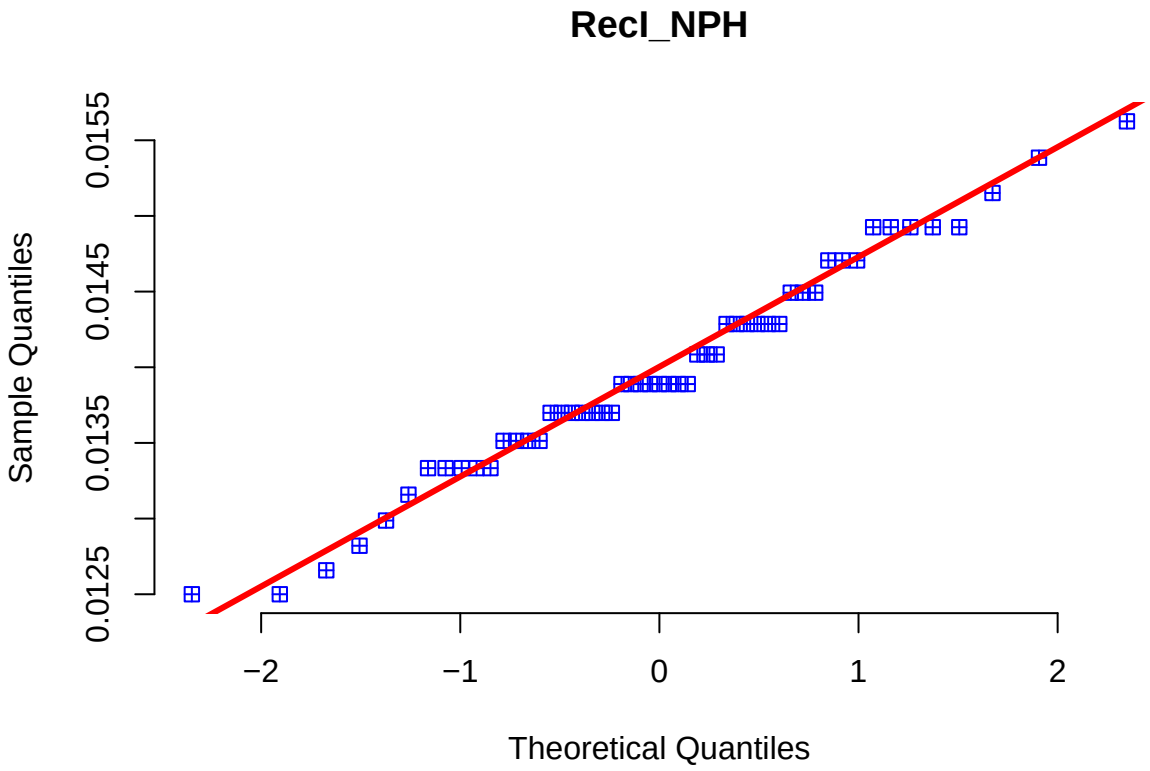
```
hist(RecI_NPH,main = "RecI_NPH",col="red")
```




```
boxplot(RecI_NPH,main="RecI_NPH",col="red")
```




```
qqnorm(RecI_NPH,pch =12,main="RecI_NPH",col="blue",frame=FALSE)
qqline(RecI_NPH,col="red",lwd=3)
```



Male Inuit BPL vs NPH- Welch Two Sample t-test

```
Men=read.csv("Project Data.csv")
t.test(Inuit_BPL,Inuit_NPH,conf.level = .95)
```

```
##
##  Welch Two Sample t-test
##
## data:  Inuit_BPL and Inuit_NPH
## t = 38.895, df = 99.073, p-value < 2.2e-16
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##  29.72295 32.91856
## sample estimates:
## mean of x mean of y
## 103.05660  71.73585
```

Male Egypt BPL vS Male Inuit BPL-Welch Two Sample t-test

```r
Men=read.csv("Project Data.csv")
t.test(Egypt_BPL,Inuit_BPL,conf.level = .95)
```

```
##
##  Welch Two Sample t-test
##
## data:  Egypt_BPL and Inuit_BPL
## t = -8.1558, df = 101.09, p-value = 9.866e-13
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##  -8.129913 -4.948812
## sample estimates:
## mean of x mean of y
##  96.51724 103.05660
```

Male Egypt NPH vs Male Inuit NPH

```r
Men=read.csv("Project Data.csv")
t.test(SqE_NPH,Inuit_NPH,conf.level = .95)
```

```
##
##  Welch Two Sample t-test
##
## data:  SqE_NPH and Inuit_NPH
## t = -126.3, df = 52.235, p-value < 2.2e-16
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##  -64.47372 -62.45730
## sample estimates:
## mean of x mean of y
##   8.27034  71.73585
```

Female Egypt BPL

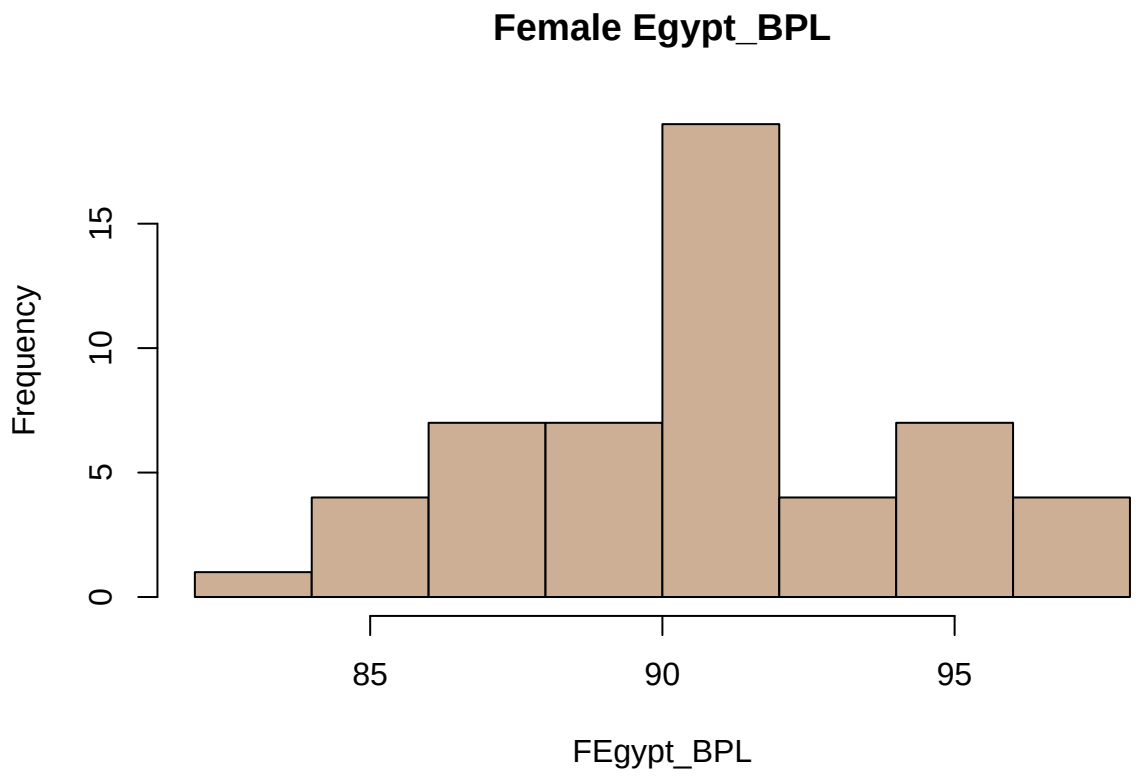
```r
Men=read.csv("Project Data.csv")
FEgypt_BPL=Men$BPL2[Men$Population2=="EGYPT"]
summary(FEgypt_BPL)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   82.00   89.00   91.00   91.25   93.00   98.00
```

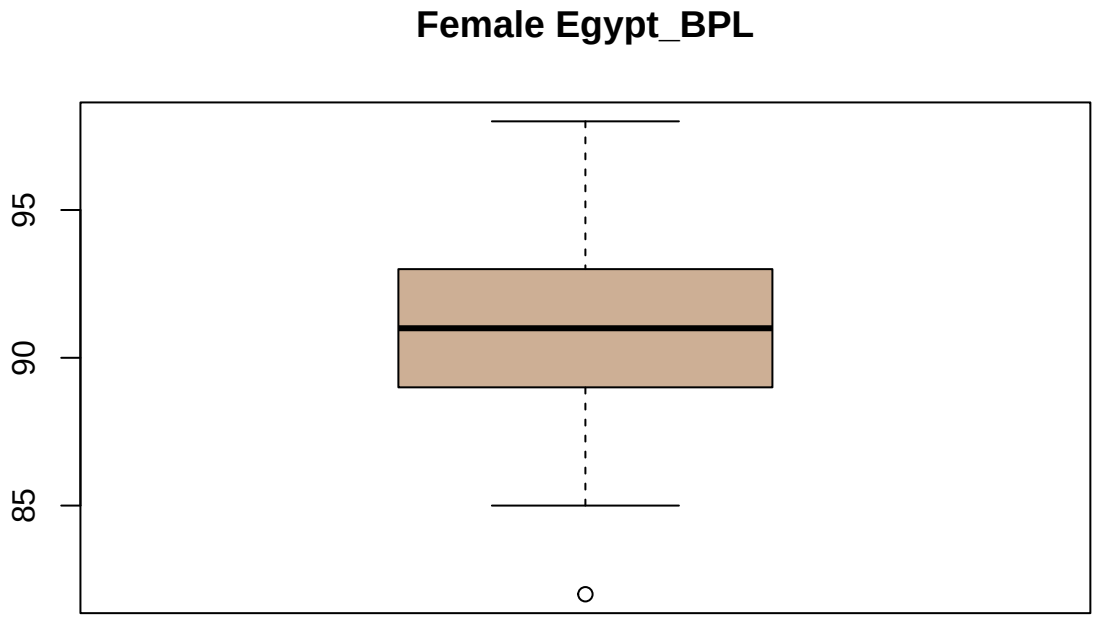
```r
sd(FEgypt_BPL)
```

```
## [1] 3.621016
```

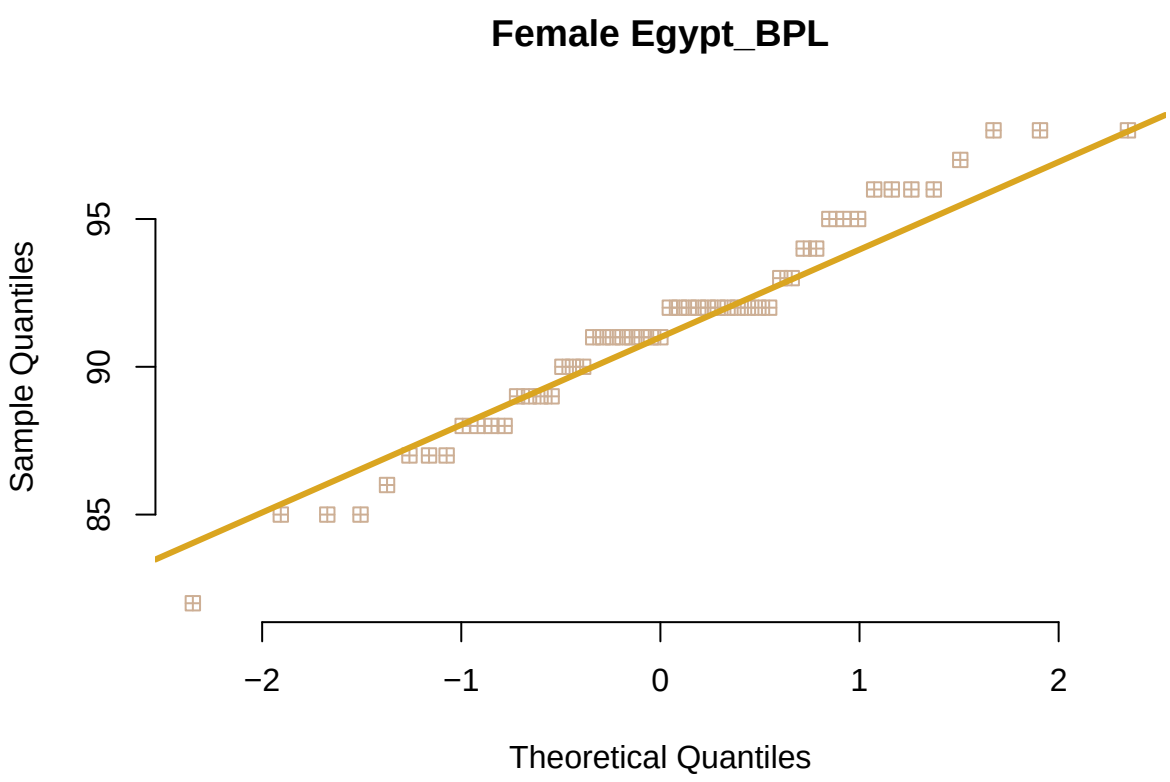
```r
hist(FEgypt_BPL,main = "Female Egypt_BPL",col="peachpuff3")
```




```r
boxplot(FEgypt_BPL,main="Female Egypt_BPL",col="peachpuff3")
```




```
qqnorm(FEgypt_BPL,pch =12,main="Female Egypt_BPL",col="peachpuff3",frame=FALSE)
qqline(FEgypt_BPL,col="goldenrod",lwd=3)
```



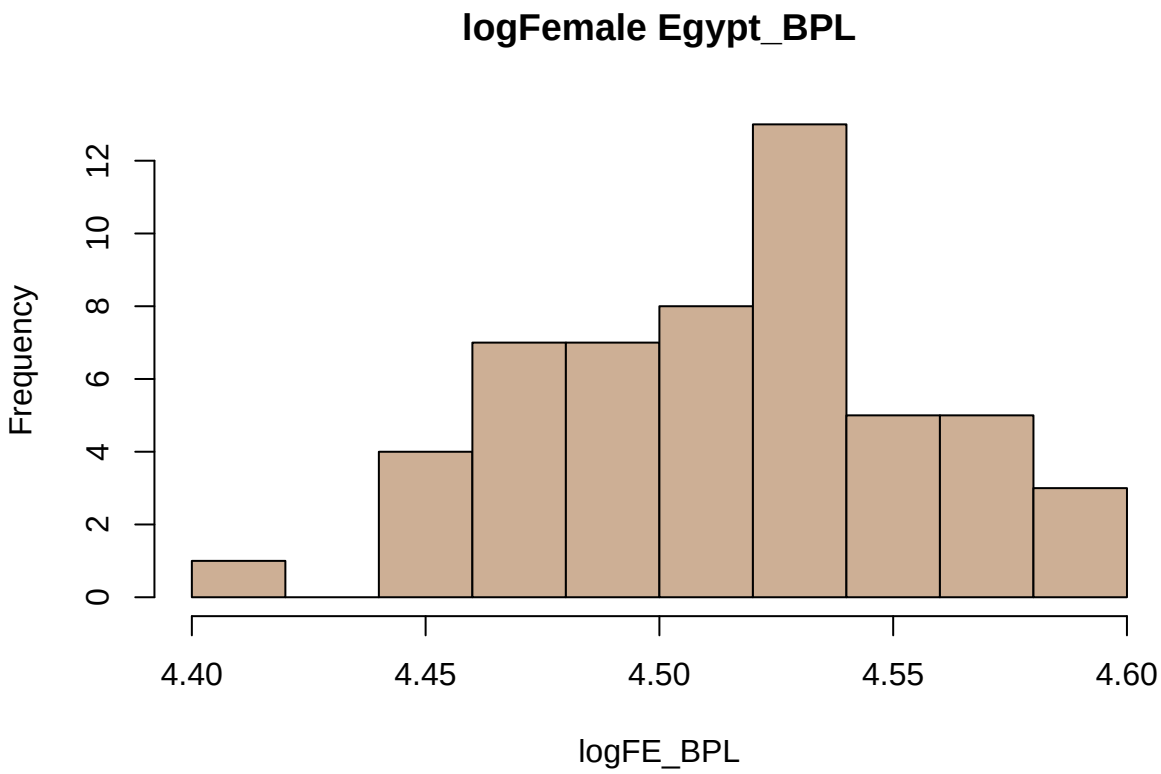

```
Men=read.csv("Project Data.csv")
FEgypt_BPL=Men$BPL2[Men$Population2=="EGYPT"]
logFE_BPL=log(FEgypt_BPL)
summary(logFE_BPL)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   4.407   4.489   4.511   4.513   4.533   4.585
```

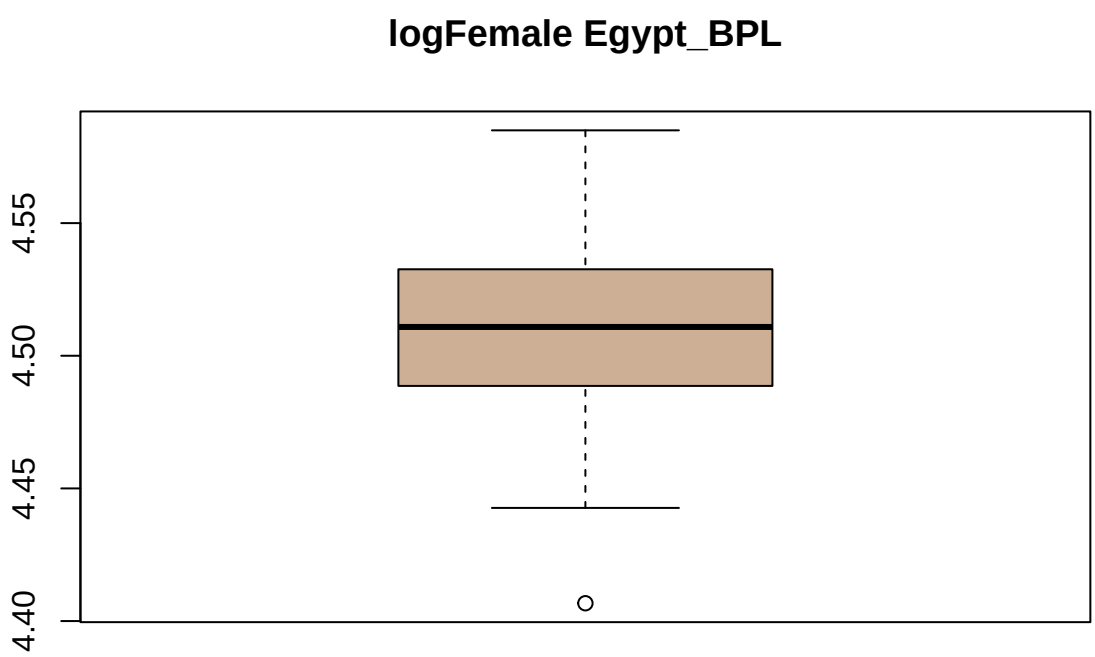
```
sd(logFE_BPL)
```

```
## [1] 0.03985845
```

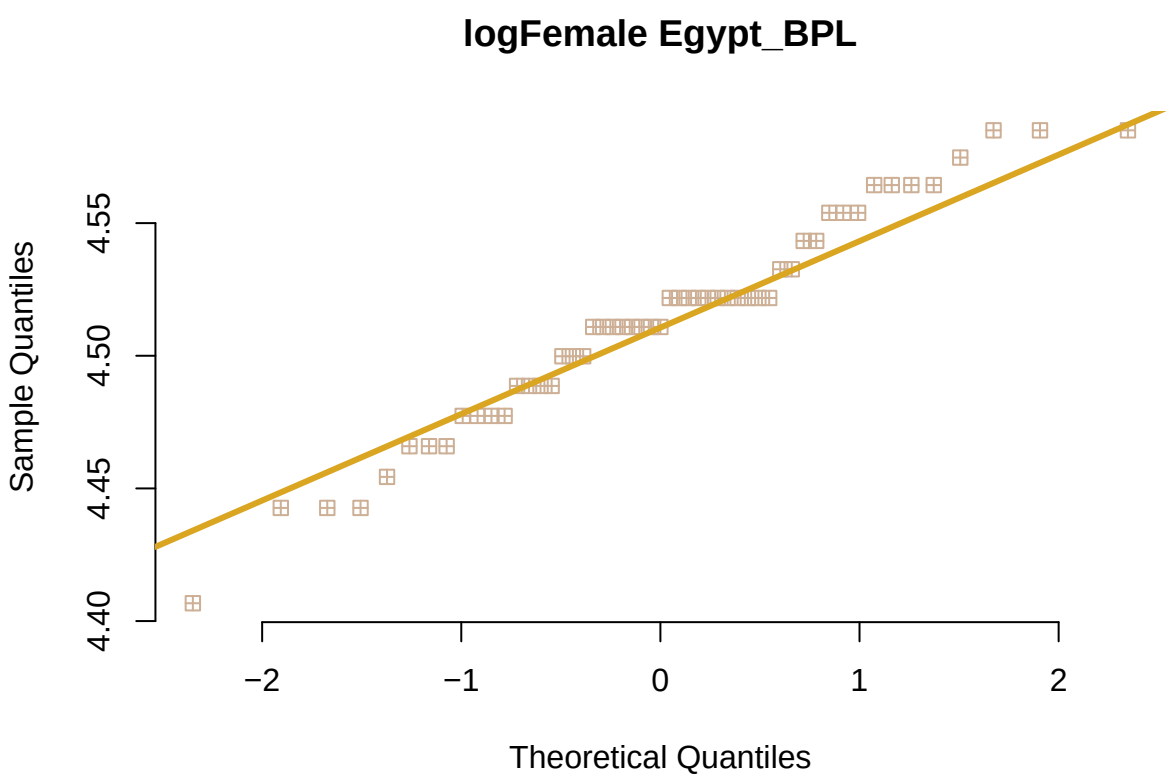
```
hist(logFE_BPL,main = "logFemale Egypt_BPL",col="peachpuff3")
```




```
boxplot(logFE_BPL,main="logFemale Egypt_BPL",col="peachpuff3")
```




```
qqnorm(logFE_BPL,pch =12,main="logFemale Egypt_BPL",col="peachpuff3",frame=FALSE)
qqline(logFE_BPL,col="goldenrod",lwd=3)
```



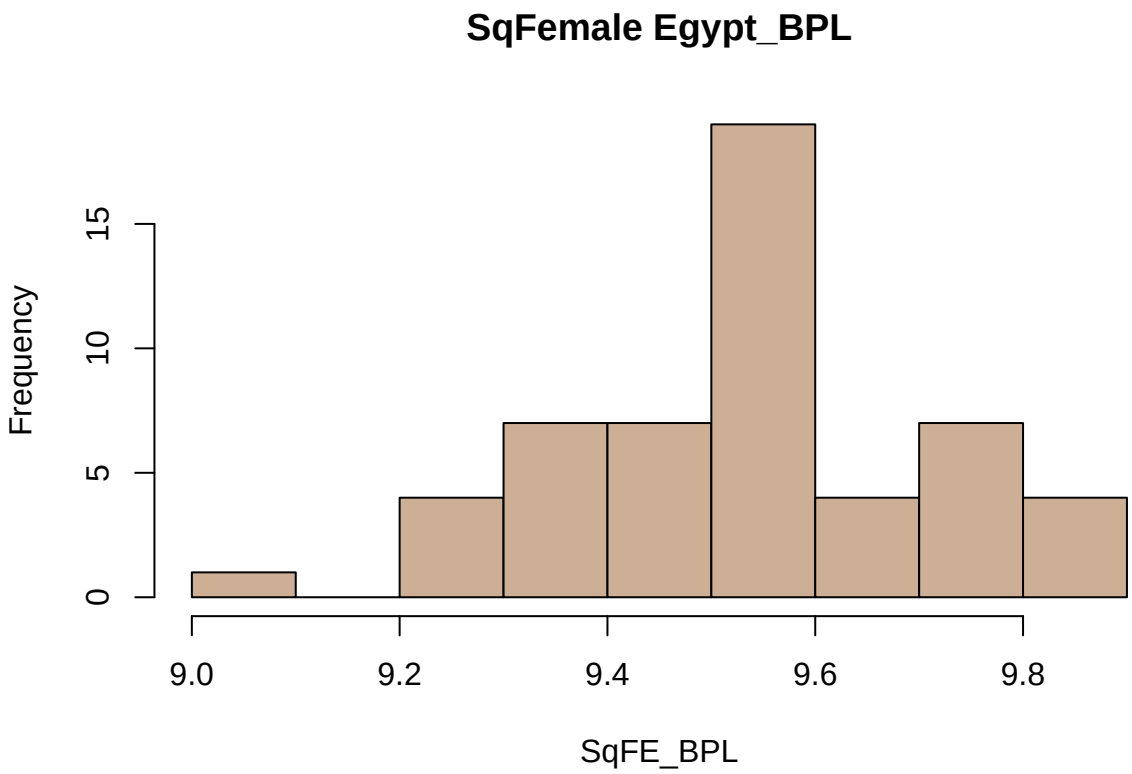

```
Men=read.csv("Project Data.csv")
FEgypt_BPL=Men$BPL2[Men$Population2=="EGYPT"]
SqFE_BPL=sqrt(FEgypt_BPL)
summary(SqFE_BPL)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   9.055   9.434   9.539   9.550   9.644   9.899
```

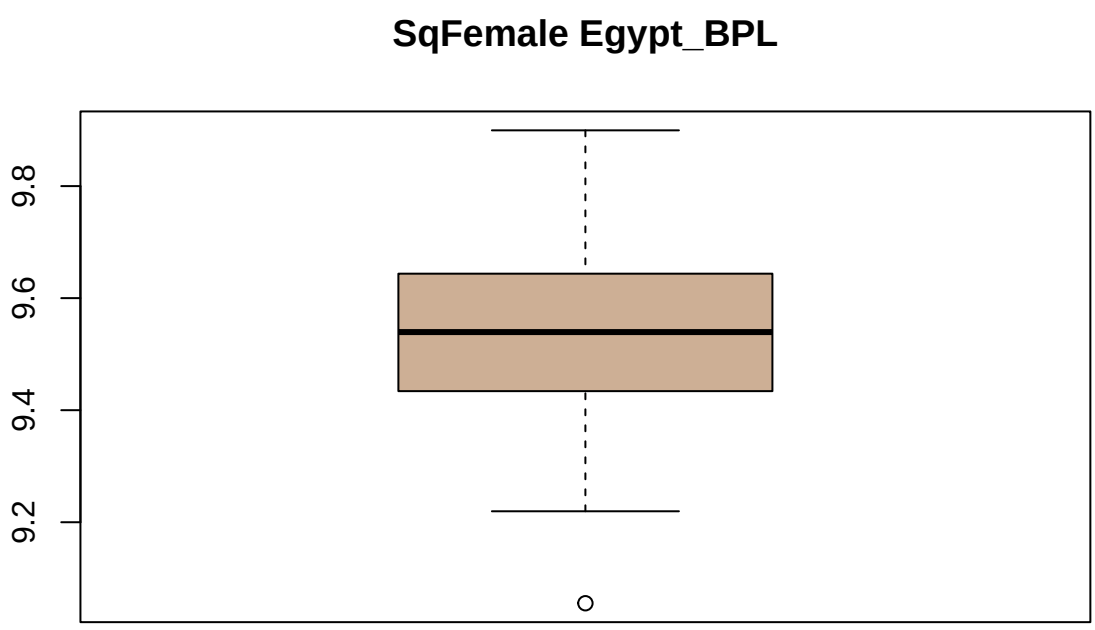
```
sd(SqFE_BPL)
```

```
## [1] 0.1899017
```

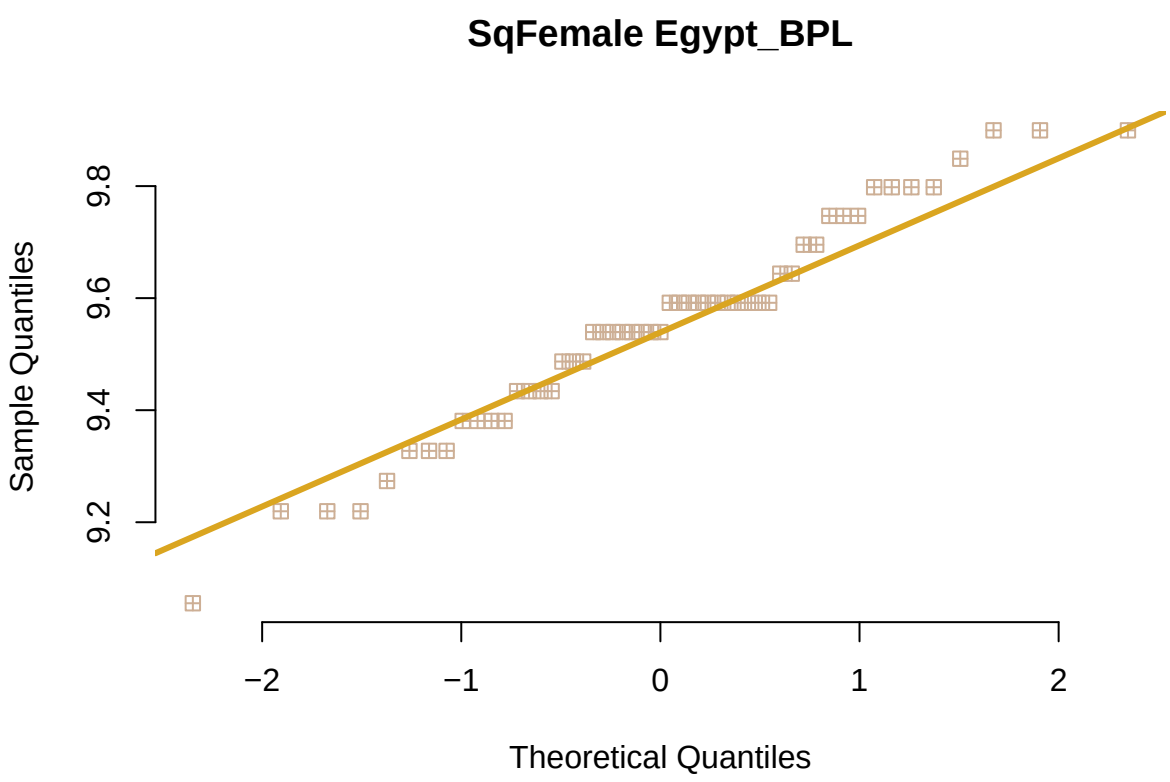
```
hist(SqFE_BPL,main = "SqFemale Egypt_BPL",col="peachpuff3")
```




```
boxplot(SqFE_BPL,main="SqFemale Egypt_BPL",col="peachpuff3")
```




```
qqnorm(SqFE_BPL,pch =12,main="SqFemale Egypt_BPL",col="peachpuff3",frame=FALSE)
qqline(SqFE_BPL,col="goldenrod",lwd=3)
```



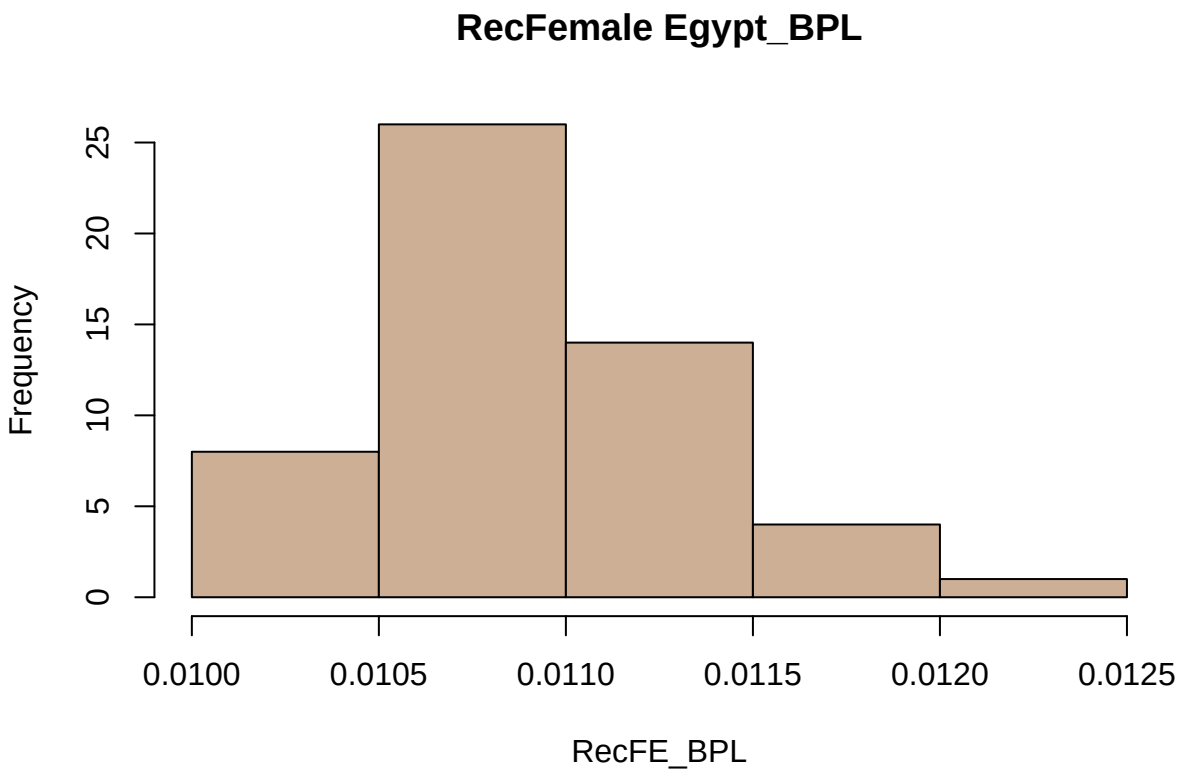

```
Men=read.csv("Project Data.csv")
FEgypt_BPL=Men$BPL2[Men$Population2=="EGYPT"]
RecFE_BPL=1/FEgypt_BPL
summary(RecFE_BPL)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## 0.01020 0.01075 0.01099 0.01098 0.01124 0.01220
```

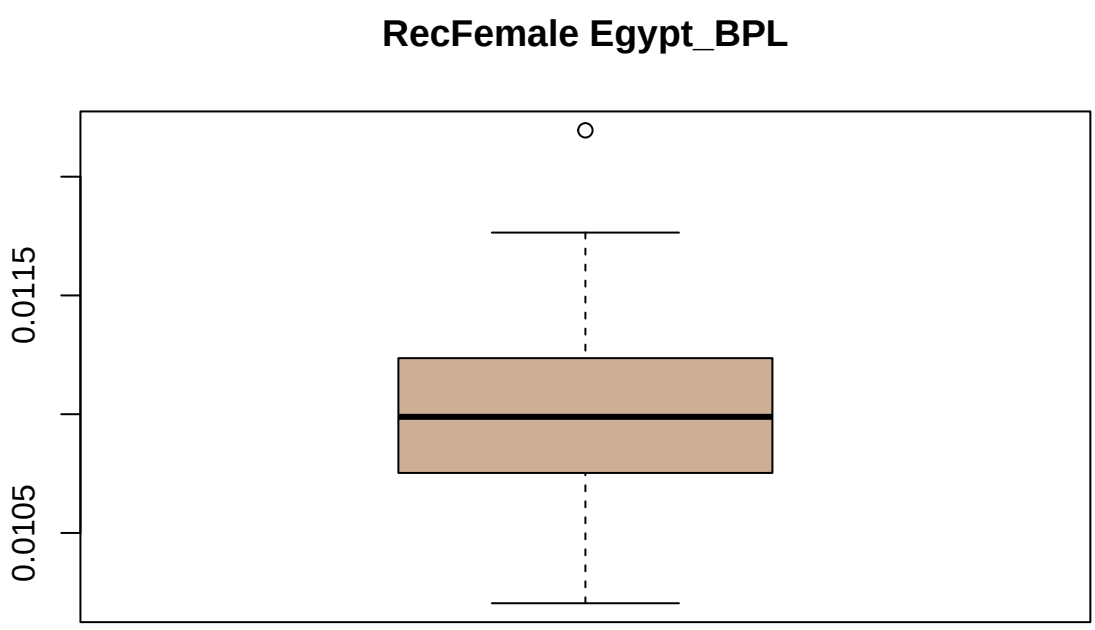
```
sd(RecFE_BPL)
```

```
## [1] 0.0004396943
```

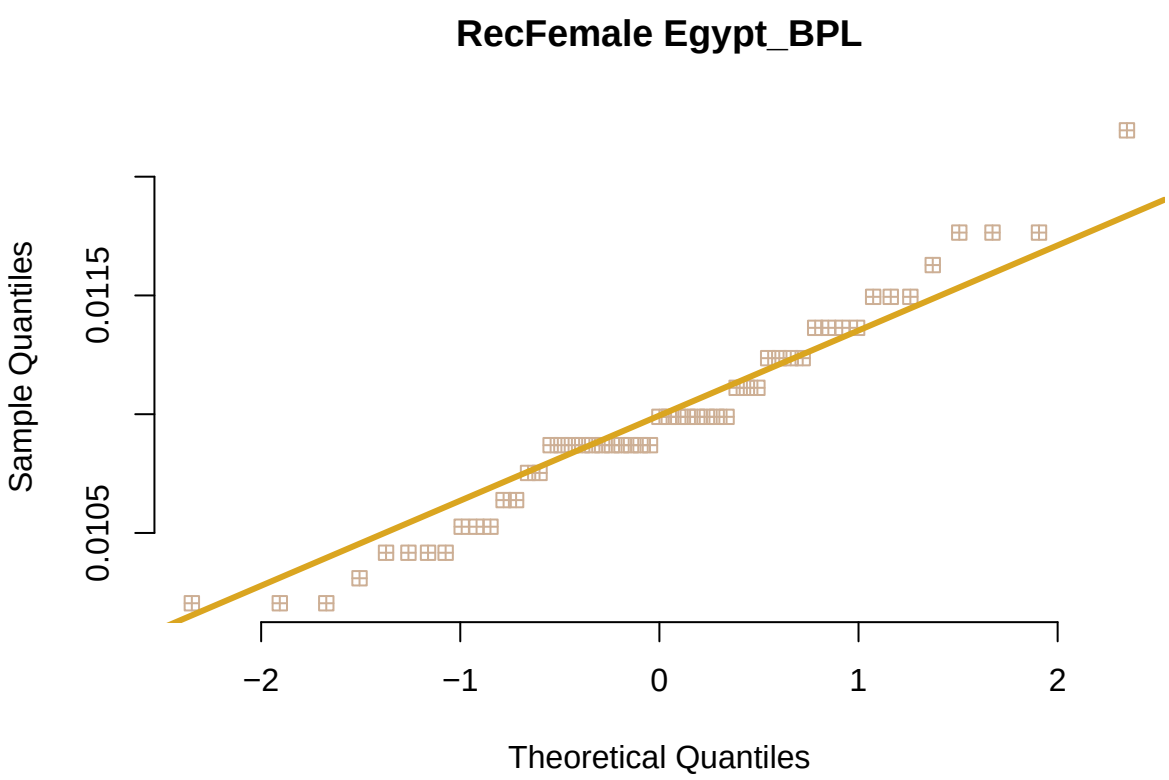
```
hist(RecFE_BPL,main = "RecFemale Egypt_BPL",col="peachpuff3")
```




```
boxplot(RecFE_BPL,main="RecFemale Egypt_BPL",col="peachpuff3")
```




```
qqnorm(RecFE_BPL,pch =12,main="RecFemale Egypt_BPL",col="peachpuff3",frame=FALSE)
qqline(RecFE_BPL,col="goldenrod",lwd=3)
```



Female Egypt NPH

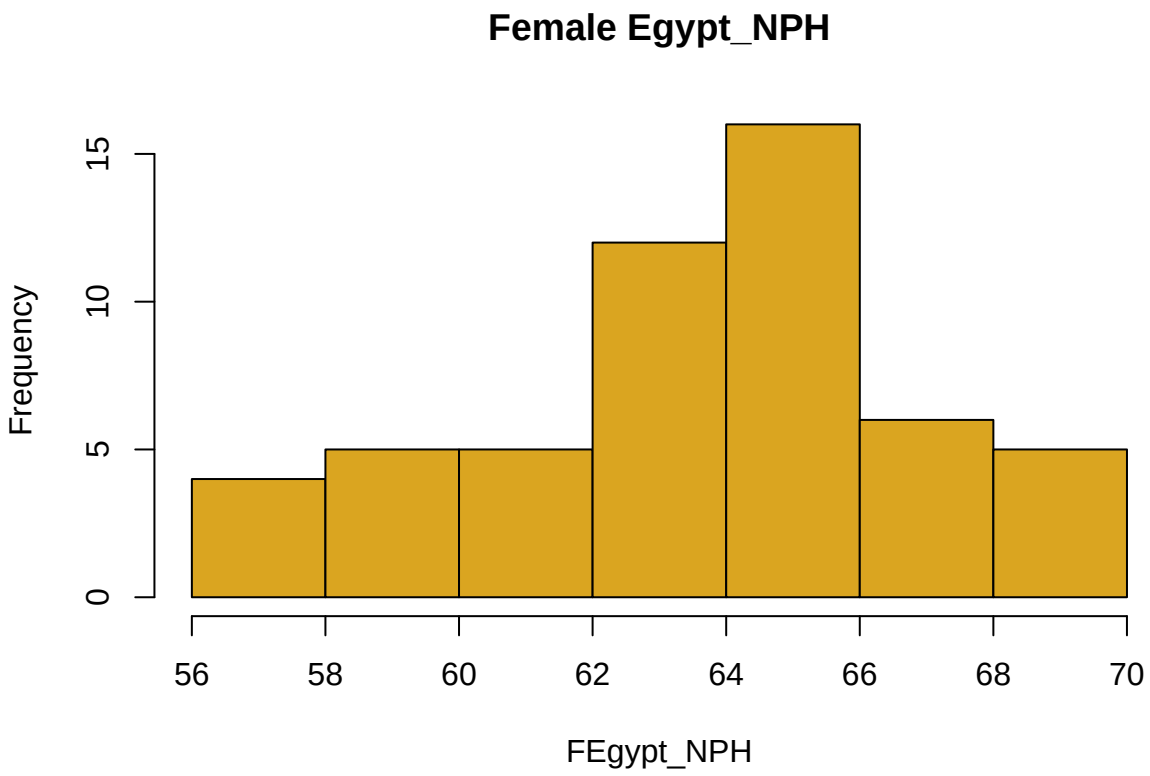
```
Men=read.csv("Project Data.csv")
FEgypt_NPH=Men$NPH2[Men$Population2=="EGYPT"]
summary(FEgypt_NPH)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   57.00   62.00   65.00   64.06   66.00   70.00
```

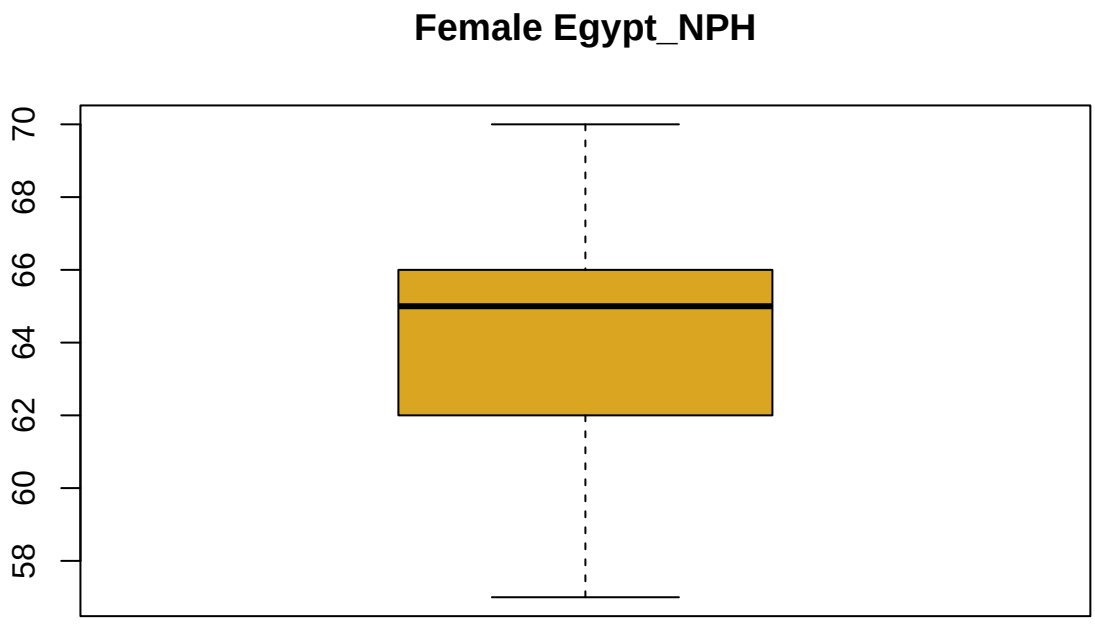
```
sd(FEgypt_NPH)
```

```
## [1] 3.342127
```

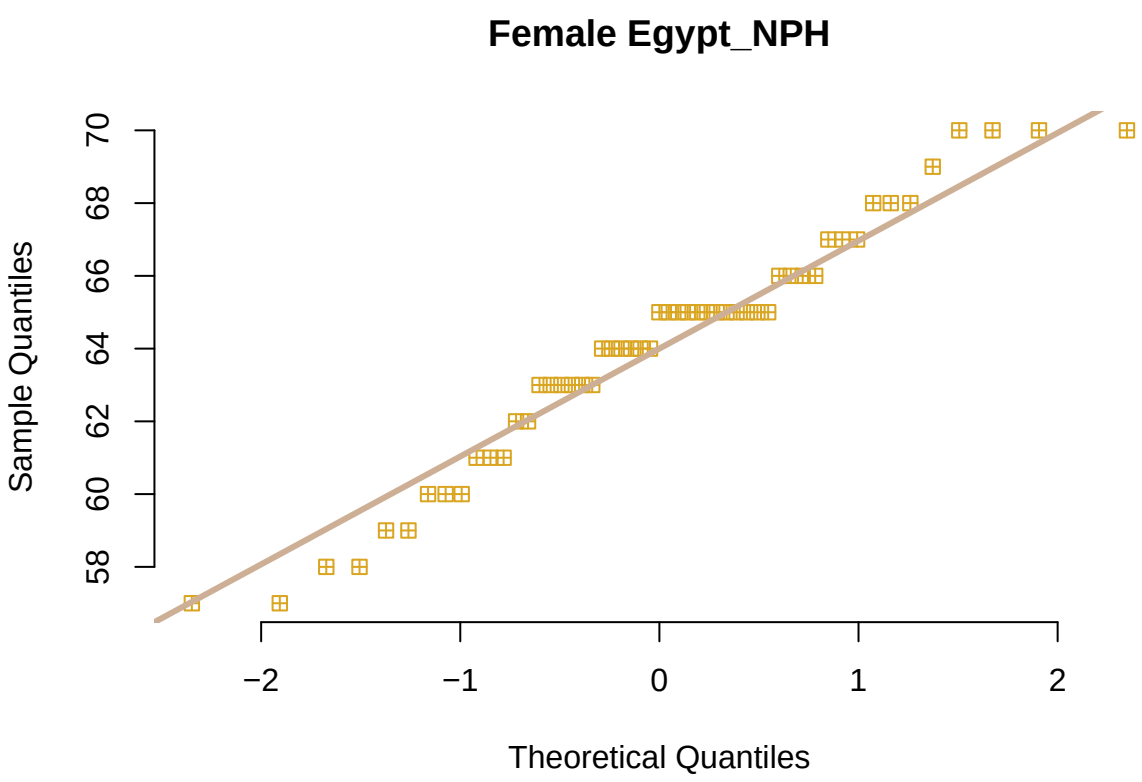
```
hist(FEgypt_NPH,main = "Female Egypt_NPH",col="goldenrod")
```




```
boxplot(FEgypt_NPH,main="Female Egypt_NPH",col="goldenrod")
```




```
qqnorm(FEgypt_NPH,pch =12,main="Female Egypt_NPH",col="goldenrod",frame=FALSE)
qqline(FEgypt_NPH,col="peachpuff3",lwd=3)
```



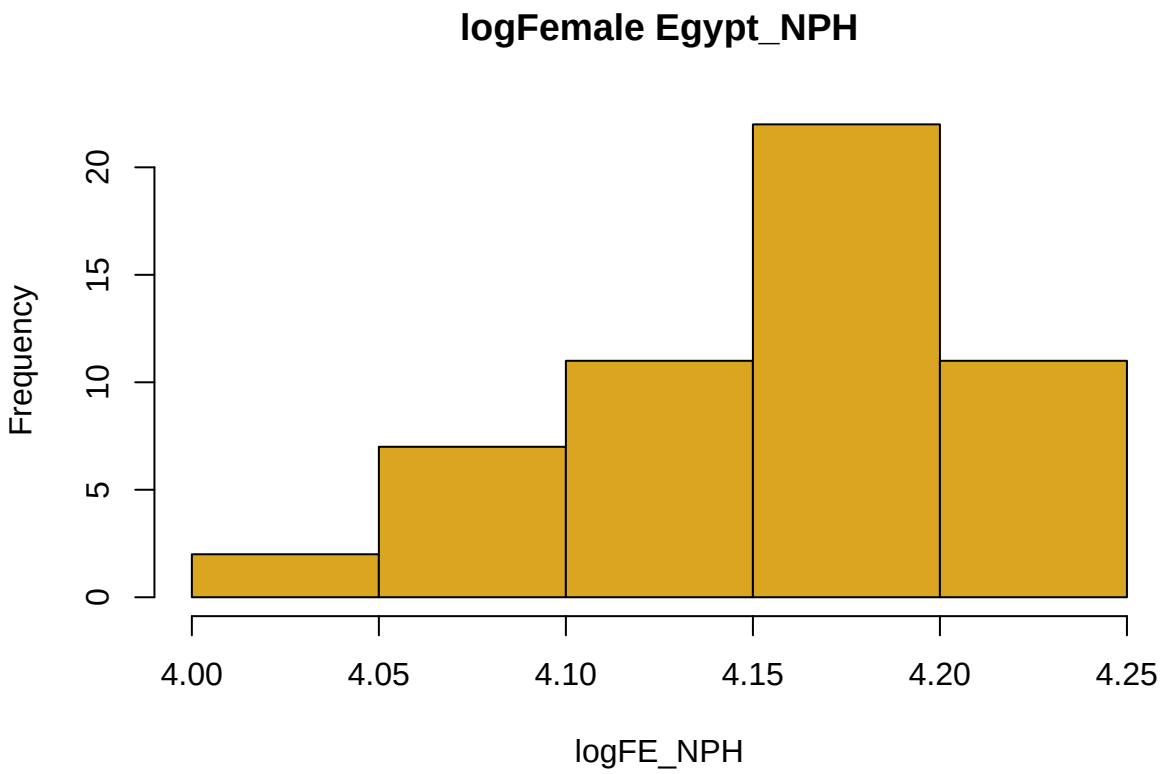

```
Men=read.csv("Project Data.csv")
FEgypt_NPH=Men$NPH2[Men$Population2=="EGYPT"]
logFE_NPH=log(FEgypt_NPH)
summary(logFE_NPH)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   4.043   4.127   4.174   4.158   4.190   4.248
```

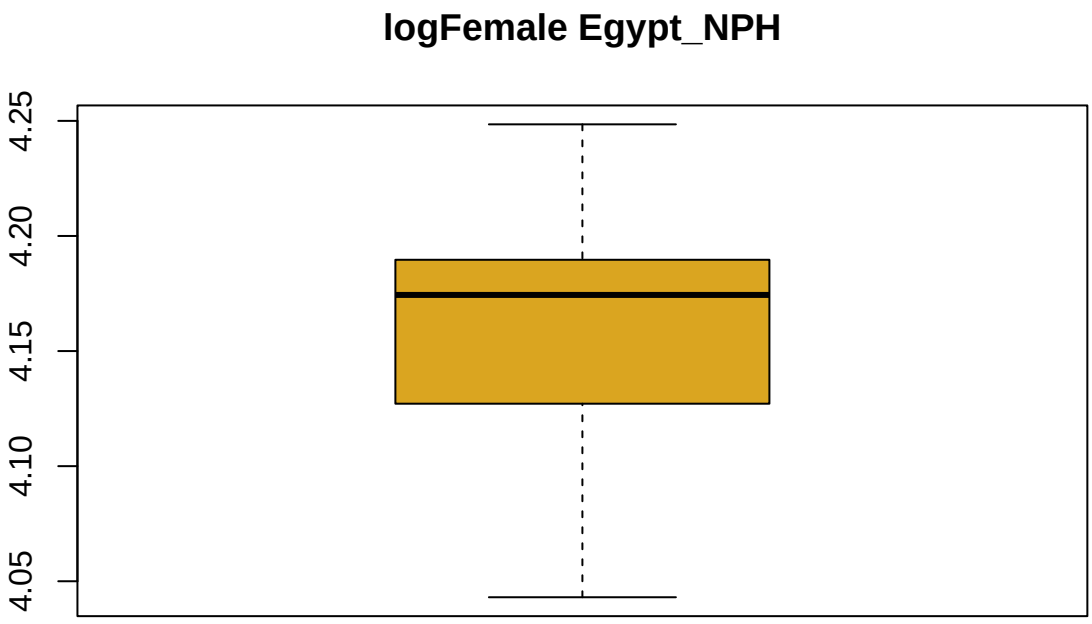
```
sd(logFE_NPH)
```

```
## [1] 0.05264642
```

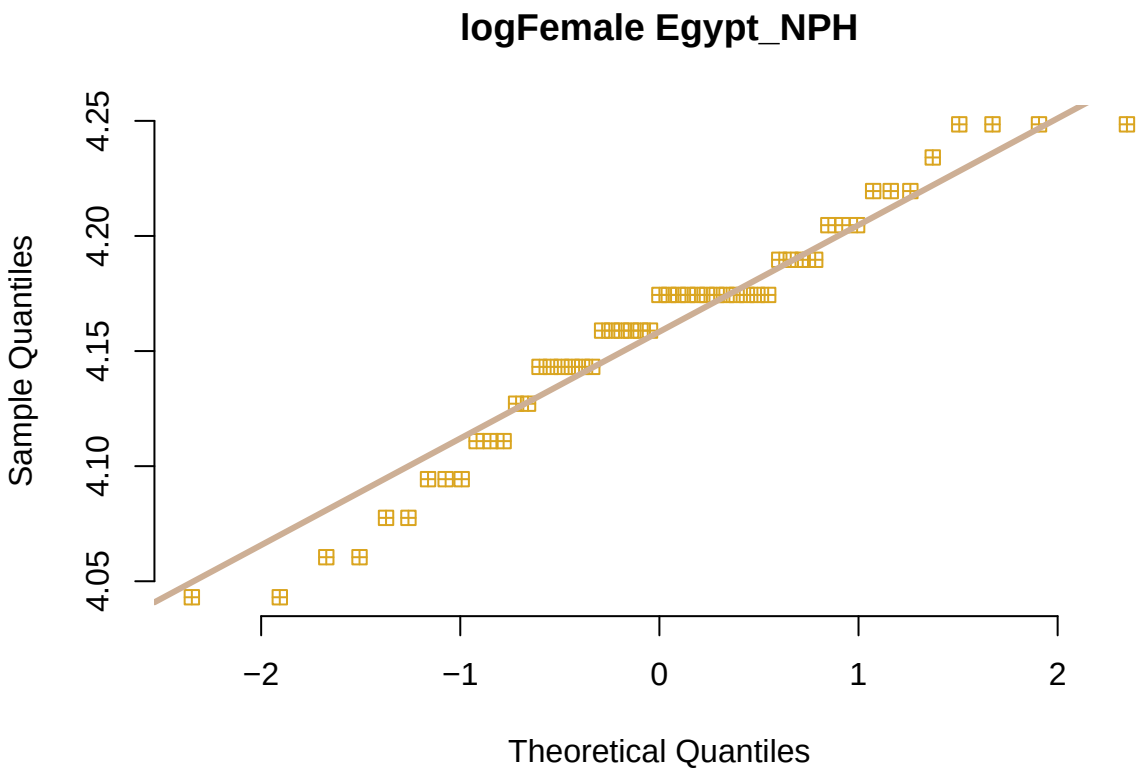
```
hist(logFE_NPH,main = "logFemale Egypt_NPH",col="goldenrod")
```




```
boxplot(logFE_NPH,main="logFemale Egypt_NPH",col="goldenrod")
```




```
qqnorm(logFE_NPH,pch =12,main="logFemale Egypt_NPH",col="goldenrod",frame=FALSE)
qqline(logFE_NPH,col="peachpuff3",lwd=3)
```



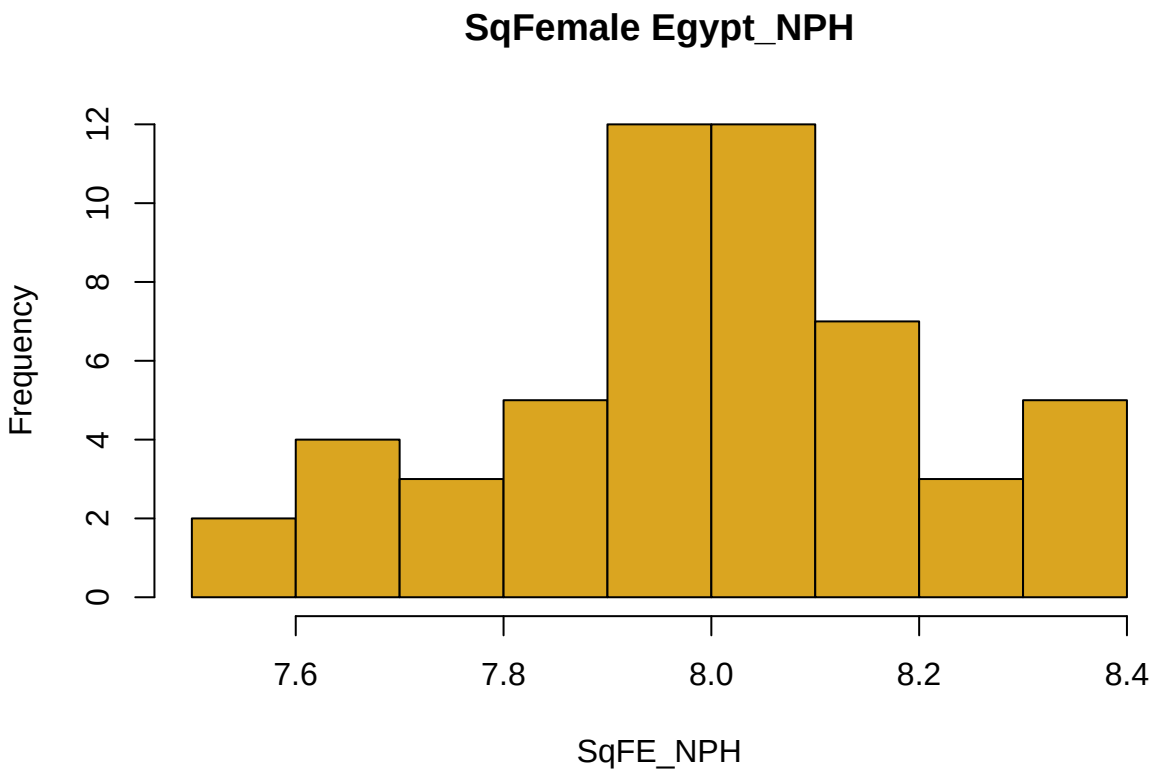

```
Men=read.csv("Project Data.csv")
FEgypt_NPH=Men$NPH2[Men$Population2=="EGYPT"]
SqFE_NPH=sqrt(FEgypt_NPH)
summary(SqFE_NPH)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   7.550   7.874   8.062   8.001   8.124   8.367
```

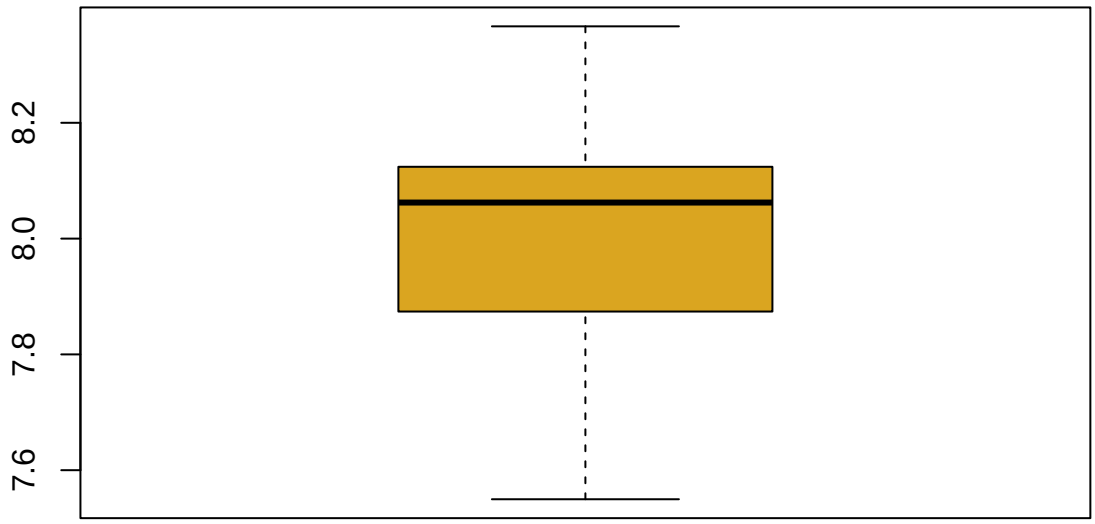
```
sd(SqFE_NPH)
```

```
## [1] 0.2096437
```

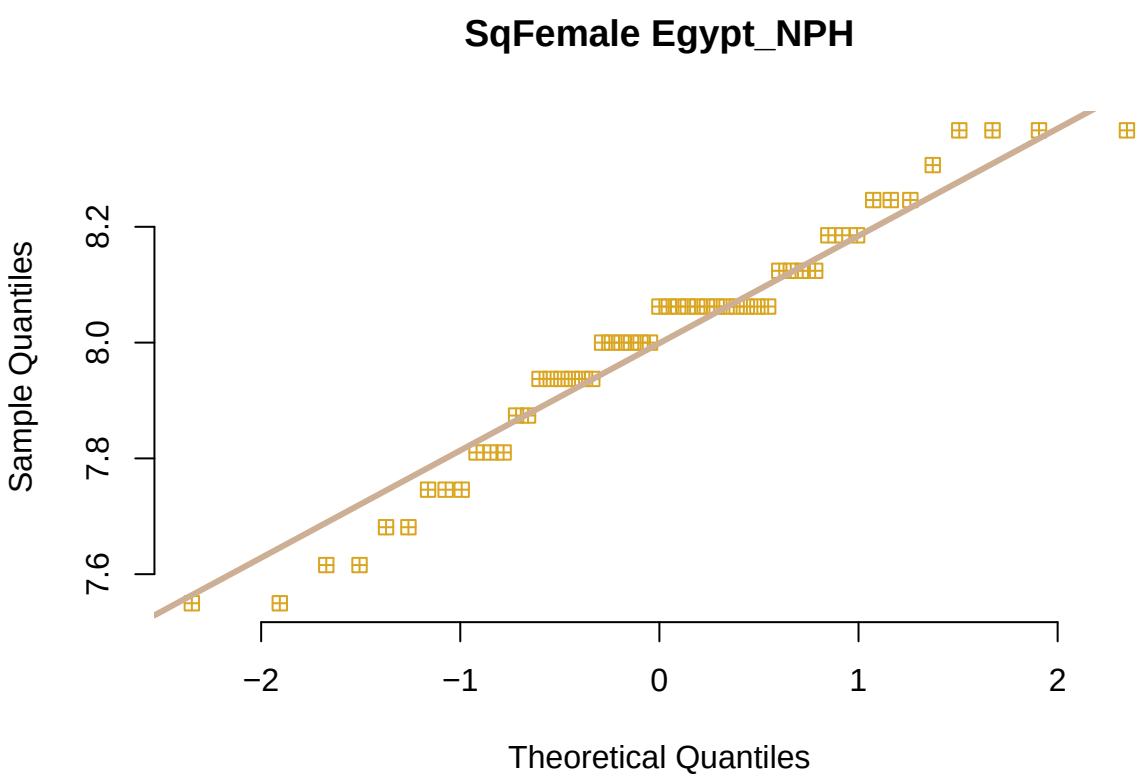
```
hist(SqFE_NPH,main = "SqFemale Egypt_NPH",col="goldenrod")
```




```
boxplot(SqFE_NPH,main="SqFemale Egypt_NPH",col="goldenrod")
```




```
qqnorm(SqFE_NPH,pch =12,main="SqFemale Egypt_NPH",col="goldenrod",frame=FALSE)
qqline(SqFE_NPH,col="peachpuff3",lwd=3)
```



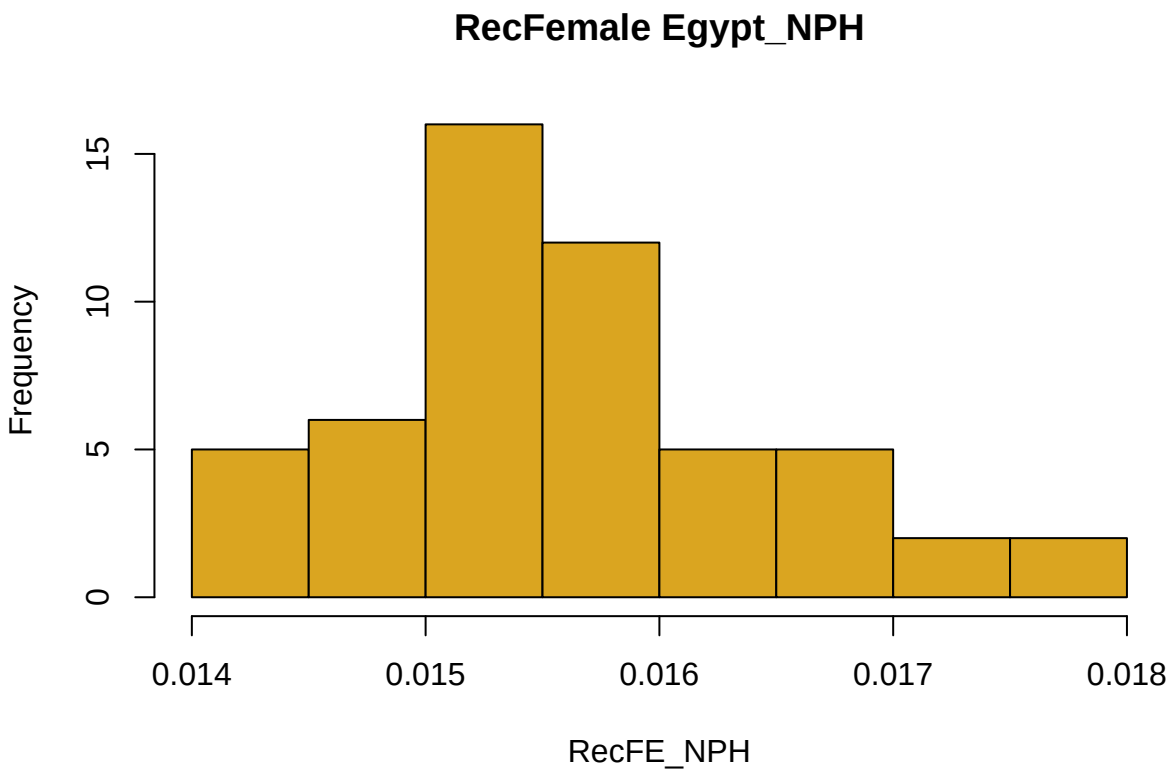

```
Men=read.csv("Project Data.csv")
FEgypt_NPH=Men$NPH2[Men$Population2=="EGYPT"]
RecFE_NPH=1/FEgypt_NPH
summary(RecFE_NPH)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## 0.01429 0.01515 0.01538 0.01565 0.01613 0.01754
```

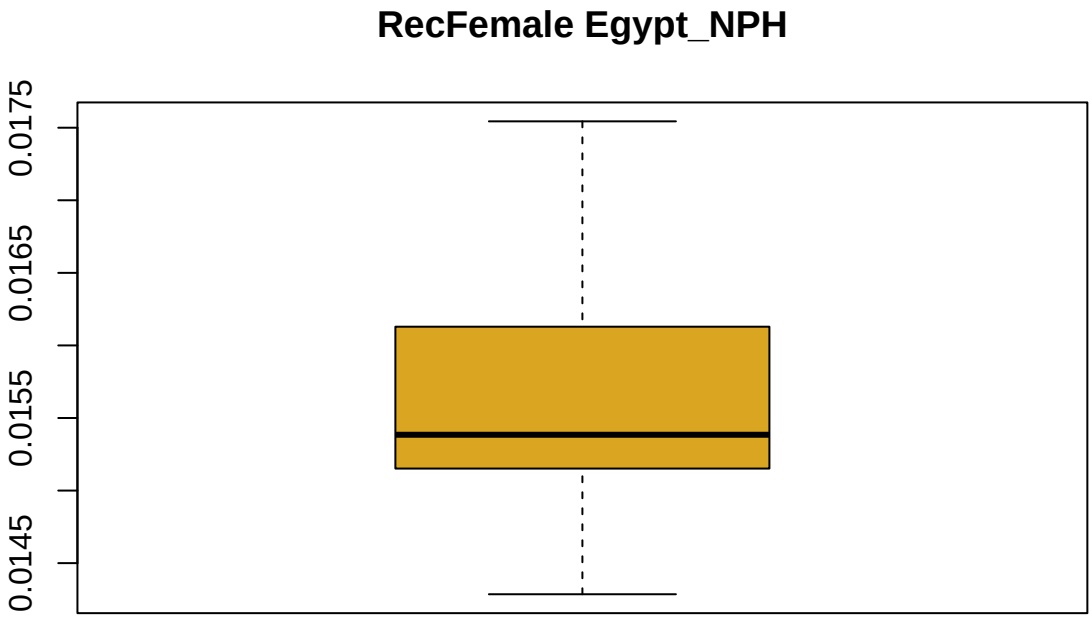
```
sd(RecFE_NPH)
```

```
## [1] 0.0008321204
```

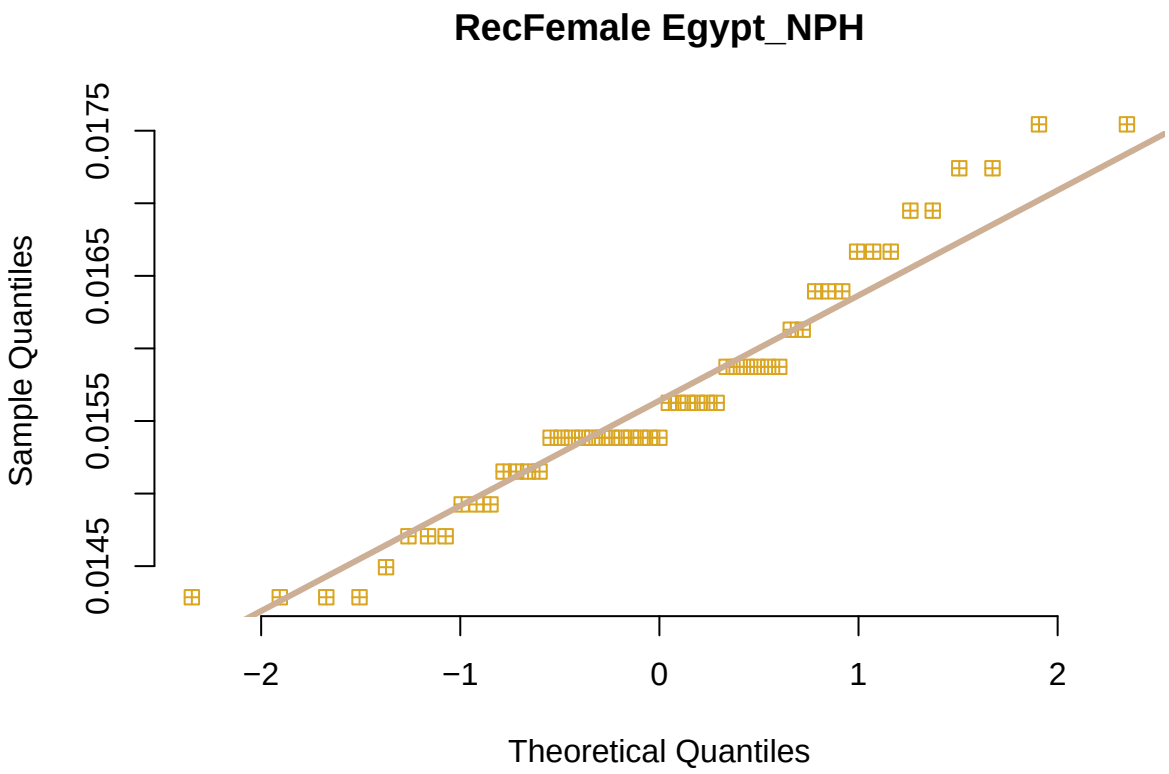
```
hist(RecFE_NPH,main = "RecFemale Egypt_NPH",col="goldenrod")
```




```
boxplot(RecFE_NPH,main="RecFemale Egypt_NPH",col="goldenrod")
```




```
qqnorm(RecFE_NPH,pch =12,main="RecFemale Egypt_NPH",col="goldenrod",frame=FALSE)
qqline(RecFE_NPH,col="peachpuff3",lwd=3)
```



Female Egypt BPL vs NPH-Welch Two Sample t-test

```
Men=read.csv("Project Data.csv")
t.test(RecFE_BPL,FEgypt_NPH,conf.level = .95)
```

```
##
##  Welch Two Sample t-test
##
## data:  RecFE_BPL and FEgypt_NPH
## t = -139.51, df = 52, p-value < 2.2e-16
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##  -64.96683 -63.12442
## sample estimates:
##   mean of x   mean of y
##  0.01097657 64.05660377
```

Female Inuit BPL

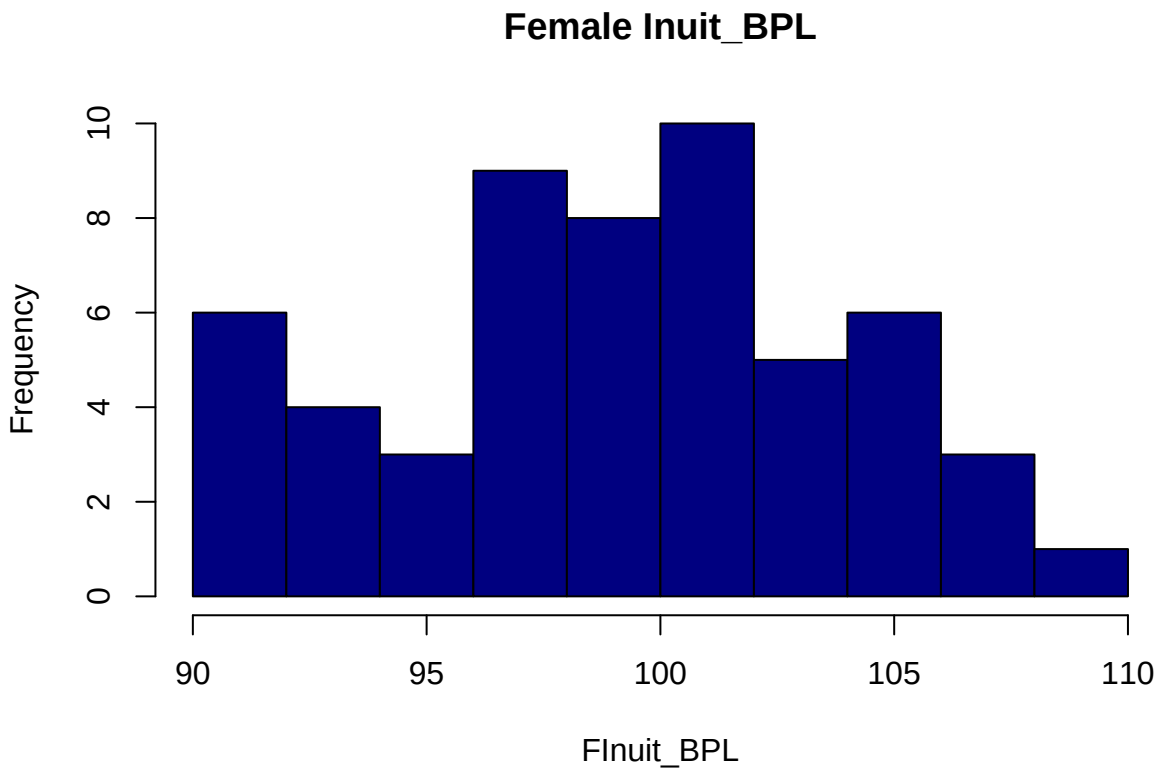
```
Men=read.csv("Project Data.csv")
FInuit_BPL=Men$BPL2[Men$Population2=="ESKIMO"]
summary(FInuit_BPL)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   90.00   97.00  100.00   99.47  103.50  109.00
```

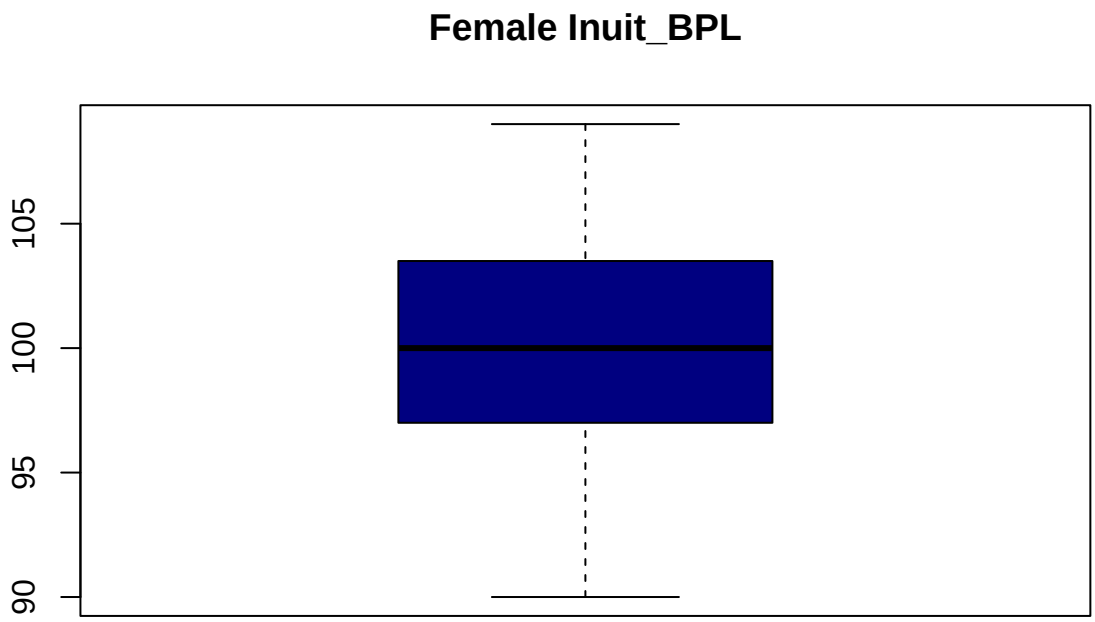
```
sd(FInuit_BPL)
```

```
## [1] 4.860478
```

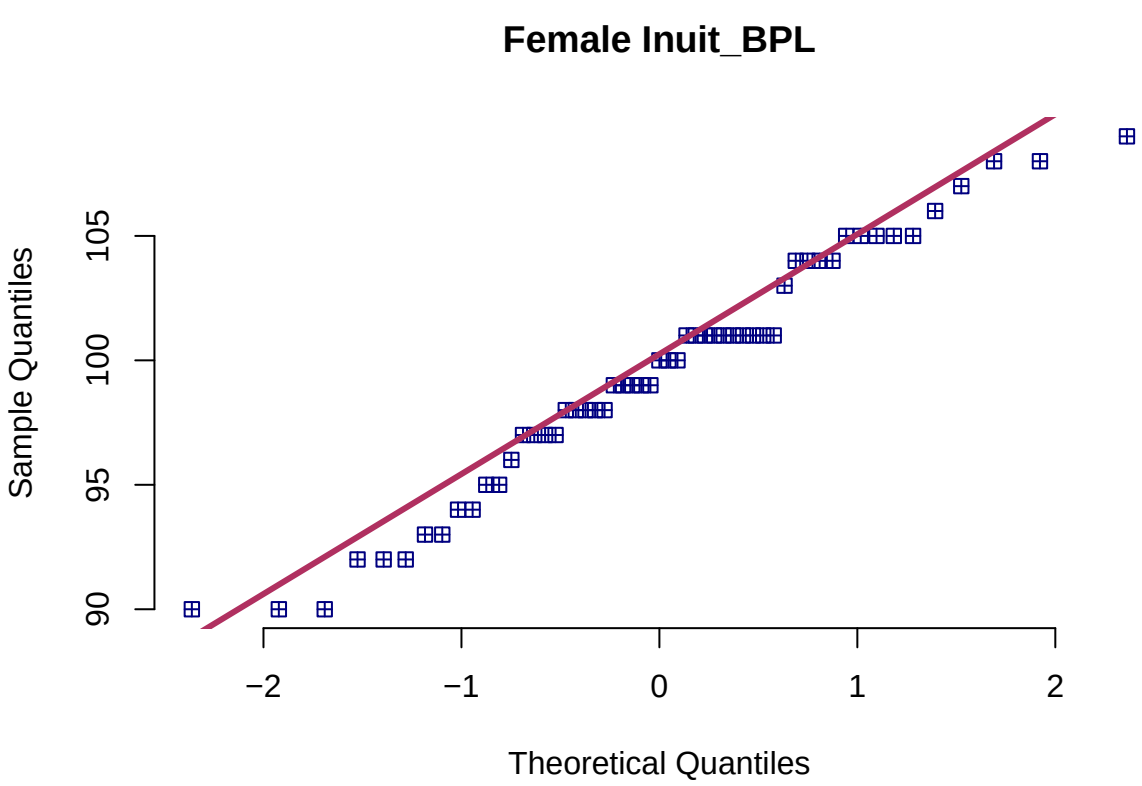
```
hist(FInuit_BPL,main = "Female Inuit_BPL",col="navy")
```



```
boxplot(FInuit_BPL,main="Female Inuit_BPL",col="navy")
```




```
qqnorm(FInuit_BPL,pch =12,main="Female Inuit_BPL",col="navy",frame=FALSE)
qqline(FInuit_BPL,col="maroon",lwd=3)
```



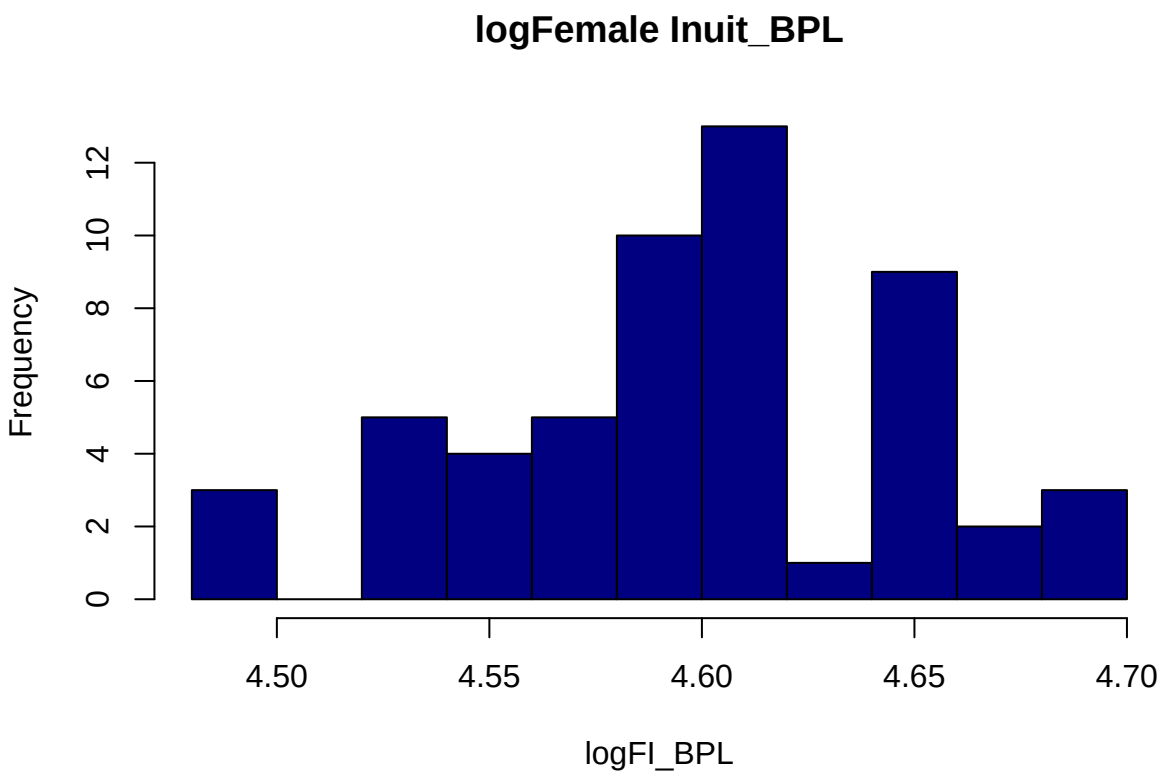

```
Men=read.csv("Project Data.csv")
FInuit_BPL=Men$BPL2[Men$Population2=="ESKIMO"]
logFI_BPL=log(FInuit_BPL)
summary(logFI_BPL)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   4.500   4.575   4.605   4.599   4.640   4.691
```

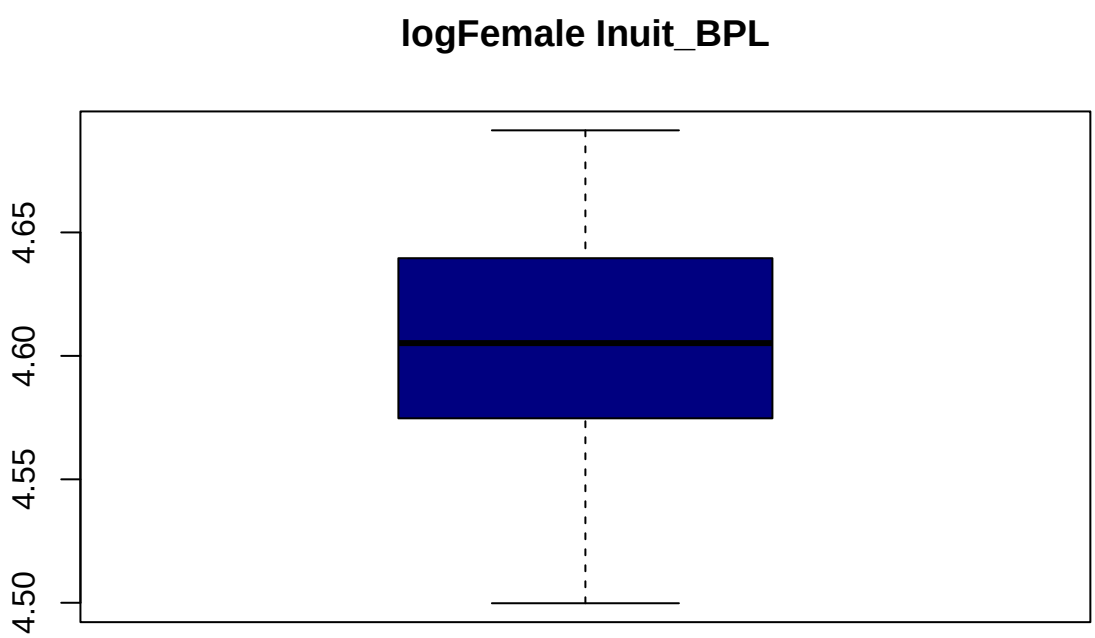
```
sd(logFI_BPL)
```

```
## [1] 0.04914072
```

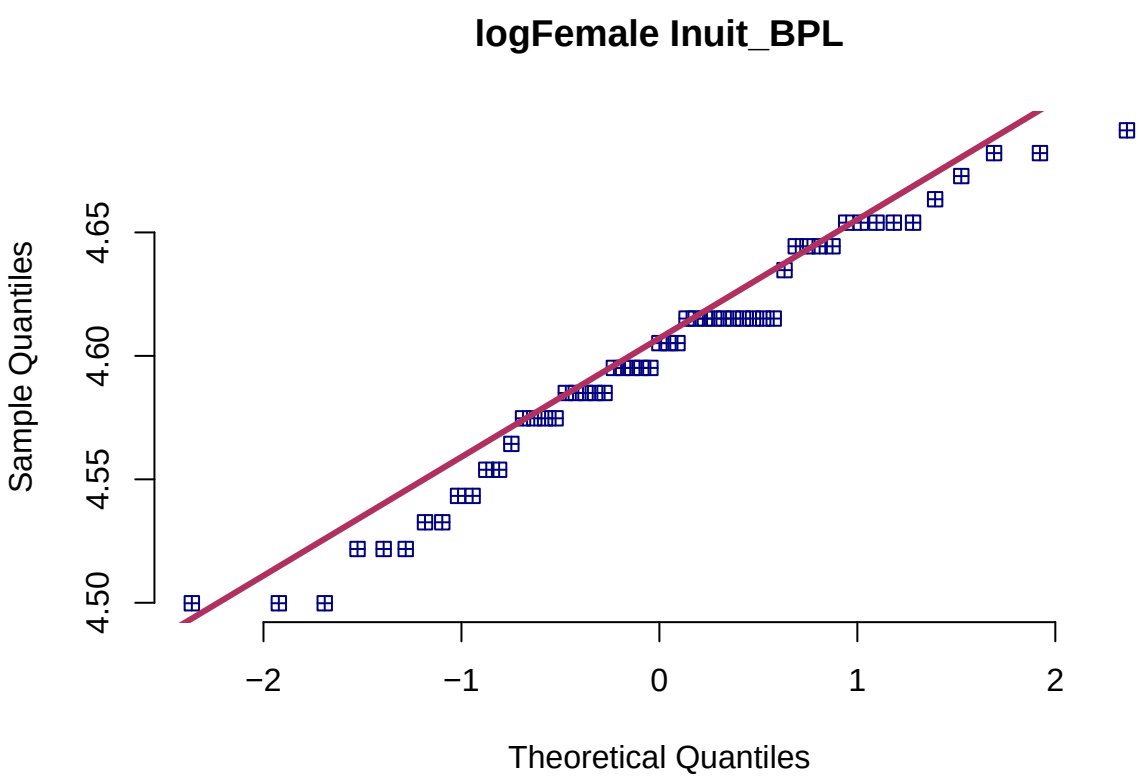
```
hist(logFI_BPL,main = "logFemale Inuit_BPL",col="navy")
```




```
boxplot(logFI_BPL,main="logFemale Inuit_BPL",col="navy")
```




```
qqnorm(logFI_BPL,pch =12,main="logFemale Inuit_BPL",col="navy",frame=FALSE)
qqline(logFI_BPL,col="maroon",lwd=3)
```



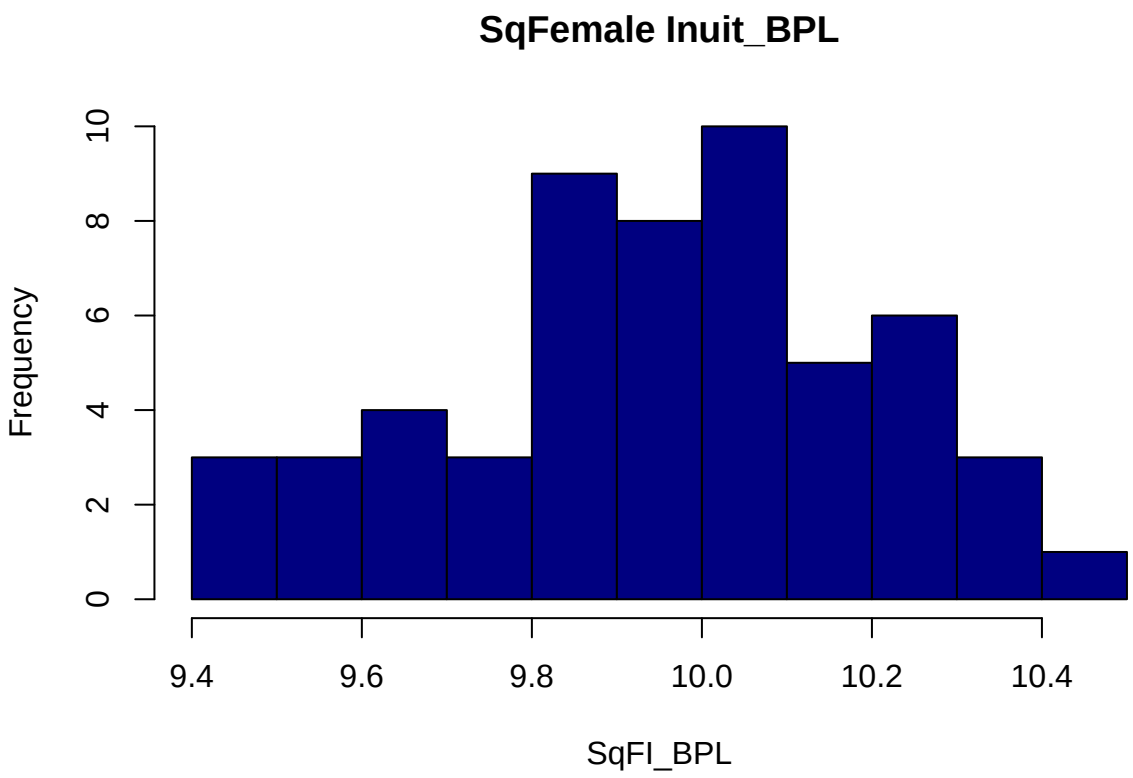

```
Men=read.csv("Project Data.csv")
FInuit_BPL=Men$BPL2[Men$Population2=="ESKIMO"]
SqFI_BPL=sqrt(FInuit_BPL)
summary(SqFI_BPL)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   9.487   9.849  10.000   9.971  10.173  10.440
```

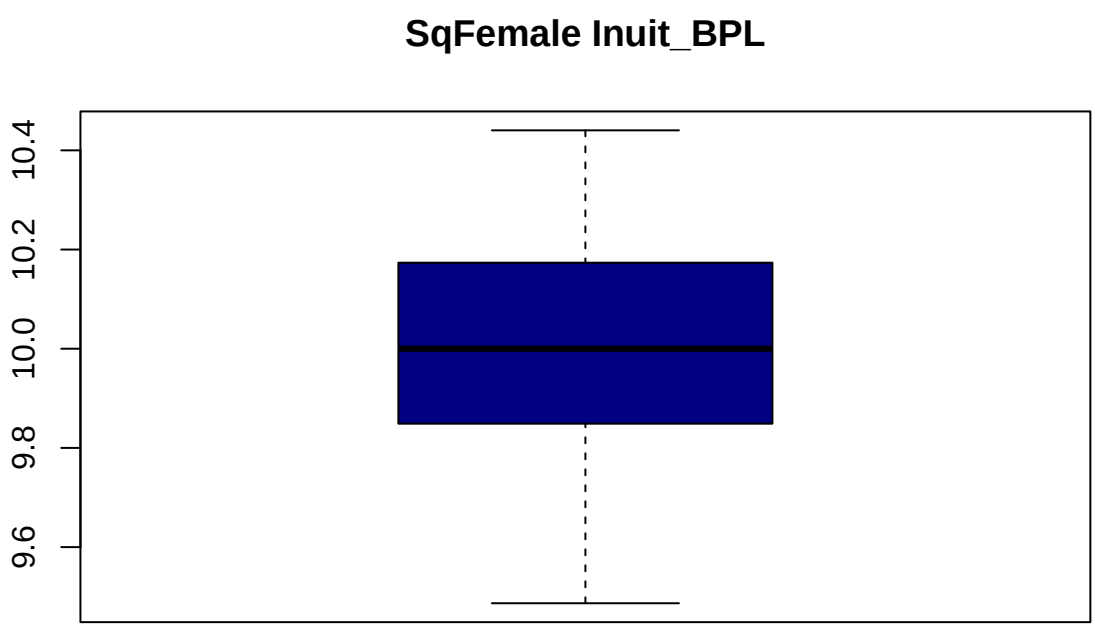
```
sd(SqFI_BPL)
```

```
## [1] 0.2442785
```

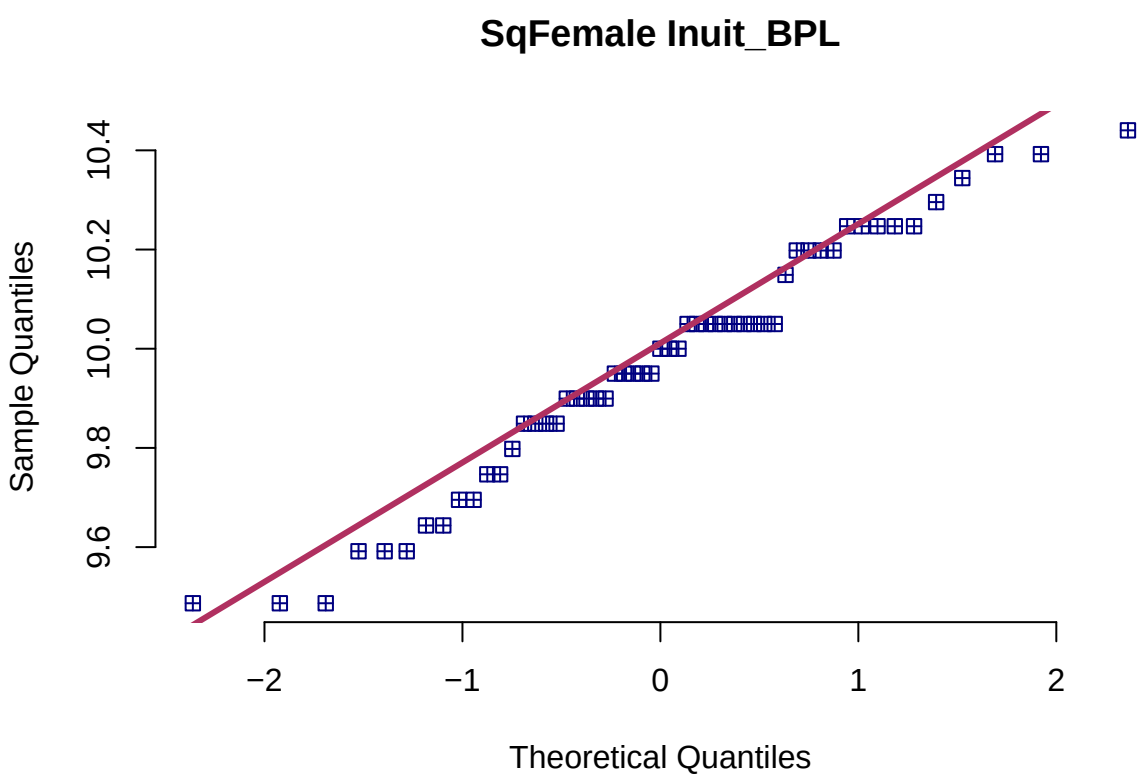
```
hist(SqFI_BPL,main = "SqFemale Inuit_BPL",col="navy")
```




```
boxplot(SqFI_BPL,main="SqFemale Inuit_BPL",col="navy")
```




```
qqnorm(SqFI_BPL,pch =12,main="SqFemale Inuit_BPL",col="navy",frame=FALSE)
qqline(SqFI_BPL,col="maroon",lwd=3)
```



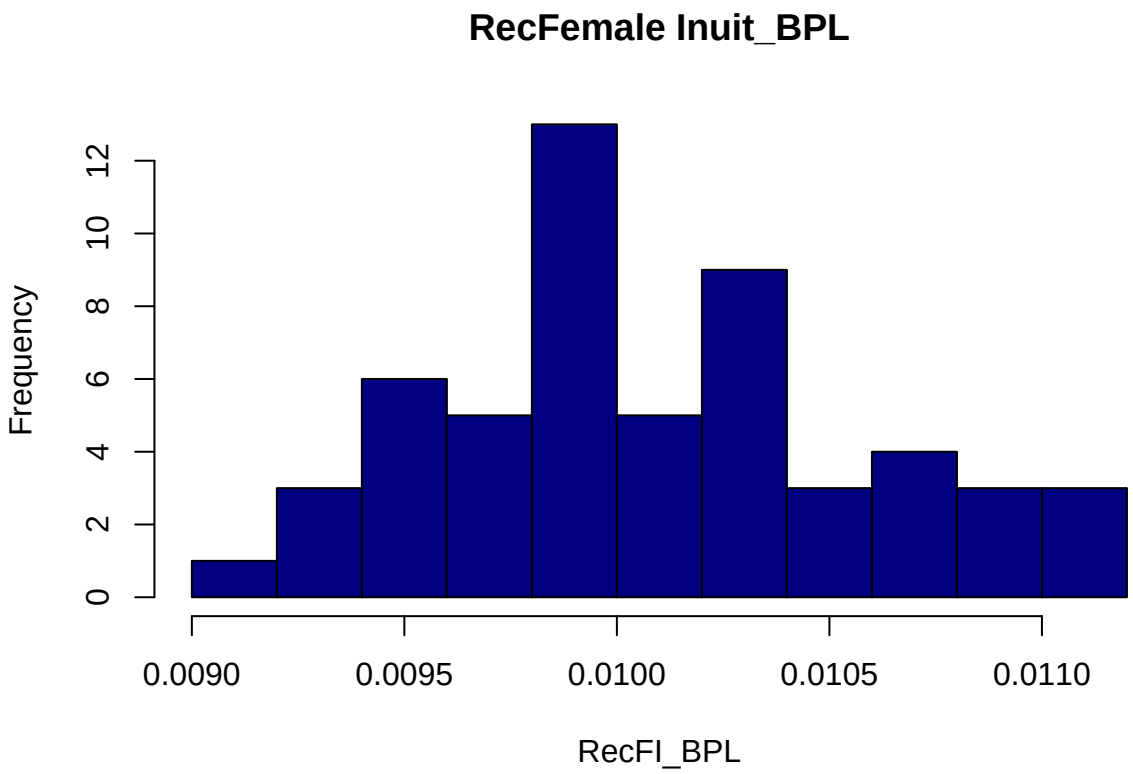

```
Men=read.csv("Project Data.csv")
FInuit_BPL=Men$BPL2[Men$Population2=="ESKIMO"]
RecFI_BPL=1/FInuit_BPL
summary(RecFI_BPL)
```

```
##     Min.  1st Qu.   Median     Mean  3rd Qu.     Max.
## 0.009174 0.009662 0.010000 0.010077 0.010309 0.011111
```

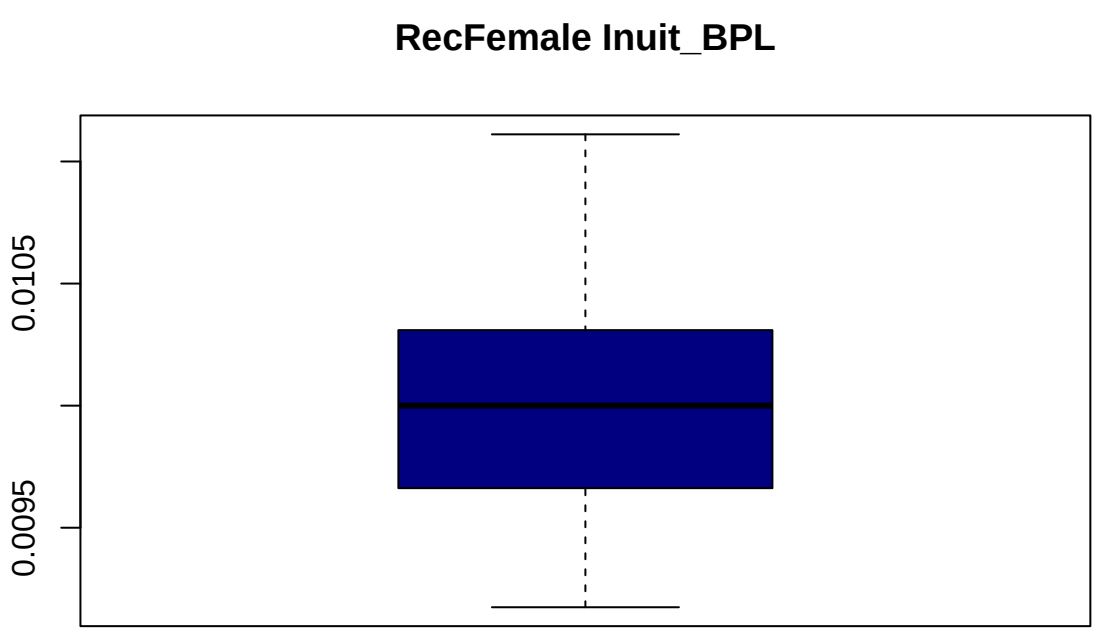
```
sd(RecFI_BPL)
```

```
## [1] 0.000498154
```

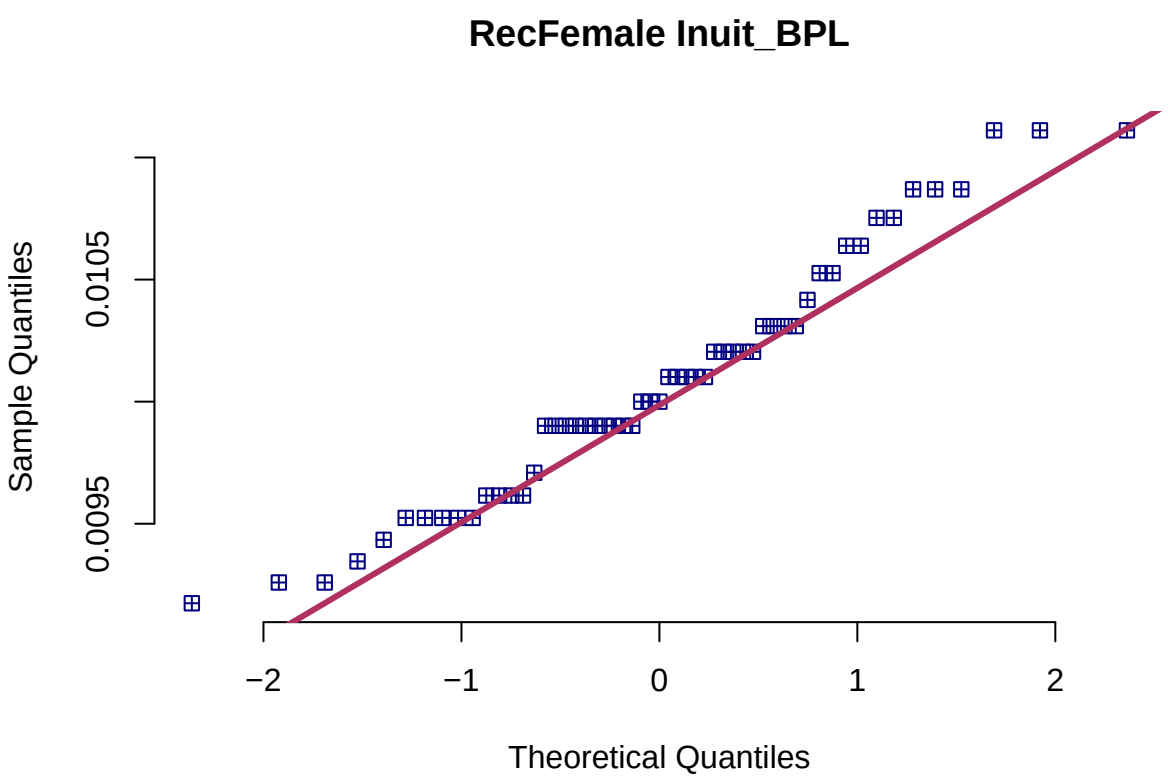
```
hist(RecFI_BPL,main = "RecFemale Inuit_BPL",col="navy")
```




```
boxplot(RecFI_BPL,main="RecFemale Inuit_BPL",col="navy")
```




```
qqnorm(RecFI_BPL,pch =12,main="RecFemale Inuit_BPL",col="navy",frame=FALSE)
qqline(RecFI_BPL,col="maroon",lwd=3)
```



Female Inuit NPH

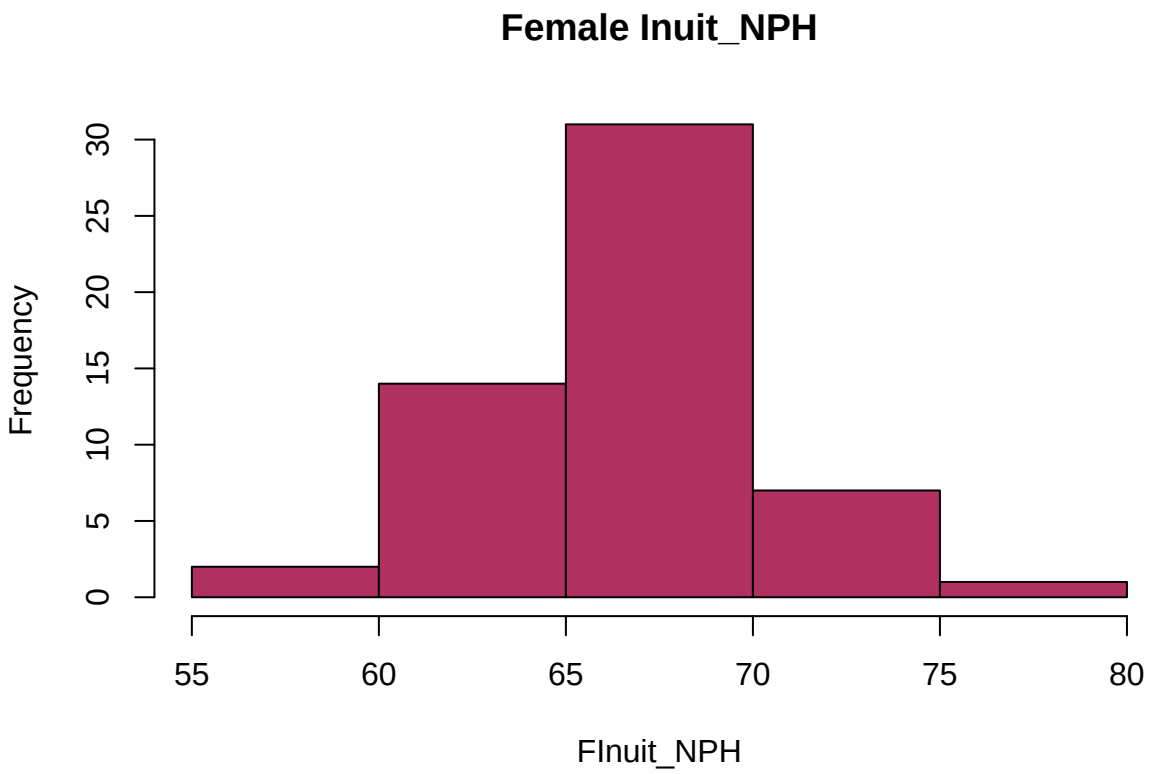
```
Men=read.csv("Project Data.csv")
FInuit_NPH=Men$NPH2[Men$Population2=="ESKIMO"]
summary(FInuit_NPH)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   58.00   65.00   67.00   67.11   69.00   78.00
```

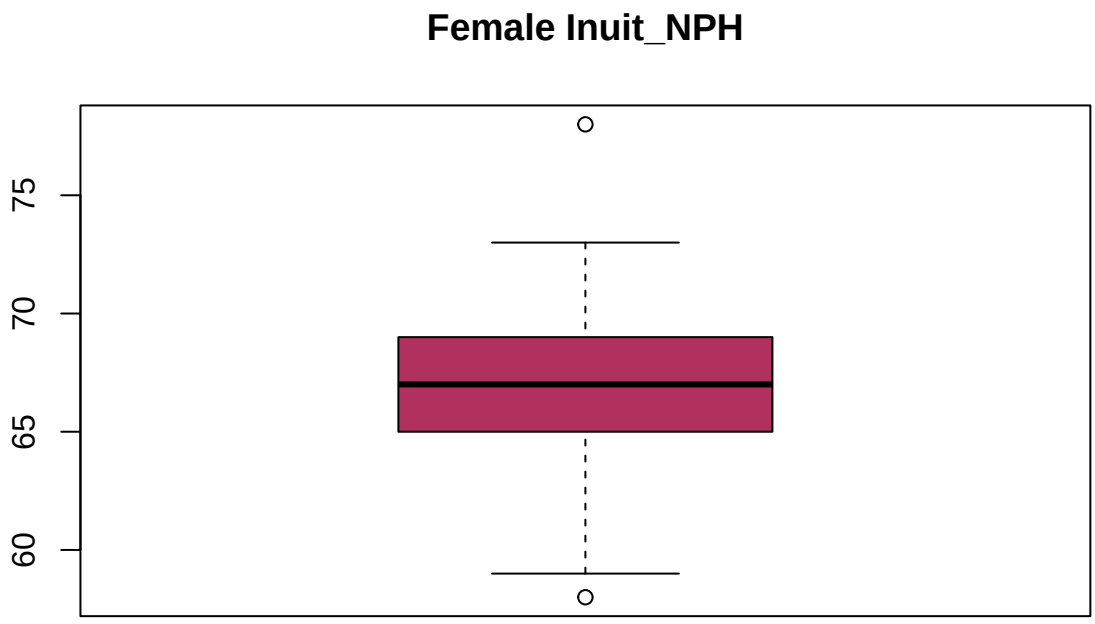
```
sd(FInuit_NPH)
```

```
## [1] 3.720179
```

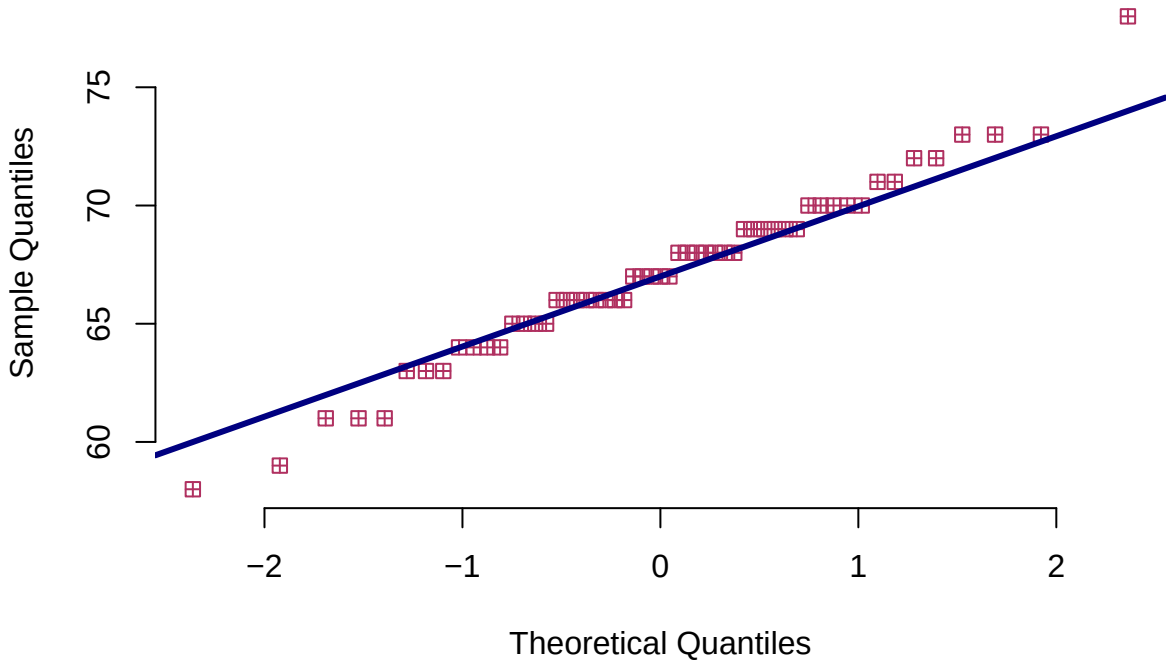
```
hist(FInuit_NPH,main = "Female Inuit_NPH",col="maroon")
```




```
boxplot(FInuit_NPH,main="Female Inuit_NPH",col="maroon")
```




```
qqnorm(FInuit_NPH,pch =12,main="Female Inuit_NPH",col="maroon",frame=FALSE)
qqline(FInuit_NPH,col="navy",lwd=3)
```



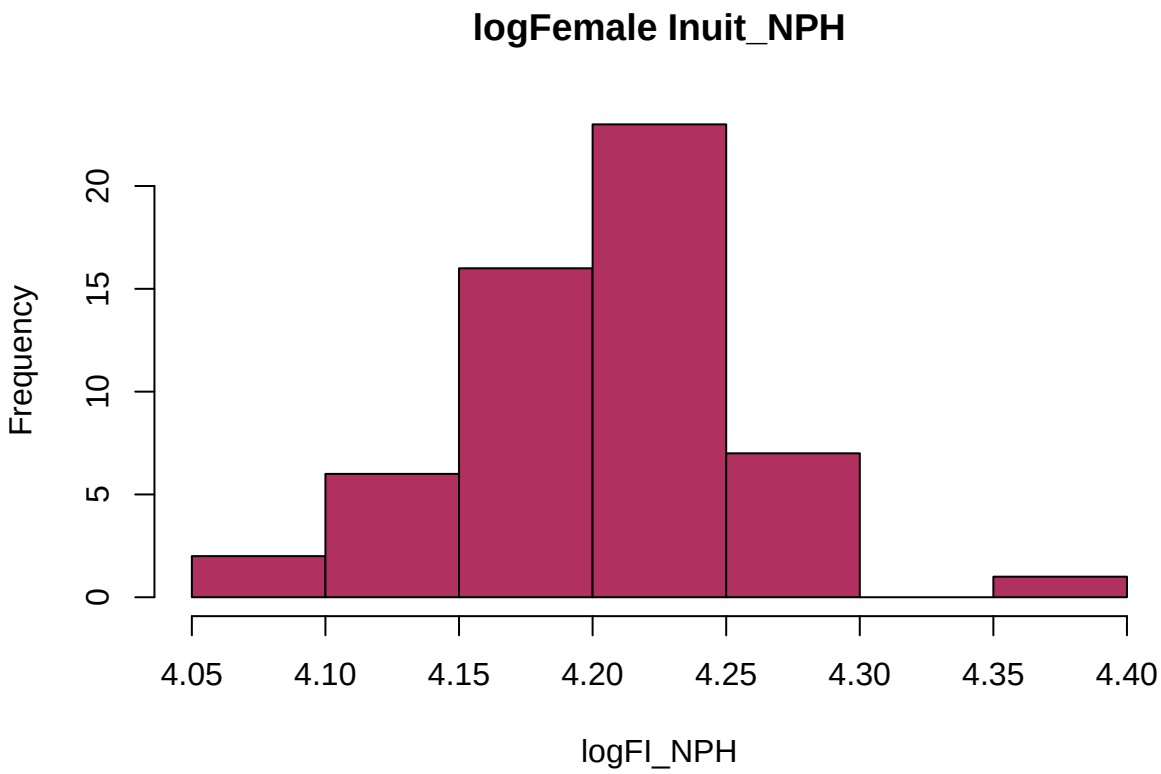

```
Men=read.csv("Project Data.csv")
FInuit_NPH=Men$NPH2[Men$Population2=="ESKIMO"]
logFI_NPH=log(FInuit_NPH)
summary(logFI_NPH)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   4.060   4.174   4.205   4.205   4.234   4.357
```

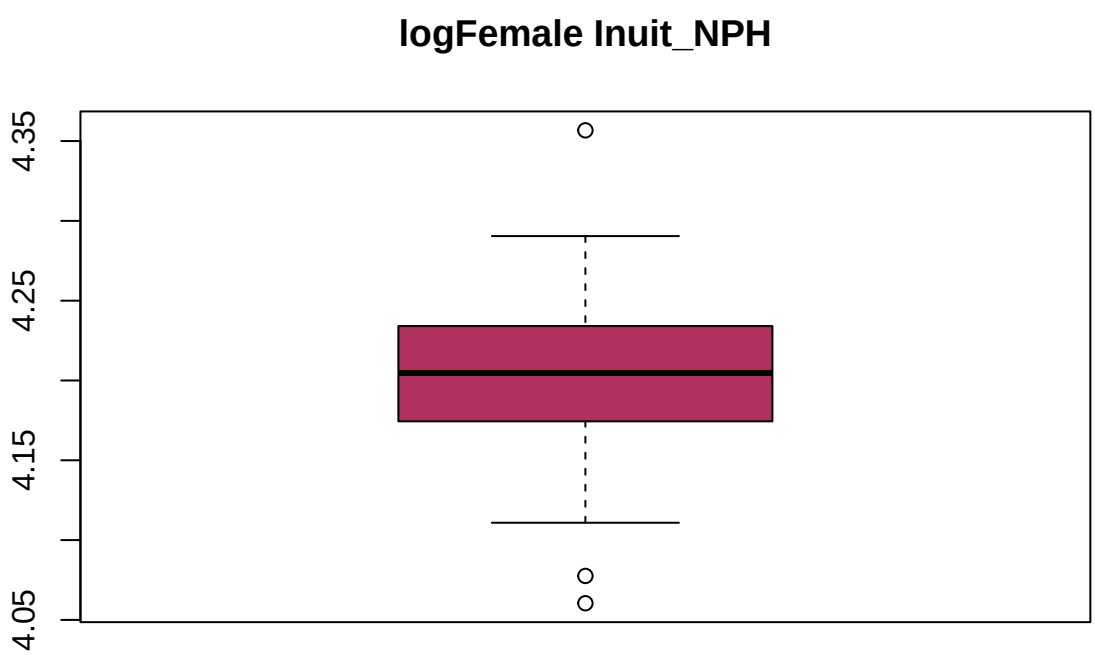
```
sd(logFI_NPH)
```

```
## [1] 0.05564596
```

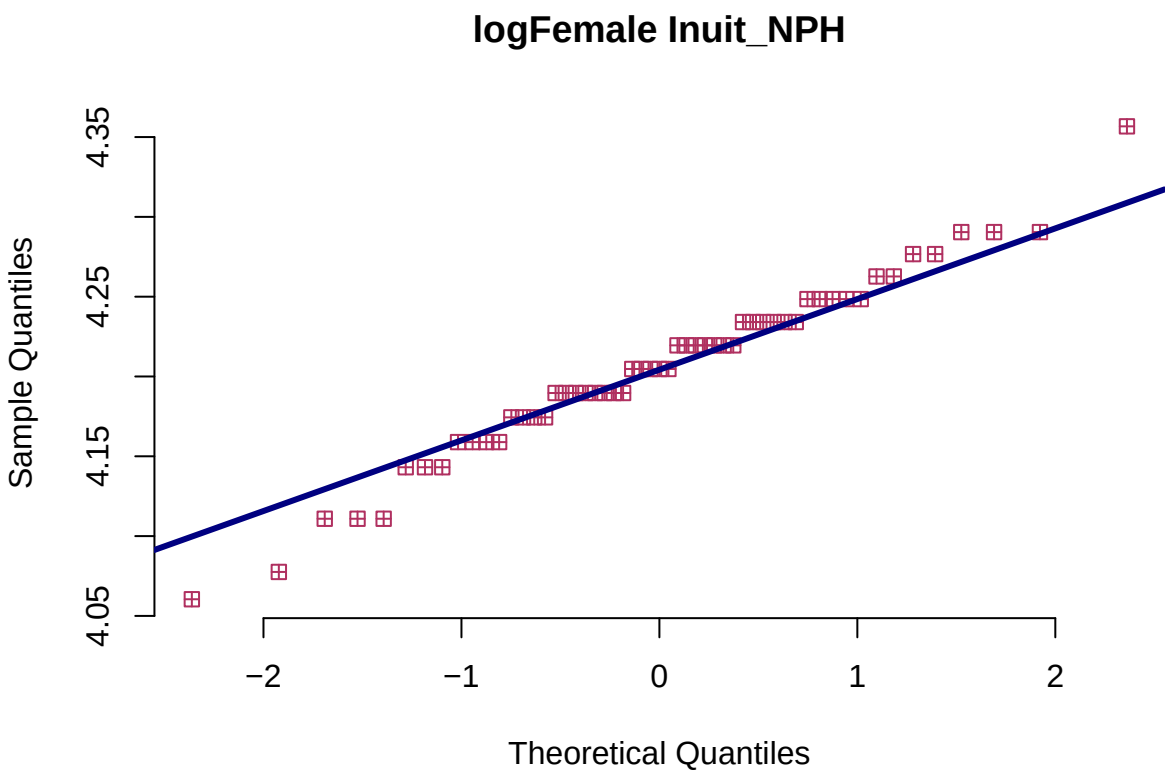
```
hist(logFI_NPH,main = "logFemale Inuit_NPH",col="maroon")
```




```
boxplot(logFI_NPH,main="logFemale Inuit_NPH",col="maroon")
```




```
qqnorm(logFI_NPH,pch =12,main="logFemale Inuit_NPH",col="maroon",frame=FALSE)
qqline(logFI_NPH,col="navy",lwd=3)
```



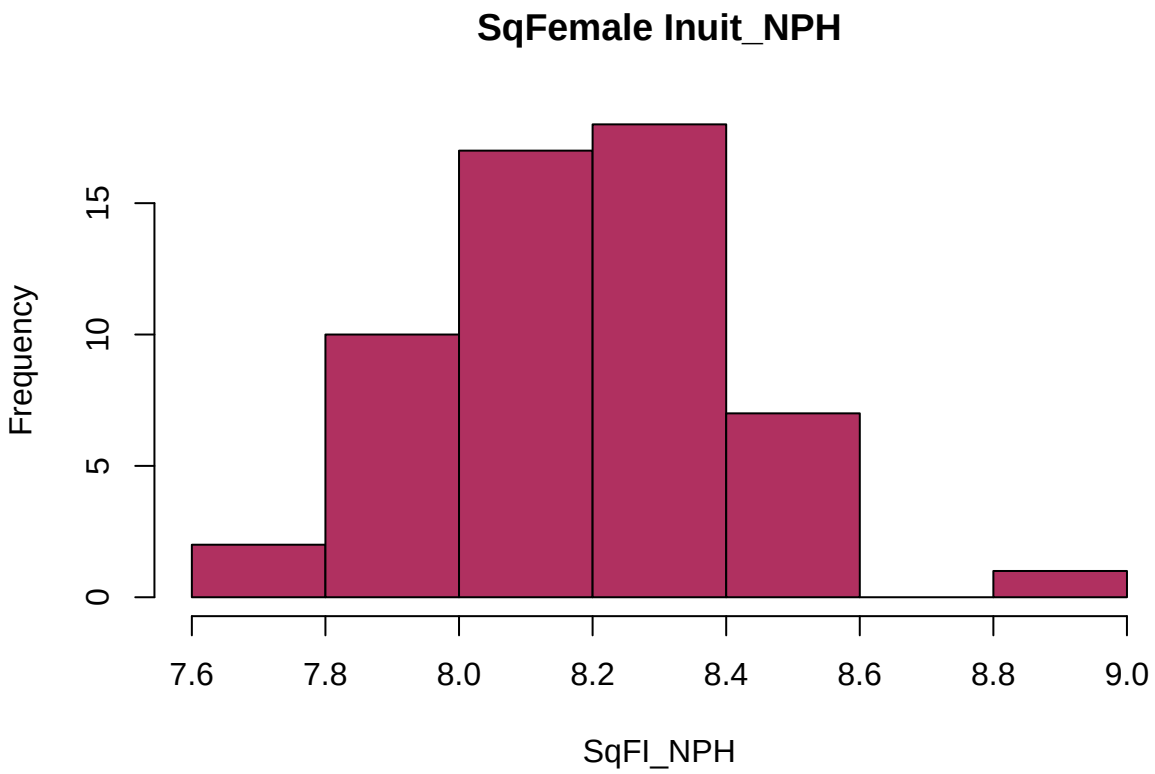

```
Men=read.csv("Project Data.csv")
FInuit_NPH=Men$NPH2[Men$Population2=="ESKIMO"]
SqFI_NPH=sqrt(FInuit_NPH)
summary(SqFI_NPH)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   7.616   8.062   8.185   8.189   8.307   8.832
```

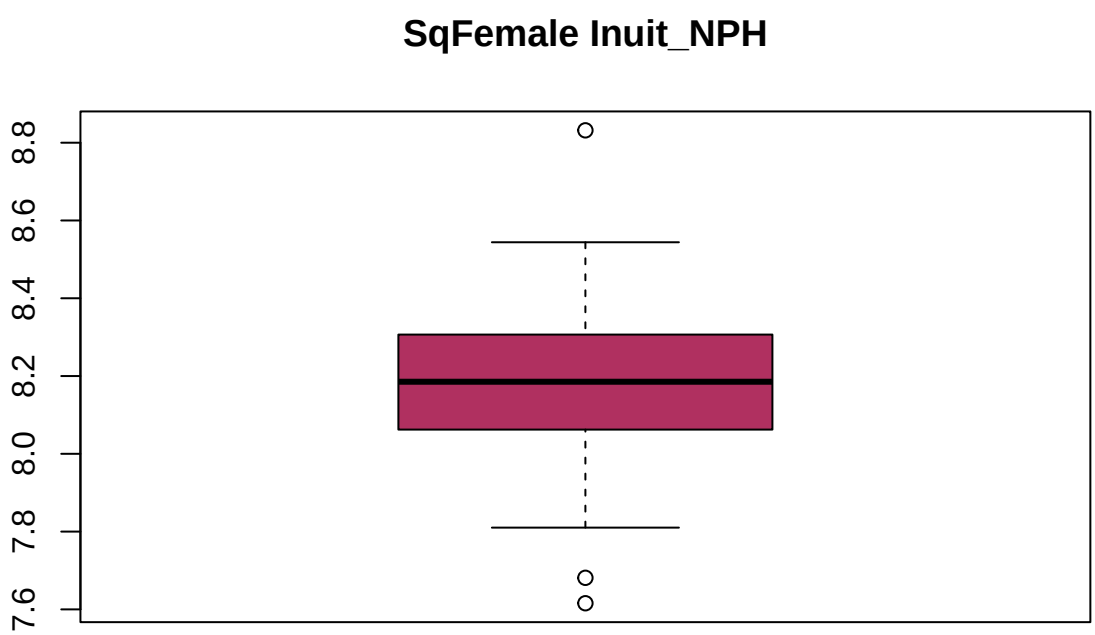
```
sd(SqFI_NPH)
```

```
## [1] 0.2273379
```

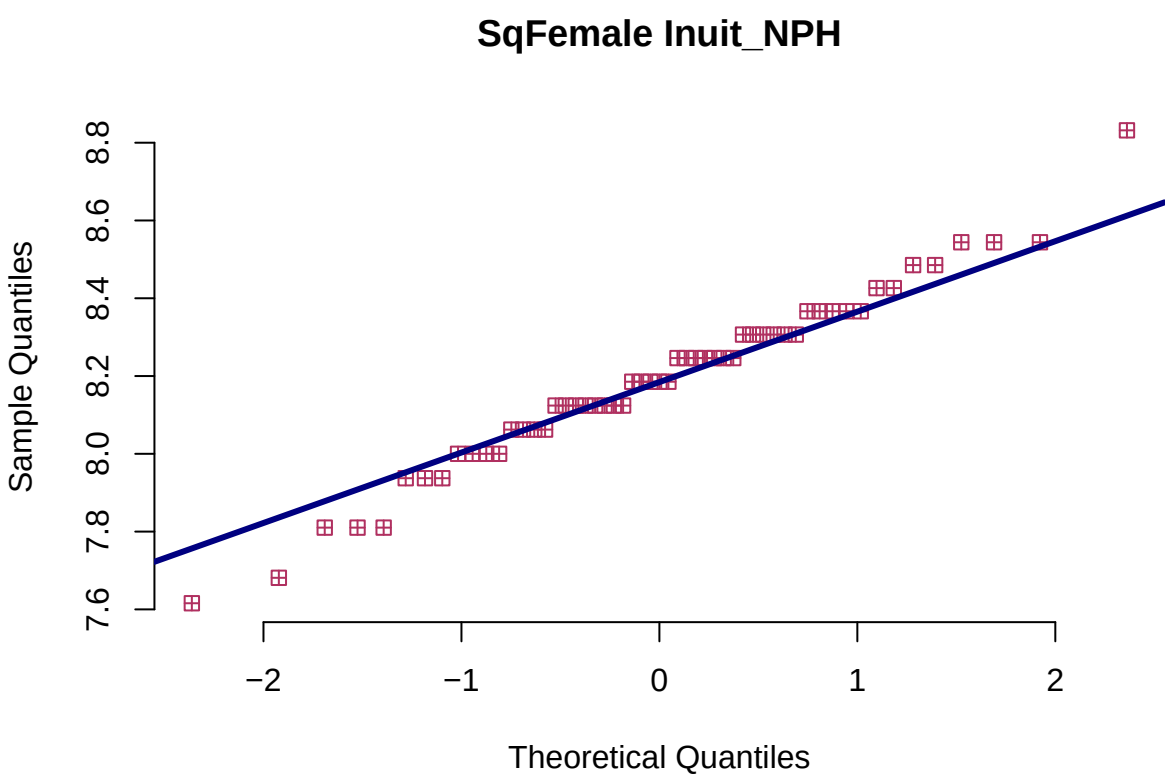
```
hist(SqFI_NPH,main = "SqFemale Inuit_NPH",col="maroon")
```




```
boxplot(SqFI_NPH,main="SqFemale Inuit_NPH",col="maroon")
```




```
qqnorm(SqFI_NPH,pch =12,main="SqFemale Inuit_NPH",col="maroon",frame=FALSE)
qqline(SqFI_NPH,col="navy",lwd=3)
```



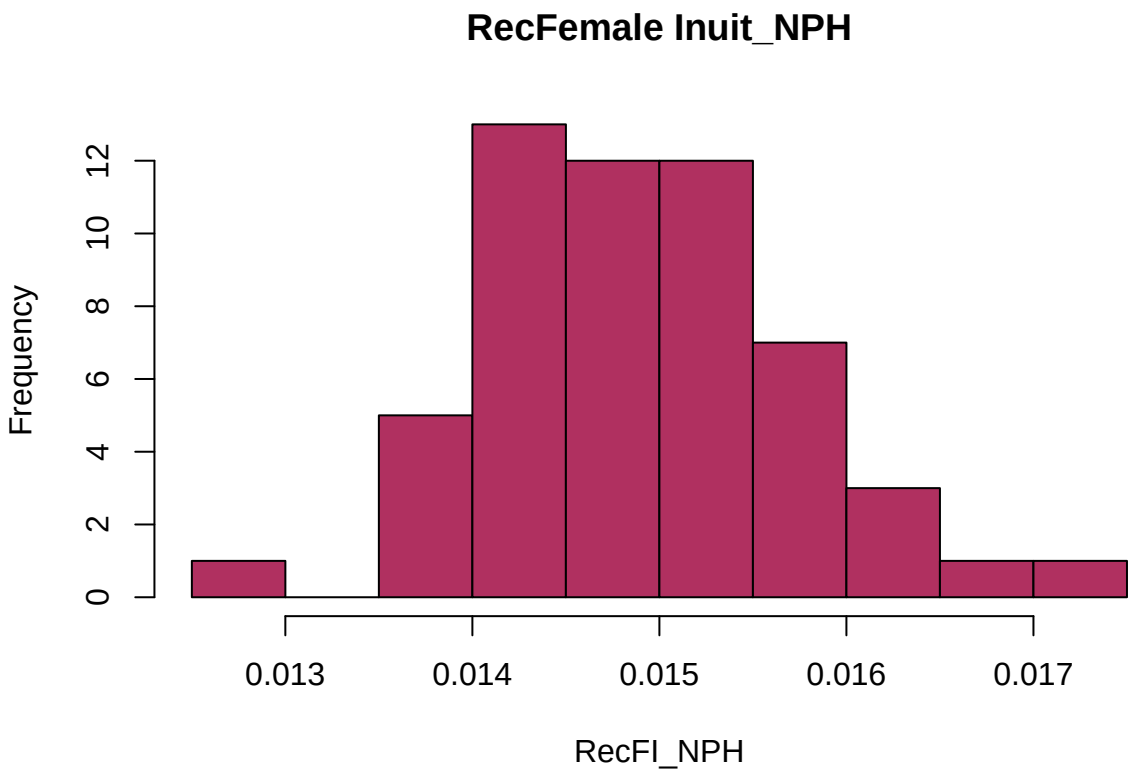

```
Men=read.csv("Project Data.csv")
FInuit_NPH=Men$NPH2[Men$Population2=="ESKIMO"]
RecFI_NPH=1/FInuit_NPH
summary(RecFI_NPH)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## 0.01282 0.01449 0.01493 0.01495 0.01538 0.01724
```

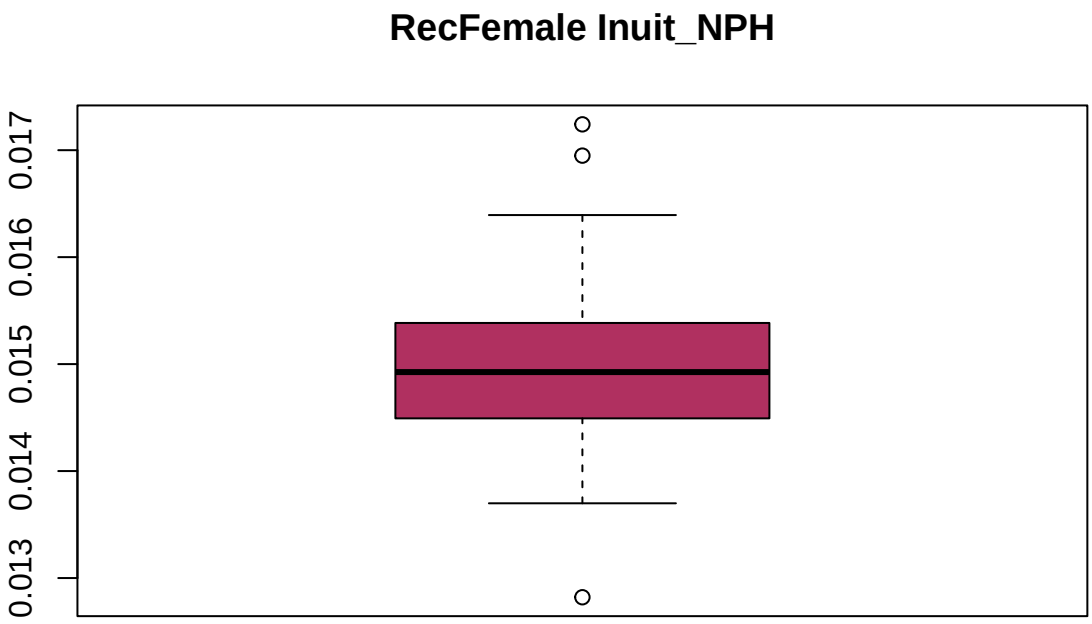
```
sd(RecFI_NPH)
```

```
## [1] 0.0008368737
```

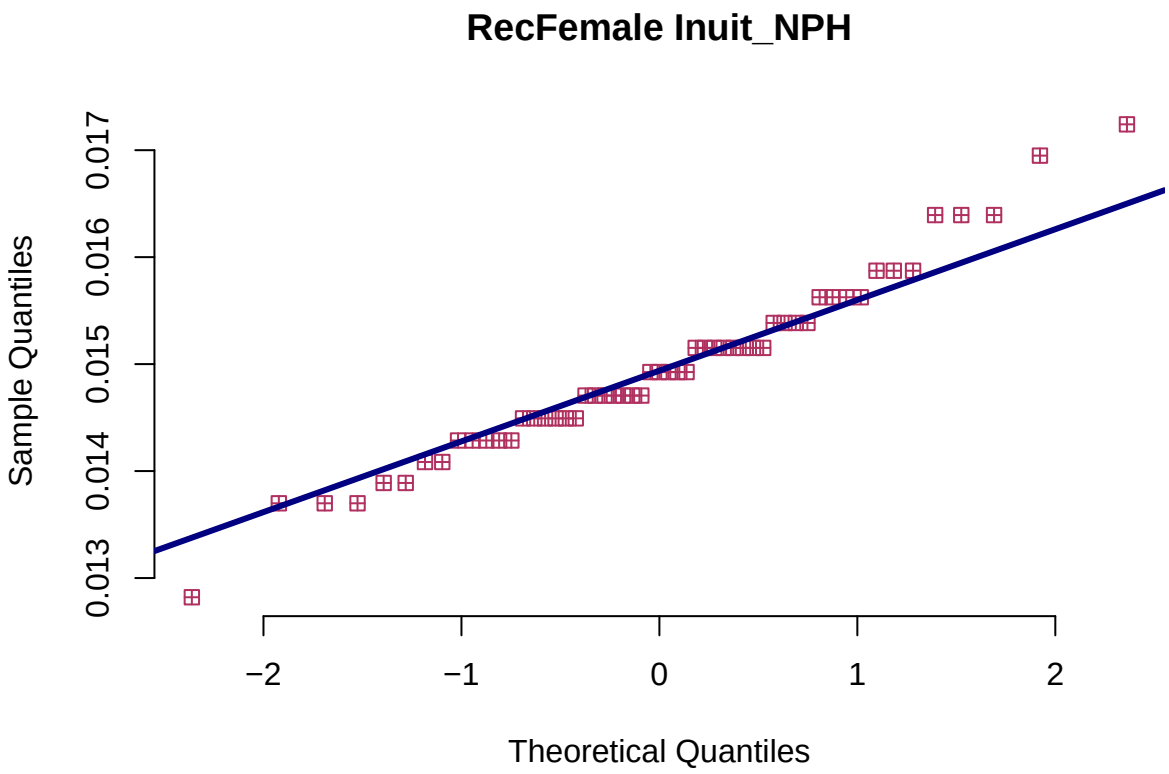
```
hist(RecFI_NPH,main = "RecFemale Inuit_NPH",col="maroon")
```




```
boxplot(RecFI_NPH,main="RecFemale Inuit_NPH",col="maroon")
```




```
qqnorm(RecFI_NPH,pch =12,main="RecFemale Inuit_NPH",col="maroon",frame=FALSE)
qqline(RecFI_NPH,col="navy",lwd=3)
```



Female Inuit BPL vs NPH-Welch Two Sample t-test

```
Men=read.csv("Project Data.csv")
t.test(SqFI_BPL,FInuit_NPH,conf.level = .95)
```

```
##
##  Welch Two Sample t-test
##
## data:  SqFI_BPL and FInuit_NPH
## t = -113.66, df = 54.466, p-value < 2.2e-16
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##  -58.14610 -56.13075
## sample estimates:
## mean of x mean of y
##  9.970664 67.109091
```

Female Egypt BPL vS Female Inuit BPL-Welch Two Sample T-Test

```r
Men=read.csv("Project Data.csv")
t.test(RecFE_BPL,SqFI_BPL,conf.level = .95)
```

```
##
##  Welch Two Sample t-test
##
## data:  RecFE_BPL and SqFI_BPL
## t = -302.37, df = 54, p-value < 2.2e-16
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##  -10.02573  -9.89365
## sample estimates:
##  mean of x  mean of y
## 0.01097657 9.97066398
```

Female Egypt NPH vs Female Inuit NPH-Welch Two Sample T-Test

```r
Men=read.csv("Project Data.csv")
t.test(FEgypt_NPH,FInuit_NPH,conf.level = .95)
```

```
##
##  Welch Two Sample t-test
##
## data:  FEgypt_NPH and FInuit_NPH
## t = -4.489, df = 105.49, p-value = 1.833e-05
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##  -4.400703 -1.704271
## sample estimates:
## mean of x mean of y
##  64.05660  67.10909
```

Male Egypt BPL vs Female Egypt BPL-Welch Two Sample t-test

```r
Men=read.csv("Project Data.csv")
t.test(Egypt_BPL,RecFE_BPL,conf.level = .95)
```

```
##
##  Welch Two Sample t-test
##
## data:  Egypt_BPL and RecFE_BPL
## t = 194.43, df = 57, p-value < 2.2e-16
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##  95.51234 97.50019
```

```
## sample estimates:
##   mean of x   mean of y
## 96.51724138  0.01097657
```

Male Egypt NPH vs Female Egypt NPH-Welch Two Sample T-Test

```
Men=read.csv("Project Data.csv")
t.test(SqE_NPH,FEgypt_NPH,conf.level = .95)
```

```
##
##  Welch Two Sample t-test
##
## data:  SqE_NPH and FEgypt_NPH
## t = -121.35, df = 52.281, p-value < 2.2e-16
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##  -56.70859 -54.86393
## sample estimates:
## mean of x mean of y
##   8.27034  64.05660
```

Male Inuit BPL vs Female Inuit BPL-Welch Two Sample T-Test

```
Men=read.csv("Project Data.csv")
t.test(Inuit_BPL,SqFI_BPL,conf.level = .95)
```

```
##
##  Welch Two Sample t-test
##
## data:  Inuit_BPL and SqFI_BPL
## t = 147.62, df = 52.285, p-value < 2.2e-16
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##  91.82078 94.35110
## sample estimates:
##  mean of x  mean of y
## 103.056604   9.970664
```

Male Inuit NPH vs Female Inuit NPH-Welch Two Sample T-Test

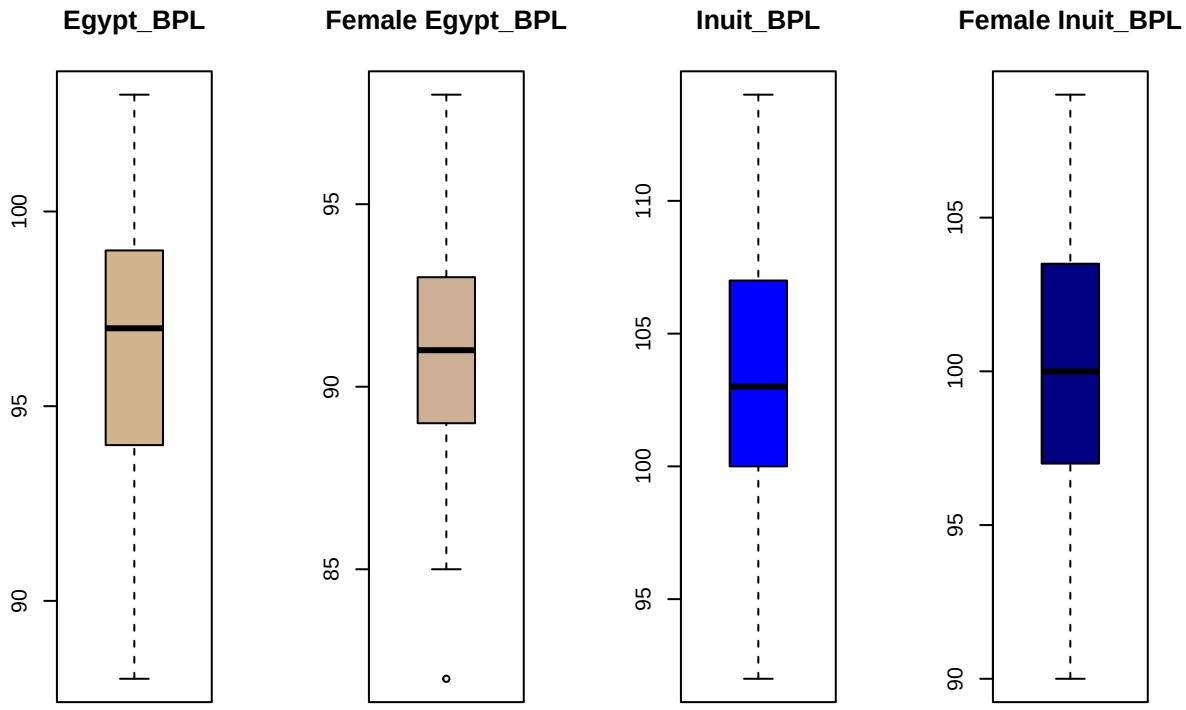
```
Men=read.csv("Project Data.csv")
t.test(Inuit_NPH,FInuit_NPH,conf.level = .95)
```

```
##
```

```
##  Welch Two Sample t-test
##
## data:  Inuit_NPH and FInuit_NPH
## t = 6.5201, df = 105.96, p-value = 2.448e-09
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##  3.219869 6.033648
## sample estimates:
## mean of x mean of y
##  71.73585  67.10909
```

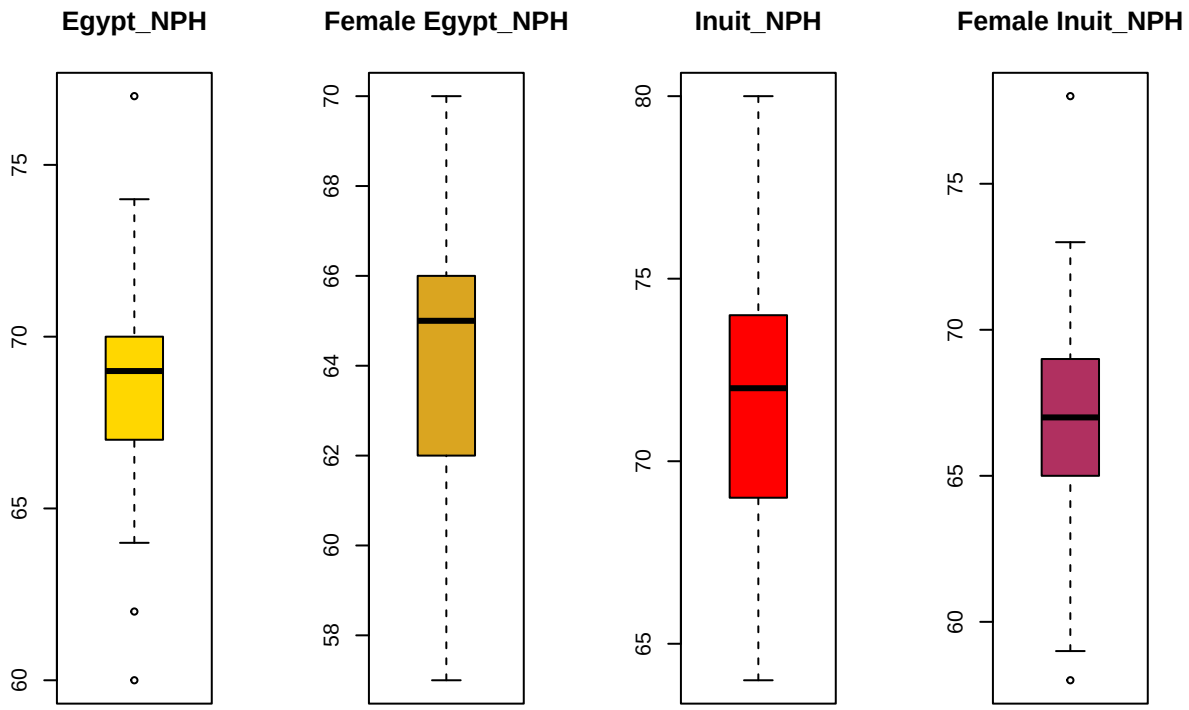
BPL Box Plots

```
par(mfrow=c(1,4))
boxplot(Egypt_BPL,main="Egypt_BPL",col="tan")
boxplot(FEgypt_BPL,main="Female Egypt_BPL",col="peachpuff3")
boxplot(Inuit_BPL,main="Inuit_BPL",col="blue")
boxplot(FInuit_BPL,main="Female Inuit_BPL",col="navy")
```



NPH Box Plots

```
par(mfrow=c(1,4))
boxplot(Egypt_NPH,main="Egypt_NPH",col="gold")
boxplot(FEgypt_NPH,main="Female Egypt_NPH",col="goldenrod")
boxplot(Inuit_NPH,main="Inuit_NPH",col="red")
boxplot(FInuit_NPH,main="Female Inuit_NPH",col="maroon")
```



Male Inuit BPL vs Female Inuit BPL vs Male Egypt BPL vs Female Egypt BPL-Two-Way ANOVA

```
Man_Woman=read.csv("Project Data2.csv")
BPLMale=aov(BPL~Sex+Population+Sex:Population,data=Man_Woman)
summary(BPLMale)
```

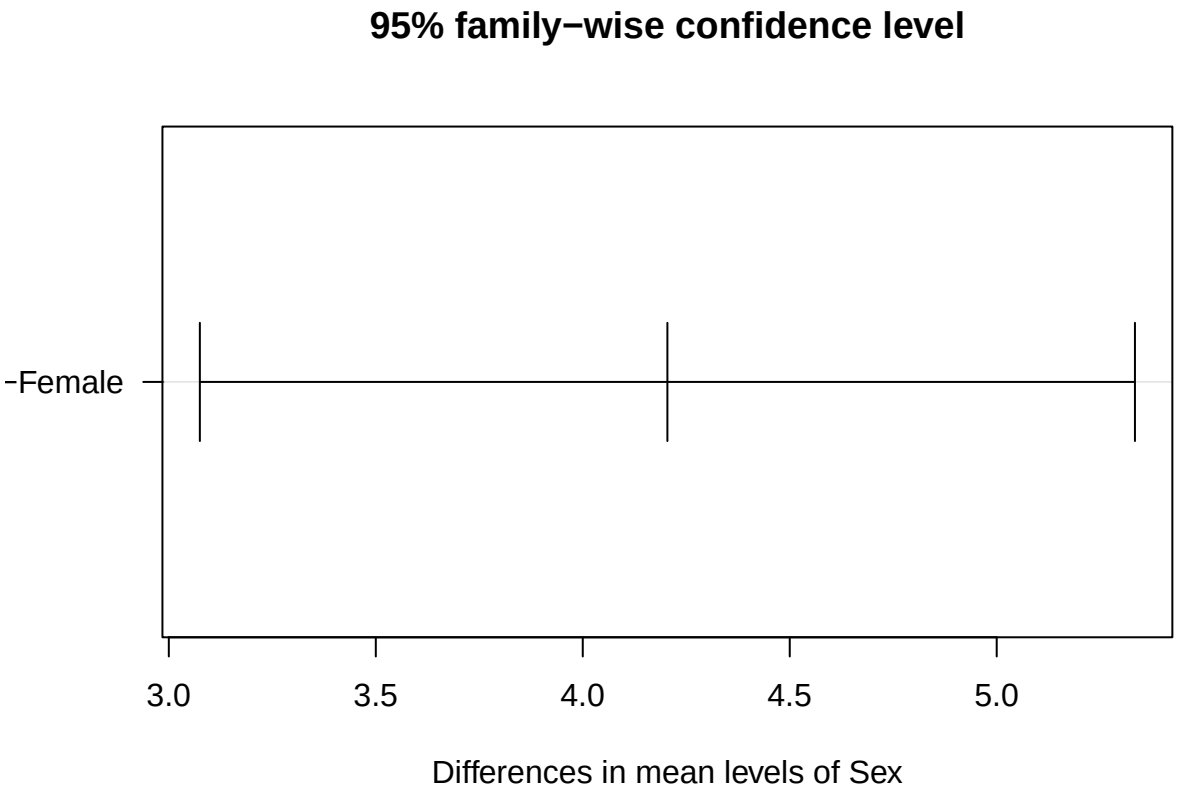
```
##                 Df Sum Sq Mean Sq F value   Pr(>F)
## Sex              1    968   967.7  53.831 4.42e-12 ***
## Population       1   2972  2972.3 165.351  < 2e-16 ***
## Sex:Population   1     39    39.0   2.167    0.142
## Residuals      215   3865    18.0
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Tukey for BPL for Sex

```
TukeyHSD(BPLMale,"Sex",conf.level = 0.95)
```

```
##   Tukey multiple comparisons of means
##     95% family-wise confidence level
##
## Fit: aov(formula = BPL ~ Sex + Population + Sex:Population, data = Man_Woman)
##
## $Sex
##                 diff      lwr      upr p adj
## Male-Female 4.204454 3.074933 5.333976     0
```

```
plot(TukeyHSD(BPLMale,"Sex",conf.level = 0.95),las=1)
```



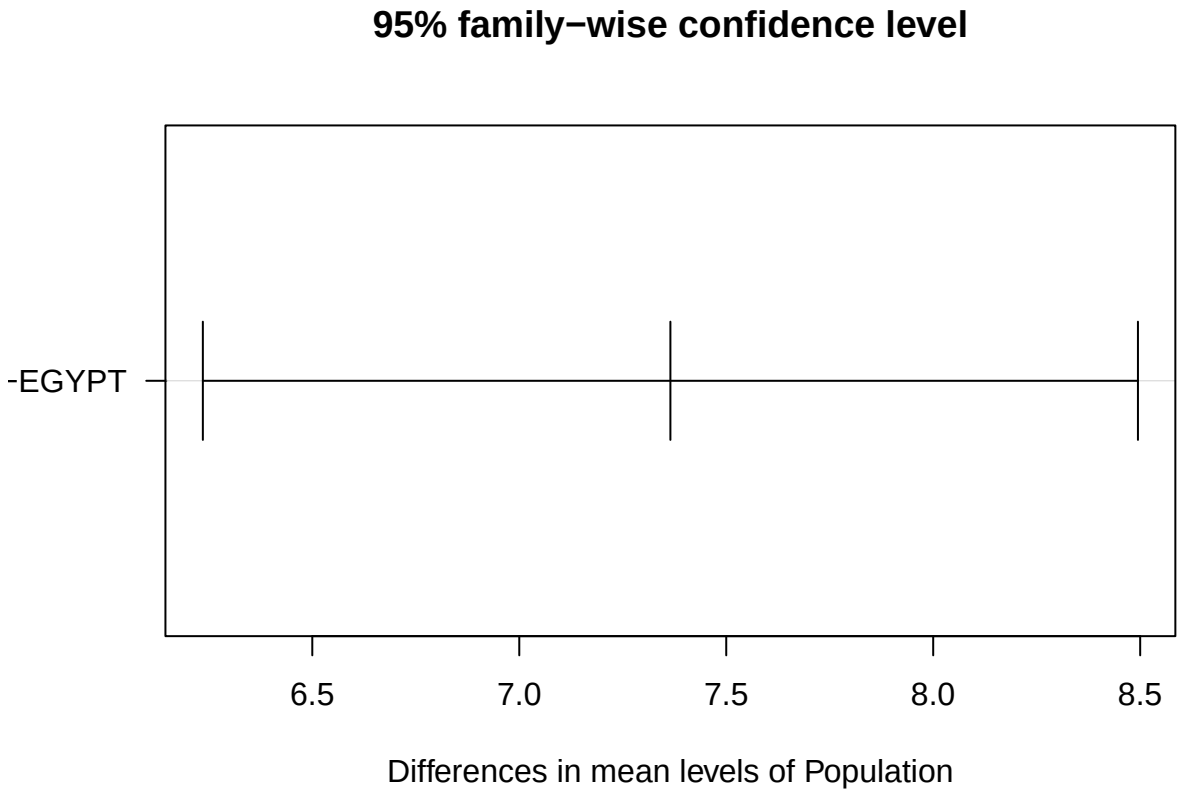
Tukey for BPL Population

```
TukeyHSD(BPLMale,"Population",conf.level = 0.95)
```

```
##   Tukey multiple comparisons of means
```

```
##     95% family-wise confidence level
##
## Fit: aov(formula = BPL ~ Sex + Population + Sex:Population, data = Man_Woman)
##
## $Population
##                   diff      lwr      upr p adj
## ESKIMO-EGYPT 7.365107 6.235585 8.494628     0
```

```
plot(TukeyHSD(BPLMale,"Population",conf.level = 0.95),las=1)
```



Regretion beginnig analysis

```
library(corrplot)
```

```
## Warning: package 'corrplot' was built under R version 4.4.3
```

```
## corrplot 0.95 loaded
```

```
library(car)
```

```
## Warning: package 'car' was built under R version 4.4.3
```

```
## Loading required package: carData
```

```
## Warning: package 'carData' was built under R version 4.4.3
```

```
library(olsrr)
```

```
## Warning: package 'olsrr' was built under R version 4.4.3
```

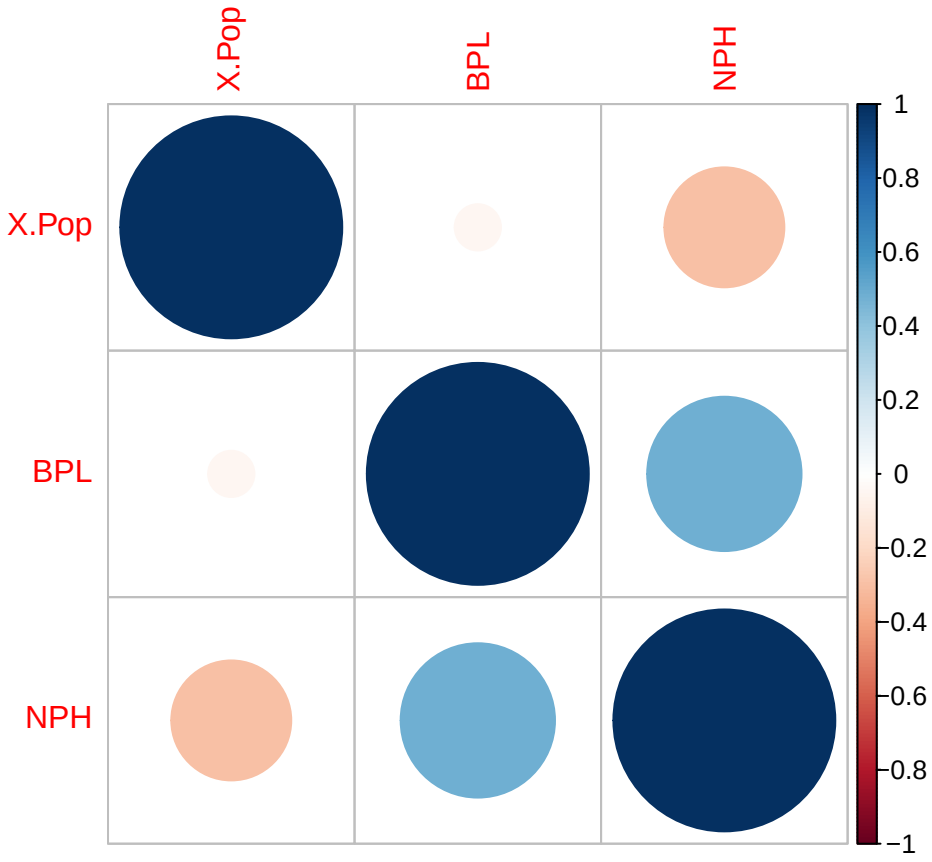
```
##
## Attaching package: 'olsrr'
```

```
## The following object is masked from 'package:datasets':
##
##     rivers
```

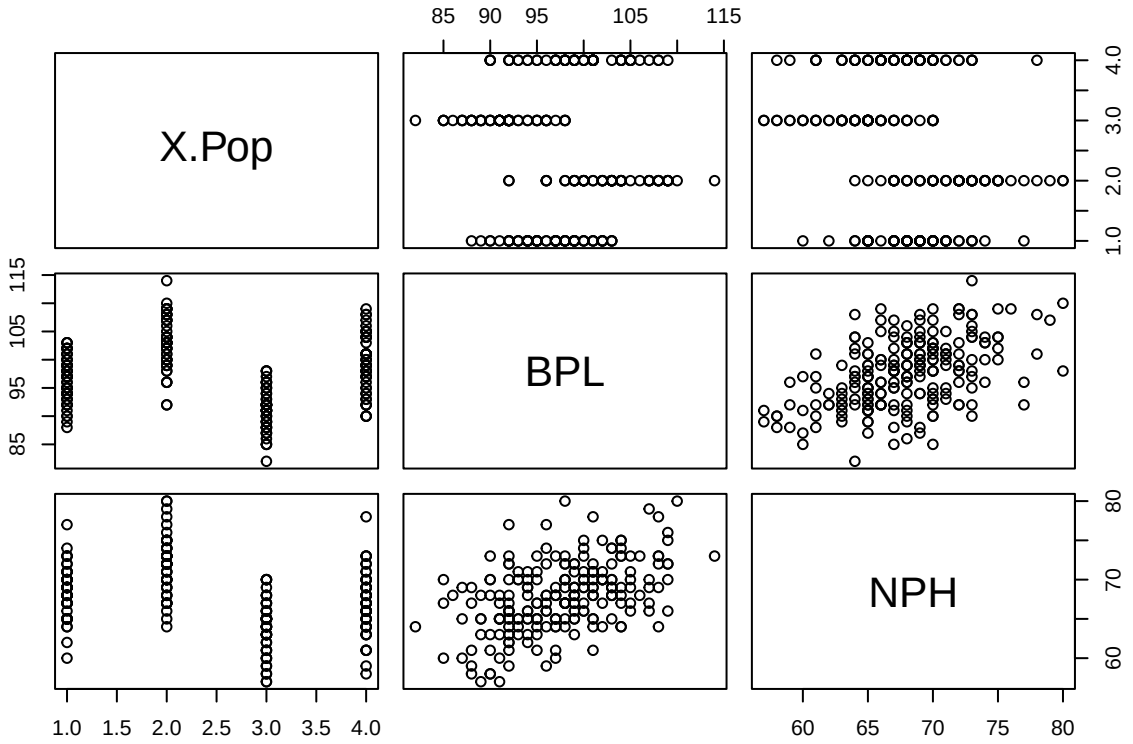
```
Man_Woman=read.csv("Project Data2.csv")
summary(Man_Woman)
```

```
##      Sex              Population            X.Pop            BPL
##  Length:219         Length:219         Min.   :1.000   Min.   : 82.00
##  Class :character   Class :character   1st Qu.:1.000   1st Qu.: 92.50
##  Mode  :character   Mode  :character   Median :2.000   Median : 98.00
##                                        Mean   :2.479   Mean   : 97.57
##                                        3rd Qu.:3.500   3rd Qu.:102.00
##                                        Max.   :4.000   Max.   :114.00
##       NPH
##  Min.   :57.00
##  1st Qu.:65.00
##  Median :68.00
##  Mean   :67.84
##  3rd Qu.:70.00
##  Max.   :80.00
```

```
EIBPLNPH=cor(Man_Woman[,3:5])
corrplot(EIBPLNPH)
```




```
pairs(Man_Woman[,3:5])
```



Regretion for BPL

```
BL=lm(BPL~Sex+Population,data=Man_Woman)
summary(BL)
```

```
##
## Call:
## lm(formula = BPL ~ Sex + Population, data = Man_Woman)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -11.4920  -2.6806  -0.0532   2.8806  10.5080
##
## Coefficients:
##                   Estimate Std. Error t value Pr(>|t|)
## (Intercept)        91.6806     0.5030 182.251  < 2e-16 ***
## SexMale             4.4388     0.5749   7.721 4.25e-13 ***
## PopulationESKIMO    7.3726     0.5749  12.824  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 4.251 on 216 degrees of freedom
## Multiple R-squared:  0.5023, Adjusted R-squared:  0.4977
```

```
## F-statistic:   109 on 2 and 216 DF,  p-value: < 2.2e-16
```

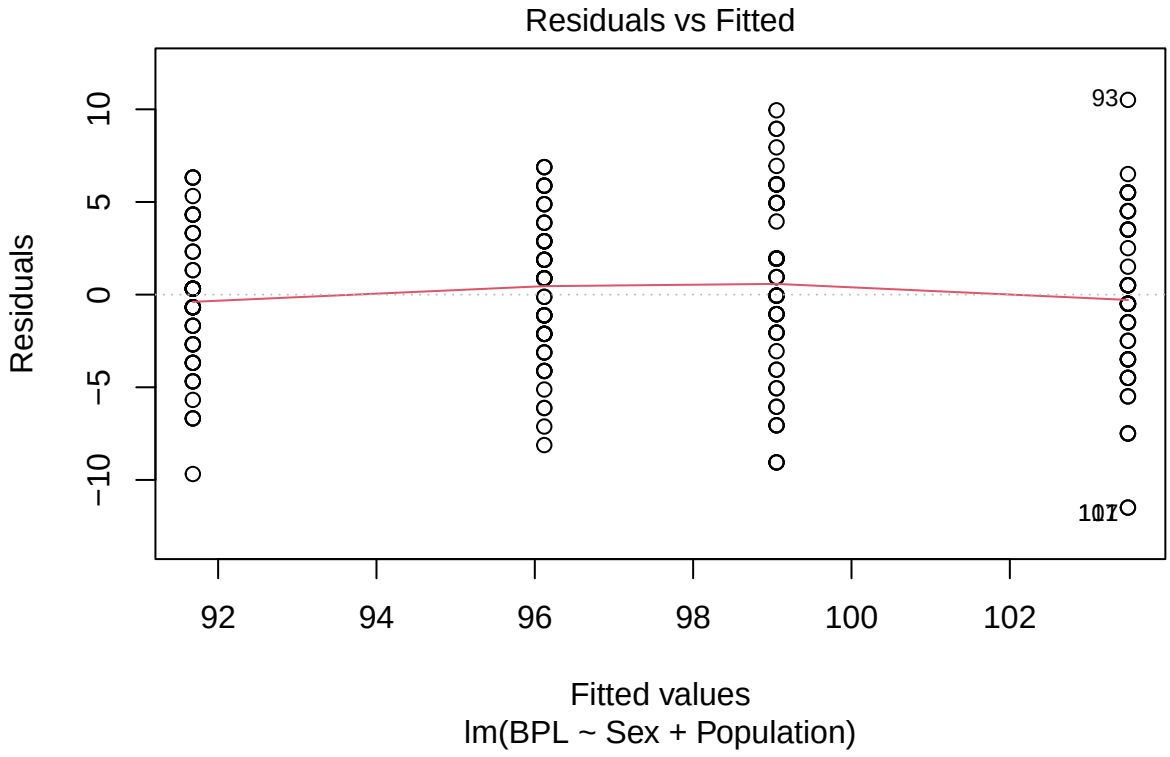
```
vif(BL)
```

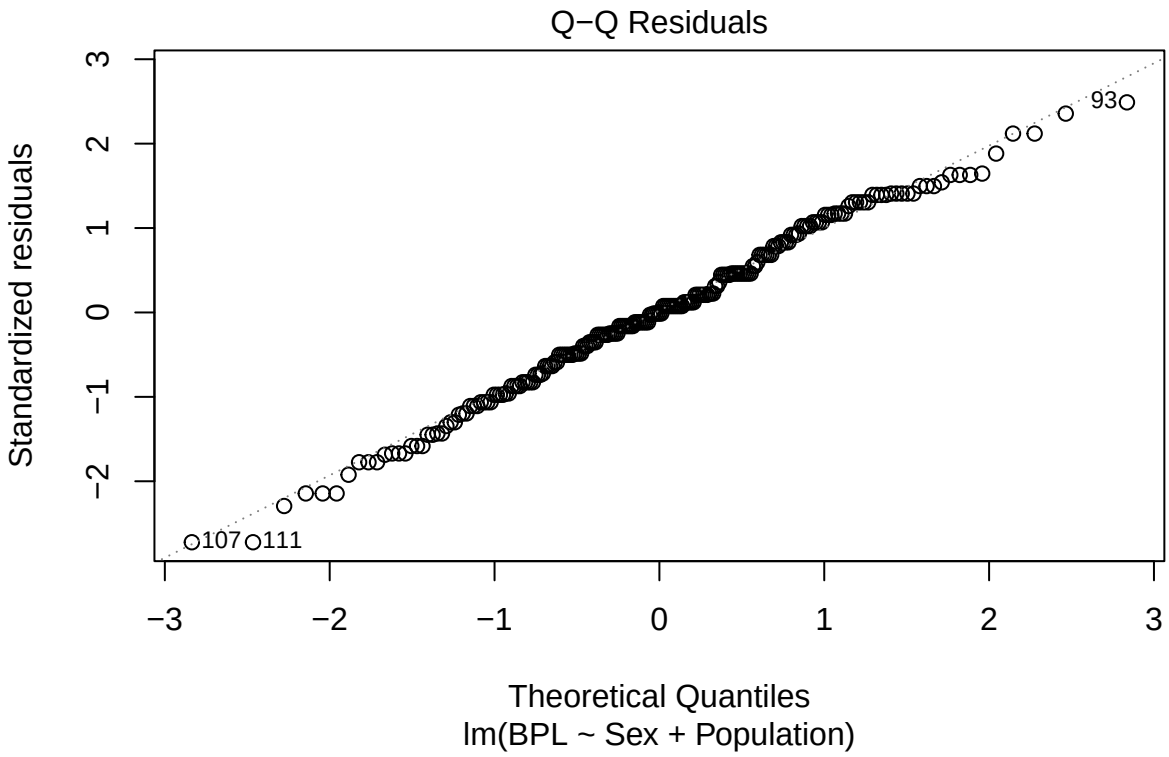
```
##        Sex Population
##   1.001011   1.001011
```

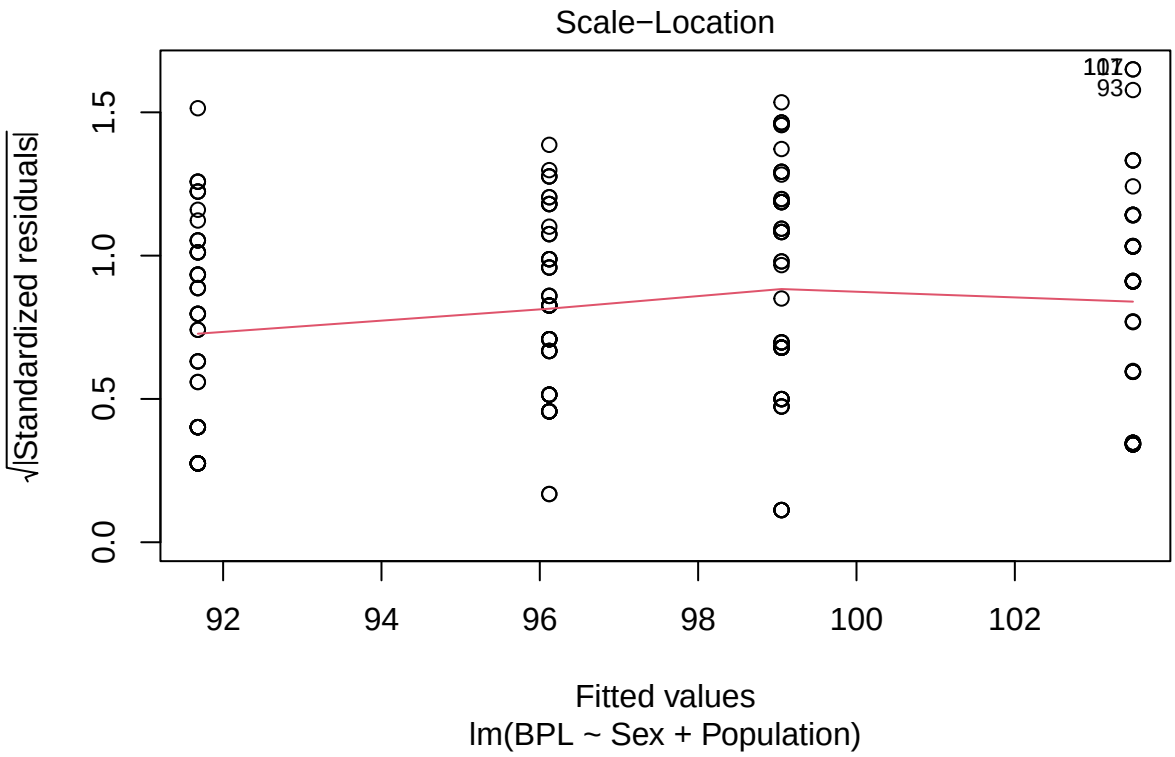
```
mean(vif(BL))
```

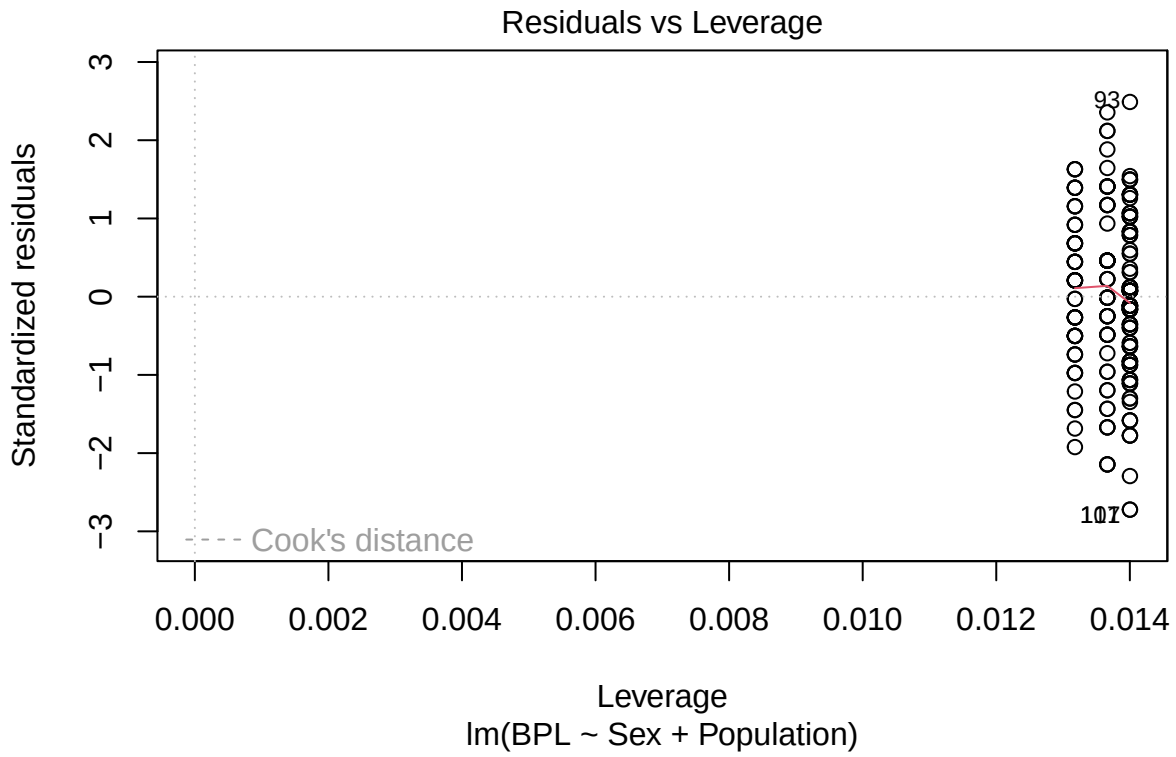
```
## [1] 1.001011
```

```
plot(BL)
```

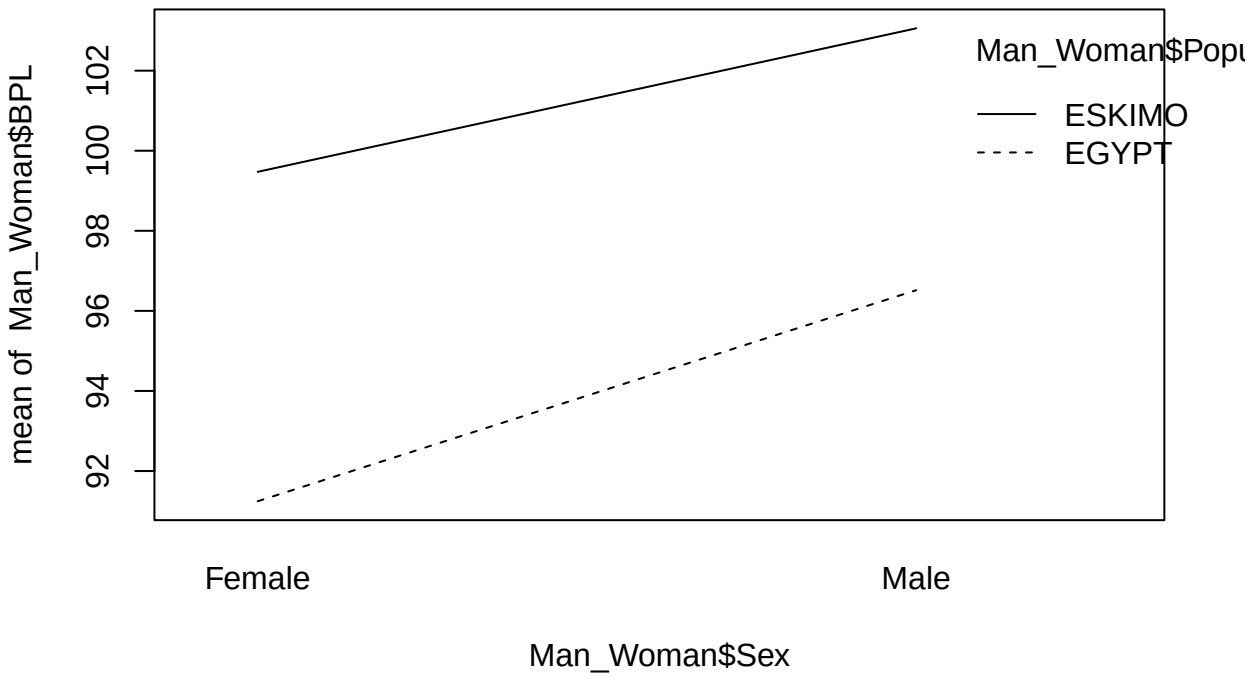



Q−Q Residuals
Standardized residuals
3
2
1
0
−1
−2
93
107
111
−3
−2
−1
0
1
2
3
Theoretical Quantiles
lm(BPL ~ Sex + Population)


Scale−Location
√|Standardized residuals|
0.0
0.5
1.0
1.5
92
94
96
98
100
102
Fitted values
lm(BPL ~ Sex + Population)




```
interaction.plot(Man_Woman$Sex,Man_Woman$Population,Man_Woman$BPL)
```



Male Inuit NPH vs Female Inuit NPH vs Male Egypt NPH vs Female Egypt NPH-Two-Way ANOVA

```
Man_Woman=read.csv("Project Data2.csv")
NPHMale=aov(NPH~Sex+Population+Sex:Population,data=Man_Woman)
summary(NPHMale)
```

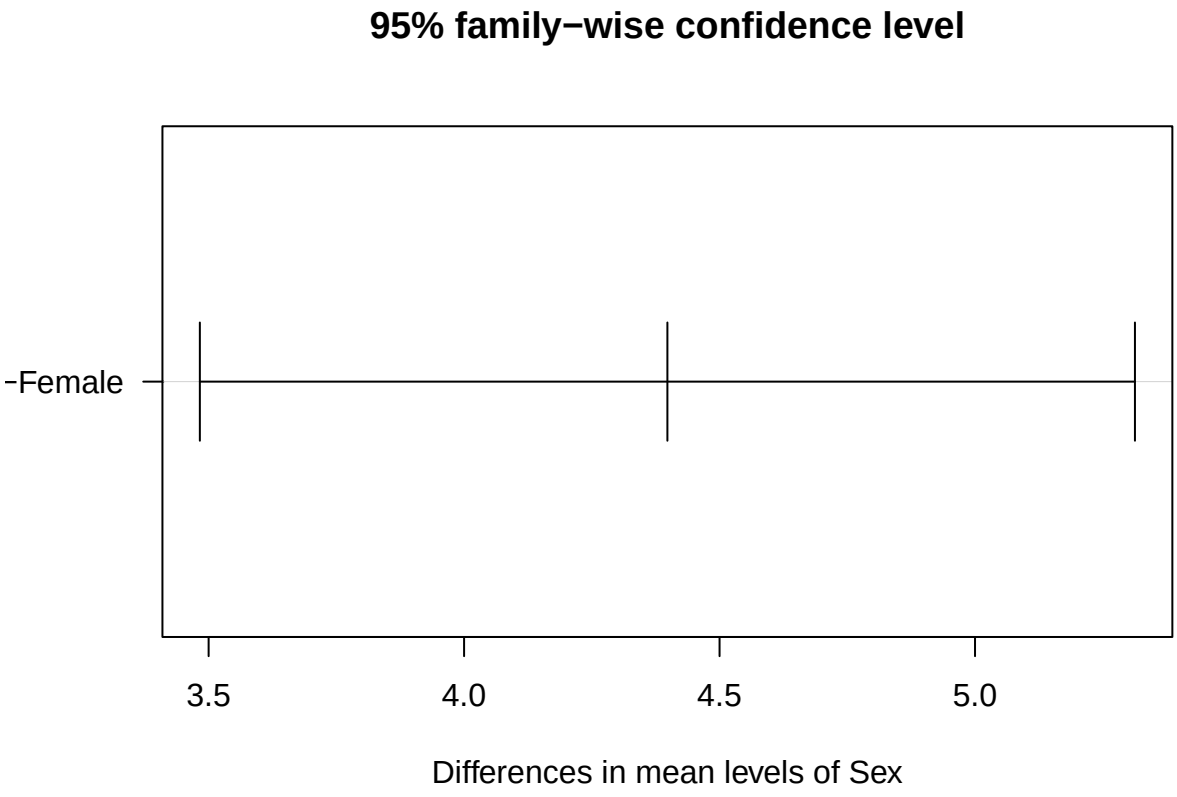
```
##                 Df Sum Sq Mean Sq F value   Pr(>F)
## Sex              1 1058.7  1058.7  89.735  < 2e-16 ***
## Population       1  553.1   553.1  46.877 7.79e-11 ***
## Sex:Population   1    0.9     0.9   0.074    0.786
## Residuals      215 2536.7    11.8
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Tukey for NPH Sex

```
TukeyHSD(NPHMale,"Sex",conf.level = 0.95)
```

```
##   Tukey multiple comparisons of means
##     95% family-wise confidence level
##
## Fit: aov(formula = NPH ~ Sex + Population + Sex:Population, data = Man_Woman)
##
## $Sex
##                 diff      lwr      upr p adj
## Male-Female 4.397898 3.482808 5.312988     0
```

```
plot(TukeyHSD(NPHMale,"Sex",conf.level = 0.95),las=1)
```

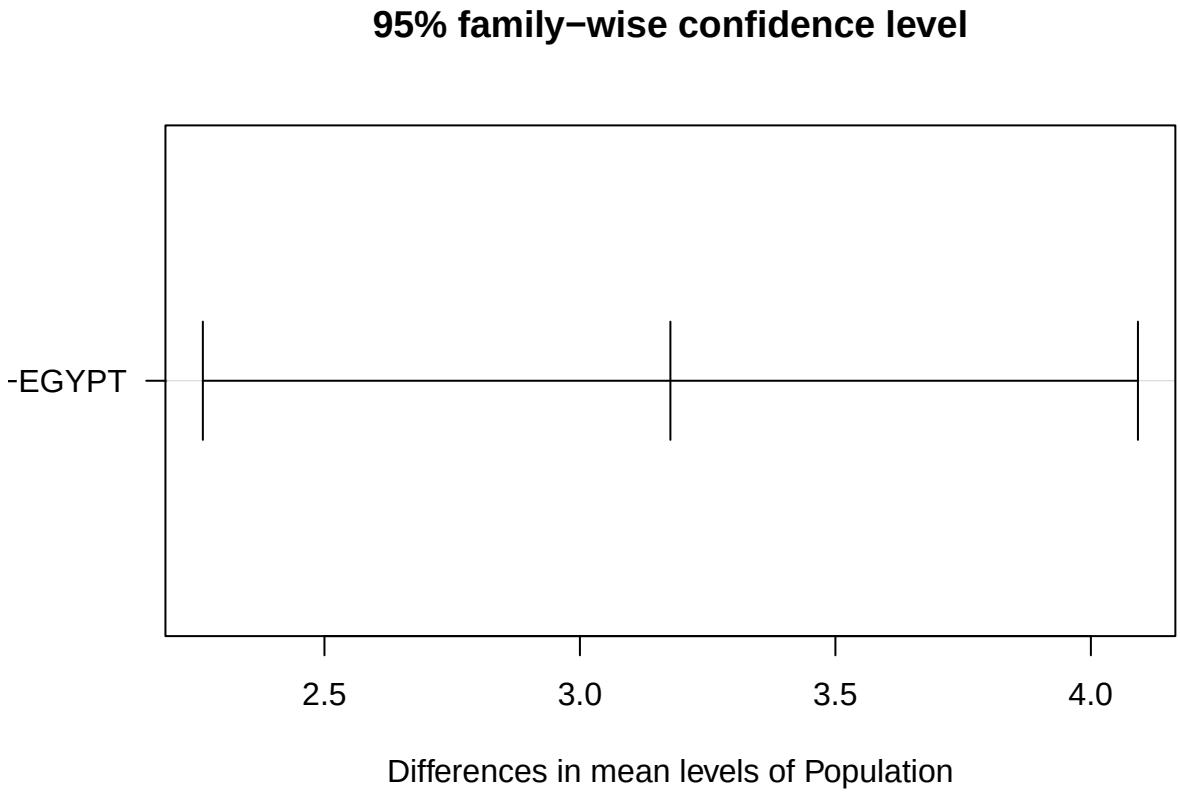


Tukey for NPH Population

```
TukeyHSD(NPHMale,"Population",conf.level = 0.95)
```

```
##   Tukey multiple comparisons of means
##     95% family-wise confidence level
##
## Fit: aov(formula = NPH ~ Sex + Population + Sex:Population, data = Man_Woman)
##
## $Population
##                    diff     lwr     upr p adj
## ESKIMO-EGYPT 3.17706 2.26197 4.09215     0
```

```r
plot(TukeyHSD(NPHMale,"Population",conf.level = 0.95),las=1)
```



Regretion for NPH

```r
library(corrplot)
library(car)
library(olsrr)
Man_Woman=read.csv("Project Data2.csv")
NH=lm(NPH~Sex+Population,data=Man_Woman)
summary(NH)
```

```
##
## Call:
## lm(formula = NPH ~ Sex + Population, data = Man_Woman)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -9.1718 -2.0817  0.3292  1.9183 10.8282
##
## Coefficients:
##                  Estimate Std. Error t value Pr(>|t|)
## (Intercept)       63.9915     0.4056 157.778  < 2e-16 ***
```

```
## SexMale            4.4990     0.4635   9.707  < 2e-16 ***
## PopulationESKIMO   3.1803     0.4635   6.861 7.09e-11 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 3.428 on 216 degrees of freedom
## Multiple R-squared:  0.3884, Adjusted R-squared:  0.3828
## F-statistic:  68.6 on 2 and 216 DF,  p-value: < 2.2e-16
```

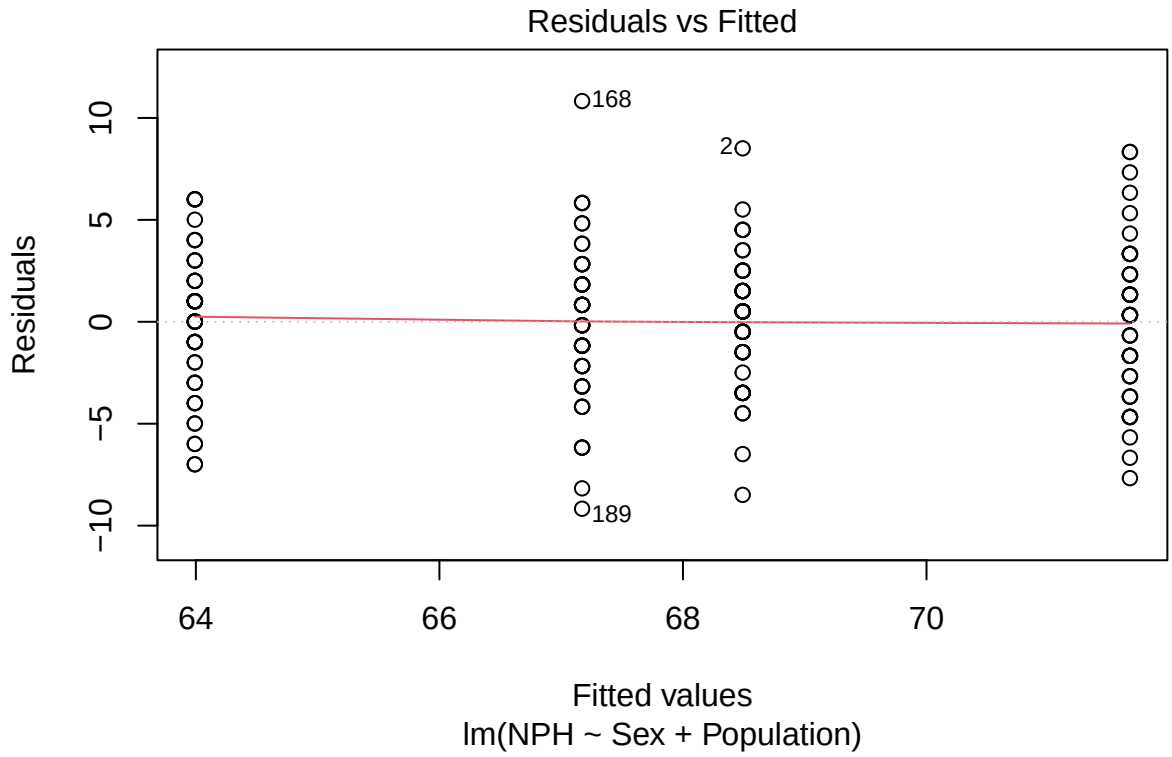
```
vif(NH)
```

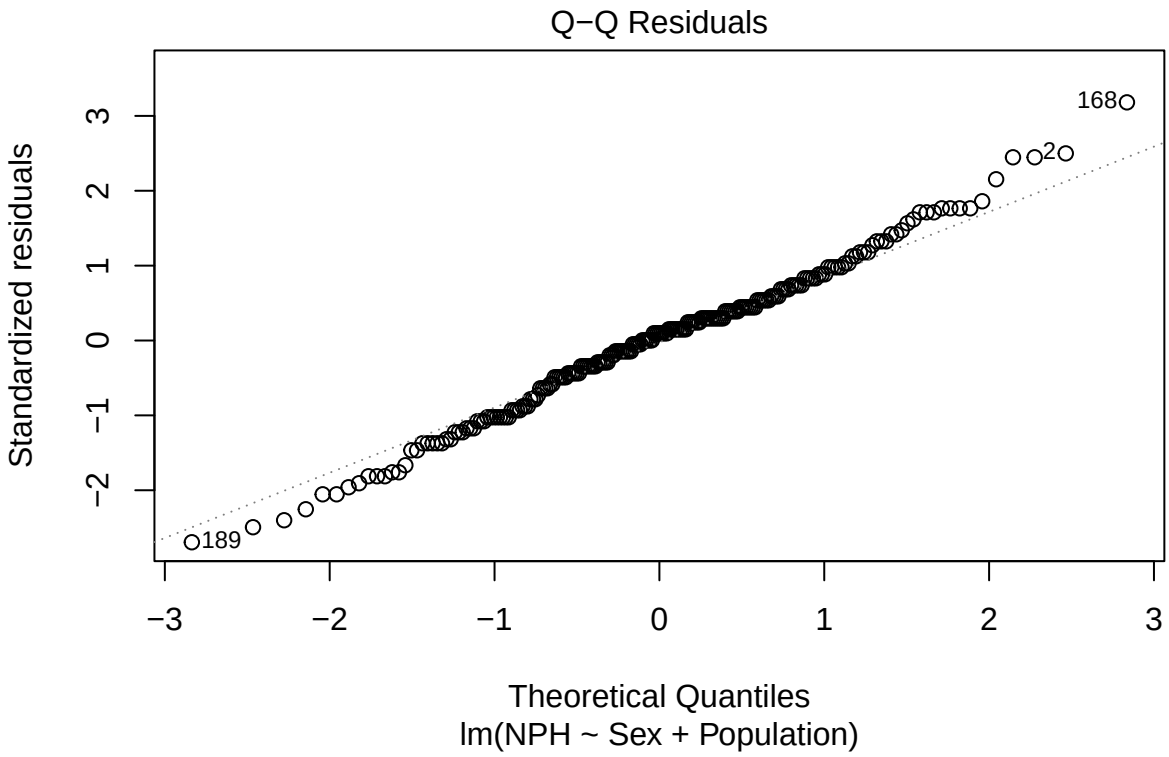
```
##        Sex Population
##   1.001011   1.001011
```

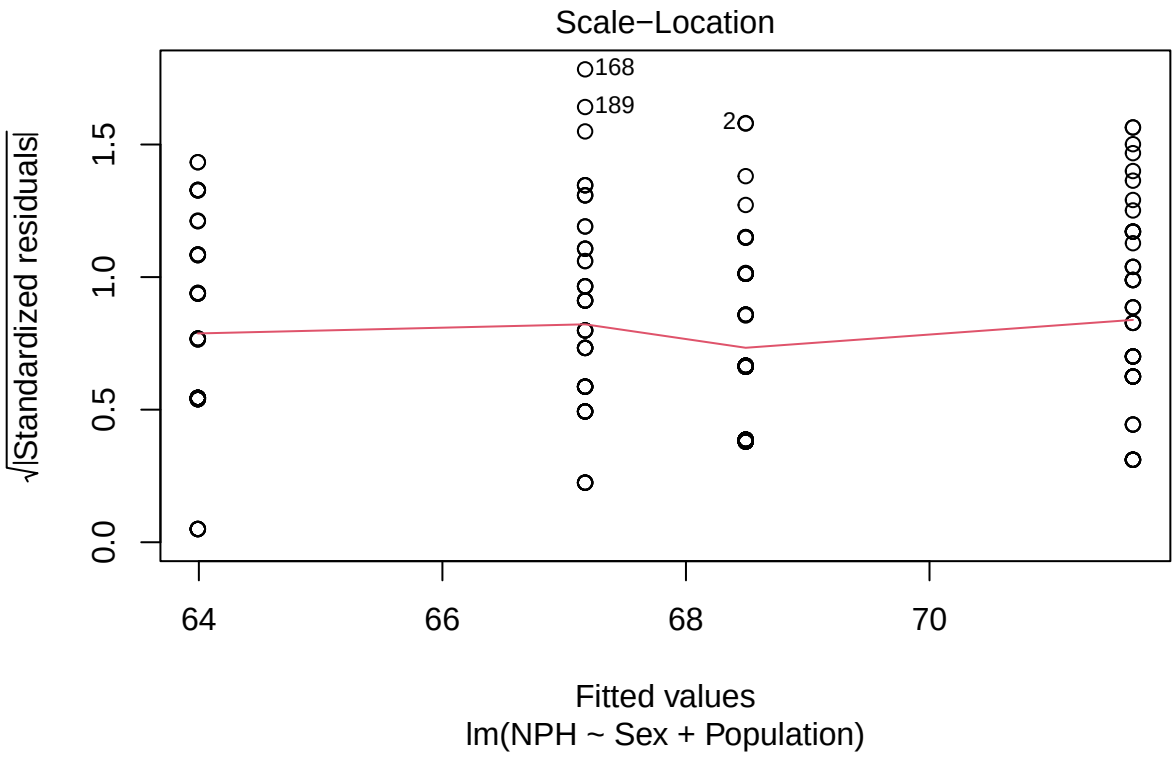
```
mean(vif(NH))
```

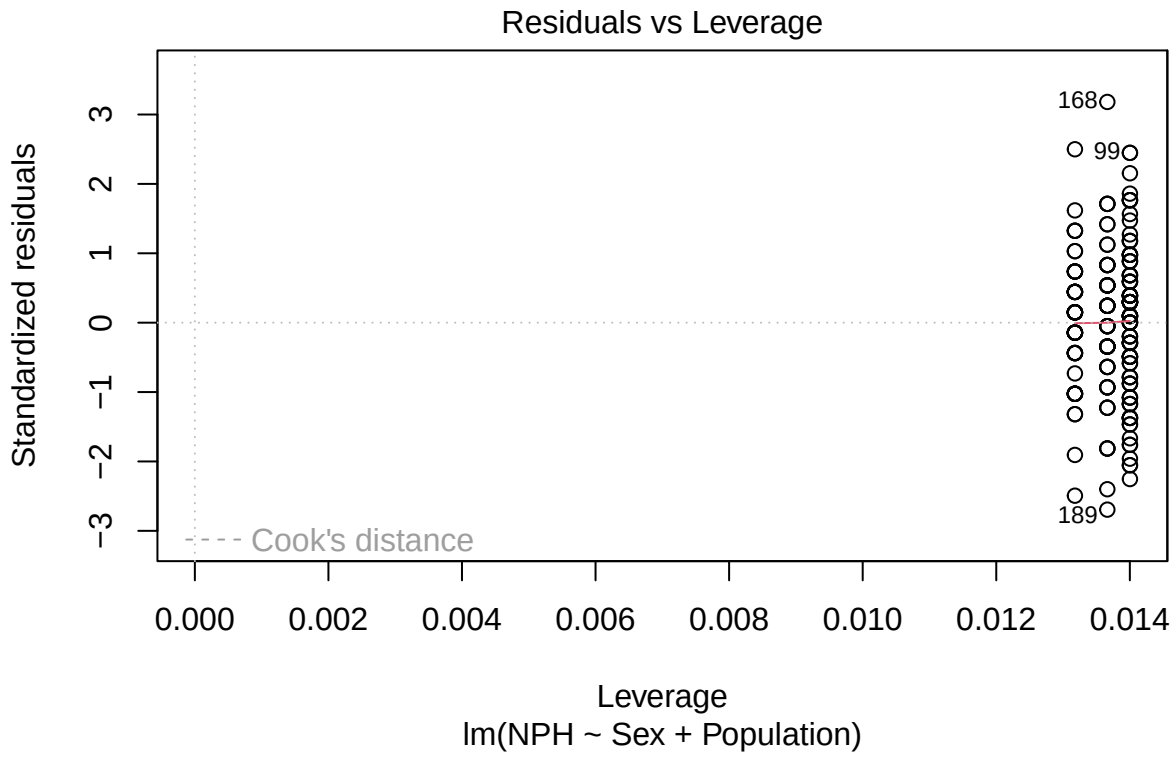
```
## [1] 1.001011
```

```
plot(NH)
```




Q−Q Residuals
Standardized residuals
−2
−1
0
1
2
3
168
2
189
−3
−2
−1
0
1
2
3
Theoretical Quantiles
lm(NPH ~ Sex + Population)

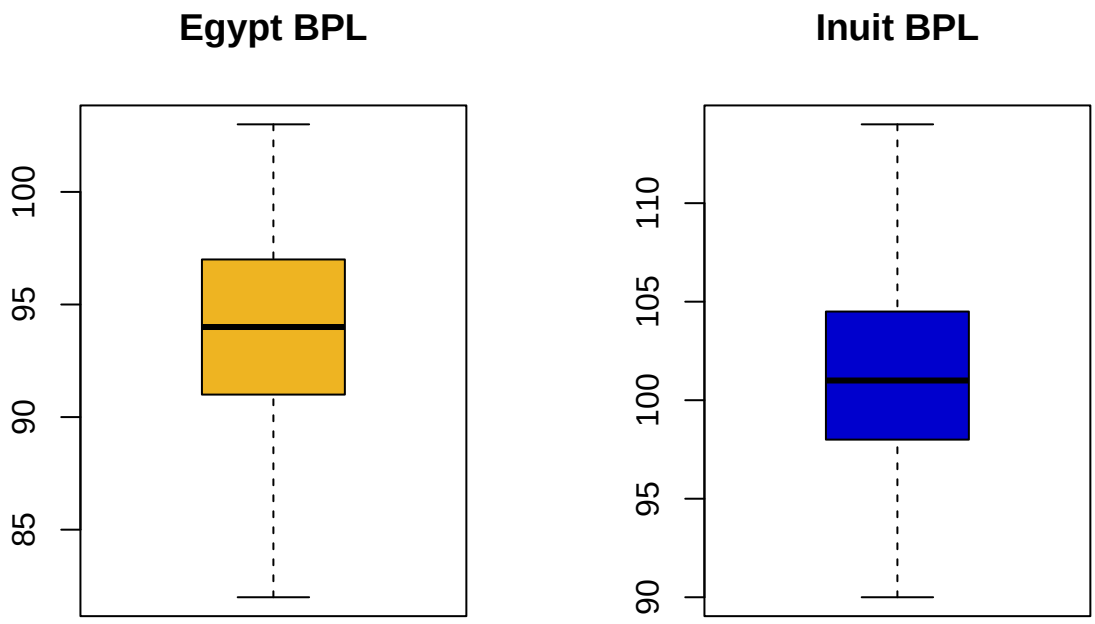

Scale−Location
√|Standardized residuals|
0.0
0.5
1.0
1.5
168
189
2
64
66
68
70
Fitted values
lm(NPH ~ Sex + Population)




```
interaction.plot(Man_Woman$Sex,Man_Woman$Population,Man_Woman$NPH)
```

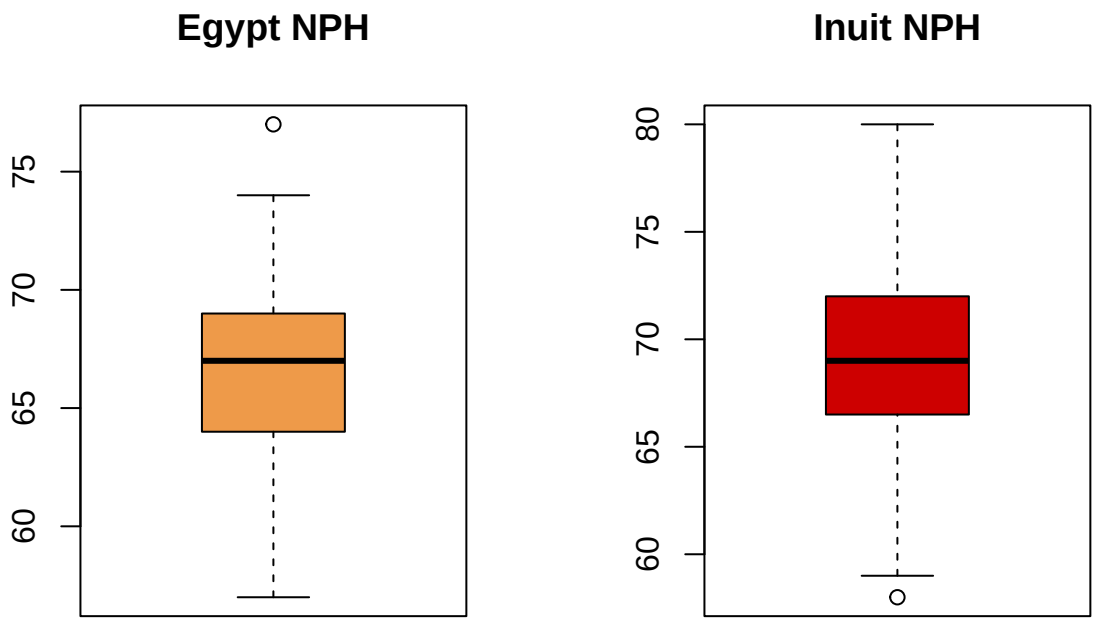
BPL Side by Side Boxplots

```
EB=Man_Woman$BPL[Man_Woman$Population=="EGYPT"]
IB=Man_Woman$BPL[Man_Woman$Population=="ESKIMO"]
par(mfrow=c(1,2))
boxplot(EB,main="Egypt BPL",col="goldenrod2")
boxplot(IB,main="Inuit BPL",col="blue3")
```



NPH Side by Side Boxplots

```
EN=Man_Woman$NPH[Man_Woman$Population=="EGYPT"]
IN=Man_Woman$NPH[Man_Woman$Population=="ESKIMO"]
par(mfrow=c(1,2))
boxplot(EN,main="Egypt NPH",col="tan2")
boxplot(IN,main="Inuit NPH",col="red3")
```



Add a new chunk by clicking the *Insert Chunk* button on the toolbar or by pressing *Ctrl+Alt+I*.

When you save the notebook, an HTML file containing the code and output will be saved alongside it (click the *Preview* button or press *Ctrl+Shift+K* to preview the HTML file).

The preview shows you a rendered HTML copy of the contents of the editor. Consequently, unlike *Knit*, *Preview* does not run any R code chunks. Instead, the output of the chunk when it was last run in the editor is displayed.