

# Data Analytics: Lab 1

Beatrice Dang

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## Exercise 1: Exploring the Distribution

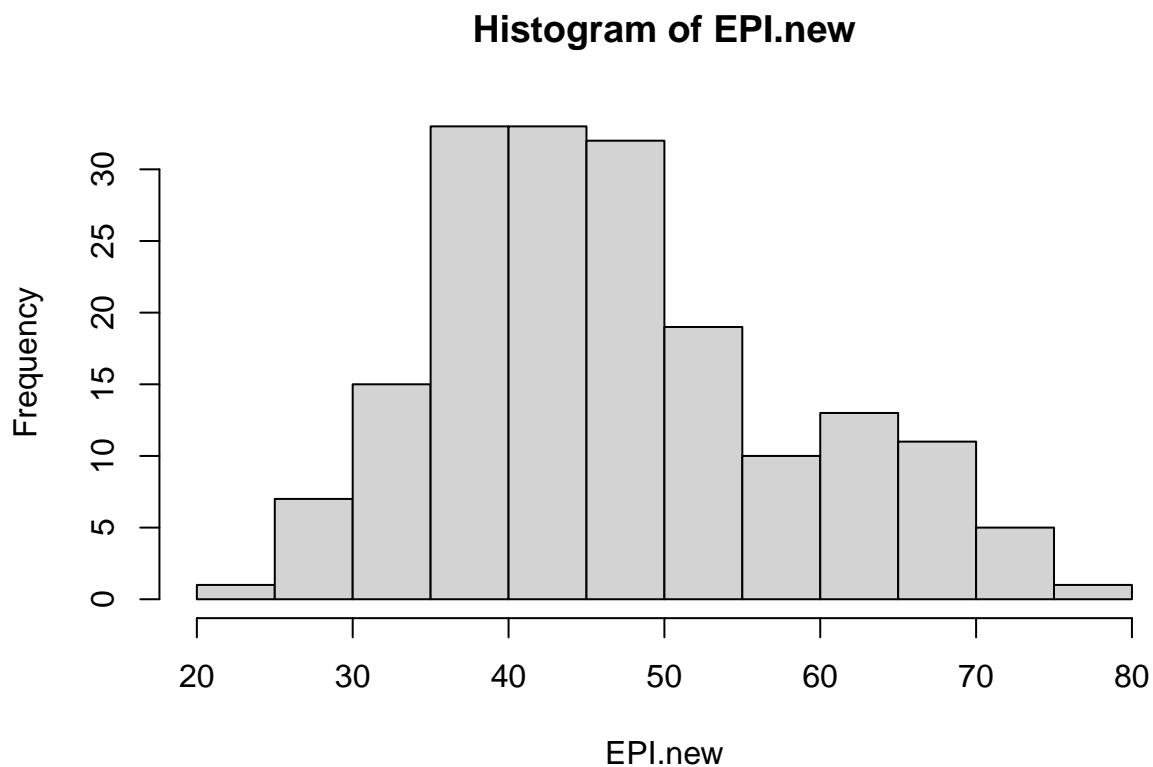
```
EPI_data <- read.csv("C:\\Users\\bmd\\Downloads\\epi2024results06022024.csv")
attach(EPI_data)
summary(EPI.new)
```

```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    24.50  38.25   45.50   46.84  53.10   75.30
```

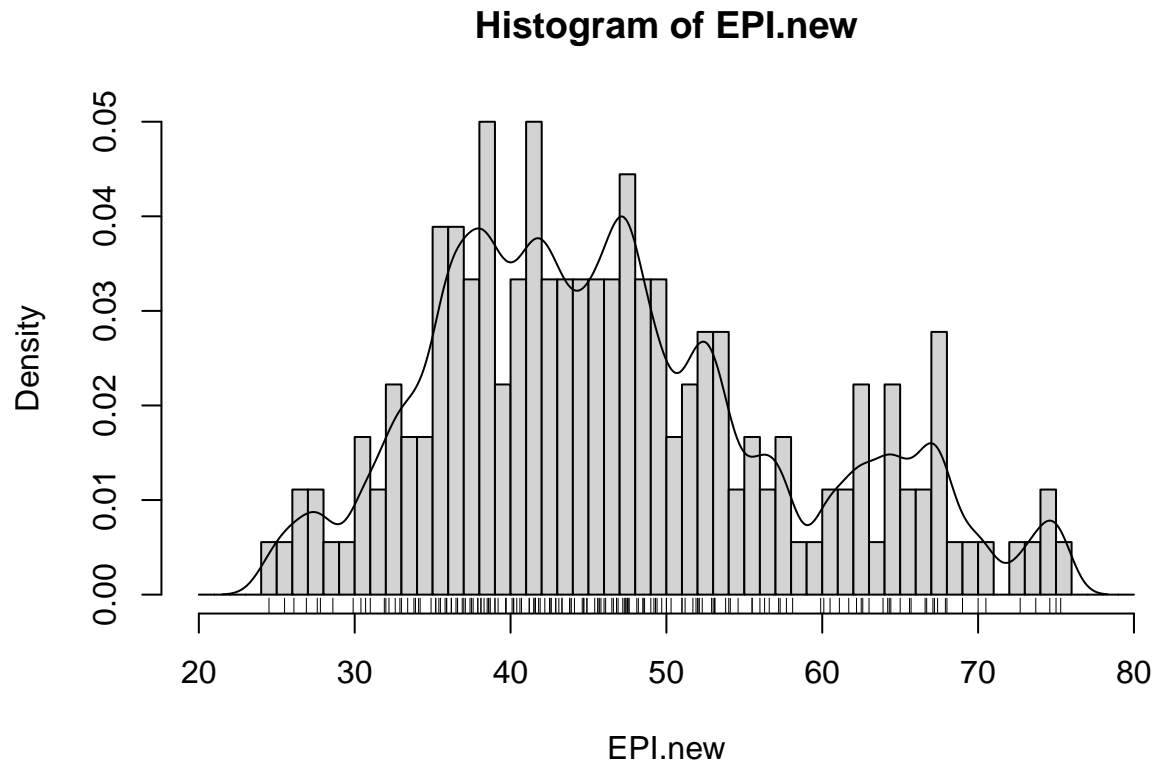
```
fivenum(EPI.new,na.rm=TRUE)
```

```
## [1] 24.5 38.2 45.5 53.1 75.3
```

```
hist(EPI.new)
```

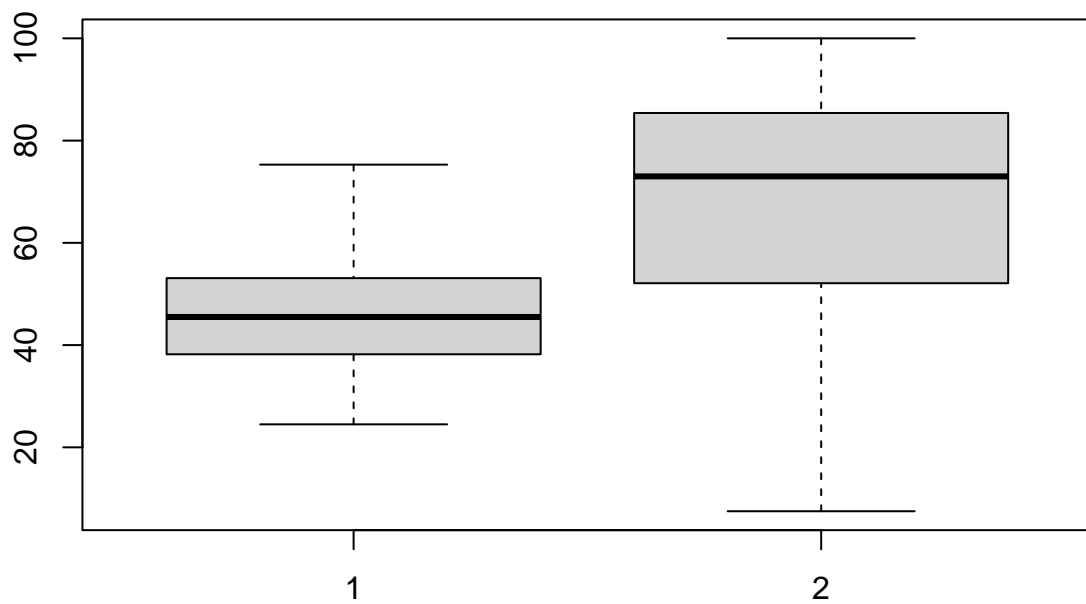


```
hist(EPI.new, seq(20., 80., 1.0), prob=TRUE)
lines(density(EPI.new, na.rm=TRUE, bw=1.)) # or try bw="SJ"
rug(EPI.new)
```

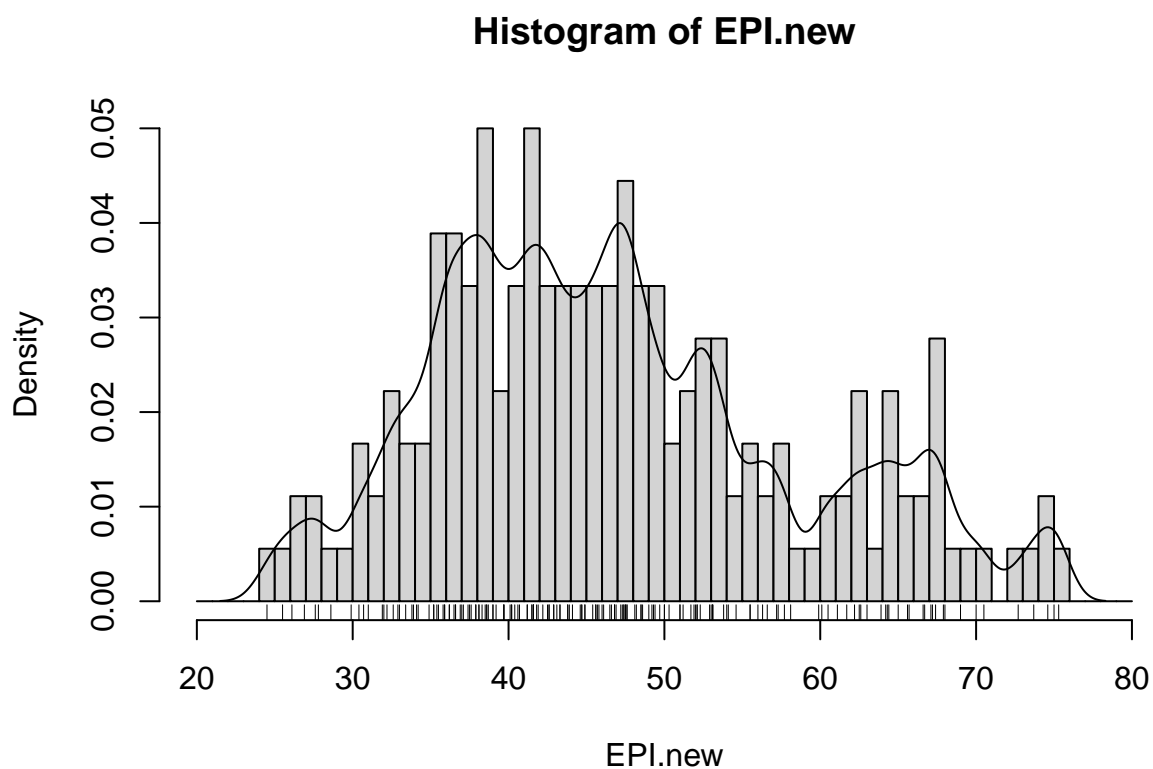


Comparing Distributions

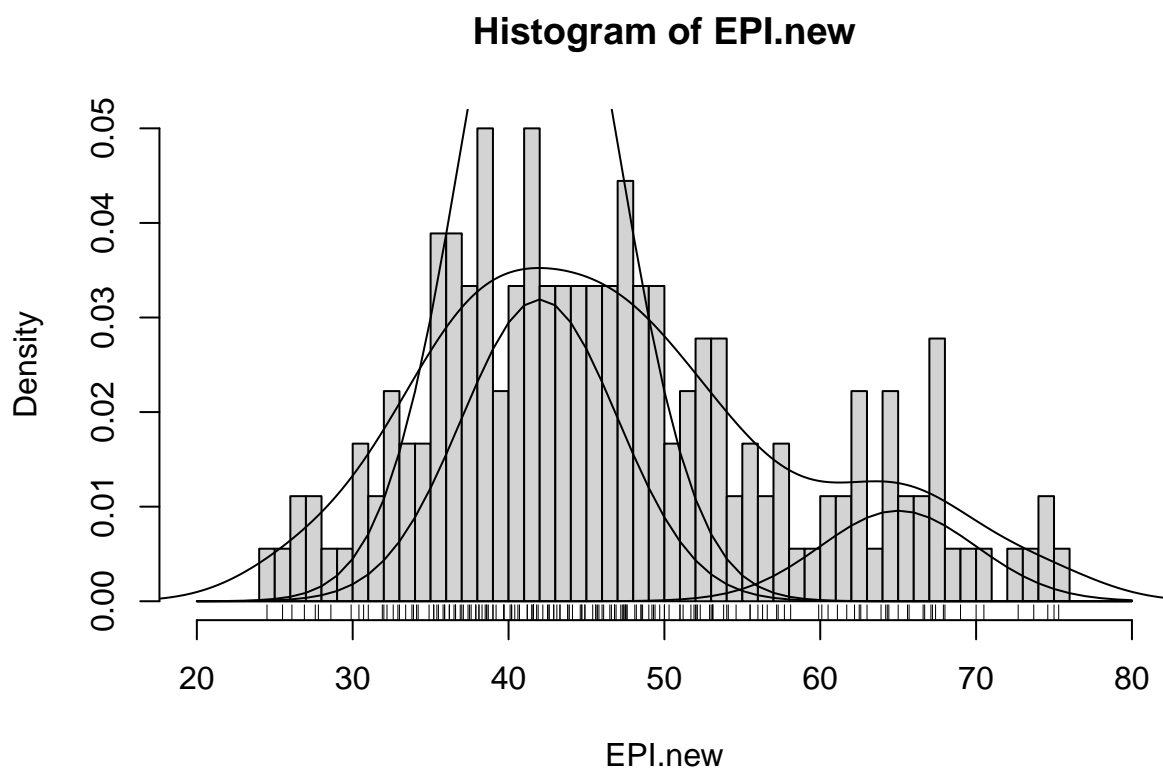
```
boxplot(EPI.new, APO.new)
```



```
hist(EPI.new, seq(20., 80., 1.0), prob=TRUE)
lines (density(EPI.new,na.rm=TRUE,bw=1.))
rug(EPI.new)
```



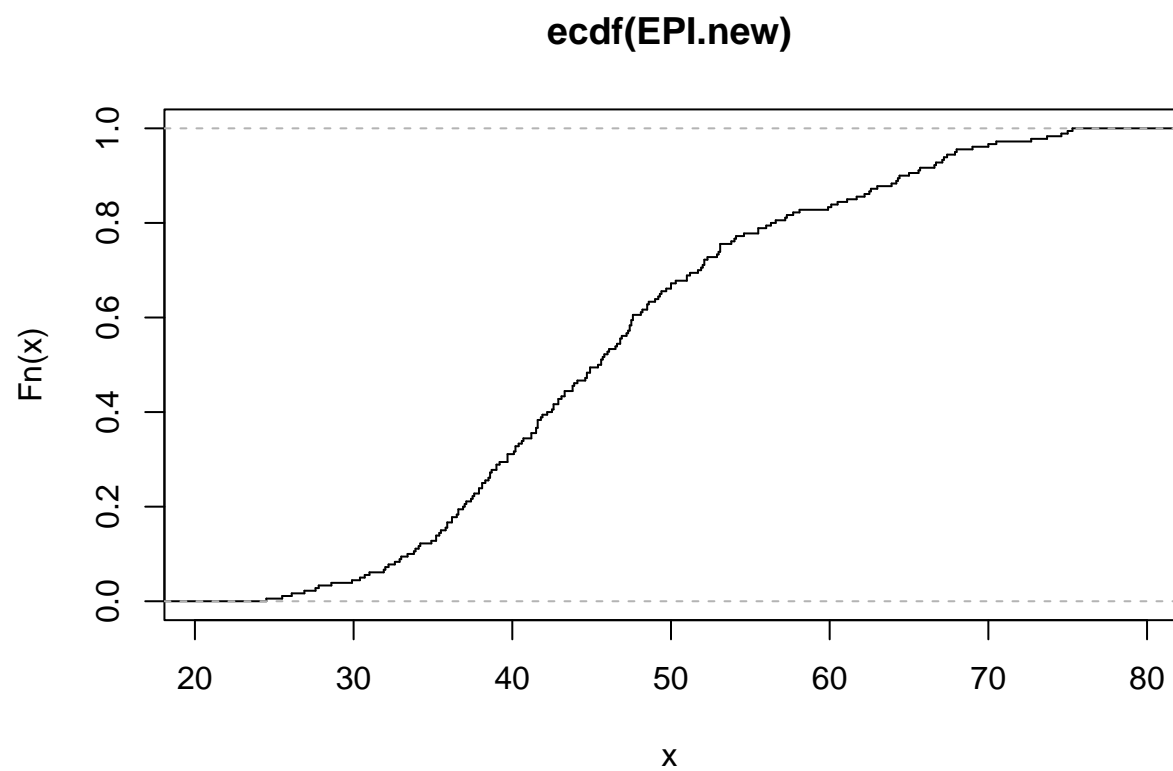
```
hist(EPI.new, seq(20., 80., 1.0), prob=TRUE)
lines (density(EPI.new,na.rm=TRUE,bw="SJ"))
rug(EPI.new)
x<-seq(20,80,1)
q<- dnorm(x,mean=42, sd=5,log=FALSE)
lines(x,q)
lines(x,.4*q)
q<-dnorm(x,mean=65, sd=5,log=FALSE)
lines(x,.12*q)
```



Exercise 2: Fitting a Distribution Beyond Histograms

Cumulative Density Function

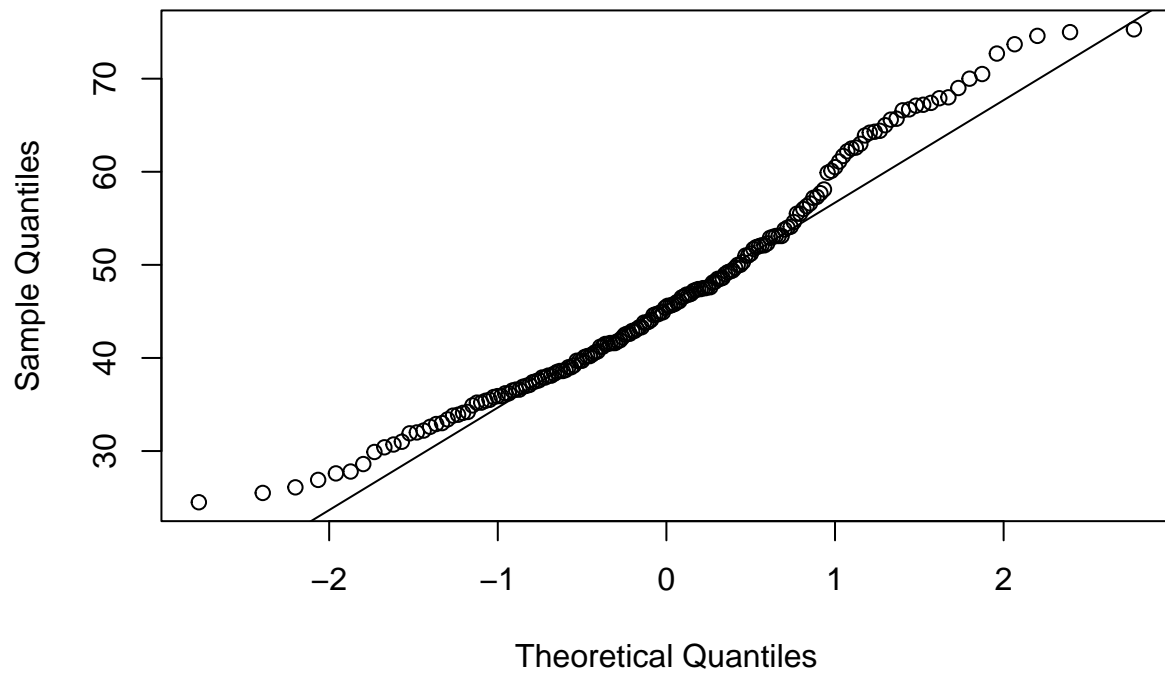
```
plot(ecdf(EPI.new), do.points=FALSE, verticals=TRUE)
```



Quantile-Quantile

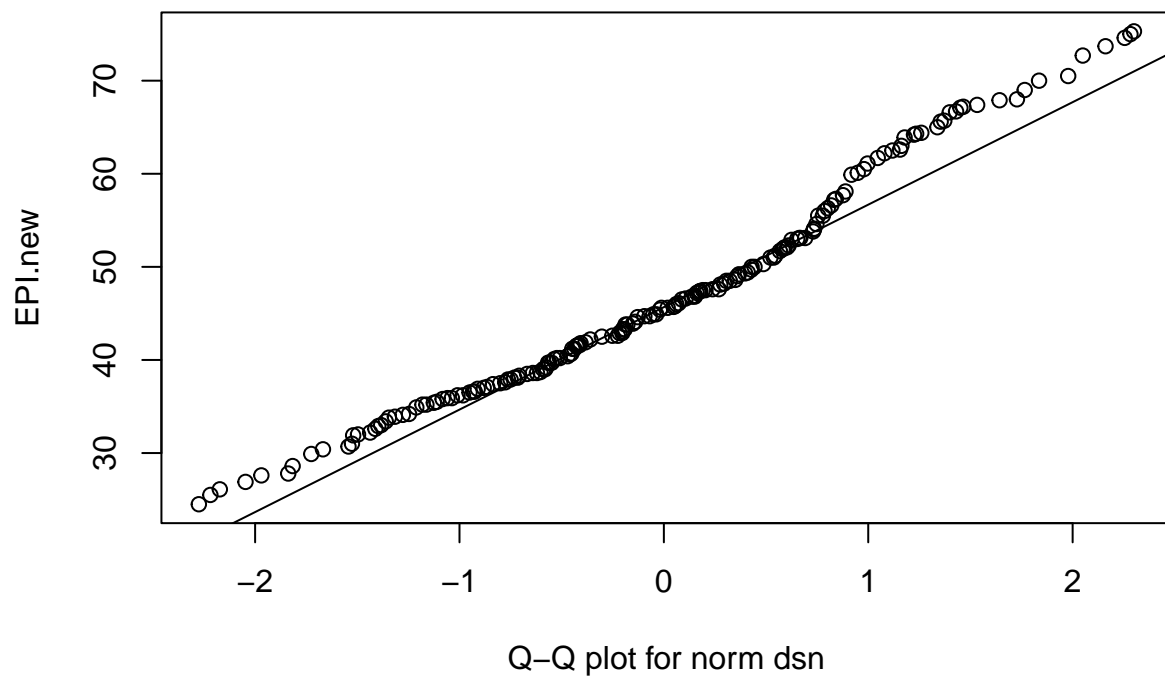
```
qqnorm(EPI.new); qqline(EPI.new)
```

## Normal Q-Q Plot



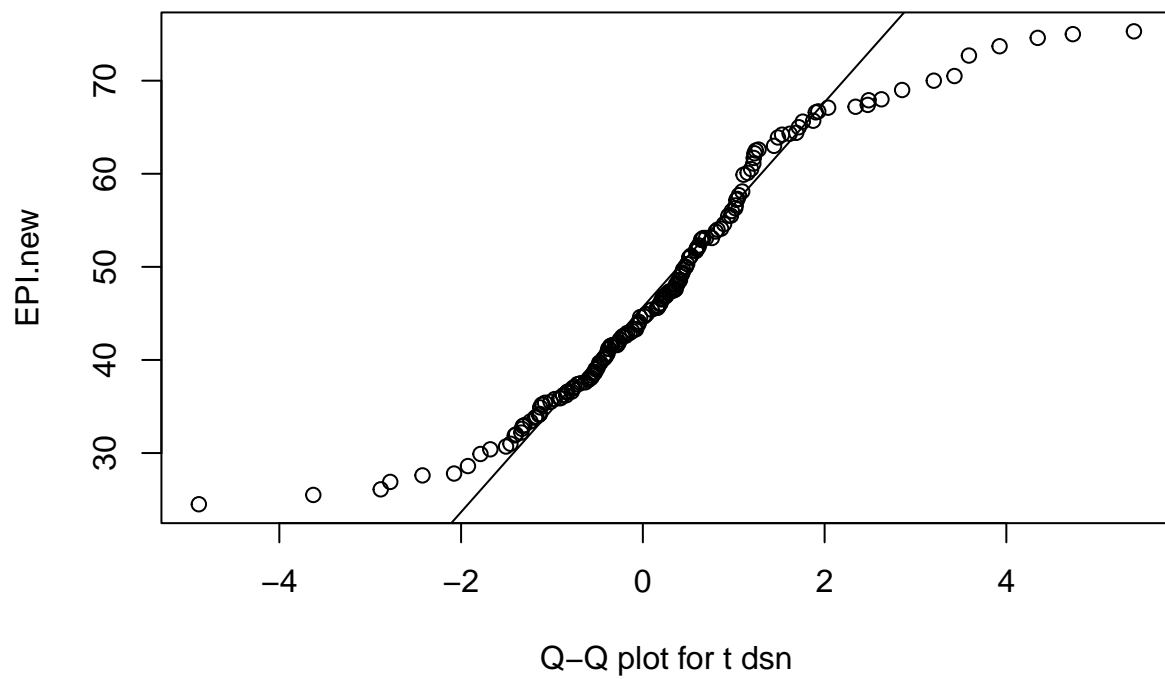
Q-Q plot against the generating distribution

```
qqplot(rnorm(250), EPI.new, xlab = "Q-Q plot for norm dsn")  
qqline(EPI.new)
```



```
qqplot(rt(250, df = 5), EPI.new, xlab = "Q-Q plot for t dsn")  
qqline(EPI.new)
```

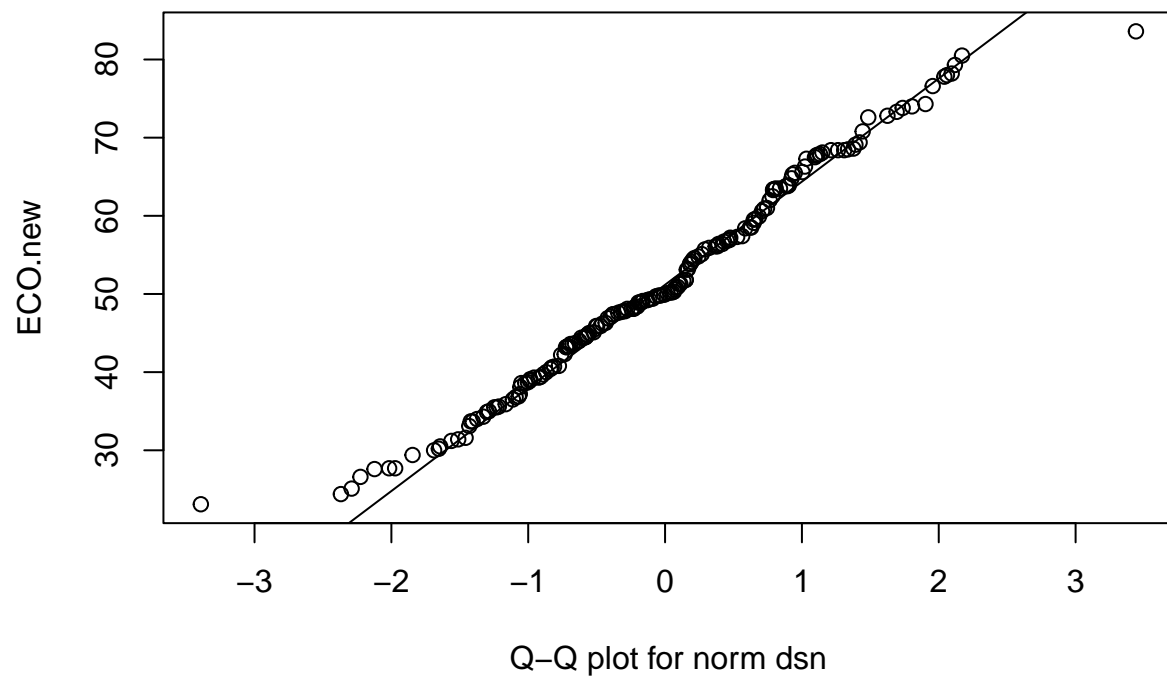




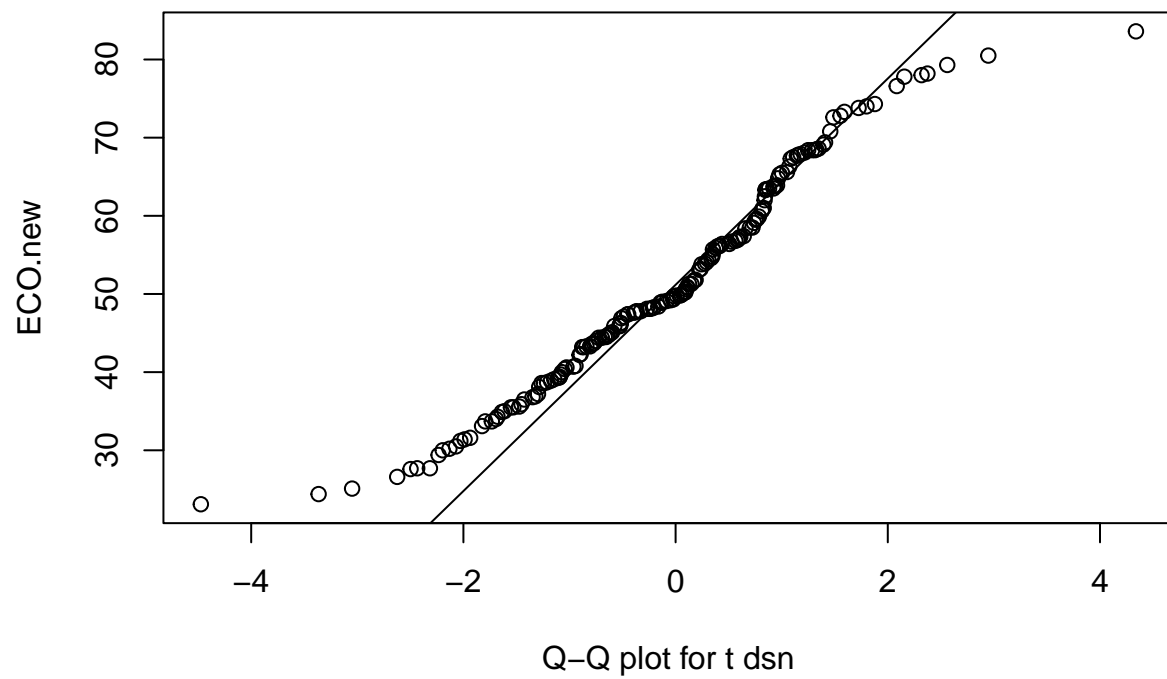
Exercise 2a: Fitting a Distribution

Fitting for ECO.new

```
qqplot(rnorm(250), ECO.new, xlab = "Q-Q plot for norm dsn")  
qqline(ECO.new)
```

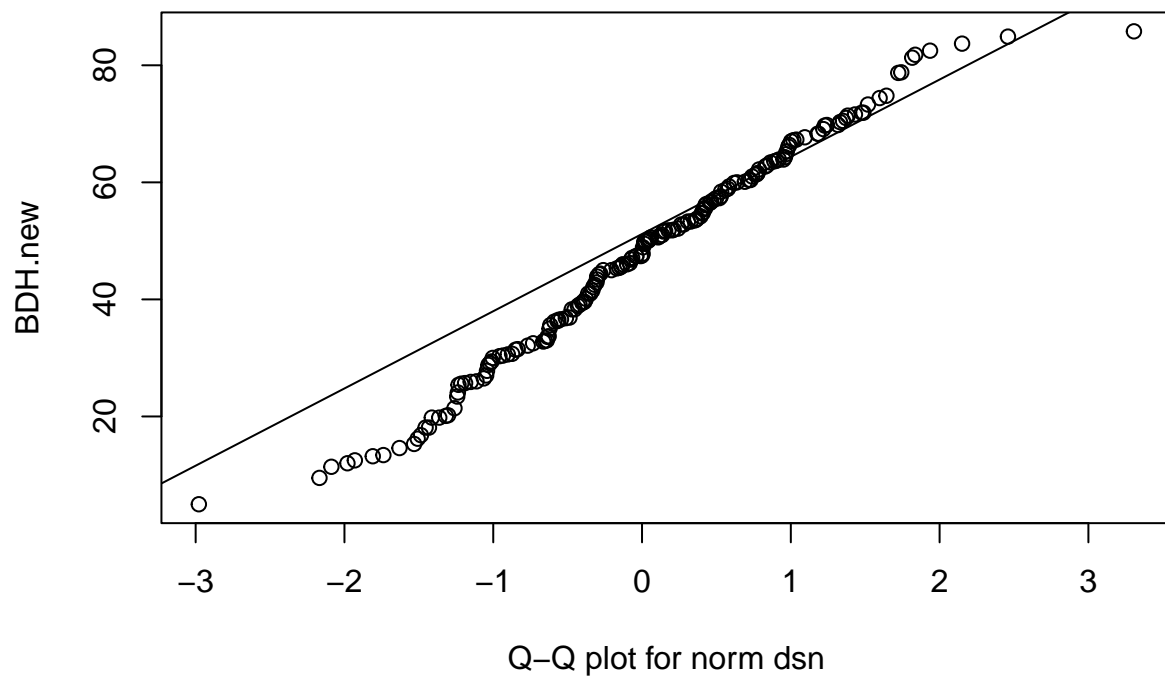


```
qqplot(rt(250, df = 5), ECO.new, xlab = "Q-Q plot for t dsn")  
qqline(ECO.new)
```



Fitting for BDH.new

```
qqplot(rnorm(250), BDH.new, xlab = "Q-Q plot for norm dsn")  
qqline(ECO.new)
```



```
qqplot(rt(250, df = 5), BDH.new, xlab = "Q-Q plot for t dsn")  
qqline(ECO.new)
```

