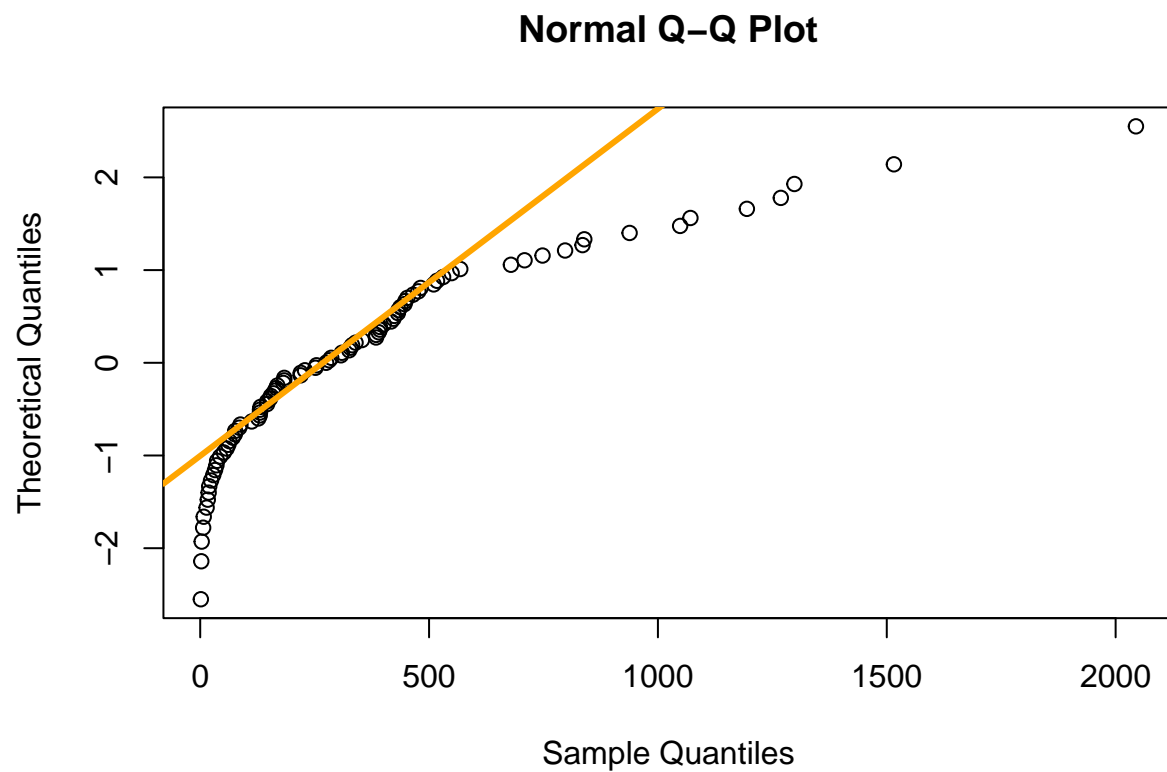


Research Space Utilization Distribution Fitting

Theodore A Moll

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```
MEdata = c(5.16200e+01, 8.79300e+01, 7.47880e+02, 1.63370e+02,  
5.17360e+02, 3.25590e+02, 5.30680e+02, 1.46120e+02,  
8.35310e+02, 1.59940e+02, 1.07101e+03, 2.81850e+02,  
7.10000e+01, 6.38000e+00, 7.56100e+01, 5.68190e+02,  
5.49370e+02, 4.65070e+02, 1.81700e+02, 9.38160e+02,  
4.23900e+02, 1.30550e+02, 6.78830e+02, 1.04856e+03,  
1.83440e+02, 4.48270e+02, 7.63700e+01, 3.69500e+01,  
1.68600e+02, 2.86230e+02, 1.26852e+03, 1.97200e+01,  
2.54070e+02, 8.53100e+01, 6.13400e+01, 3.92650e+02,  
3.09460e+02, 4.52450e+02, 1.12510e+02, 5.10100e+02,  
4.35500e+01, 1.30690e+02, 7.08660e+02, 3.89940e+02,  
2.19700e+02, 4.76550e+02, 7.97190e+02, 1.83630e+02,  
4.81480e+02, 1.51564e+03, 3.54000e+01, 3.53270e+02,  
1.29817e+03, 1.37000e+00, 1.29950e+02, 1.66310e+02,  
1.65400e+01, 2.35000e+00, 1.19440e+03, 3.07530e+02,  
6.35700e+01, 1.46350e+02, 4.37280e+02,  
4.46300e+02, 2.84300e+01, 2.51870e+02, 2.04444e+03,  
4.31910e+02, 1.27060e+02, 4.01050e+02,  
4.22230e+02, 3.25000e+00, 1.84200e+01, 1.52500e+02,  
2.28780e+02, 1.31840e+02, 7.66000e+00,  
3.28050e+02, 8.39150e+02, 3.39380e+02, 3.92430e+02,  
2.19470e+02, 1.39600e+01, 2.36700e+01, 3.84180e+02,  
4.17080e+02, 1.54450e+02, 3.84550e+02, 5.76000e+01,  
3.31830e+02, 4.33200e+02, 3.23800e+01, 2.75050e+02)  
  
qqnorm(MEdata, datax = TRUE)  
qqline(MEdata, datax = TRUE, col = "orange", lwd = 3)
```



```
#Test for normality
```

```
library(nortest)  
ad.test(MEdata)
```

```
##  
## Anderson-Darling normality test  
##  
## data: MEdata  
## A = 4.7466, p-value = 7.592e-12
```

```
#Create histogram of ME data
```

```
library(kableExtra)  
library(knitr)  
histVar = hist(MEdata, col = "orange", right = FALSE)
```

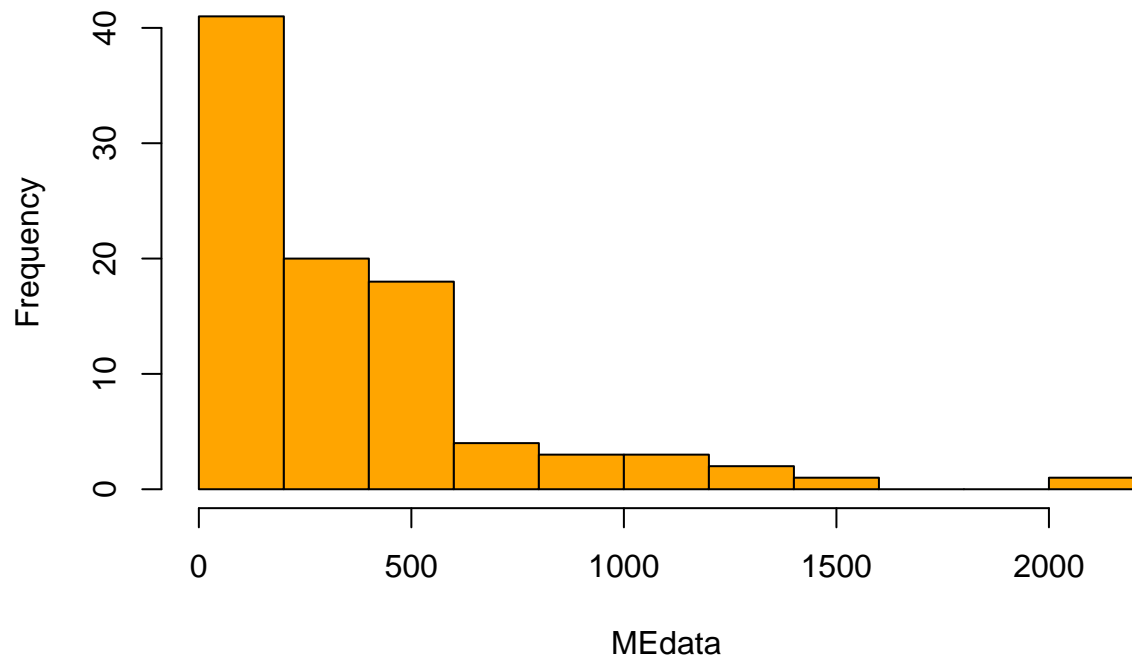
```
#Find appropriate distribution
```

```
library(fitdistrplus)
```

```
## Loading required package: MASS
```

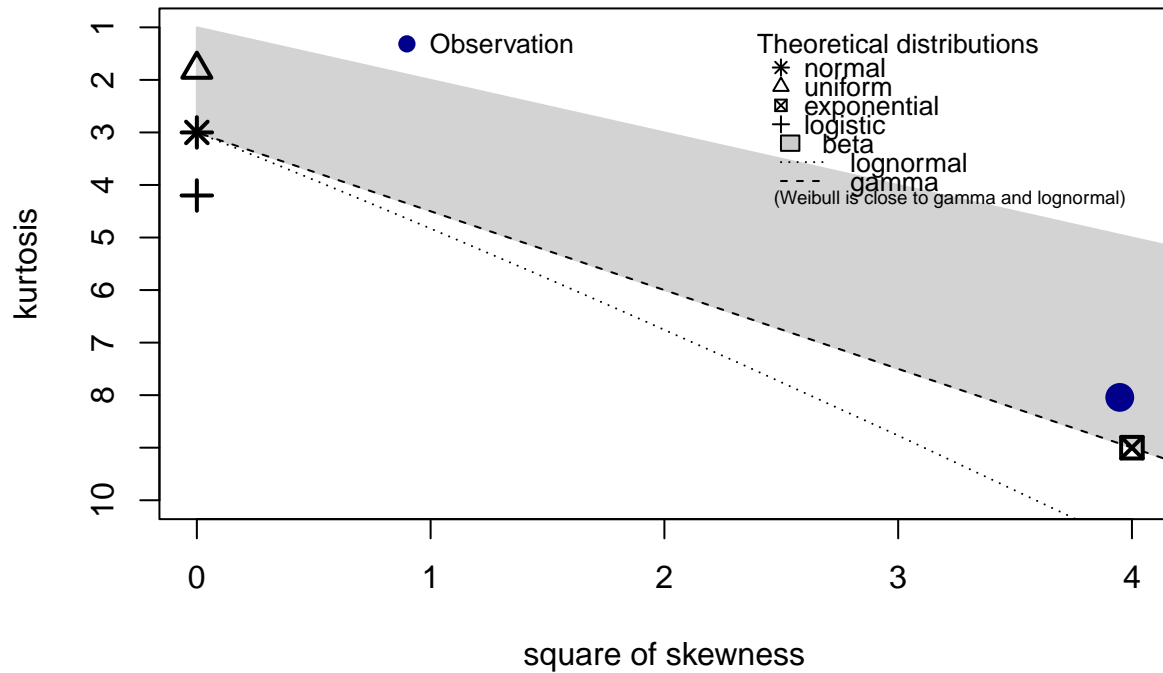
```
## Loading required package: survival
```

Histogram of MEdata



```
library(logspline)
descdist(MEdata, discrete = FALSE)
```

Cullen and Frey graph

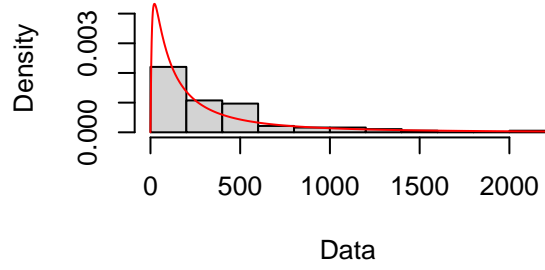


```
## summary statistics
## -----
## min:  1.37   max: 2044.44
## median: 275.05
## mean: 356.3834
## estimated sd: 368.8678
## estimated skewness: 1.98692
## estimated kurtosis: 8.042705
```

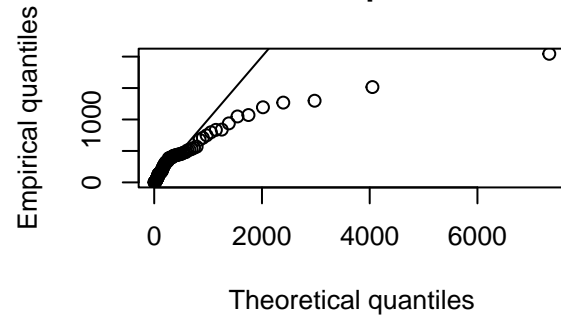
```
#Check fit of lognormal distribution
```

```
fit.lognormal <- fitdist(MEdata, "lnorm")
plot(fit.lognormal)
```

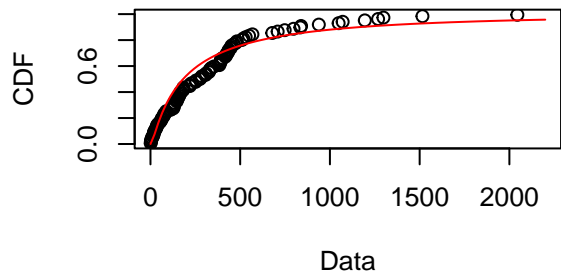
Empirical and theoretical dens.



Q-Q plot



Empirical and theoretical CDFs



P-P plot

