Question 2.c The tukey ladder model said that once we calculate the correlation and if the value of the power is negitive, we have to transform with 1/datacolumn .

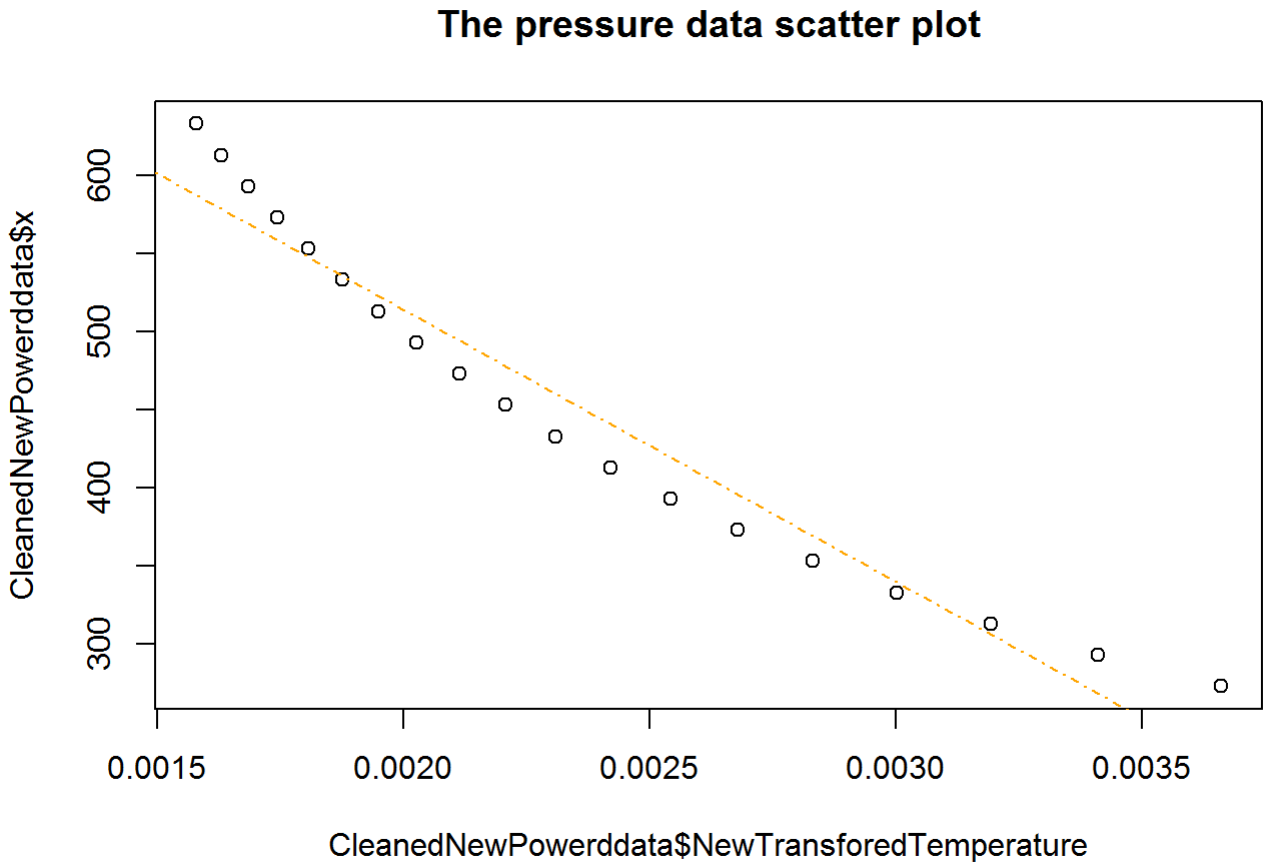
```
data(pressure)
attach(pressure)
```

```
## The following object is masked _by_ .GlobalEnv:
##
##     pressure
##
## The following object is masked from package:datasets:
##
##     pressure
```

```
x=pressure$temperature
y=pressure$pressure
x = x+273.15
y = y*0.133
NewTransforedTemperature = 1/(x)
CleanedNewPowerddata = data.frame(x,NewTransforedTemperature)
CleanedNewPowerddata
```

```
##         x NewTransforedTemperature
## 1  273.15              0.003660992
## 2  293.15              0.003411223
## 3  313.15              0.003193358
## 4  333.15              0.003001651
## 5  353.15              0.002831658
## 6  373.15              0.002679887
## 7  393.15              0.002543558
## 8  413.15              0.002420428
## 9  433.15              0.002308669
## 10 453.15              0.002206775
## 11 473.15              0.002113495
## 12 493.15              0.002027781
## 13 513.15              0.001948748
## 14 533.15              0.001875645
## 15 553.15              0.001807828
## 16 573.15              0.001744744
## 17 593.15              0.001685914
## 18 613.15              0.001630922
## 19 633.15              0.001579405
```

```
plot(CleanedNewPowerddata$x~CleanedNewPowerddata$NewTransforedTemperature, main = "The pressure data scatter plot" )
fit = lm(CleanedNewPowerddata$x~CleanedNewPowerddata$NewTransforedTemperature)
abline(fit, lty=4, col='orange')
```



The 1/x calculation brings a lot of straigtness. It looks very much transformed now.

Question 2 : d For the above graph i have drawn, the intercept is to be calculated.

```
x = pressure$temperature
y=pressure$pressure
x = x+273.15
y = y*0.133
NewTransforedTemperature = 1/(x)
CleanedNewPowerddata = data.frame(x,NewTransforedTemperature)
CleanedNewPowerddata
```

```
##         x NewTransforedTemperature
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## 11 473.15              0.002113495
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## 15 553.15              0.001807828
## 16 573.15              0.001744744
## 17 593.15              0.001685914
## 18 613.15              0.001630922
## 19 633.15              0.001579405
```
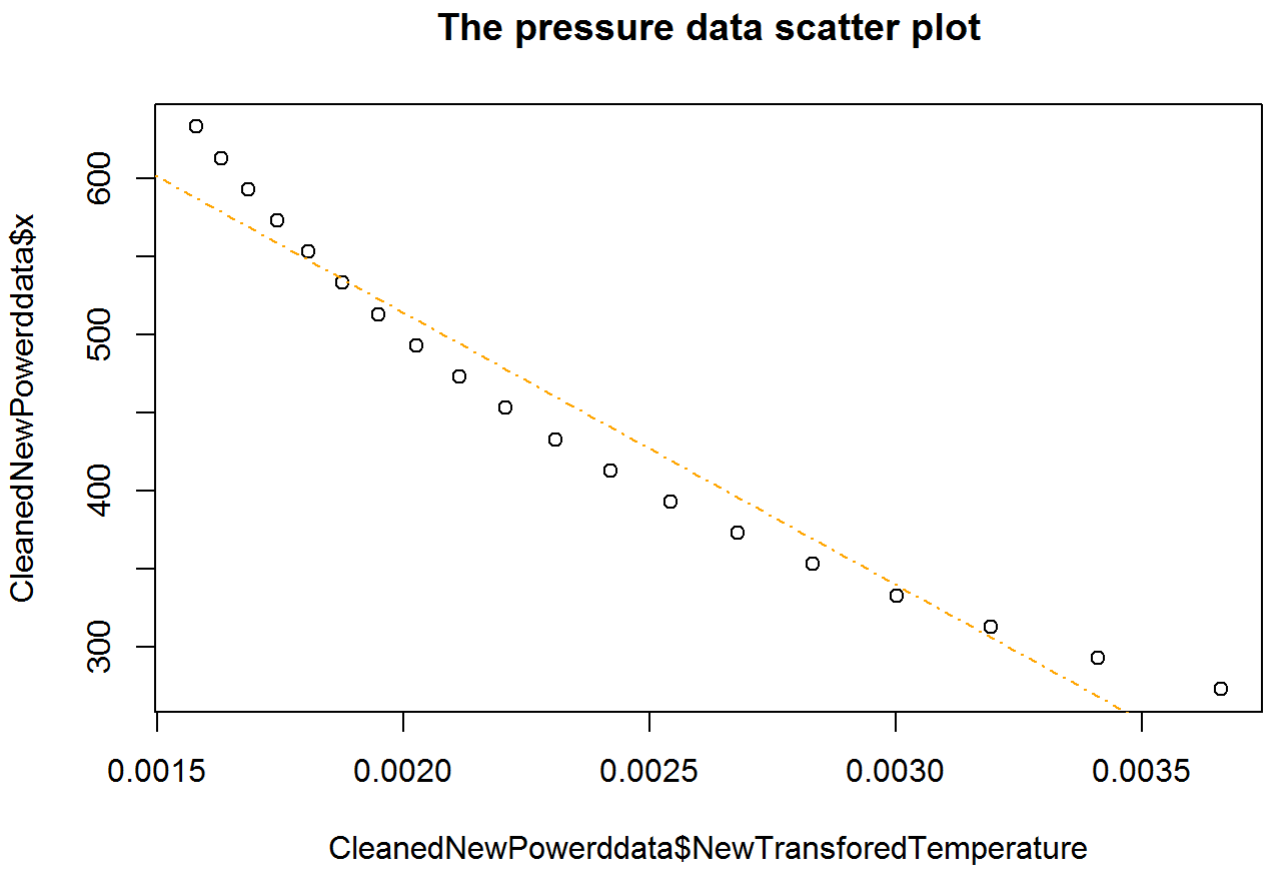

```
plot(CleanedNewPowerddata$x~CleanedNewPowerddata$NewTransforedTemperature, main = "The pressure data scatter plot" )
fit = lm(CleanedNewPowerddata$x~CleanedNewPowerddata$NewTransforedTemperature)
abline(fit, lty=4, col='orange')
```



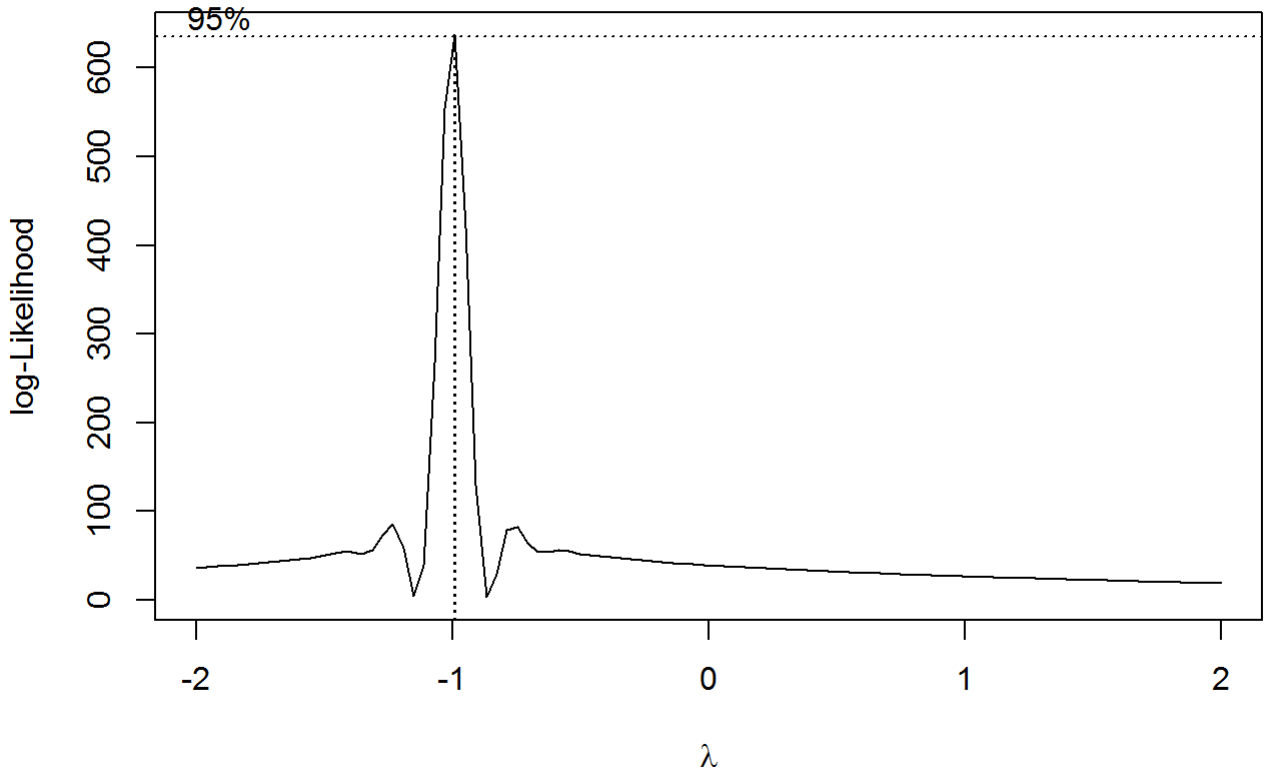

```
CorrelationValuforNewdata = cor(CleanedNewPowerddata,use = "everything", method = c("pearson"))
corlation= CorrelationValuforNewdata
corlation
```

```
##                                 x NewTransforedTemperature
## x                       1.0000000               -0.9742615
## NewTransforedTemperature -0.9742615                1.0000000
```

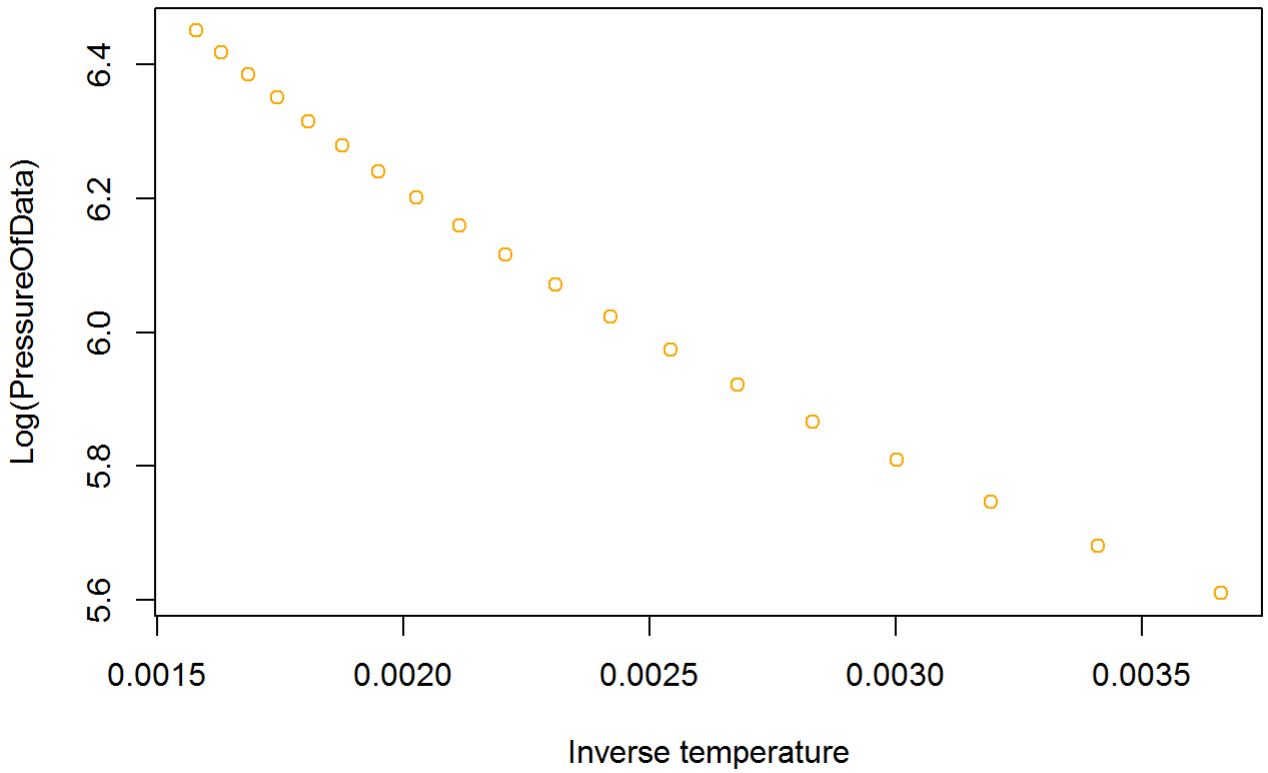
The correlation between x and y tells that a value of 0.97 , which says that we can use a power factor of 0.97. but these can be again done in the other way explained in the book. lower, upper and mid summariess, get p as a set of medians obtained for the summaries. usse tha p for the calculations.

Box Cox Tranformations

```
library(MASS)
boxcox(CleanedNewPowerddata$x~CleanedNewPowerddata$NewTransforedTemperature)
```




```
plot(log(CleanedNewPowerddata$x)~CleanedNewPowerddata$NewTransforedTemperature, ylab = "Log(PressureOfData)", xlab = "Invers
e temperature", col = "orange")
```




```
fit = lm(log(CleanedNewPowerddata$x)~CleanedNewPowerddata$NewTransforedTemperature)
print(fit)
```

```
##
## Call:
## lm(formula = log(CleanedNewPowerddata$x) ~ CleanedNewPowerddata$NewTransforedTemperature)
##
## Coefficients:
##                                     (Intercept)
##                                           7.047
## CleanedNewPowerddata$NewTransforedTemperature
##                                        -409.049
```