

Homework3.R

Chris

Sun Apr 24 00:11:55 2016

```
#####  
# Pharm 609 Homework 3  
# Yaowen Mei (20470193)  
#  
#####  
# Read a csv file  
library(stats4)  
library(MASS)  
library(pander)  
library(lattice)  
library(survival)  
library(Formula)  
library(ggplot2)  
library(Hmisc)
```

```
##  
## Attaching package: 'Hmisc'  
  
## The following objects are masked from 'package:base':  
##  
##   format.pval, round.POSIXt, trunc.POSIXt, units
```

```
library(corrplot)  
library(matrixStats)
```

```
## matrixStats v0.50.1 (2015-12-14) successfully loaded. See ?matrixStats for help.
```

```
library(varhandle)  
library(nlme)  
  
# improt the data  
data <- read.csv("CIPROFLOXACIN.csv")  
head(data)
```

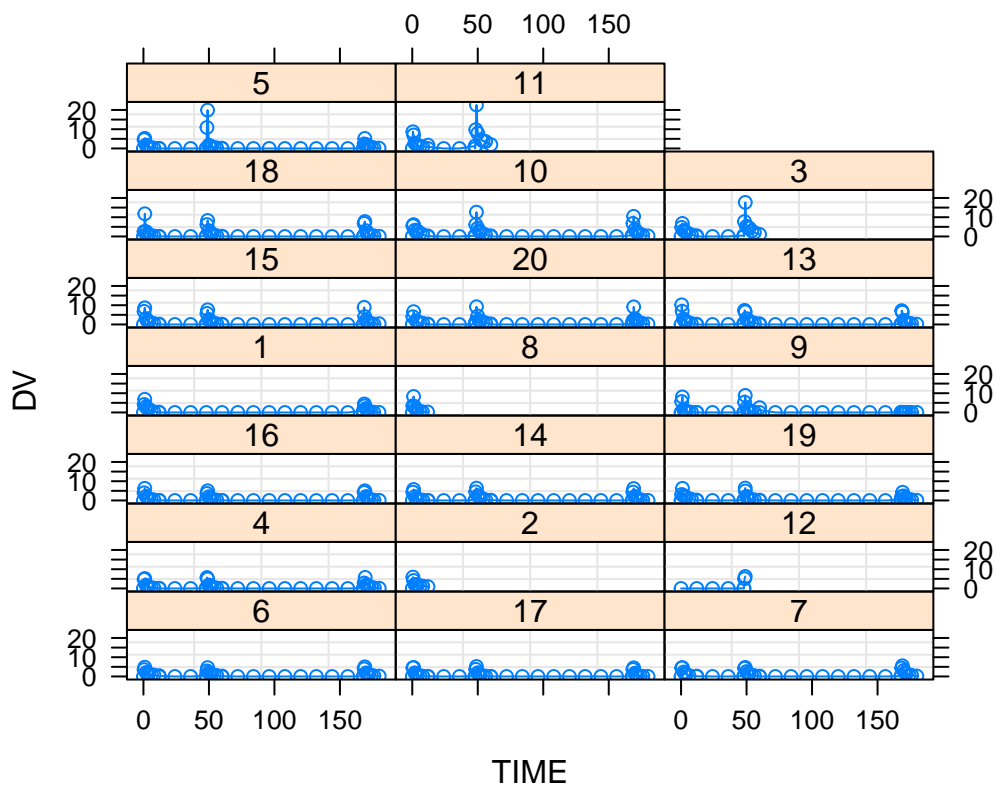
```
##   ID  TIME AMT   DV RATE  AGE  WT  GEND  
## 1  1 0.000  73 0.00   73 0.67 7.2    2  
## 2  1 0.583   0 4.16    0 0.67 7.2    2  
## 3  1 1.000   0 6.86    0 0.67 7.2    2  
## 4  1 1.849   0 2.96    0 0.67 7.2    2  
## 5  1 3.000   0 2.11    0 0.67 7.2    2  
## 6  1 3.917   0 1.77    0 0.67 7.2    2
```

```
data$GEND <- factor(data$GEND, levels=c(1,2),  
                    labels=c("male", "female"))
```

```
data <- groupedData(DV~TIME|ID,data = data)
data.sub = gsummary(data)
data.sub1 = gsummary(data, inv=T)
data.sub1
```

```
##   ID AGE  WT  GEND
## 6   6 0.32  4.2 female
## 17  17 1.25 14.3 female
## 7   7 0.27  4.8 female
## 4   4 0.67  9.3 female
## 2   2 0.42  8.9  male
## 12  12 1.25 11.0  male
## 16  16 1.75 12.0 female
## 14  14 1.55 11.3 female
## 19  19 1.54 11.1  male
## 1   1 0.67  7.2 female
## 8   8 0.38  7.2  male
## 9   9 0.99 12.1  male
## 15  15 4.54 23.2 female
## 20  20 1.27 13.7  male
## 13  13 1.00 10.7 female
## 18  18 1.23 13.1 female
## 10  10 0.33  6.2 female
## 3   3 0.33  5.4 female
## 5   5 0.36  6.9 female
## 11  11 4.75 19.5 female
```

```
plot(data)
```



```
sort(table(data$ID))
```

```
##  
## 12  2  8 11  3  1  7 20  6 17  4 16 14 19  9 15 13 18 10  5  
##  8  9  9 21 22 32 40 40 41 41 41 41 41 41 41 41 41 41 41
```

```
table(data$GEND)
```

```
##  
##   male female  
##   148    525
```

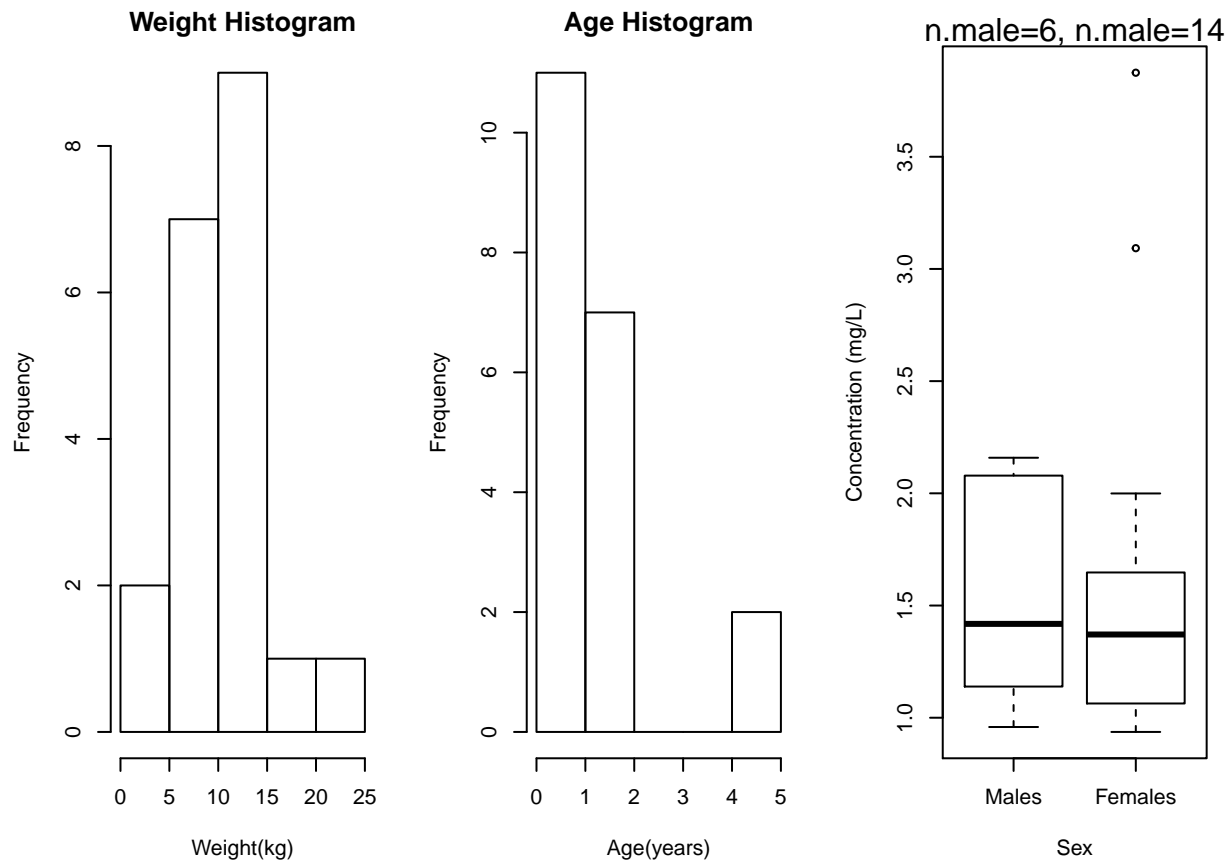
```
sapply(data.sub[,c("WT", "AGE")],summary)
```

```
##           WT    AGE  
## Min.      4.200 0.270  
## 1st Qu.    7.125 0.375  
## Median    10.850 0.995  
## Mean      10.600 1.244  
## 3rd Qu.   12.350 1.338  
## Max.      23.200 4.750
```

```
table(data.sub$GEND)
```

```
##  
##   male female  
##     6     14
```

```
#demographic characteristics  
par(mfrow=c(1,3))  
par(mar=c(4,4,2,2))  
hist(data.sub$WT, main='Weight Histogram', xlab='Weight(kg)')  
hist(data.sub$AGE,main='Age Histogram', xlab='Age(years)')  
boxplot(DV~GEND,xlab="Sex", ylab="Concentration (mg/L)", names=c("Males","Females"),data=data.sub)  
mtext("n.male=6, n.male=14",side=3)
```



```
# Print the corralation table:
dat <- subset(data.sub, select = -c(ID, GEND,RATE,AMT,DV, TIME))
cor_table = rcorr(as.matrix(dat),type= 'pearson')
plot(dat)
cor_table$r
```

```
##          AGE          WT
## AGE 1.0000000 0.9104811
## WT  0.9104811 1.0000000
```

```
cor_table$P
```

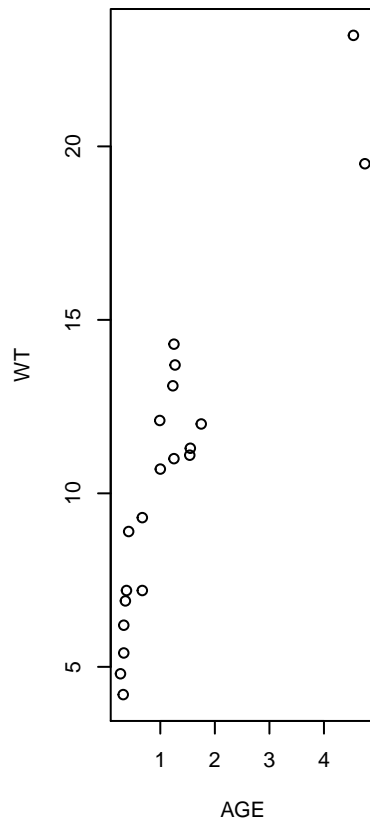
```
##          AGE          WT
## AGE          NA 2.524298e-08
## WT  2.524298e-08          NA
```

```
# plot for the bootstrap
bootdata <- read.csv("boot.csv")
head(bootdata)
```

```
##   ReturnCode    LL    tvV    tvCl    dVdWT    dClIdWT    dVdAGE
## 1           1 -450.355 24.8091 8.72806 1.423260 1.81456 -0.1535800
## 2           1 -472.525 23.1632 7.58819 1.213540 1.43932 -0.0996301
## 3           1 -420.495 23.4467 7.15389 1.419440 1.66849 -0.1529660
```

```
## 4      1 -327.624 18.6735 6.52101 0.838361 1.27774 -0.0570463
## 5      1 -408.703 24.3058 7.95834 1.385730 1.72108 -0.1322110
## 6      1 -400.201 23.5001 7.71053 0.918194 1.23970 -0.1206900
##      dCldAGE      CEps      Ke      Tinf      AUC      Coef      Cmax      AUMCIV
## 1 -0.197805 0.691671 0.351810 0.916600 4.81206 5.24990 1.44709 13.6780
## 2 -0.124443 0.694923 0.327597 1.000000 8.30237 8.30237 2.31924 25.3432
## 3 -0.212734 0.644216 0.305113 0.833301 14.81710 17.78120 3.99194 48.5628
## 4 -0.186311 0.491031 0.349211 1.000000 11.19460 11.19460 3.29967 32.0568
## 5 -0.215110 0.676670 0.327426 1.000000 7.41361 7.41361 2.07005 22.6421
## 6 -0.202107 0.686439 0.328107 1.000000 9.46757 9.46757 2.64821 28.8552
##      AUMC      MRT      VSS      Ke_hl      omega.nV.nV.      omega.nCl.nV.
## 1 15.8834 2.84245 24.8091 1.97023 0.1233520 0.1111970
## 2 29.4944 3.05253 23.1632 2.11585 0.1268120 0.1167310
## 3 54.7363 3.27748 23.4467 2.27177 0.1367260 0.1333020
## 4 37.6541 2.86360 18.6735 1.98489 0.0176431 0.0249385
## 5 26.3489 3.05413 24.3058 2.11696 0.1053710 0.0922766
## 6 33.5890 3.04779 23.5001 2.11257 0.1043380 0.0912464
##      omega.nCl.nCl.
## 1 0.1060920
## 2 0.1120940
## 3 0.1321230
## 4 0.0389497
## 5 0.0855728
## 6 0.0889882
```

```
par(mfrow=c(1,7))
```



```

par(mar=c(4,4,2,2))

hist(bootdata$tvV)
hist(bootdata$tvCl)
hist(bootdata$dVdWT)
hist(bootdata$dClIdWT)
hist(bootdata$dVdAGE)
hist(bootdata$dClIdAGE)
hist(bootdata$CEps)

```

ogram of bootogram of bootgram of bootdaram of bootdaram of bootdatam of bootdatgram of bootd

