Parametric Bootstrap

Progyan Sarkar

November 2022

Whenever we are testing a hypothesis in a linear mixed effects model,a safe bet is to use parametric bootstrap.We can generate new data from a fitted linear mixed effects model as follows:

```
    dat=read.table('data.txt',head=T)
dat1=with(dat,data.frame(amt=c(HPLC,NIR),method=c(rep("HPLC",10),rep("NIR",10)),tab=rep(1:10,2)))
library(nlme)
fit=lme(amt~method,dat1,random~1|tab)
mu=fixef(fit)[1]
alpha=c(0,fixef[2])
sigma.e=fit$sigma
sigma.b=0.2988868
eps=matrix(rnorm(20,mean=0,sd=sigma.e),2,10)
b=rnorm(10,mean=0,sd=sigma.b)
tmp=matrix(0,2,10)
for(i in 1:2){
  for(j in 1:10){
    tmp[i,j]=mu+alpha[i]+b[j]+eps[i,j]
```

```
  }
}
amt=c(tmp[1,],tmp[2,])
newDat=data.frame(amt,dat1[,-1])
newDat
```

The data set newDat contains the fresh data generated from our parametric bootstrap.