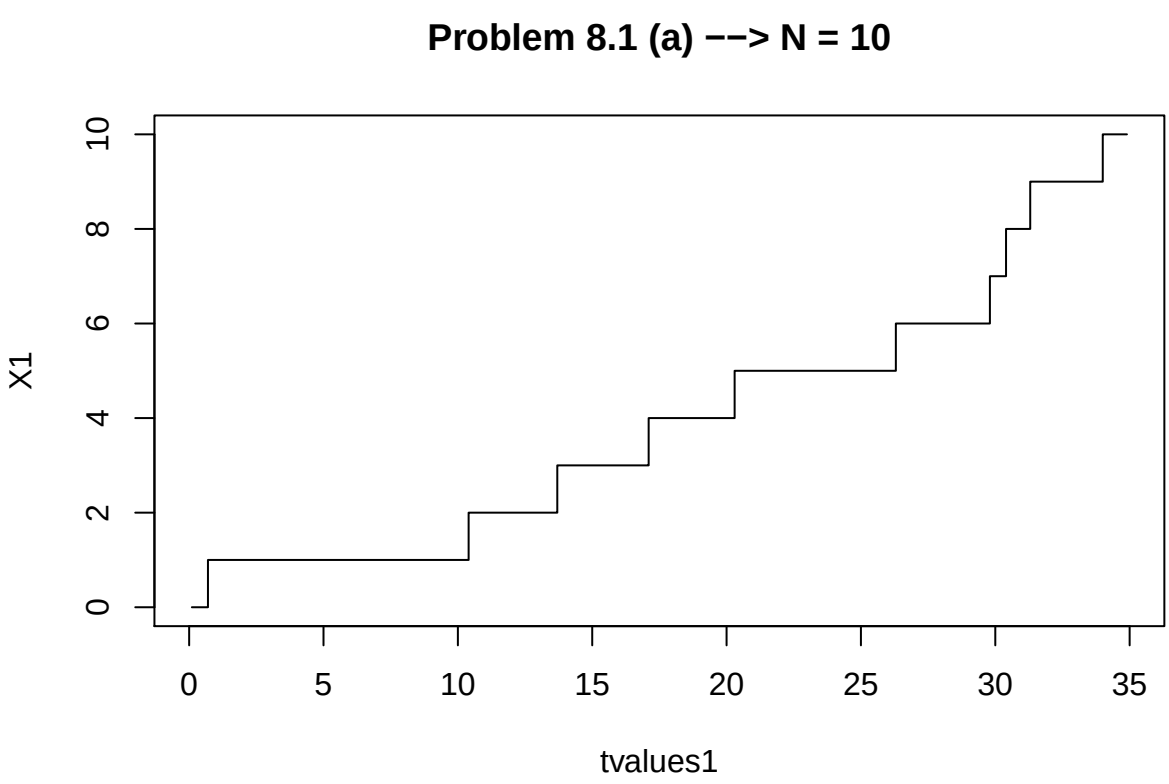
Oblig 5

Sigbjørn Fjelland

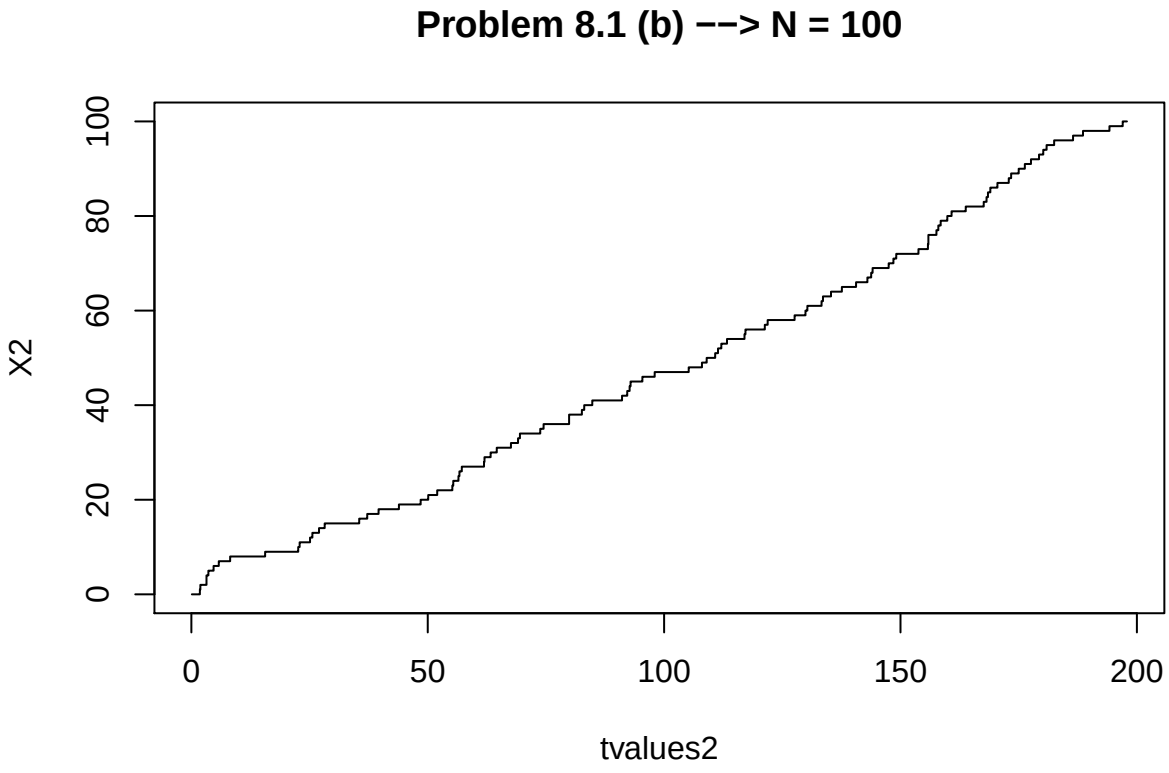
10/29/2020

Problem 8.1

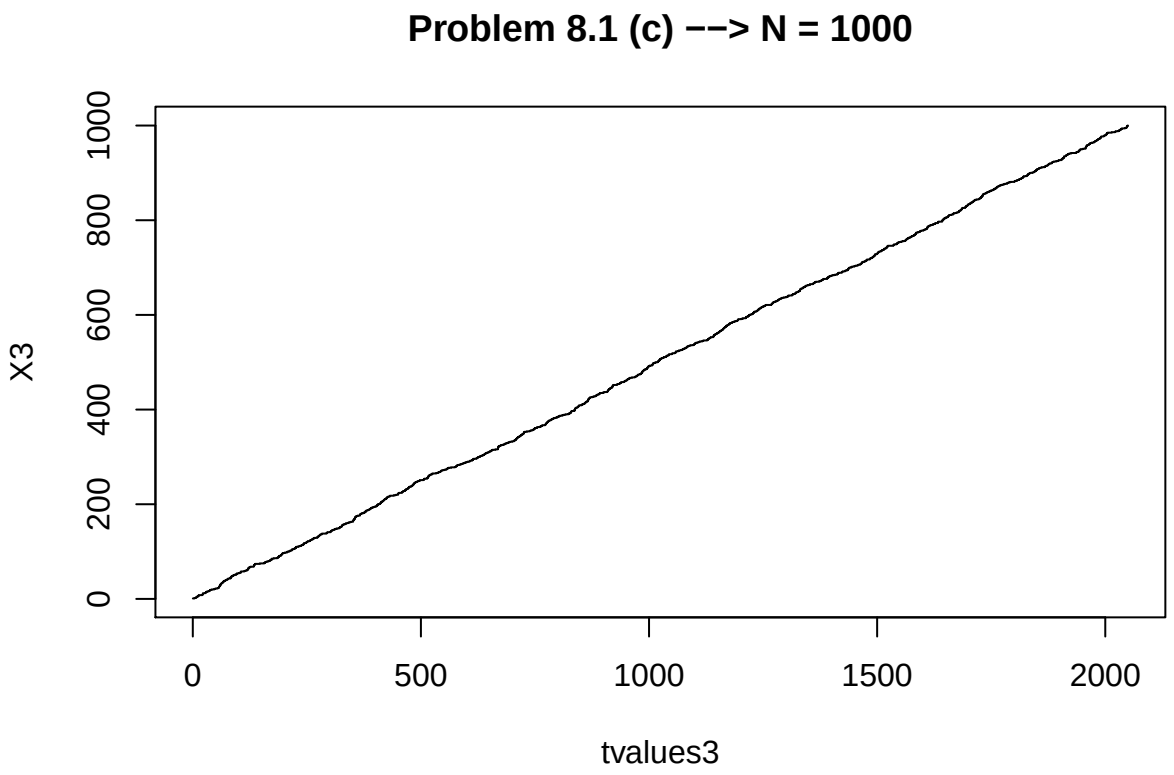
```
lb<-0.5
delta<-0.1
N<-c(10, 100, 1000)

T1<-rexp(N[1],lb)
S1<-rep(0,N[1])
S1[1]<-T1[1]

for(k in 2:N[1]) S1[k]<- S1[k-1] + T1[k]

tmax1<- S1[N[1]]+ 0.5/lb
tvalues1<-seq(delta, tmax1,delta)
ntvalues1<- length(tvalues1)
X1<-rep(0, ntvalues1)
for(t in 1: ntvalues1) X1[t]<- length( which( S1<=tvalues1[t] ))
plot(tvalues1, X1, type="s", main = 'Problem 8.1 (a) --> N = 10')
```


Problem 8.1 (a) −−> N = 10
X1
0
2
4
6
8
10
0
5
10
15
20
25
30
35
tvalues1

```r
T2<-rexp(N[2],lb)
S2<-rep(0,N[2])
S2[1]<-T2[1]

for(k in 2:N[2]) S2[k]<- S2[k-1] + T2[k]

tmax2 <- S2[N[2]]+ 0.5/lb
tvalues2<-seq(delta, tmax2, delta)
ntvalues2<- length(tvalues2)
X2<-rep(0, ntvalues2)
for(t in 1: ntvalues2) X2[t]<- length( which( S2<=tvalues2[t] ))

plot(tvalues2, X2, type="s", main = 'Problem 8.1 (b) --> N = 100')
```

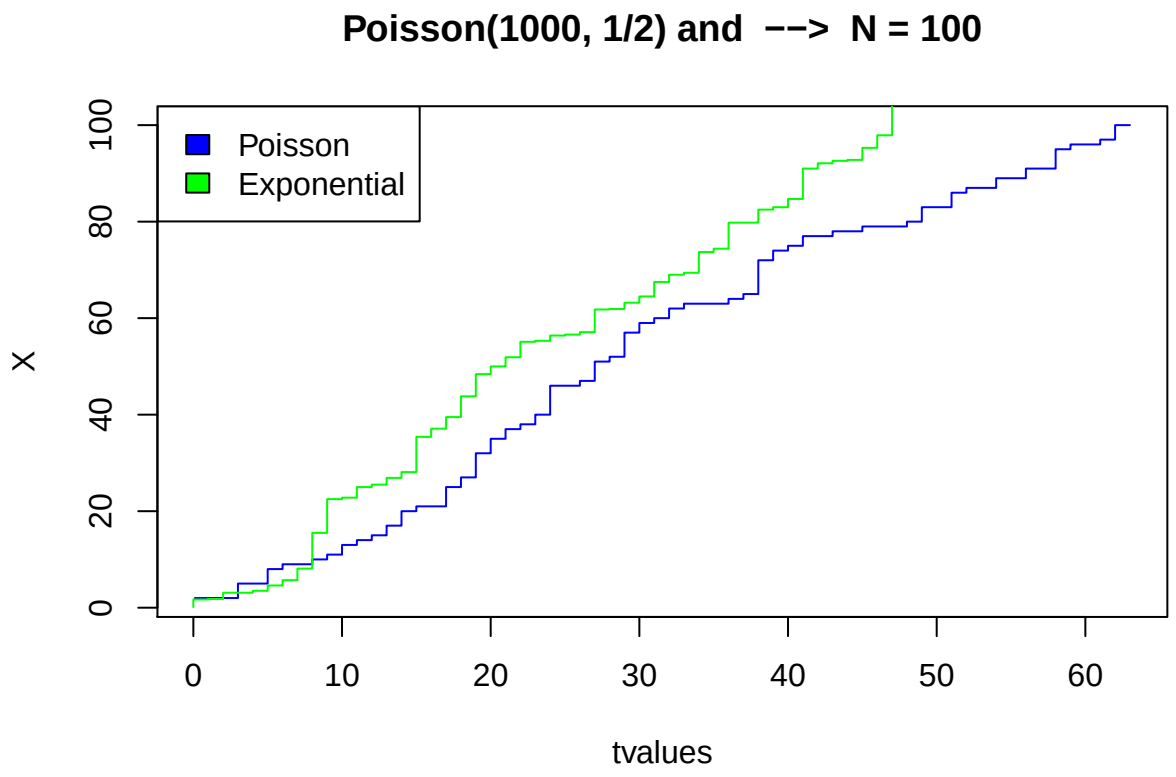


```r
T3<-rexp(N[3],lb)
S3<-rep(0,N[3])
S3[1]<-T3[1]

for(k in 2:N[3]) S3[k]<- S3[k-1] + T3[k]

tmax3 <- S3[N[3]]+ 0.5/lb
tvalues3<-seq(delta, tmax3,delta)
ntvalues3<- length(tvalues3)
X3 <-rep(0, ntvalues3)
for(t in 1: ntvalues3) X3[t]<- length( which( S3<=tvalues3[t] ))
plot(tvalues3, X3, type="s", main = 'Problem 8.1 (c) --> N = 1000')
```



d)

```
POI<-rpois(n=1000 ,lambda=lb)
S <-rep(0,N[2])
S[1]<-POI[1]
for(k in 2:N[2]) S[k]<- S[k-1] + POI[k]

tmax<- S[N[2]]+ 0.5/lb
tvalues<-seq(delta, tmax,delta)
ntvalues<- length(tvalues)
X<-rep(0, ntvalues)
for(t in 1: ntvalues) X[t]<- length( which( S<=tvalues[t] ))
plot(tvalues, X, type="s",col= 'blue', main = 'Poisson(1000, 1/2) and  -->  N = 100')
lines(y=tvalues2, X2, type="s", col= 'green')

legend("topleft",
c("Poisson","Exponential"),
fill=c("blue","green")
)
```



Problem 8.2