

# Tarea 10

Simulación estocástica, 12 de abril de 2018

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Generar un proceso *Poisson* (150) con intensidad  $\theta = 6.34$  en  $(0, 2.01)$  y graficar. *Hint:*

1.  $t_0 = 0, n = 1$
2.  $u \sim U(u|0,1)$  y  $t_n = t_{n-1} - \frac{1}{\theta} \log u$
3.  $t_n > t$  para y  $n = n - 1$ , si no, regresamos.

```
genX <- function(obs = 150){
  tf <- 20; theta <- 0.7; t0 <- 0; n <- 1; N <- list(); t <- list()
  N[1] <- 0; t[1] <- t0
  obs <- 2
  repeat{
    repeat{
      u <- runif(n = 1,min = 0,max = 1)
      tn <- t0 - (1/theta) * log(u)
      if(tn > tf){
        N[obs] <- n-1
        t[obs] <- tn
        t0 <- tn
        break
      } else {
        obs <- obs + 1
        t0 <- tn;
        N[obs] <- n
        t[obs] <- tn
        n <- n + 1
      }
    }
    obs <- obs + 1
    if(obs == 151) break
  }
  data.frame(t = unlist(t), N = unlist(N))
}
#Generar 150 Xi's
set.seed(1234)
Xs <- genX()
#Algunos valores
head(Xs,20)
```

```
##           t  N
## 1  0.000000  0
## 2  3.105946  1
## 3  3.783565  2
## 4  4.491403  3
## 5  5.166545  4
## 6  5.380487  5
## 7  6.017347  6
## 8 12.670076  7
## 9 14.753858  8
```

```
## 10 15.334344 9
## 11 16.284406 10
## 12 16.807081 11
## 13 17.674246 12
## 14 19.478889 13
## 15 21.349713 14
## 16 21.603396 14
## 17 23.390515 14
## 18 25.277912 14
## 19 27.675241 14
## 20 29.761019 14
```

```
#Graficar
par(mfrow = c(1, 2))
plot(Xs,pch=16,xlab = "t",ylab = "N(t)");plot(Xs[1:25,],pch=16,xlab = "t",ylab = "N(t)")
```

