

lista_6

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PPGI/UFRJ // Análise de Risco // Prof. Eber
 Lista 06 // Data: 17/07/2018 // Entrega: 24/07/2018
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Uma empresa de projetos está fazendo um estudo de previsão dos negócios para o primeiro semestre do próximo ano. Quase todos os negócios, à exceção de dois contratos tem uma chance de serem fechados. Além disto, sua data de início e faturamento total são dados por uma estimativa.

Após uma reunião com a equipe do departamento comercial, foram identificados 8 projetos cujas características estão mostradas nas tabelas 1 e 2. A partir destes dados, construa um modelo de risco do negócio da empresa de projetos, que mostra o risco da contribuição líquida mensal para o para os primeiros meses do próximo ano.

Contrato	chance	Início			duracao		
		min	prov	max	min	prov	max
A	1	1	1	1	2	3	5
B	1	1	1	1	6	7	9
C	0.3	2	3	5	4	4	5
D	0.4	1.5	2	3	2	2.5	3.5
E	0.2	2	2	4	3	3	5
F	0.4	2	3	6	2	2	3
G	0.4	1	2	3.5	2	3	5
H	0.5	2.5	3	5	3	3.5	4.5

Tabela 1 - Estimativa de início e duração dos contratos

Contrato	faturamento			margem		
	min	prov	max	min	prov	max
A	400	425	525	0.14	0.18	0.21
B	375	480	550	0.17	0.22	0.26
C	525	600	780	0.14	0.18	0.21
D	625	700	800	0.14	0.18	0.21
E	250	300	370	0.17	0.22	0.26
F	425	475	550	0.14	0.18	0.21
G	480	500	550	0.17	0.22	0.26
H	550	600	700	0.17	0.22	0.26

Tabela 2 - Estimativas faturamento e margem dos contratos

```
In [3]: set.seed(1)
        library(triangle)
```

Warning message:

"package 'triangle' was built under R version 3.3.3"

```
In [4]: d <- function(){
  list(c(rbinom(1,1,1),rtriangle(1,1,1,1),rtriangle(1,2,5,3),
        rtriangle(1,400,525,425), rtriangle(1,.14,.21,.18)),
        c(rbinom(1,1,1),rtriangle(1,1,1,1),rtriangle(1,6,9,7),
        rtriangle(1,375,550,480), rtriangle(1,.17,.26,.22)),
        c(rbinom(1,1,.3),rtriangle(1,2,5,3),rtriangle(1,4,5,4),
        rtriangle(1,525,780,600), rtriangle(1,.14,.21,.18)),
        c(rbinom(1,1,.4),rtriangle(1,1.5,3,2),rtriangle(1,2,3.5,2.5),
        rtriangle(1,625,800,700), rtriangle(1,.14,.21,.18)),
        c(rbinom(1,1,.2),rtriangle(1,2,4,2),rtriangle(1,3,5,3),
        rtriangle(1,250,370,300), rtriangle(1,.17,.26,.22)),
        c(rbinom(1,1,.4),rtriangle(1,2,6,3),rtriangle(1,2,3,2),
        rtriangle(1,425,550,475), rtriangle(1,.14,.21,.18)),
        c(rbinom(1,1,.4),rtriangle(1,1,3.5,2),rtriangle(1,2,5,3),
        rtriangle(1,480,550,500), rtriangle(1,.17,.26,.22)),
        c(rbinom(1,1,.5),rtriangle(1,2.5,5,3),rtriangle(1,3,4.5,3.5),
        rtriangle(1,550,700,600), rtriangle(1,.17,.26,.22)))
}
d()
```

1. (a) 1 (b) 1 (c) 3.05905780555441 (d) 451.929260588788 (e) 0.196116065362767
2. (a) 1 (b) 1 (c) 8.21919151503469 (d) 523.966791216132 (e) 0.225055358822169
3. (a) 0 (b) 2.4305331710829 (c) 4.10891895705233 (d) 583.108931259463 (e) 0.184363073077714
4. (a) 0 (b) 2.41243054027446 (c) 2.63198436830195 (d) 729.702943835658 (e) 0.205877233834428
5. (a) 0 (b) 3.05648576337142 (c) 4.48894317774208 (d) 285.67709528109 (e) 0.22458849844908
6. (a) 0 (b) 3.03464134120852 (c) 2.21649128437759 (d) 434.148201038625 (e) 0.172721342878862
7. (a) 1 (b) 1.92242749943787 (c) 3.23718426737966 (d) 512.563124983351 (e) 0.217126806402725
8. (a) 0 (b) 4.0709502666891 (c) 3.79480506757957 (d) 644.44460342053 (e) 0.192039653275298

```
In [5]: distribui <- function(inicio,duracao,valor){
  fim <- inicio + duracao -1
  mensal <- valor / duracao
  parcela <- rep(0,12)
  for(mes in 1:12){
    if(floor(inicio) == mes){
      parcela[[mes]] <- round((mes-inicio+1)*mensal,2)
    }
  }
}
```

```

    }

    if(floor(fim) + 1 == mes){
      parcela[[mes]] <- round((fim-mes+1)*mensal,2)
    }

    if((floor(inicio) + 1 <= mes) & (floor(fim) >= mes)){
      parcela[[mes]] <- round(mensal,2)
    }
  }
  parcela
}
distribui(2,2,4)

```

1.0 2.2 3.2 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0

```

In [6]: simula <- function(){
  dados <- d()
  fatura <- rep(0,12)
  n <- length(dados)
  resultado <- c()
  for(i in 1:n){

    fatura <- fatura +(distribui(dados[[i]][2], dados[[i]][3],
                                dados[[i]][1] * dados[[i]][4] *
                                dados[[i]][5]))

  }
  fatura
}
simula()

```

1. 42.94 2. 81.77 3. 119.12 4. 81.89 5. 56.93 6. 44.04 7. 14.96 8. 5.42 9. 0 10. 0 11. 0 12. 0

```

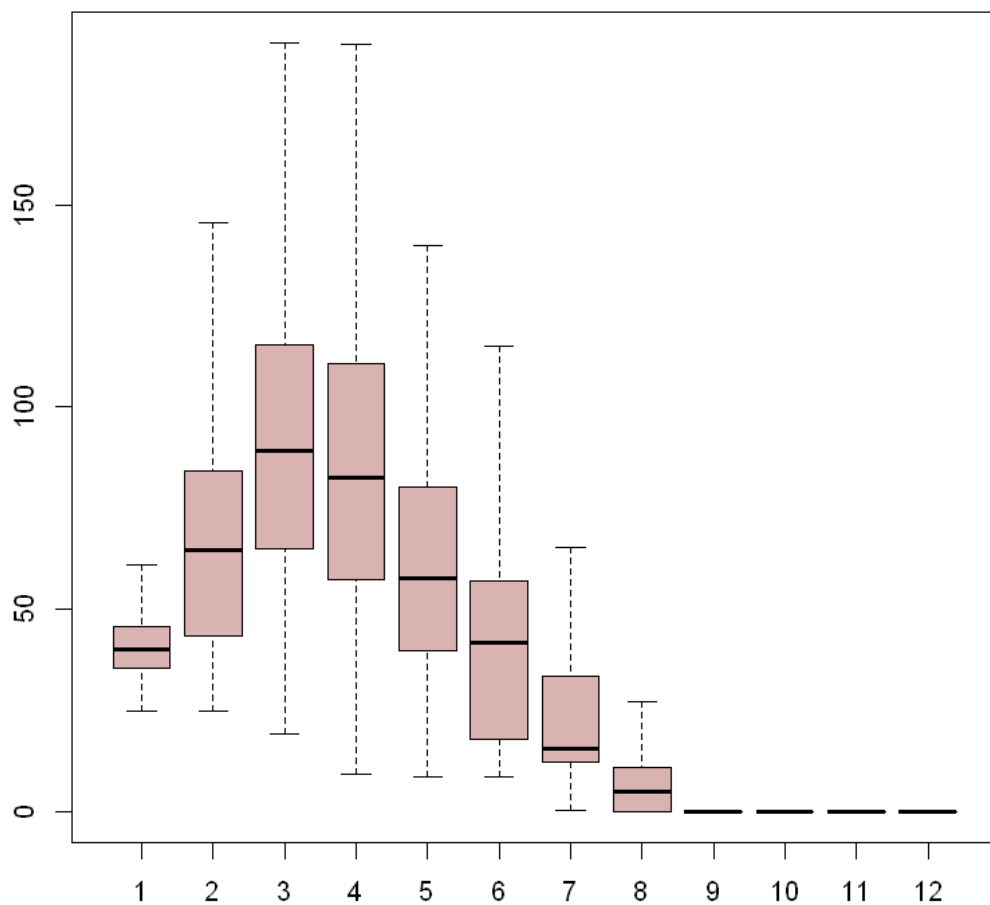
In [7]: n <- c()
  for(j in 1:3000){
    n <- rbind(n,c(simula()))
  }

```

```

In [12]: boxplot(n, outline = F, col=rgb(.5,0,0,.3))

```



```
In [16]: for( i in 1:12){
          print(c(i, mean(n[,i]), sd(n[,i])^2))
        }
        for( i in 1:12){
          hist(n[,i], main=i,xlim=c(0,250), freq=F,breaks=seq(0,250,10))
        }
```

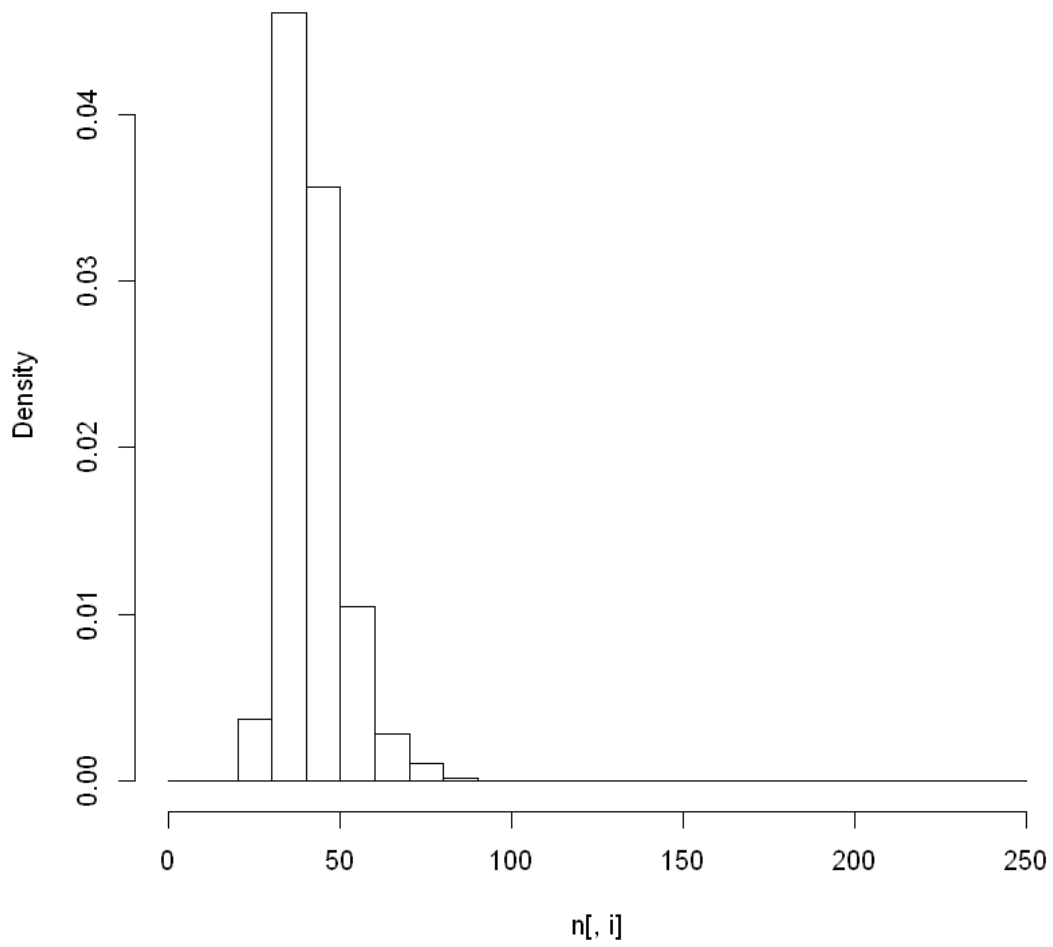
```
[1] 1.00000 41.64291 76.82464
[1] 2.00000 66.68516 672.57061
[1] 3.00000 91.36161 1334.49884
[1] 4.00000 85.22721 1387.26256
[1] 5.00000 60.48399 884.54260
[1] 6.00000 42.44126 551.40933
```

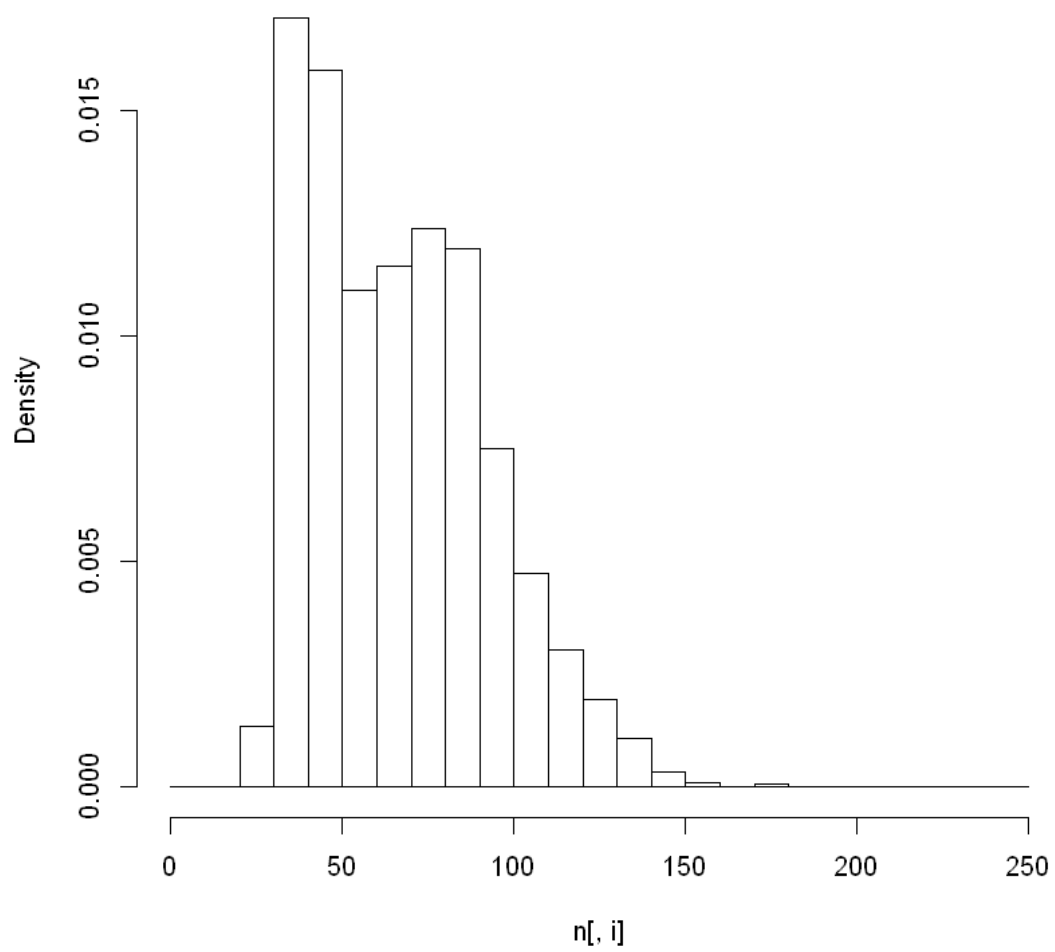
```

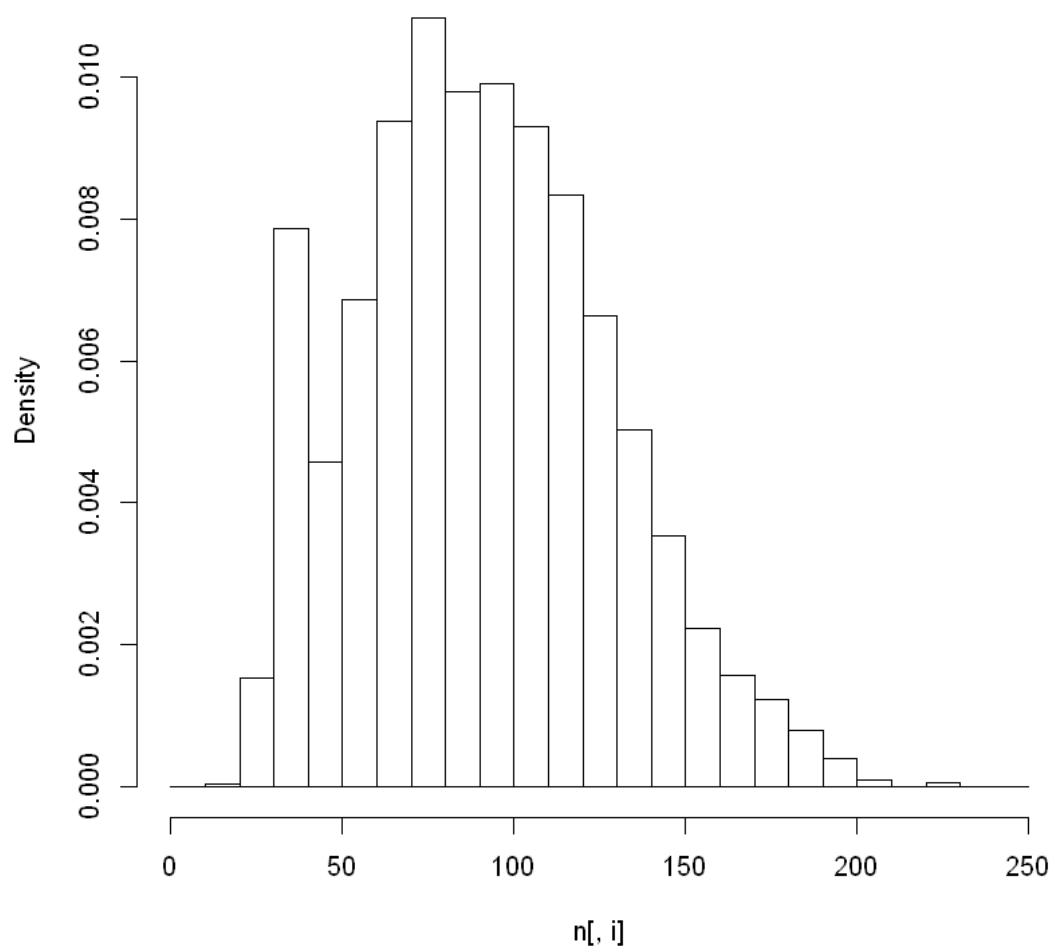
[1] 7.00000 23.29301 230.64731
[1] 8.000000 6.490737 50.062296
[1] 9.0000000 0.6676167 3.5622482
[1] 10 0 0
[1] 11 0 0
[1] 12 0 0

```

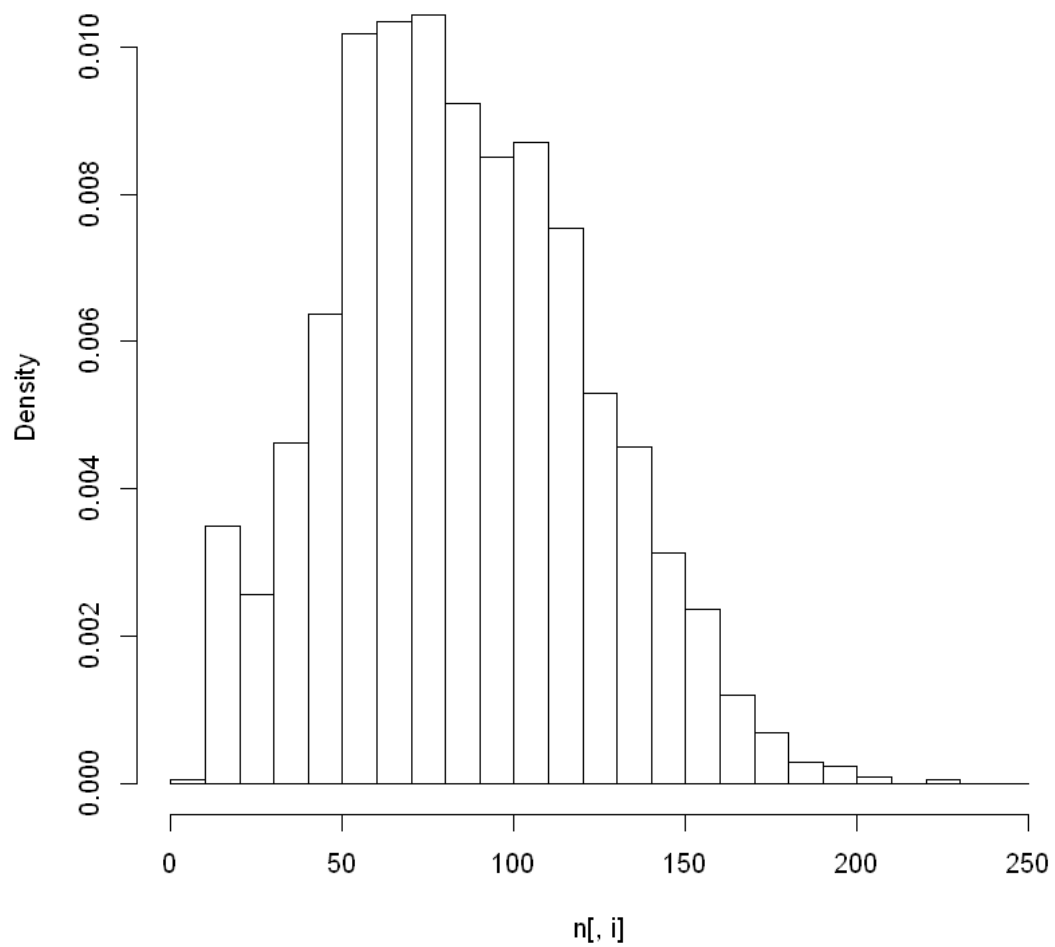
1

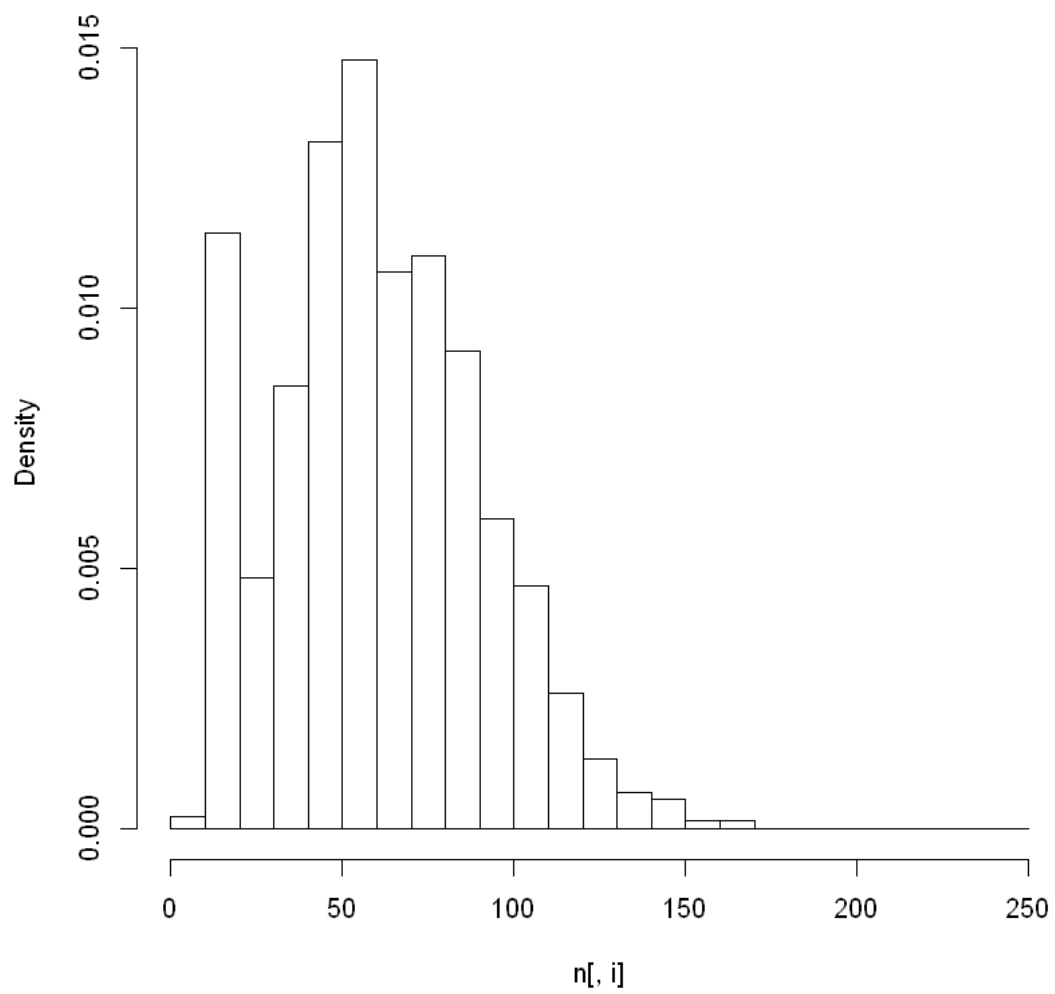


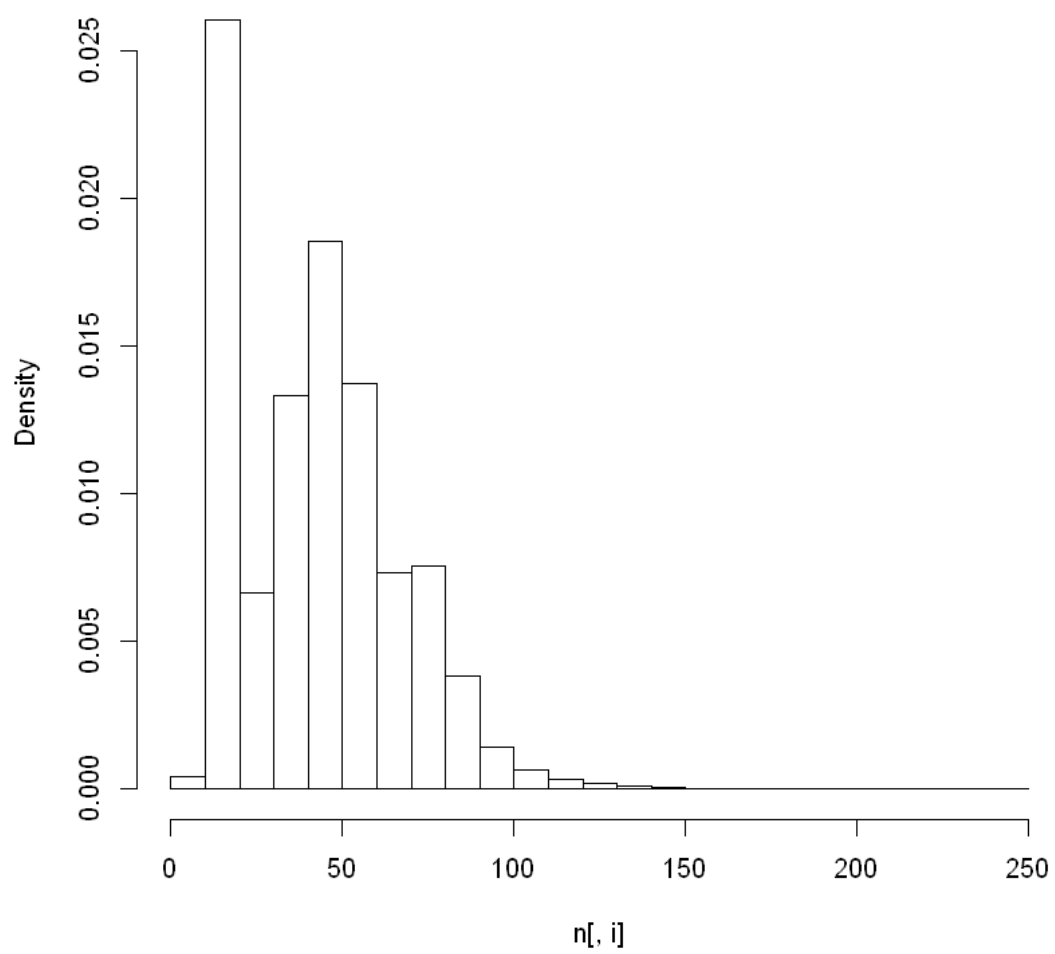


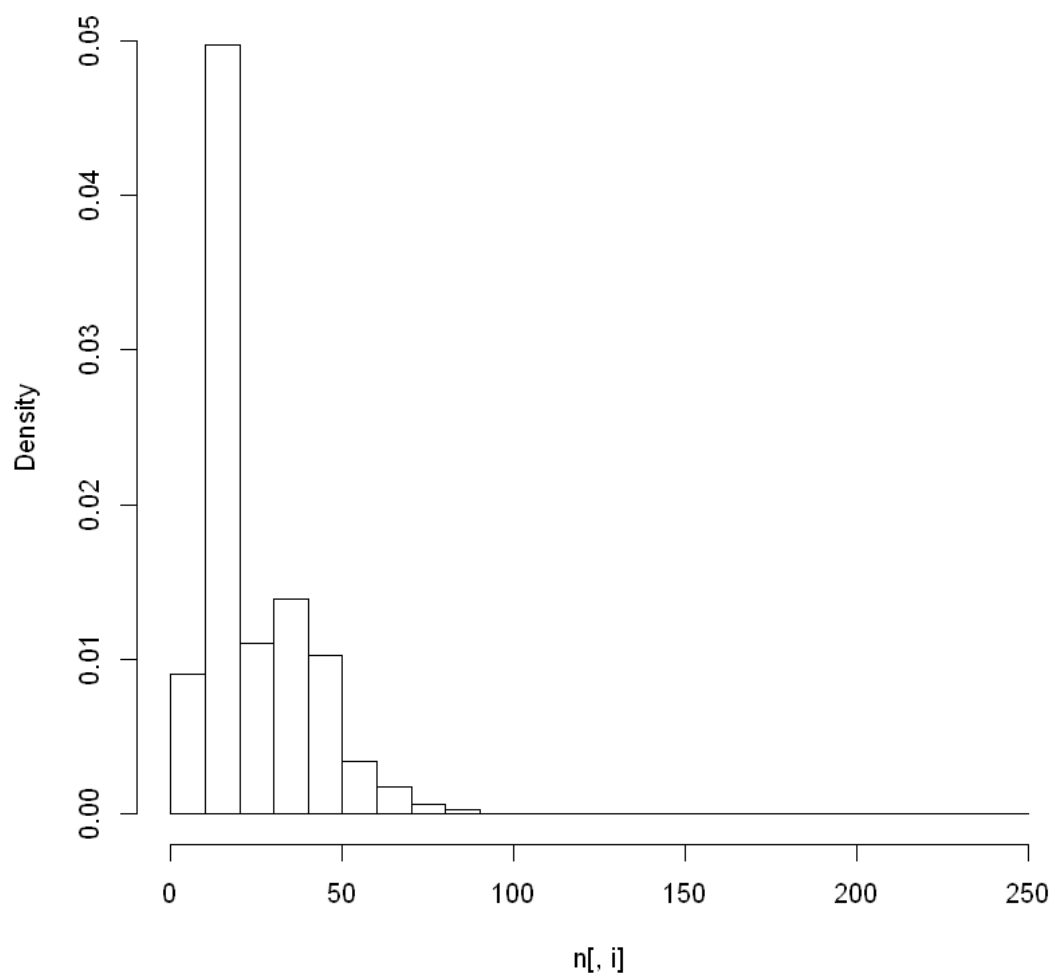


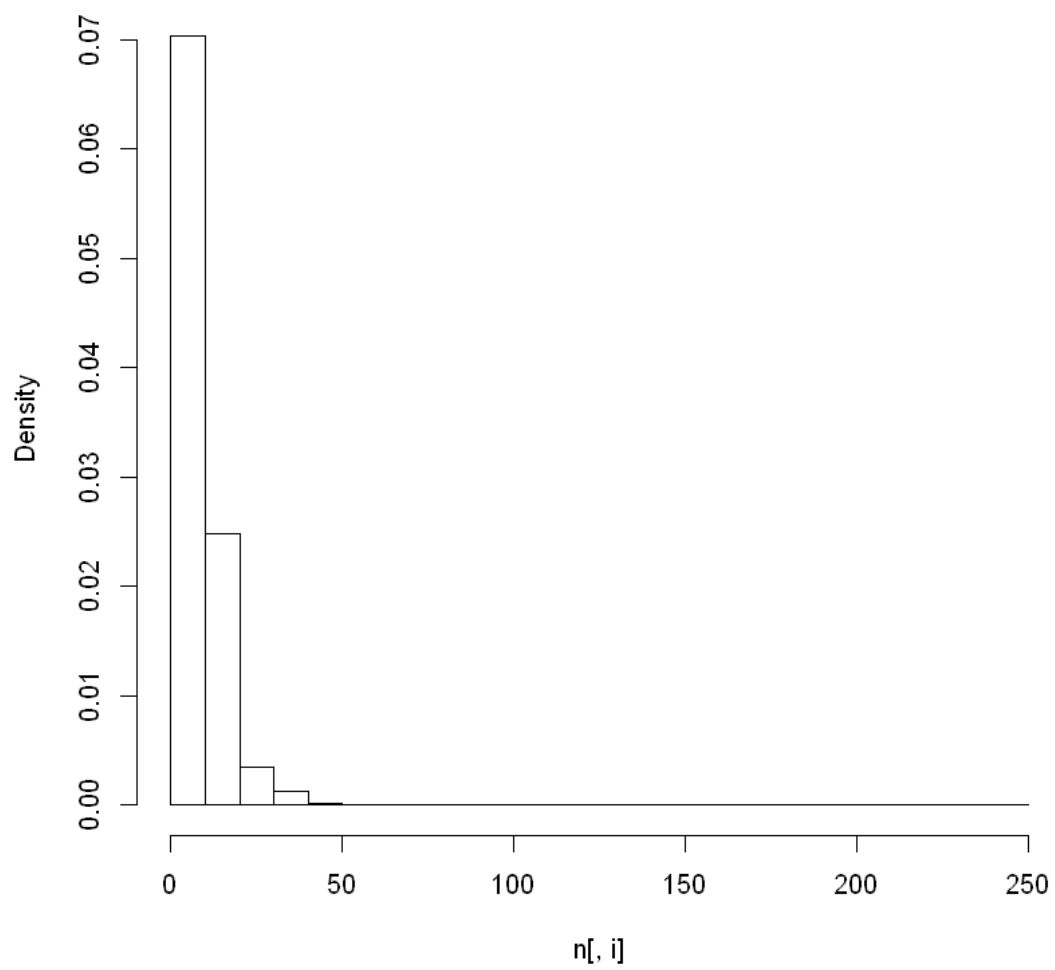
4

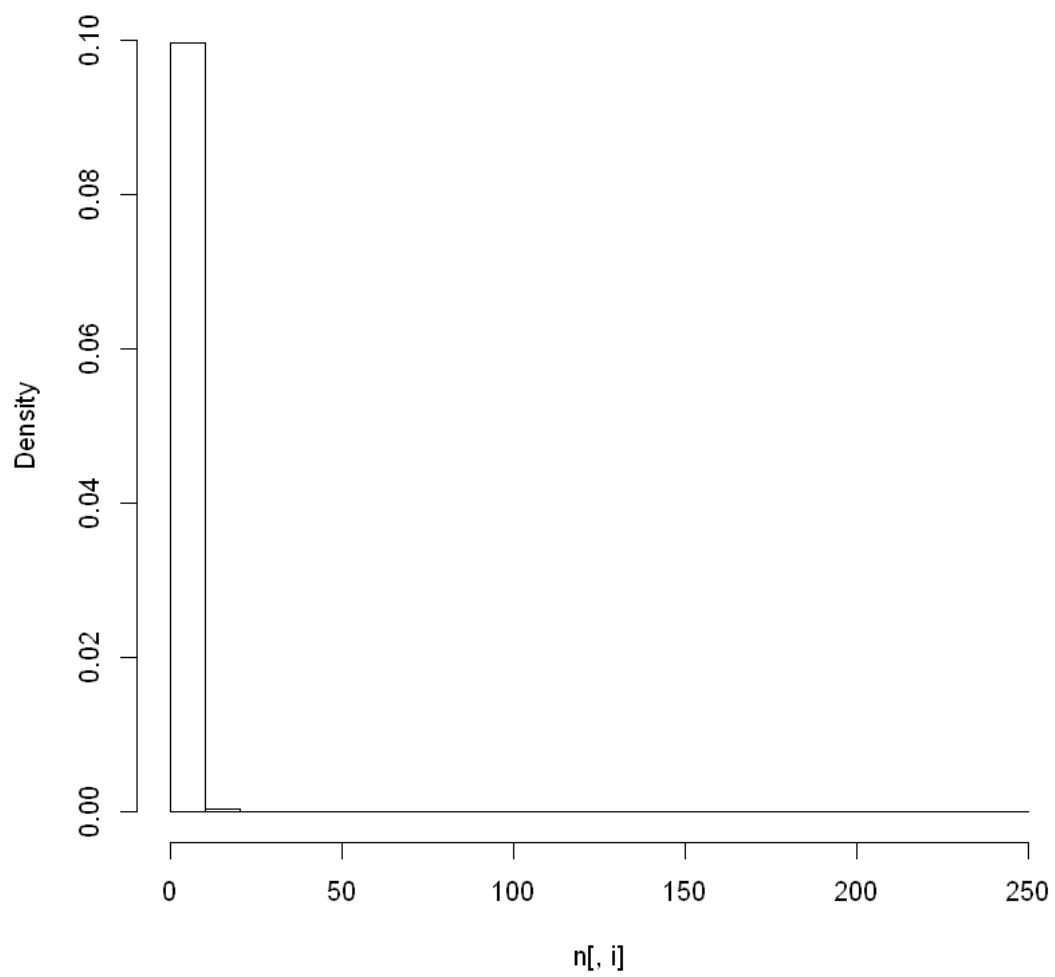


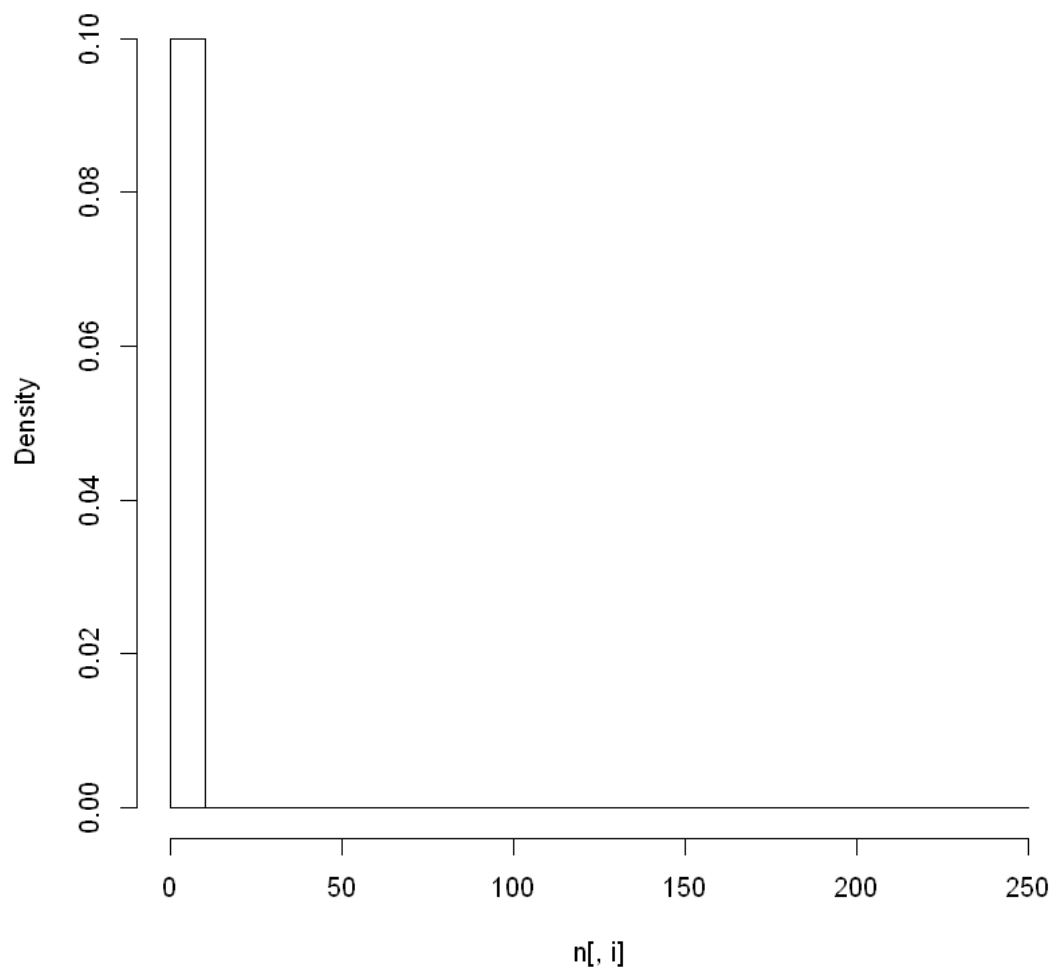


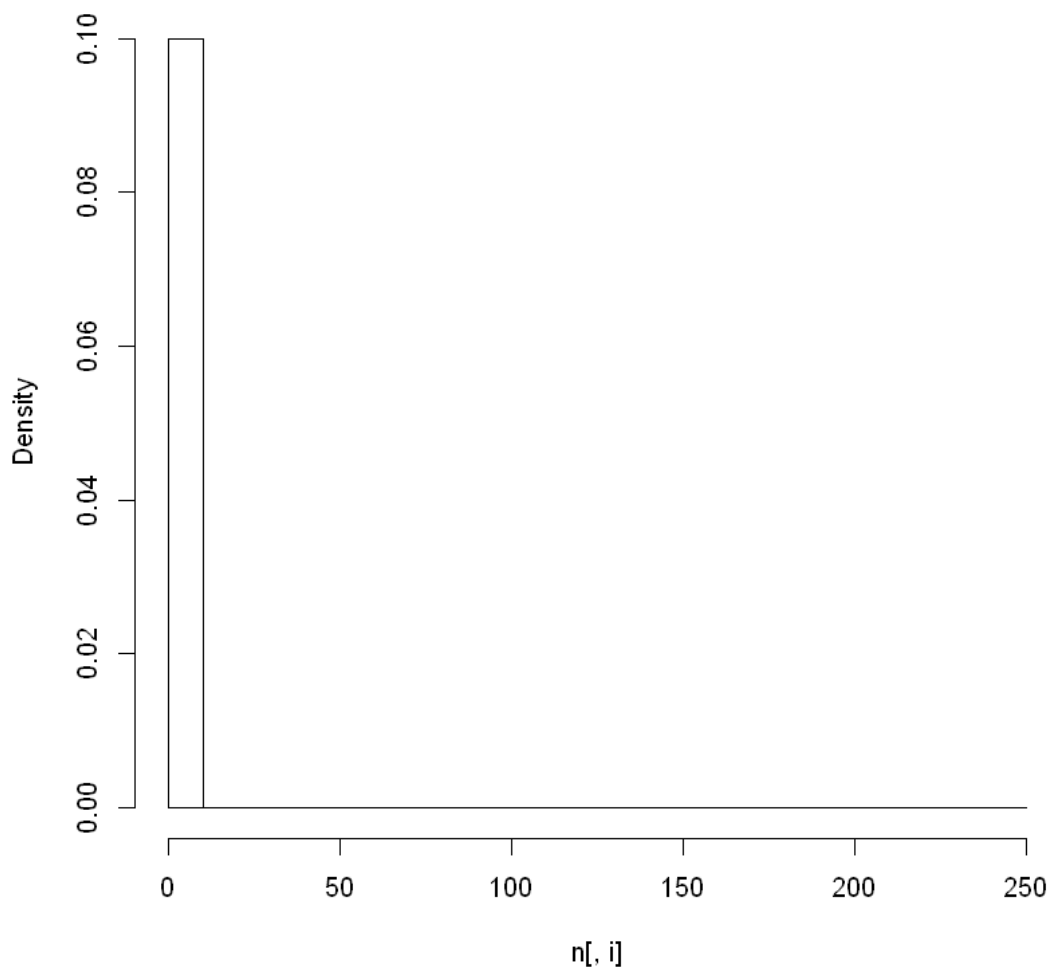




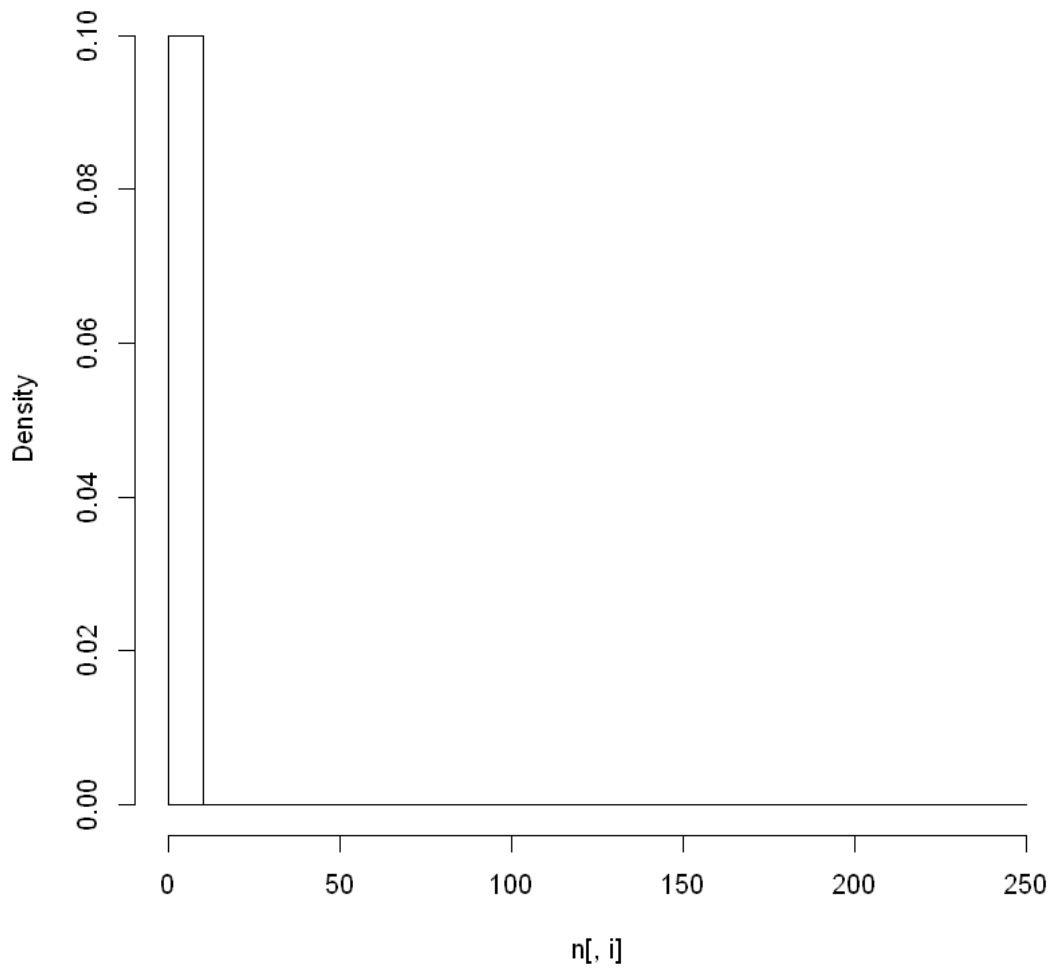








12



```
In [17]: plot(ecdf(n[,1]), col="black")
         for(i in 2:12){
           lines(ecdf(n[,i]), col=rgb(i/12,0,0,.3))
         }
```