PRÁCTICO Nº 5: DISTRIBUCIONES MUESTRALES Y ESTADÍSTICA DESCRIPTIVA

Ejercicio N°1

$P(\overline{X} < 140) = 0{,}0286$

Ejercicio N°2

a y b) $\overline{X} \rightarrow$ Normal ($\mu = 165$, $\sigma = 8/\sqrt{36}$) por el TLC

c) $P(\overline{X} > 167) = 0{,}0668$

d) $P(162 < \overline{X} < 170) = 0{,}9877$

e) $P(\overline{X} < q) = 0{,}90$ $\quad q=P_{90}=166{,}71$

Ejercicio N°3

a) $\overline{X} \rightarrow$ Normal ($\mu = 3100$, $\sigma = 150/\sqrt{n}$)

b) $P(\overline{X} > 3130) = 0{,}0228$

c) $P(|\overline{X} - 3100| < 10) = 0{,}4950$

d) $P(S^2 > 10000) = 0{,}9963$

Ejercicio N°4

a) $E(\overline{X}) = \mu = 1{,}3$

b) $DE(\overline{X}) = S = \sigma/\sqrt{n} = 0{,}0354$

c) $\overline{X} \rightarrow$ Normal por el TLC

d) $P(\overline{X} > 1{,}4) = 0{,}0023$

e) $P(1 < \overline{X} < 1{,}6) = 1$

Ejercicio N°5

a) Normal

b) $\overline{X} \rightarrow$ Normal ($\mu = 50$, $\sigma = 20/\sqrt{25}$)

c) $P(\overline{X} < 54) = 0{,}8413$

Ejercicio N°6

$P(\overline{X} < 685) = 0{,}0041$

Ejercicio N°7

Normal ($\mu = 3{,}9$, $\sigma = 0{,}8/\sqrt{64}$)

$P(\overline{X} > 4) = 0{,}1587$

$q_{0,9} = 4{,}0282$

Ejercicio N°8

a) $\overline{X}$
b) $E(\overline{X}) = \mu = 4$
c) $DE(\overline{X}) = s = 4$
d) $P(\overline{X} > 3) = 0,9938$

Ejercicio N°9

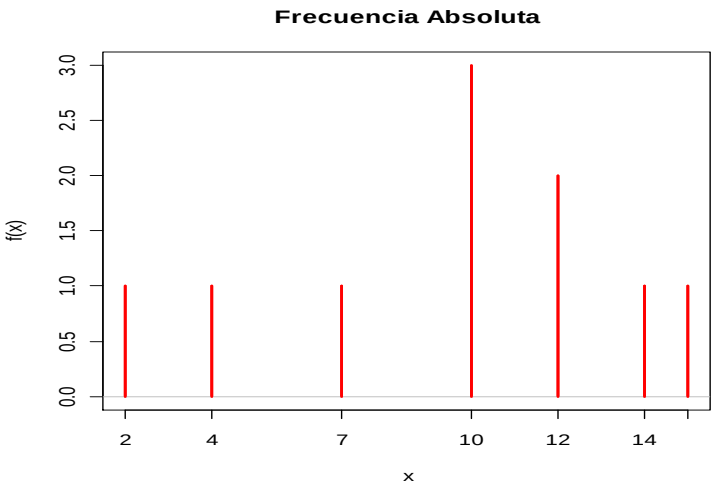
a) $\overline{X} \sim$ Normal ($\mu = 160$, $\sigma = 4/\sqrt{25}$)
b) $P(160 < \overline{X} < 160,8) = 0,3413$
c) $q_{0,95} = 161,3159$

Ejercicio N°10

a) $T \rightarrow$ Normal ($n\mu = 1200$, $n\sigma^2 = 1000$)
b) $P(T > 1250) = 0,0569$
c) $P(\overline{X} < 30) = 0,5$
d) $P(\overline{X} > 32) = 0,0057$

Ejercicio N°12 (Sentencias en R)

```
auto=c(2,4,7,10,12,10,14,10,15,12)
> table(auto)
auto
 2  4  7 10 12 14 15
 1  1  1  3  2  1  1
> table(auto)/length(auto)
auto
  2   4   7  10  12  14  15
0.1 0.1 0.1 0.3 0.2 0.1 0.1
> cumsum(table(auto))
 2  4  7 10 12 14 15
 1  2  3  6  8  9 10
> cumsum(table(auto)/length(auto))
  2   4   7  10  12  14  15
0.1 0.2 0.3 0.6 0.8 0.9 1.0
> plot(table(auto),type="h",col="red",xlab="x",ylab="f(x)",main="Frecuencia Absoluta")
> abline(h=0,col="gray")
```




```
summary(auto)
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
   2.00    7.75   10.00    9.60   12.00   15.00
> mean(auto)
[1] 9.6
> median(auto)
[1] 10
> var(auto)
[1] 17.37778
> sd(auto)
[1] 4.168666
> sd(auto)/mean(auto)
[1] 0.4342361
```

Ejercicio N°14

a) X_E: "Salarios de los trabajadores de una fábrica del sector ensamblaje, en pesos".
X_E ~ Normal ($\mu_E = 6500$, $\sigma_E = 450$)
X_A: "Salarios de los trabajadores de una fábrica del sector administrativo, en pesos".
X_A ~ Normal ($\mu_A = 7000$, $\sigma_A = 400$)

b) $\overline{X}_E$: "Salarios promedio de los trabajadores de una fábrica del sector ensamblaje, en pesos".
$\overline{X}_E$ ~ Normal ($\mu_{\overline{X}_E} = 6500$, $\sigma_{\overline{X}_E} = 450/\sqrt{50} = 63{,}64$)
$\overline{X}_A$: "Salarios promedio de los trabajadores de una fábrica del sector administrativo, en pesos".
$\overline{X}_A$ ~ Normal ($\mu_{\overline{X}_A} = 7000$, $\sigma_{\overline{X}_A} = 400/\sqrt{50} = 56{,}57$)

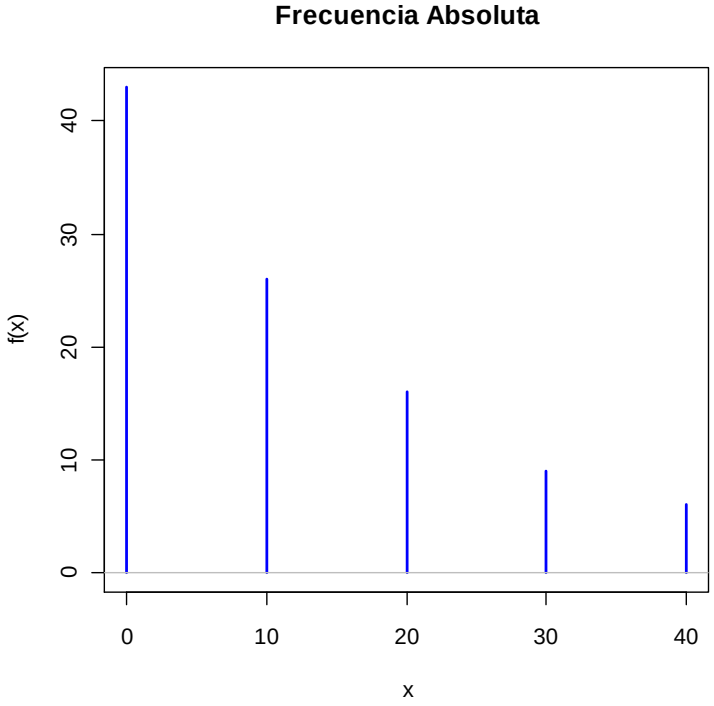
c) 0,0383
d) 7512,621
e) 6196,48
f) 0,8799

Ejercicio N°15

b) 0,0334

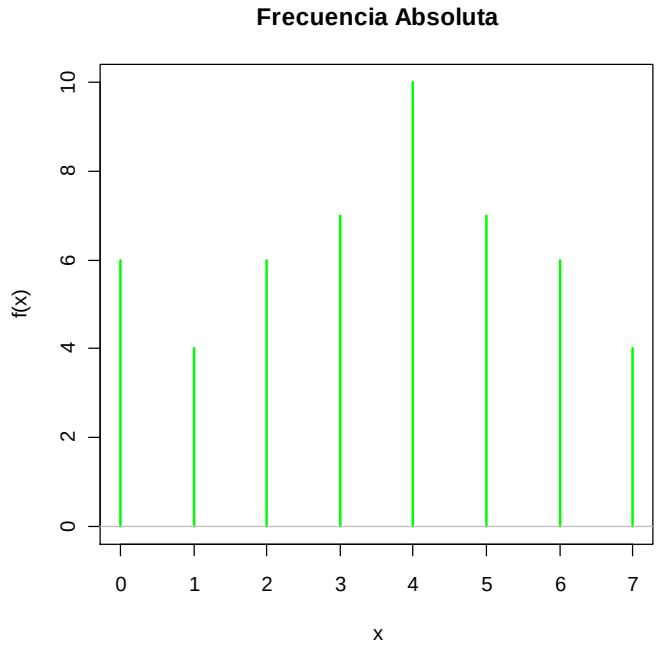
Ejercicio N°16 (Sentencias en R)

```
hora=c(rep(0,43),rep(10,26),rep(20,16),rep(30,9),rep(40,6))
> table(hora)
hora
 0 10 20 30 40
43 26 16  9  6
> plot(table(hora),type="h",col="blue",xlab="x",ylab="f(x)",main="Frecuencia Absoluta")
> abline(h=0,col="gray")
> summary(hora)
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.0     0.0    10.0    10.9    20.0    40.0
> var(hora)
[1] 149.6869
> sd(hora)
[1] 12.23466
> sd(hora)/mean(hora)
[1] 1.122446
```



Ejercicio N°17 (Sentencias en R)

```
litro=c(rep(0,6),rep(1,4),rep(2,6),rep(3,7),rep(4,10),rep(5,7),rep(6,6),rep(7,4))
> table(litro)
litro
 0  1  2  3  4  5  6  7
 6  4  6  7 10  7  6  4
> cumsum(table(litro))
 0  1  2  3  4  5  6  7
 6 10 16 23 33 40 46 50
> table(litro)/length(litro)
litro
  0   1   2   3   4   5   6   7
0.12 0.08 0.12 0.14 0.20 0.14 0.12 0.08
> cumsum(table(litro))/length(litro)
  0   1   2   3   4   5   6   7
0.12 0.20 0.32 0.46 0.66 0.80 0.92 1.00

> plot(table(litro),type="h",col="green",xlab="x",ylab="f(x)",main="Frecuencia Absoluta")
> abline(h=0,col="gray")
```



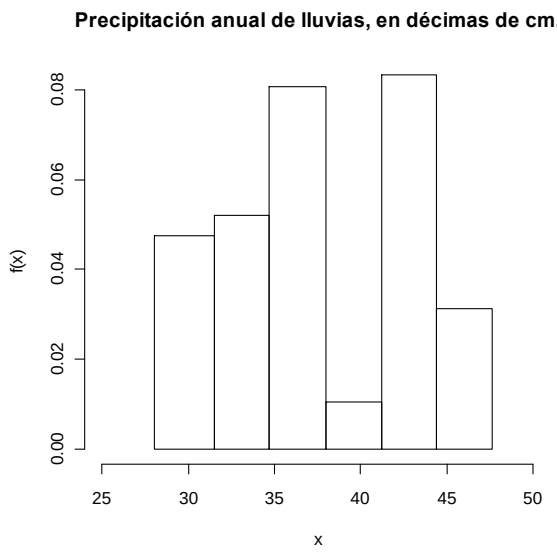
```
> summary(litro)
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
   0.00    2.00    4.00    3.52    5.00    7.00
> quantile(litro,0.25)
25%
 2
> quantile(litro,0.5)
50%
 4
> quantile(litro,0.75)
75%
 5
> quantile(litro,0.1)
10%
 0
> quantile(litro,0.5)
50%
 4
> quantile(litro,0.42)
42%
 3
> quantile(litro,0.96)
96%
 7

> var(litro)
[1] 4.458776
> sd(litro)
[1] 2.111581
> sd(litro)/mean(litro)
[1] 0.599881
```

Ejercicio N°18

```
lluvia=c(28.3,29.3,30.7,30.7,31.2,31.7,32.4,32.8,34.3,34.7,35.2,35.3,35.7,35.7,36.2,36.3,36.8,37.0,38.4,41.3,41.3
,41.5,42.3,43.0,43.2,43.2,43.6,45.2,46.5,47.6)
> table(cut(lluvia,6))
(28.3,31.5] (31.5,34.7]   (34.7,38]   (38,41.2] (41.2,44.4] (44.4,47.6]
          5           5           8           1           8           3
> table(cut(lluvia,6))/length(cut(lluvia,6))
(28.3,31.5] (31.5,34.7]   (34.7,38]   (38,41.2] (41.2,44.4] (44.4,47.6]
 0.16666667  0.16666667  0.26666667  0.03333333  0.26666667  0.10000000
```

```
> cumsum(table(cut(lluvia,6)))
(28.3,31.5] (31.5,34.7]   (34.7,38]   (38,41.2] (41.2,44.4] (44.4,47.6]
          5          10          18          19          27          30
> cumsum(table(cut(lluvia,6)))/length(cut(lluvia,6))
(28.3,31.5] (31.5,34.7]   (34.7,38]   (38,41.2] (41.2,44.4] (44.4,47.6]
  0.1666667   0.3333333   0.6000000   0.6333333   0.9000000   1.0000000
```

hist((lluvia),breaks=c(28,31.5,34.7,38,41.2,44.4,47.6),xlab="x",ylab="f(x)",main="Precipitación anual de lluvias, en décimas de cm.",xlim=c(25,50))




```
summary(lluvia)
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  28.30   33.17   36.25   37.38   42.10   47.60
```

```
> quantile(lluvia,0.2)
  20%
32.26
> quantile(lluvia,0.8)
  80%
43.04
> quantile(lluvia,0.32)
  32%
34.84
> quantile(lluvia,0.73)
   73%
41.636
```