

### TRABAJO PRACTICO N3 - RStudio

#### Ejercicio 1

```
> N = 10
> 1:N-1
[1] 0 1 2 3 4 5 6 7 8 9
> 1:(N-1)
[1] 1 2 3 4 5 6 7 8 9
```

#### Ejercicio 2

a)

```
> #i
> 1:10
[1] 1 2 3 4 5 6 7 8 9 10

> #ii
> 3:5.5
[1] 3 4 5

> #iii
> 2.8:10.2
[1] 2.8 3.8 4.8 5.8 6.8 7.8 8.8 9.8

> #iv
> seq(1, 30, by=2)
[1] 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29

> #v
> seq(10, -6, -2)
[1] 10 8 6 4 2 0 -2 -4 -6

> #vi
> seq(10, -6, 2)
```

```
Error en seq.default(10, -6, 2): wrong sign in 'by' argument
```

```
> #vii  
> rep('a', 5)  
[1] "a" "a" "a" "a" "a"
```

```
> #viii  
> seq(10, 15, length = 6)  
[1] 10 11 12 13 14 15  
> seq(10,15)  
[1] 10 11 12 13 14 15
```

```
> #ix  
> seq(10, 15, length = 4)  
[1] 10.00000 11.66667 13.33333 15.00000
```

```
> #x  
> seq(10, 15, len = 4)  
[1] 10.00000 11.66667 13.33333 15.00000
```

```
> #xi  
> rep(c(10, 12), 3)  
[1] 10 12 10 12 10 12  
> rep((10:12), 3)  
[1] 10 11 12 10 11 12 10 11 12
```

```
> #xii  
> rep(c(5, 8), c(2, 3))  
[1] 5 5 8 8 8
```

```
> #xiii  
> rep(1:4, c(2, 1, 5, 2))  
[1] 1 1 2 3 3 3 3 3 4 4
```

```
> #xiv
> double(20)
[1] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
```

```
b)
> V1 = 10:18
> V1
[1] 10 11 12 13 14 15 16 17 18
```

```
> V1 = c(10,11,12,13,14,15,16,17,18)
> V1
[1] 10 11 12 13 14 15 16 17 18
```

```
> V1 = seq(10,18)
> V1
[1] 10 11 12 13 14 15 16 17 18
```

```
> V1 = rep(10:18)
> V1
[1] 10 11 12 13 14 15 16 17 18
```

```
> V2 = c(1,4,7,10,13,16,19,22,25)
> V2
[1] 1 4 7 10 13 16 19 22 25
```

```
> V2 = seq(1,25,3)
> V2
[1] 1 4 7 10 13 16 19 22 25
```

```
> V2 = seq(from = 1, by = 3, length = 9)
> V2
[1] 1 4 7 10 13 16 19 22 25
```

```

c)
> V1 = c(1,2,4,7,10); length(V1)
[1] 5
> length(V1) = 20; V1
[1] 1 2 4 7 10 NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA
> length(V1) = 2; V1
[1] 1 2

d)
> set.seed(123)
> x = sample(1:100,20); x
[1] 31 79 51 14 67 42 50 43 97 25 90 69 57 9 72 26 7 95 87 36
> x[10]
[1] 25
> x[22]
[1] NA
> x[c(2,8,4,10:12)]
[1] 79 43 14 25 90 69
> x[10:15]
[1] 25 90 69 57 9 72
> x[-5]
[1] 31 79 51 14 42 50 43 97 25 90 69 57 9 72 26 7 95 87 36
> x[-(5:15)]
[1] 31 79 51 14 26 7 95 87 36
> x%%2 == 0
[1] FALSE FALSE FALSE TRUE FALSE TRUE TRUE FALSE FALSE FALSE TRUE FALSE FALSE FALSE TRUE TRUE FALSE FALSE FALSE
TRUE
> x[x%%2 == 0]
[1] 14 42 50 90 72 26 36
> sum(x[x%%2 == 0])
[1] 330
> sum(x%%2 == 0)
[1] 7

```

```

> nombres = c("juan","ana","maria","luis","pedro")
> sexo = c("H","M","M","H","H")
> nombres[sexo == "M"]
[1] "ana" "maria"
> sum(sexo == "M")
[1] 2

```

### Ejercicio 3

```

> x = sample(0:10,20,replace = TRUE);x
[1] 1 0 8 10 8 5 4 8 9 3 5 10 7 5 5 6 0 5 1 0

```

a)

```

> soloPARES = x[(x%%2 == 0)];soloPARES
[1] 0 8 10 8 4 8 10 6 0 0

```

b)

```

> x%%4 == 0
[1] FALSE TRUE TRUE FALSE TRUE FALSE TRUE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE
TRUE

```

```

> subset(x, x%%4 == 0 & x!=0)
[1] 8 8 4 8
> b = subset(x, x%%4==0 & x!=0)
> b[1]
[1] 8
> x[match(TRUE, x%%4 == 0 & x!= 0)]
[1] 4

```

c)

```

> match(TRUE, x%%4 == 0 & x!= 0)
[1] 1

```

```
> x
[1] 4 4 7 2 9 1 9 1 9 5 3 0 5 2 7 2 7 0 6 10
```

d)

```
> x%%2 == 0
[1] FALSE TRUE TRUE TRUE TRUE FALSE TRUE TRUE FALSE FALSE FALSE TRUE FALSE FALSE FALSE TRUE TRUE FALSE FALSE
TRUE
> sum (x%%2 == 0)
[1] 10
```

e)

```
> x[x%%3 == 0]
[1] 0 9 3 6 0 0
> x[x%%3 == 0 & x%%2 != 0]
[1] 9 3
> sum (x%%3 == 0 & x%%2 !=0 & x!=0)
[1] 2
```

f)

```
> all(x%%2 == 0)
[1] FALSE
```

g)

```
> any(x%%10 == 0)
[1] TRUE
```

h) En algun momento se modifiko x y tuve que crear una nueva x

```
> x = sample(0:10,20,replace = TRUE);x
[1] 1 3 4 5 2 8 3 5 8 8 6 2 7 8 2 6 2 6 5 9
> x[x%%2 != 0]
[1] 1 3 5 3 5 7 5 9
> x[x%%2 != 0] = 0
> x
```

```
[1] 0 0 4 0 2 8 0 0 8 8 6 2 0 8 2 6 2 6 0 0
```

#### Ejercicio 4

```
> set.seed(0)
> a = sample(1:100, 12)
> matriz = matrix(a,3)
> a
[1] 14 68 39 1 34 87 43 100 82 59 51 85
```

```
> matriz
      [,1] [,2] [,3] [,4]
[1,]  14    1  43   59
[2,]  68   34 100   51
[3,]  39   87  82   85
```

```
a)
> min(matriz)
[1] 1
> max(matriz)
[1] 100
> mean(matriz)
[1] 55.25
> c = c(min(matriz),max(matriz),mean(matriz))
> c
[1] 1.00 100.00 55.25
```

```
b)
> apply(matriz, 1, sum)
[1] 117 253 293
> matriz
      [,1] [,2] [,3] [,4]
[1,]  14    1  43   59
[2,]  68   34 100   51
[3,]  39   87  82   85
```

```
c)
> min(apply(matriz, 1, sum))
[1] 117
```

```
d)
> nrow(matriz)
[1] 3
> ncol(matriz)
[1] 4
> dim(matriz)
[1] 3 4
> nrow(matriz) == ncol(matriz)
[1] FALSE
```

(MATRIZ NO SIMÉTRICA)

```
> matriz == t(matriz)
Error en matriz == t(matriz): arreglos de dimensión no compatibles
> nrow(matriz) == ncol(matriz) && matriz == t(matriz)
[1] FALSE
> nrow(matriz) == ncol(matriz) && all(matriz == t(matriz))
[1] FALSE
```

(MATRIZ SIMÉTRICA)

```
> matriz2 = matrix(sample(1:10, 16, replace=TRUE), 4)
> matriz2
      [,1] [,2] [,3] [,4]
[1,]    5    7    9    2
[2,]   10    9    9   10
[3,]    6    5    5    9
[4,]   10    5    5    1
> nrow(matriz2) == ncol(matriz2) & matriz2 == t(matriz2)
```



```

      [,1] [,2] [,3] [,4]
[1,]  TRUE FALSE FALSE FALSE
[2,] FALSE  TRUE FALSE FALSE
[3,] FALSE FALSE  TRUE FALSE
[4,] FALSE FALSE FALSE  TRUE
> nrow(matriz2) == ncol(matriz2) & all(matriz2 == t(matriz2))
[1] FALSE
> matriz2
      [,1] [,2] [,3] [,4]
[1,]     5     7     9     2
[2,]    10     9     9    10
[3,]     6     5     5     9
[4,]    10     5     5     1
> matriz2 = matrix(sample(1:10, 4, replace=TRUE), 2)
> matriz2
      [,1] [,2]
[1,]     4     6
[2,]     3    10
> matriz2[1,2]=3
> matriz2
      [,1] [,2]
[1,]     4     3
[2,]     3    10
> nrow(matriz2) == ncol(matriz2) & all(matriz2 == t(matriz2))
[1] TRUE

```

### Ejercicio 5

```

set.seed(0)
> m = sample(1:20, 9);m
[1] 14  4  7  1  2 13 18 11 16
> M = matrix(m,3)
> M

```

```

      [,1] [,2] [,3]
[1,]   14    1   18
[2,]    4    2   11
[3,]    7   13   16
> sum(M)
[1] 86

```

### Ejercicio 6

```

> data(ToothGrowth)
> View(ToothGrowth)
> head(ToothGrowth)

```

```

      len supp dose
1  4.2   VC  0.5
2 11.5   VC  0.5
3  7.3   VC  0.5
4  5.8   VC  0.5
5  6.4   VC  0.5
6 10.0   VC  0.5

```

a)

```

> tapply(ToothGrowth$len, ToothGrowth$dose==0.5, mean)
      FALSE      TRUE
22.9175 10.6050
> tapply(ToothGrowth$len[ToothGrowth$dose==0.5], ToothGrowth$supp[ToothGrowth$dose==0.5], mean)
      OJ      VC
13.23   7.98

```

b)

```

> hist(ToothGrowth)
Error en hist.default(ToothGrowth): 'x' debe ser numérico
> hist(ToothGrowth$len)

```

### Ejercicio 7

```
> data("PlantGrowth")
```

```
> head(PlantGrowth)
```

	weight	group
1	4.17	ctrl
2	5.58	ctrl
3	5.18	ctrl
4	6.11	ctrl
5	4.50	ctrl
6	4.61	ctrl

```
> View(PlantGrowth)
```

a)

```
> tapply(PlantGrowth$weight, PlantGrowth$group, mean)
```

	ctrl	trt1	trt2
	5.032	4.661	5.526

b)

```
> pie(tapply(PlantGrowth$weight, PlantGrowth$group, mean), main = "Promedio pesos segun tipo")
```

### Ejercicio 8

```
> data("iris")
```

```
> head(iris)
```

	Sepal.Length	Sepal.Width	Petal.Length	Petal.Width	Species
1	5.1	3.5	1.4	0.2	setosa
2	4.9	3.0	1.4	0.2	setosa
3	4.7	3.2	1.3	0.2	setosa
4	4.6	3.1	1.5	0.2	setosa
5	5.0	3.6	1.4	0.2	setosa
6	5.4	3.9	1.7	0.4	setosa

```
> View(iris)
```

```

a)
> longPetalos = tapply(iris$Petal.Width, iris$Species, mean)
> longPetalos
      setosa versicolor  virginica
      0.246      1.326      2.026

b)
> pie(longPetalos, main = "Longitud promedio de pétalos por especie")

```

### Ejercicio 9

```

> data("airquality")
> head(airquality)
  Ozone Solar.R Wind Temp Month Day
1    41     190  7.4   67     5   1
2    36     118  8.0   72     5   2
3    12     149 12.6   74     5   3
4    18     313 11.5   62     5   4
5    NA      NA 14.3   56     5   5
6    28      NA 14.9   66     5   6
> View(airquality)

```

```

a)
> airquality$Temp>75
 [1] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
[17] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE  TRUE  TRUE  TRUE
[33] FALSE FALSE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE
[49] FALSE FALSE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE FALSE  TRUE FALSE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE
[65]  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE
[81]  TRUE FALSE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE
[97]  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE
[113]  TRUE FALSE FALSE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE
[129]  TRUE  TRUE  TRUE FALSE FALSE  TRUE  TRUE  TRUE FALSE FALSE  TRUE FALSE  TRUE FALSE  TRUE FALSE
[145] FALSE  TRUE FALSE FALSE FALSE  TRUE FALSE  TRUE FALSE

```

```
> sum(airquality$Temp>75)
```

```
[1] 101
```

b)

```
> subset(airquality, airquality$Month == 6)
```

	Ozone	Solar.R	Wind	Temp	Month	Day
32	NA	286	8.6	78	6	1
33	NA	287	9.7	74	6	2
34	NA	242	16.1	67	6	3
35	NA	186	9.2	84	6	4
36	NA	220	8.6	85	6	5
37	NA	264	14.3	79	6	6
38	29	127	9.7	82	6	7
39	NA	273	6.9	87	6	8
40	71	291	13.8	90	6	9
41	39	323	11.5	87	6	10
42	NA	259	10.9	93	6	11
43	NA	250	9.2	92	6	12
44	23	148	8.0	82	6	13
45	NA	332	13.8	80	6	14
46	NA	322	11.5	79	6	15
47	21	191	14.9	77	6	16
48	37	284	20.7	72	6	17
49	20	37	9.2	65	6	18
50	12	120	11.5	73	6	19
51	13	137	10.3	76	6	20
52	NA	150	6.3	77	6	21
53	NA	59	1.7	76	6	22
54	NA	91	4.6	76	6	23
55	NA	250	6.3	76	6	24
56	NA	135	8.0	75	6	25
57	NA	127	8.0	78	6	26
58	NA	47	10.3	73	6	27
59	NA	98	11.5	80	6	28

```
60    NA      31 14.9   77      6 29
61    NA     138  8.0   83      6 30
```

c)

```
subset(airquality, airquality$Day <= 15 & airquality$Month == 8)
```

	Ozone	Solar.R	Wind	Temp	Month	Day
93	39	83	6.9	81	8	1
94	9	24	13.8	81	8	2
95	16	77	7.4	82	8	3
96	78	NA	6.9	86	8	4
97	35	NA	7.4	85	8	5
98	66	NA	4.6	87	8	6
99	122	255	4.0	89	8	7
100	89	229	10.3	90	8	8
101	110	207	8.0	90	8	9
102	NA	222	8.6	92	8	10
103	NA	137	11.5	86	8	11
104	44	192	11.5	86	8	12
105	28	273	11.5	82	8	13
106	65	157	9.7	80	8	14
107	NA	64	11.5	79	8	15

d)

```
> tapply(airquality$Temp, airquality$Month, mean)
```

```
      5      6      7      8      9
65.54839 79.10000 83.90323 83.96774 76.90000
```

e)

```
> hist(airquality$Temp, main = "FRECUENCIA DE TEMPERATURAS", xlab = "Temperatura", ylab = "Frecuencia")
```