

Tarea_05_Yesenia_Villarreal_Torres.R

yesiv

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```
#Yesenia Villarreal Torres  
#TAREA 5  
#Matrícula 1109559  
#02 de marzo de 2023
```

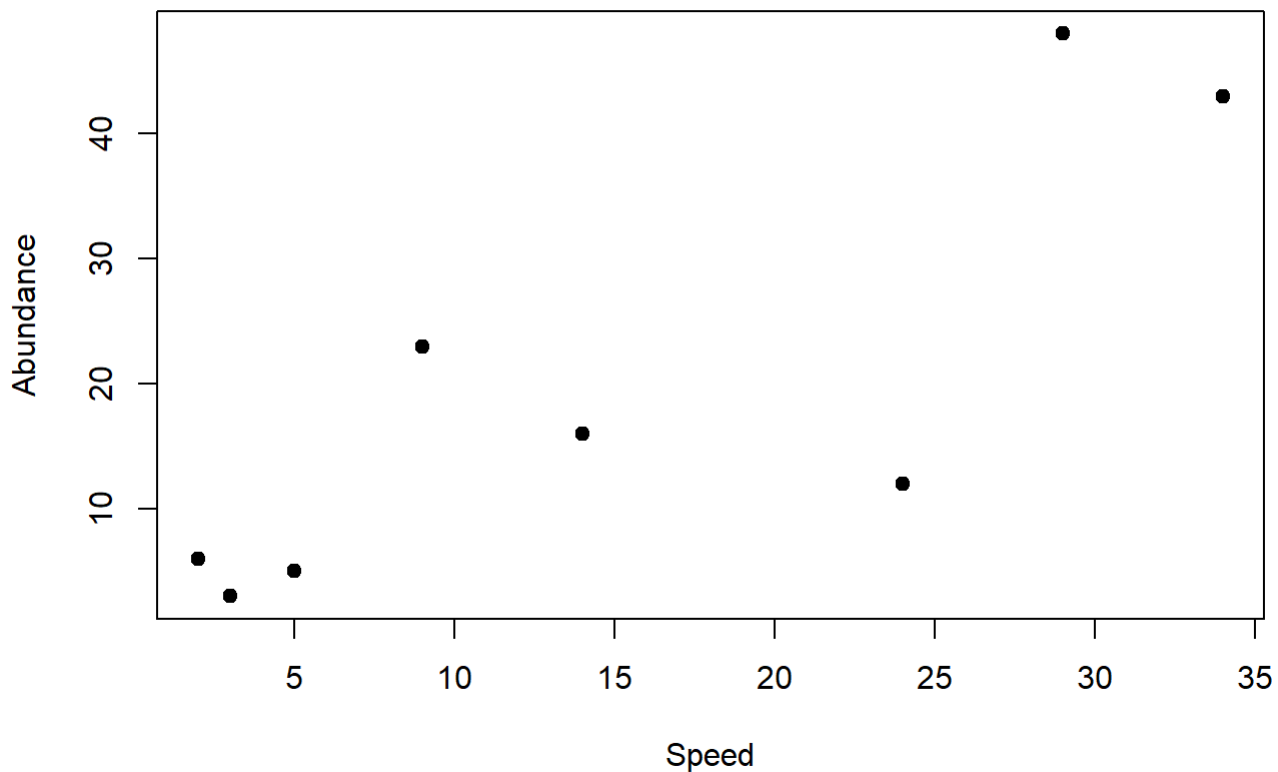
```
Speed <- c(2, 3, 5, 9, 14, 24, 29, 34)  
Speed
```

```
## [1]  2  3  5  9 14 24 29 34
```

```
Abundance <- c(6, 3, 5, 23, 16, 12, 48, 43)  
Abundance
```

```
## [1]  6  3  5 23 16 12 48 43
```

```
Emi <- data.frame(Speed, Abundance)  
plot(Emi, pch = 19)
```



#Figura 1: Diagrama de dispersión de efímeros (*Ecdyonurus dispar*) y datos de velocidad del flujo. La velocidad de la corriente es el eje independiente y los datos de la mosca de mayo el eje dependiente

#Parece que puede haber una relación entre la velocidad y la abundancia, pero hay varias inconsistencias, no es una correlación perfecta. Contestar las siguientes interrogantes: + ¿Es estadísticamente significativa la correlación?

#Si es estadísticamente significativa porque el valor de p es menor al valor de la referencia que es 0.406

#H1: Existe una correlación positiva entre la velocidad de los arroyos y la abundancia de efímeras (*Ecdyonurus dispar*)”.

#Nuestra hipótesis nula (H_0) ahora se convierte en: “No existe una correlación entre la velocidad del arroyo y la abundancia de efímeras”

```
cor.test(Speed, Abundance)
```

```
##
## Pearson's product-moment correlation
##
## data: Speed and Abundance
## t = 3.8568, df = 6, p-value = 0.008393
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
## 0.3442317 0.9711386
## sample estimates:
## cor
## 0.8441408
```

#Ejercicio 2

#Conjunto de datos: Composiciones del suelo, características físicas y químicas.

#Descripción: Las características del suelo se midieron en muestras de tres áreas diferentes (cima, pendiente y depresión) y a cuatro profundidades (0-10 cm, 10-30 cm, 30-60 cm y 60-90 cm). El área se dividió en 4 bloques, en un diseño de bloques al azar (Cuadro 2).

```
library(repmis)
```

```
suelos <- read.csv("suelo.csv")
head(suelos)
```

```
##   X Group Contour Depth Gp Block   pH     N Dens   P    Ca  Mg   K   Na
## 1 1      1      Top 0-10 T0     1 5.40 0.188 0.92 215 16.35 7.65 0.72 1.14
## 2 2      1      Top 0-10 T0     2 5.65 0.165 1.04 208 12.25 5.15 0.71 0.94
## 3 3      1      Top 0-10 T0     3 5.14 0.260 0.95 300 13.02 5.68 0.68 0.60
## 4 4      1      Top 0-10 T0     4 5.14 0.169 1.10 248 11.92 7.88 1.09 1.01
## 5 5      2      Top 10-30 T1     1 5.14 0.164 1.12 174 14.17 8.12 0.70 2.17
## 6 6      2      Top 10-30 T1     2 5.10 0.094 1.22 129  8.55 6.92 0.81 2.67
##   Conduc
## 1    1.09
## 2    1.35
## 3    1.41
## 4    1.64
## 5    1.85
## 6    3.18
```

#Realizar un análisis de correlación para las variables y reportar en un cuadro los valores de coeficiente de correlación y su valor de significancia (p-value):

#Cuadro 3: Ejemplo de cuadro de datos con los estadísticos de interés.

```
cor.test(suelos$pH, suelos$N)
```

```
##
## Pearson's product-moment correlation
##
## data:  suelos$pH and suelos$N
## t = 5.5994, df = 46, p-value = 1.149e-06
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  0.4303716 0.7797377
## sample estimates:
##          cor
## 0.636654
```

```
cor.test(suelos$pH, suelos$Dens)
```

```
##
## Pearson's product-moment correlation
##
## data:  suelos$pH and suelos$Dens
## t = -4.9436, df = 46, p-value = 1.062e-05
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
## -0.7479775 -0.3661760
## sample estimates:
##          cor
## -0.5890264
```

```
cor.test(suelos$pH, suelos$P)
```

```
##
## Pearson's product-moment correlation
##
## data:  suelos$pH and suelos$P
## t = 4.9694, df = 46, p-value = 9.74e-06
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  0.3688348 0.7493286
## sample estimates:
##          cor
## 0.5910303
```

```
cor.test(suelos$pH, suelos$Ca)
```

```
##
## Pearson's product-moment correlation
##
## data:  suelos$pH and suelos$Ca
## t = 9.3221, df = 46, p-value = 3.614e-12
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  0.6809493 0.8885997
## sample estimates:
##          cor
## 0.8086293
```

```
cor.test(suelos$pH, suelos$Mg)
```

```
##
## Pearson's product-moment correlation
##
## data:  suelos$pH and suelos$Mg
## t = -2.923, df = 46, p-value = 0.005361
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
## -0.6111857 -0.1257936
## sample estimates:
##          cor
## -0.3957821
```

```
cor.test(suelos$pH, suelos$K)
```

```
##
## Pearson's product-moment correlation
##
## data:  suelos$pH and suelos$K
## t = 4.8236, df = 46, p-value = 1.585e-05
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  0.3536810 0.7415855
## sample estimates:
##          cor
## 0.5795727
```

```
cor.test(suelos$pH, suelos$Na)
```

```
##
## Pearson's product-moment correlation
##
## data:  suelos$pH and suelos$Na
## t = -6.5242, df = 46, p-value = 4.724e-08
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
## -0.8165520 -0.5094849
## sample estimates:
##          cor
## -0.6932614
```

```
cor.test(suelos$pH, suelos$Conduc)
```

```
##
## Pearson's product-moment correlation
##
## data:  suelos$pH and suelos$Conduc
## t = -8.0515, df = 46, p-value = 2.484e-10
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
## -0.8616916 -0.6141322
## sample estimates:
##          cor
## -0.7648104
```

```
cuadro5p_H <- read.csv("cuadro5.csv")
```

```
cuadro5p_H
```

```
## Conjunto      r valor.de.P
## 1    pH-N  0.6366540 1.190e-06
## 2  pH-Dens -0.5890264 1.060e-05
## 3    pH-P  0.5910303 9.740e-06
## 4    pH-Ca 0.8086293 0.000e+00
## 5    pH-Mg -0.3957821 5.361e-03
## 6    pH-K  0.5795727 1.590e-05
## 7    pH-Na -0.6932614 4.720e-08
```

```
head(cuadro5p_H)
```

```
## Conjunto      r valor.de.P
## 1    pH-N  0.6366540 1.190e-06
## 2  pH-Dens -0.5890264 1.060e-05
## 3    pH-P  0.5910303 9.740e-06
## 4    pH-Ca 0.8086293 0.000e+00
## 5    pH-Mg -0.3957821 5.361e-03
## 6    pH-K  0.5795727 1.590e-05
```

```
#Matriz de correlación
suelos.0 <- suelos[, 7:15]
suelos.0
```

##	pH	N	Dens	P	Ca	Mg	K	Na	Conduc
## 1	5.40	0.188	0.92	215	16.35	7.65	0.72	1.14	1.09
## 2	5.65	0.165	1.04	208	12.25	5.15	0.71	0.94	1.35
## 3	5.14	0.260	0.95	300	13.02	5.68	0.68	0.60	1.41
## 4	5.14	0.169	1.10	248	11.92	7.88	1.09	1.01	1.64
## 5	5.14	0.164	1.12	174	14.17	8.12	0.70	2.17	1.85
## 6	5.10	0.094	1.22	129	8.55	6.92	0.81	2.67	3.18
## 7	4.70	0.100	1.52	117	8.74	8.16	0.39	3.32	4.16
## 8	4.46	0.112	1.47	170	9.49	9.16	0.70	3.76	5.14
## 9	4.37	0.112	1.07	121	8.85	10.35	0.74	5.74	5.73
## 10	4.39	0.058	1.54	115	4.73	6.91	0.77	5.85	6.45
## 11	4.17	0.078	1.26	112	6.29	7.95	0.26	5.30	8.37
## 12	3.89	0.070	1.42	117	6.61	9.76	0.41	8.30	9.21
## 13	3.88	0.077	1.25	127	6.41	10.96	0.56	9.67	10.64
## 14	4.07	0.046	1.54	91	3.82	6.61	0.50	7.67	10.07
## 15	3.88	0.055	1.53	91	4.98	8.00	0.23	8.78	11.26
## 16	3.74	0.053	1.40	79	5.86	10.14	0.41	11.04	12.15
## 17	5.11	0.247	0.94	261	13.25	7.55	0.61	1.86	2.61
## 18	5.46	0.298	0.96	300	12.30	7.50	0.68	2.00	1.98
## 19	5.61	0.145	1.10	242	9.66	6.76	0.63	1.01	0.76
## 20	5.85	0.186	1.20	229	13.78	7.12	0.62	3.09	2.85
## 21	4.57	0.102	1.37	156	8.58	9.92	0.63	3.67	3.24
## 22	5.11	0.097	1.30	139	8.58	8.69	0.42	4.70	4.63
## 23	4.78	0.122	1.30	214	8.22	7.75	0.32	3.07	3.67
## 24	6.67	0.083	1.42	132	12.68	9.56	0.55	8.30	8.10
## 25	3.96	0.059	1.53	98	4.80	10.00	0.36	6.52	7.72
## 26	4.00	0.050	1.50	115	5.06	8.91	0.28	7.91	9.78
## 27	4.12	0.086	1.55	148	6.16	7.58	0.16	6.39	9.07
## 28	4.99	0.048	1.46	97	7.49	9.38	0.40	9.70	9.13
## 29	3.80	0.049	1.48	108	3.82	8.80	0.24	9.57	11.57
## 30	3.96	0.036	1.28	103	4.78	7.29	0.24	9.67	11.42
## 31	3.93	0.048	1.42	109	4.93	7.47	0.14	9.65	13.32
## 32	4.02	0.039	1.51	100	5.66	8.84	0.37	10.54	11.57
## 33	5.24	0.194	1.00	445	12.27	6.27	0.72	1.02	0.75
## 34	5.20	0.256	0.78	380	11.39	7.55	0.78	1.63	2.20
## 35	5.30	0.136	1.00	259	9.96	8.08	0.45	1.97	2.27
## 36	5.67	0.127	1.13	248	9.12	7.04	0.55	1.43	0.67
## 37	4.46	0.087	1.24	276	7.24	9.40	0.43	4.17	5.08
## 38	4.91	0.092	1.47	158	7.37	10.57	0.59	5.07	6.37
## 39	4.79	0.047	1.46	121	6.99	9.91	0.30	5.15	6.82
## 40	5.36	0.095	1.26	195	8.59	8.66	0.48	4.17	3.65
## 41	3.94	0.054	1.60	148	4.85	9.62	0.18	7.20	10.14
## 42	4.52	0.051	1.53	115	6.34	9.78	0.34	8.52	9.74
## 43	4.35	0.032	1.55	82	5.99	9.73	0.22	7.02	8.60
## 44	4.64	0.065	1.46	152	4.43	10.54	0.22	7.61	9.09
## 45	3.82	0.038	1.40	105	4.65	9.85	0.18	10.15	12.26
## 46	4.24	0.035	1.47	100	4.56	8.95	0.33	10.51	11.29
## 47	4.22	0.030	1.56	97	5.29	8.37	0.14	8.27	9.51
## 48	4.41	0.058	1.58	130	4.58	9.46	0.14	9.28	12.69

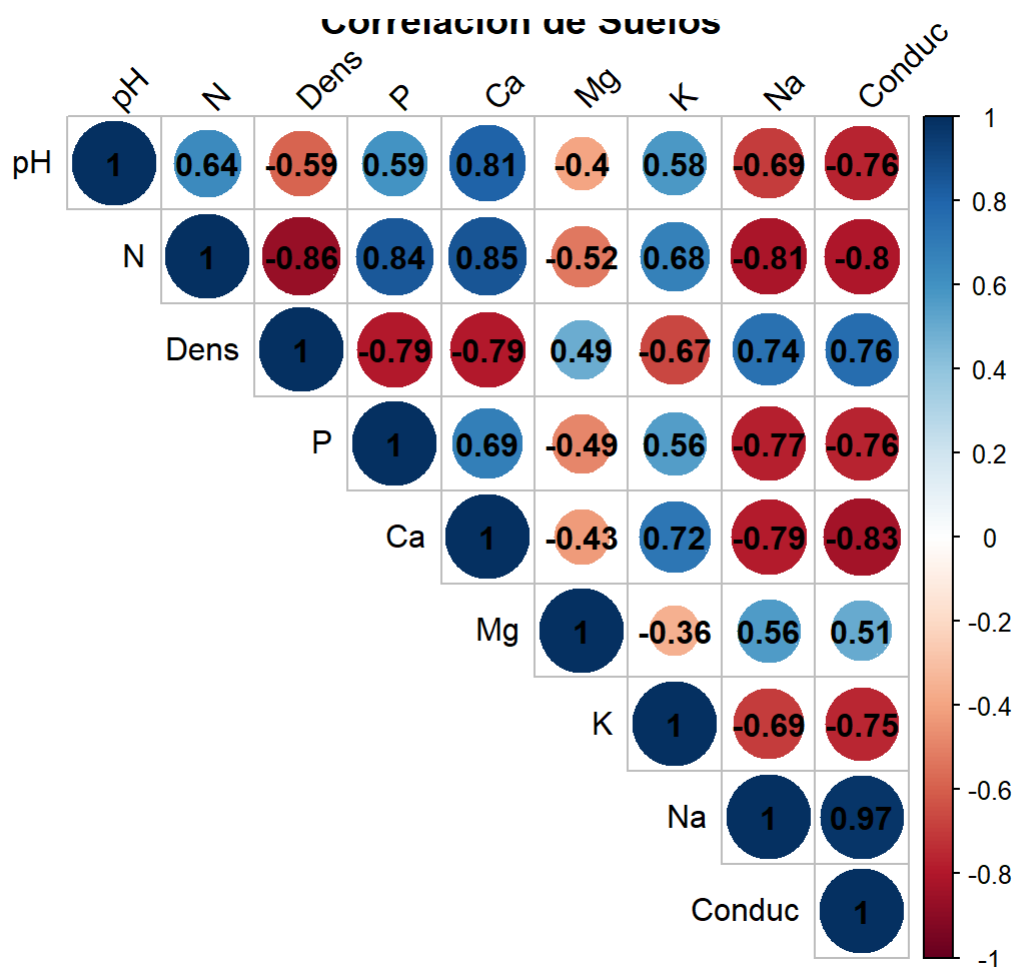

```
suelos.cor <- round(cor(suelos.0), digits = 4)
suelos.cor
```

```
##           pH      N    Dens      P      Ca      Mg      K      Na    Conduc
## pH      1.0000  0.6367 -0.5890  0.5910  0.8086 -0.3958  0.5796 -0.6933 -0.7648
## N       0.6367  1.0000 -0.8642  0.8422  0.8502 -0.5215  0.6760 -0.8119 -0.8038
## Dens    -0.5890 -0.8642  1.0000 -0.7937 -0.7914  0.4901 -0.6671  0.7423  0.7626
## P       0.5910  0.8422 -0.7937  1.0000  0.6876 -0.4890  0.5557 -0.7729 -0.7617
## Ca      0.8086  0.8502 -0.7914  0.6876  1.0000 -0.4275  0.7209 -0.7889 -0.8321
## Mg     -0.3958 -0.5215  0.4901 -0.4890 -0.4275  1.0000 -0.3567  0.5645  0.5083
## K       0.5796  0.6760 -0.6671  0.5557  0.7209 -0.3567  1.0000 -0.6932 -0.7531
## Na     -0.6933 -0.8119  0.7423 -0.7729 -0.7889  0.5645 -0.6932  1.0000  0.9724
## Conduc -0.7648 -0.8038  0.7626 -0.7617 -0.8321  0.5083 -0.7531  0.9724  1.0000
```

```
library(corrplot)
```

```
## corrplot 0.92 loaded
```

```
corrplot(suelos.cor, tl.col="black", bg="white", tl.srt=45,
         title = "Correlación de Suelos",
         addCoef.col= "black", type = "upper")
```



##