tarea5-Jonathan_Abelardo_Mata_Hernandez.R

Jana0

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```
#ANALISIS ESTADISTICO
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#Asignacion 5:  Correlación


# Ejericio 1 ------------------------------------------------------------

#Cuadro 1: Abundancia de las efímeras de un arroyo y la velocidad de la corriente de un arroyo.

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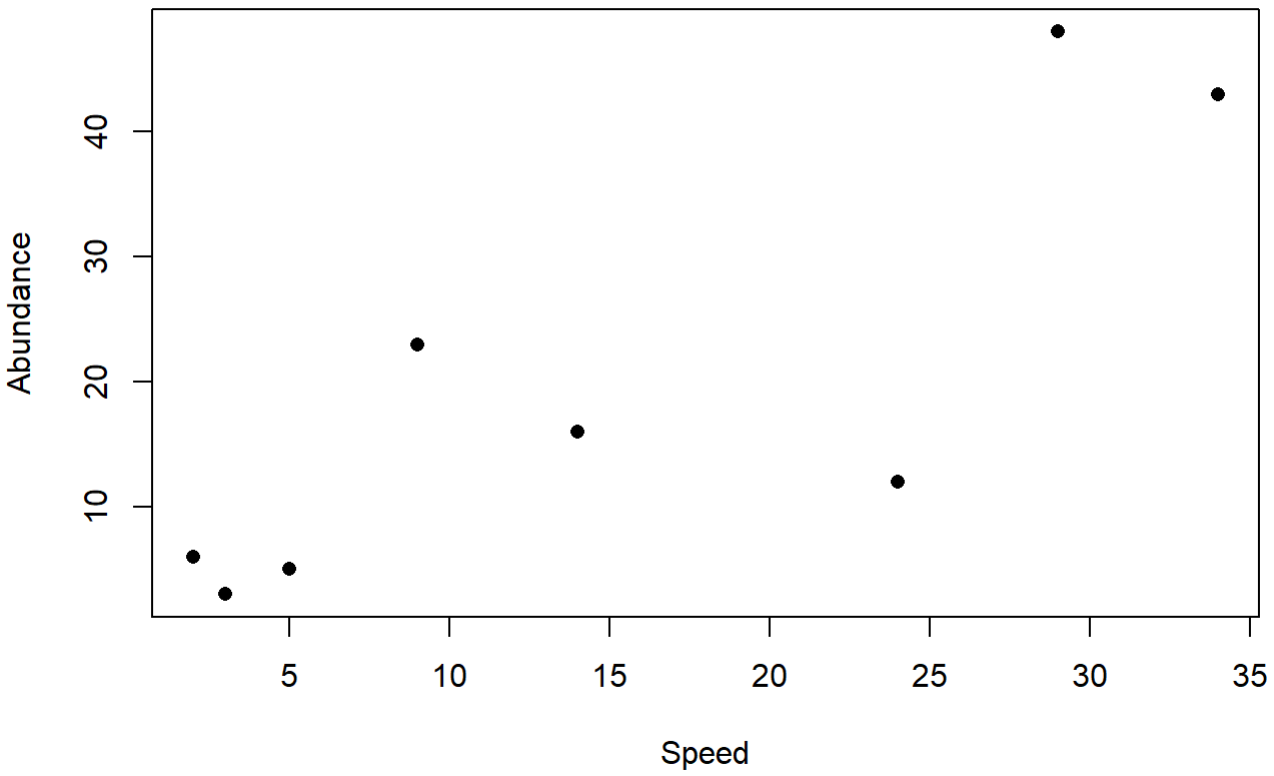

```
## [1]  2  3  5  9 14 24 29 34
```

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

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

```
plot(Speed, Abundance, pch = 16)
```




```
#Es estadísticamentesignificativa la correlación?
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
```

```
#R= Si, es significativa porque su (p-value= 0.008393) es mas baja al valor  de referencia 0.05


#Comenzamos con una hipótesis para probar. En este caso, esperamos una mayor abundancia deefímer
as a medida que aumenta la velocidad del arroyo. Escribiríamos esto formalmente (nuestrahipótesi
s alternativa H1) como:

#R= Existe una correlación positiva entre la velocidad de los arroyos y la abundanciade efímeras
(Ecdyonurus dispar)


# Ejericio 2 ------------------------------------------------------------

library(repmis)

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

```
##     X Group    Contour Depth Gp Block   pH     N Dens   P    Ca    Mg    K
## 1   1     1        Top  0-10 T0     1 5.40 0.188 0.92 215 16.35  7.65 0.72
## 2   2     1        Top  0-10 T0     2 5.65 0.165 1.04 208 12.25  5.15 0.71
## 3   3     1        Top  0-10 T0     3 5.14 0.260 0.95 300 13.02  5.68 0.68
## 4   4     1        Top  0-10 T0     4 5.14 0.169 1.10 248 11.92  7.88 1.09
## 5   5     2        Top 10-30 T1     1 5.14 0.164 1.12 174 14.17  8.12 0.70
## 6   6     2        Top 10-30 T1     2 5.10 0.094 1.22 129  8.55  6.92 0.81
## 7   7     2        Top 10-30 T1     3 4.70 0.100 1.52 117  8.74  8.16 0.39
## 8   8     2        Top 10-30 T1     4 4.46 0.112 1.47 170  9.49  9.16 0.70
## 9   9     3        Top 30-60 T3     1 4.37 0.112 1.07 121  8.85 10.35 0.74
## 10 10     3        Top 30-60 T3     2 4.39 0.058 1.54 115  4.73  6.91 0.77
## 11 11     3        Top 30-60 T3     3 4.17 0.078 1.26 112  6.29  7.95 0.26
## 12 12     3        Top 30-60 T3     4 3.89 0.070 1.42 117  6.61  9.76 0.41
## 13 13     4        Top 60-90 T6     1 3.88 0.077 1.25 127  6.41 10.96 0.56
## 14 14     4        Top 60-90 T6     2 4.07 0.046 1.54  91  3.82  6.61 0.50
## 15 15     4        Top 60-90 T6     3 3.88 0.055 1.53  91  4.98  8.00 0.23
## 16 16     4        Top 60-90 T6     4 3.74 0.053 1.40  79  5.86 10.14 0.41
## 17 17     5      Slope  0-10 S0     1 5.11 0.247 0.94 261 13.25  7.55 0.61
## 18 18     5      Slope  0-10 S0     2 5.46 0.298 0.96 300 12.30  7.50 0.68
## 19 19     5      Slope  0-10 S0     3 5.61 0.145 1.10 242  9.66  6.76 0.63
## 20 20     5      Slope  0-10 S0     4 5.85 0.186 1.20 229 13.78  7.12 0.62
## 21 21     6      Slope 10-30 S1     1 4.57 0.102 1.37 156  8.58  9.92 0.63
## 22 22     6      Slope 10-30 S1     2 5.11 0.097 1.30 139  8.58  8.69 0.42
## 23 23     6      Slope 10-30 S1     3 4.78 0.122 1.30 214  8.22  7.75 0.32
## 24 24     6      Slope 10-30 S1     4 6.67 0.083 1.42 132 12.68  9.56 0.55
## 25 25     7      Slope 30-60 S3     1 3.96 0.059 1.53  98  4.80 10.00 0.36
## 26 26     7      Slope 30-60 S3     2 4.00 0.050 1.50 115  5.06  8.91 0.28
## 27 27     7      Slope 30-60 S3     3 4.12 0.086 1.55 148  6.16  7.58 0.16
## 28 28     7      Slope 30-60 S3     4 4.99 0.048 1.46  97  7.49  9.38 0.40
## 29 29     8      Slope 60-90 S6     1 3.80 0.049 1.48 108  3.82  8.80 0.24
## 30 30     8      Slope 60-90 S6     2 3.96 0.036 1.28 103  4.78  7.29 0.24
## 31 31     8      Slope 60-90 S6     3 3.93 0.048 1.42 109  4.93  7.47 0.14
## 32 32     8      Slope 60-90 S6     4 4.02 0.039 1.51 100  5.66  8.84 0.37
## 33 33     9 Depression  0-10 D0     1 5.24 0.194 1.00 445 12.27  6.27 0.72
## 34 34     9 Depression  0-10 D0     2 5.20 0.256 0.78 380 11.39  7.55 0.78
## 35 35     9 Depression  0-10 D0     3 5.30 0.136 1.00 259  9.96  8.08 0.45
## 36 36     9 Depression  0-10 D0     4 5.67 0.127 1.13 248  9.12  7.04 0.55
## 37 37    10 Depression 10-30 D1     1 4.46 0.087 1.24 276  7.24  9.40 0.43
## 38 38    10 Depression 10-30 D1     2 4.91 0.092 1.47 158  7.37 10.57 0.59
## 39 39    10 Depression 10-30 D1     3 4.79 0.047 1.46 121  6.99  9.91 0.30
## 40 40    10 Depression 10-30 D1     4 5.36 0.095 1.26 195  8.59  8.66 0.48
## 41 41    11 Depression 30-60 D3     1 3.94 0.054 1.60 148  4.85  9.62 0.18
## 42 42    11 Depression 30-60 D3     2 4.52 0.051 1.53 115  6.34  9.78 0.34
## 43 43    11 Depression 30-60 D3     3 4.35 0.032 1.55  82  5.99  9.73 0.22
## 44 44    11 Depression 30-60 D3     4 4.64 0.065 1.46 152  4.43 10.54 0.22
## 45 45    12 Depression 60-90 D6     1 3.82 0.038 1.40 105  4.65  9.85 0.18
## 46 46    12 Depression 60-90 D6     2 4.24 0.035 1.47 100  4.56  8.95 0.33
## 47 47    12 Depression 60-90 D6     3 4.22 0.030 1.56  97  5.29  8.37 0.14
## 48 48    12 Depression 60-90 D6     4 4.41 0.058 1.58 130  4.58  9.46 0.14
##       Na Conduc
## 1   1.14   1.09
## 2   0.94   1.35
```

```
## 3   0.60   1.41
## 4   1.01   1.64
## 5   2.17   1.85
## 6   2.67   3.18
## 7   3.32   4.16
## 8   3.76   5.14
## 9   5.74   5.73
## 10  5.85   6.45
## 11  5.30   8.37
## 12  8.30   9.21
## 13  9.67  10.64
## 14  7.67  10.07
## 15  8.78  11.26
## 16 11.04  12.15
## 17  1.86   2.61
## 18  2.00   1.98
## 19  1.01   0.76
## 20  3.09   2.85
## 21  3.67   3.24
## 22  4.70   4.63
## 23  3.07   3.67
## 24  8.30   8.10
## 25  6.52   7.72
## 26  7.91   9.78
## 27  6.39   9.07
## 28  9.70   9.13
## 29  9.57  11.57
## 30  9.67  11.42
## 31  9.65  13.32
## 32 10.54  11.57
## 33  1.02   0.75
## 34  1.63   2.20
## 35  1.97   2.27
## 36  1.43   0.67
## 37  4.17   5.08
## 38  5.07   6.37
## 39  5.15   6.82
## 40  4.17   3.65
## 41  7.20  10.14
## 42  8.52   9.74
## 43  7.02   8.60
## 44  7.61   9.09
## 45 10.15  12.26
## 46 10.51  11.29
## 47  8.27   9.51
## 48  9.28  12.69
```

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

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
```

```
#Cuadro 3: Ejemplo de cuadro de datos con los estadísticos de interés.
cuadro3 <- read.csv("cuadro3.csv")
cuadro3
```

```
##   CONJUNTO          r valor.de.P
## 1     Ph-N  0.6366540   1.149000
## 2  Ph-Dens -0.5890264   1.062000
## 3     Ph-P  0.5910303   9.740000
## 4    Ph-Ca  0.8086293   3.614000
## 5    Ph-Mg -0.3957821   0.005361
## 6     Ph-K  0.5795727   1.585000
## 7    Ph-Na -0.6932614   4.724000
```

```
#Columnas que se necesita hacer correlacion
suelo.1 <- suelos[, 7:15]
suelo.1
```

```
##      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
```

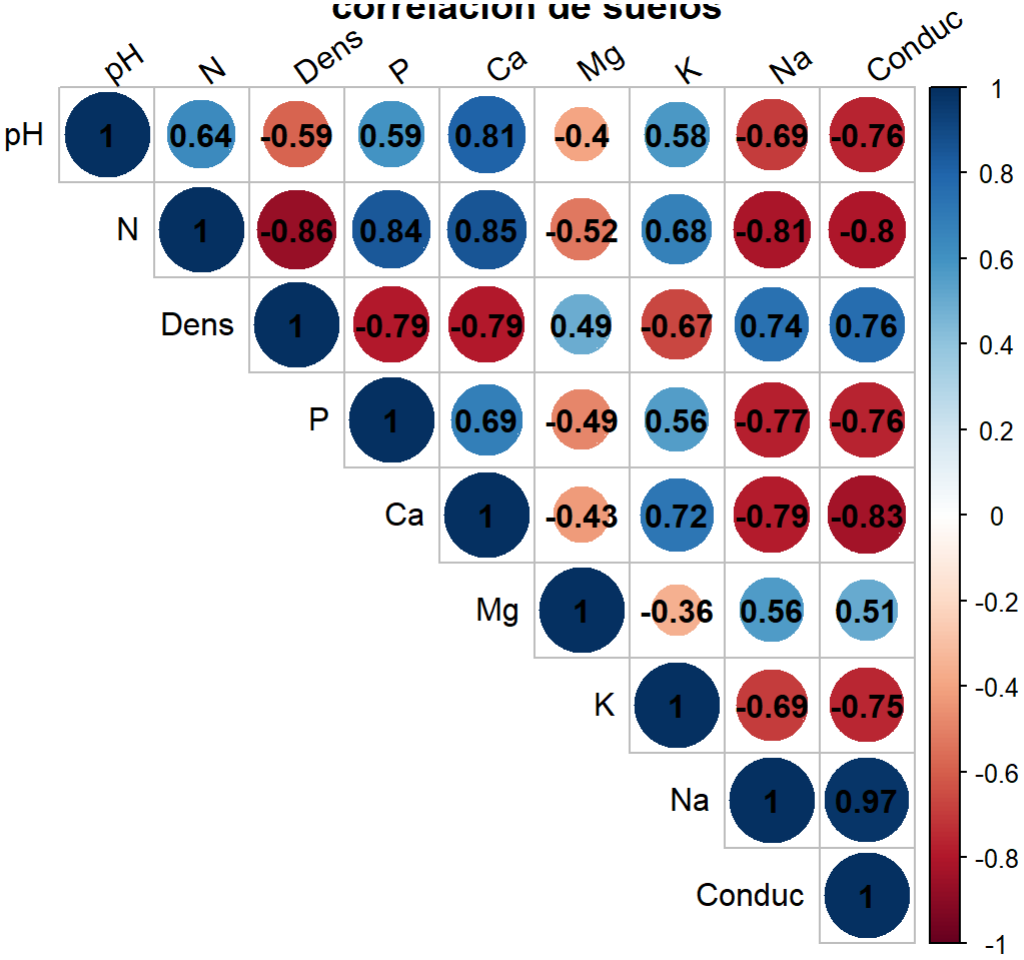
```
#base con solo las 4 columas que se nececita hacer una correlacion

suelos.cor <- round(cor(suelo.1), 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 = 35,
         title = "correlacion de suelos",
         addCoef.col = "black", type = "upper")
```


correlación de suelos
pH
N
Dens
P
Ca
Mg
K
Na
Conduc
1
0.64
-0.59
0.59
0.81
-0.4
0.58
-0.69
-0.76
1
-0.86
0.84
0.85
-0.52
0.68
-0.81
-0.8
1
-0.79
-0.79
0.49
-0.67
0.74
0.76
1
0.69
-0.49
0.56
-0.77
-0.76
1
-0.43
0.72
-0.79
-0.83
1
-0.36
0.56
0.51
1
-0.69
-0.75
1
0.97
1
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1