UNIVERSIDAD AUTONOMA DE NUEVO LEÓN

FACULTAD DE CIENCIAS FORESTALES

MAESTRIA EN CIENCIAS FORESTALES

UNIDAD DE APRENDIZAJE:

ANALISIS ESTADISTICOS POSGRADO ORDINARIO

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21 de septiembre de 2022

Tarea_5_DiegoAxayacatl.R

FCF

2022-09-21

```r
##Tarea 5
##Diego Axayacatl Gonzalez Cuellar
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## Correlación


# Ejercicio 1 ------------------------------------------------------------------

spd <- c(2,3,5,9,14,24,29,34)
abnd <- c(6,3,5,23,16,12,48,43)

efime.lm <- lm(abnd ~ spd)

plot(spd, abnd, pch = 23)
abline(efime.lm, col = "blue")
```
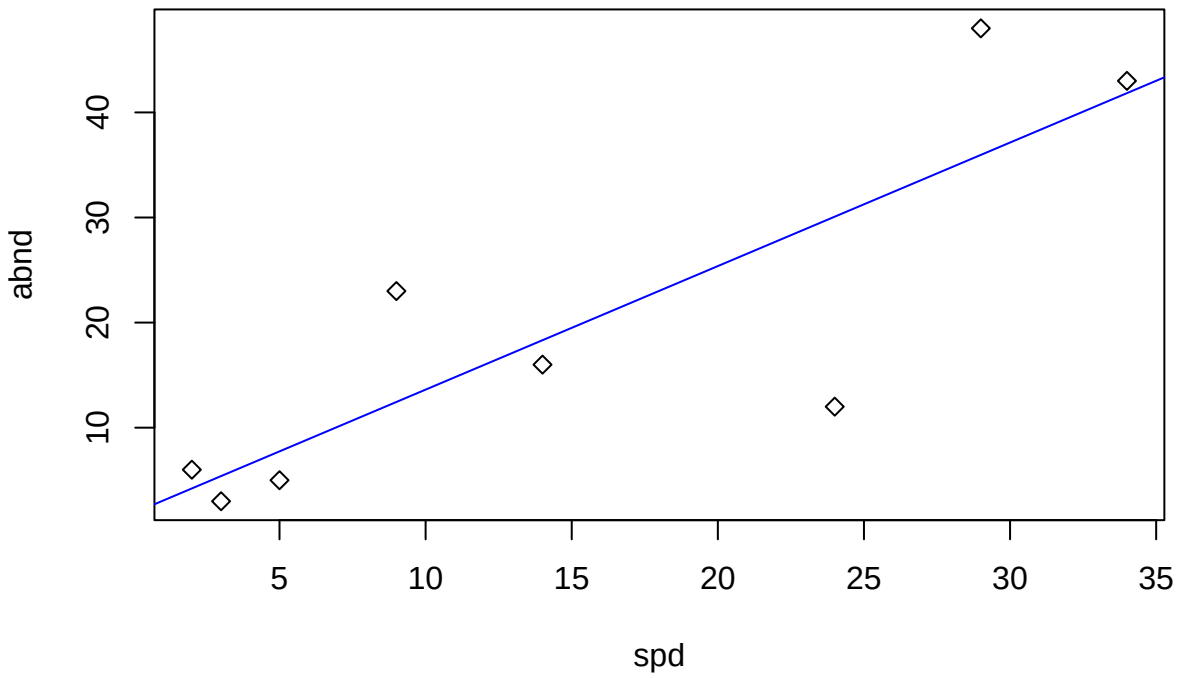




```
##Graficamente los datos tienen una correlacion lineal positiva
##aunque su dispersion en el grafico varia mucho en relacion de la regresion

efime.cor <- cor.test(spd, abnd)
efime.cor
```

```
##
##  Pearson's product-moment correlation
##
## data:  spd and abnd
## 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
```

```
## el valor de r = 0.8441408 df = 6, el valor de p = 0.008393, por lo cual
## se acepta la hipotesis alterna demostrando que si Existe una correlacion
## positiva entre la velocidad del arroyo y la abundancia de efimeras

summary(efime.lm)
```

```
##
## Call:
## lm(formula = abnd ~ spd)
```

```
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -18.080  -2.481  -0.580   3.975  12.042
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)   1.8667     5.7912   0.322  0.75813
## spd           1.1756     0.3048   3.857  0.00839 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 10.05 on 6 degrees of freedom
## Multiple R-squared:  0.7126, Adjusted R-squared:  0.6647
## F-statistic: 14.87 on 1 and 6 DF,  p-value: 0.008393
```

```
# Ejercicio 2 ------------------------------------------------------------

suelo <- read.csv("suelo.csv", header = T)
suelo
```

```
##     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 oct-30 T1     1 5.14 0.164 1.12 174 14.17  8.12 0.70
## 6   6     2        Top oct-30 T1     2 5.10 0.094 1.22 129  8.55  6.92 0.81
## 7   7     2        Top oct-30 T1     3 4.70 0.100 1.52 117  8.74  8.16 0.39
## 8   8     2        Top oct-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 oct-30 S1     1 4.57 0.102 1.37 156  8.58  9.92 0.63
## 22 22     6      Slope oct-30 S1     2 5.11 0.097 1.30 139  8.58  8.69 0.42
## 23 23     6      Slope oct-30 S1     3 4.78 0.122 1.30 214  8.22  7.75 0.32
## 24 24     6      Slope oct-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 oct-30 D1     1 4.46 0.087 1.24 276  7.24  9.40 0.43
## 38 38    10 Depression oct-30 D1     2 4.91 0.092 1.47 158  7.37 10.57 0.59
## 39 39    10 Depression oct-30 D1     3 4.79 0.047 1.46 121  6.99  9.91 0.30
## 40 40    10 Depression oct-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
```

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

```
##
##  Pearson's product-moment correlation
##
## data:  suelo$pH and suelo$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(suelo$pH, suelo$Dens)
```

```
##
##  Pearson's product-moment correlation
##
## data:  suelo$pH and suelo$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(suelo$pH, suelo$P)
```

```
##
##  Pearson's product-moment correlation
##
## data:  suelo$pH and suelo$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(suelo$pH, suelo$Ca)
```

```
##
##  Pearson's product-moment correlation
```

```
##
## data:  suelo$pH and suelo$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(suelo$pH, suelo$Mg)
```

```
##
##  Pearson's product-moment correlation
##
## data:  suelo$pH and suelo$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(suelo$pH, suelo$K)
```

```
##
##  Pearson's product-moment correlation
##
## data:  suelo$pH and suelo$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(suelo$pH, suelo$Na)
```

```
##
##  Pearson's product-moment correlation
##
## data:  suelo$pH and suelo$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(suelo$pH, suelo$Conduc)
```

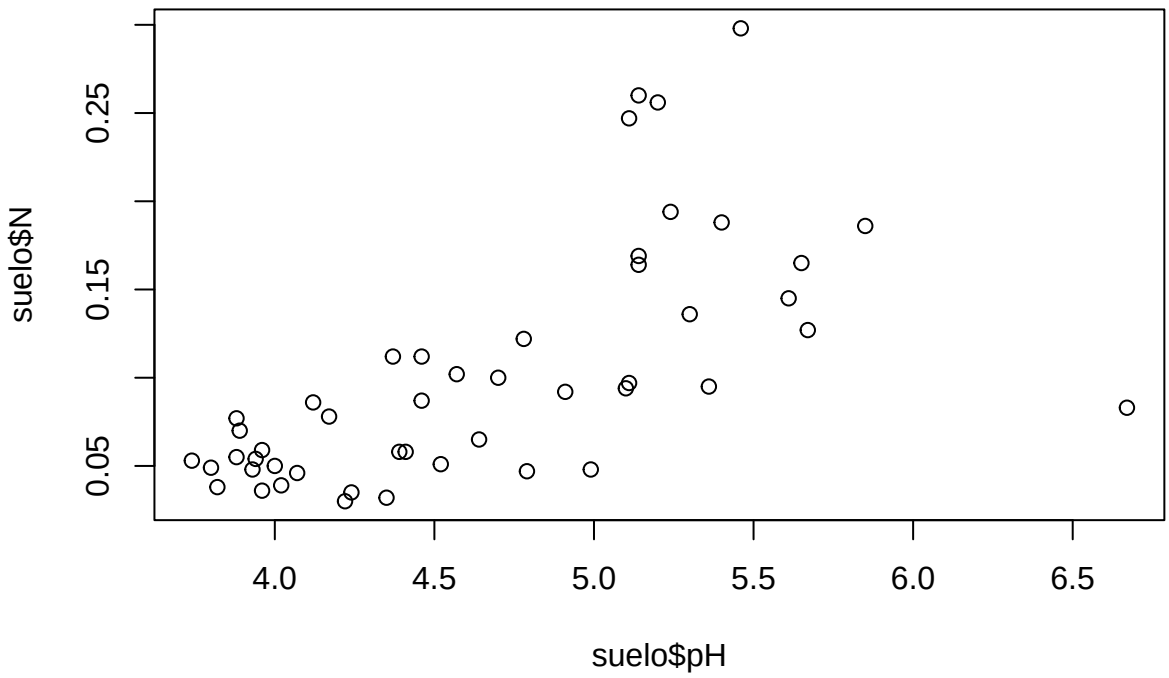
```
##
##  Pearson's product-moment correlation
##
```

```
## data:  suelo$pH and suelo$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
```

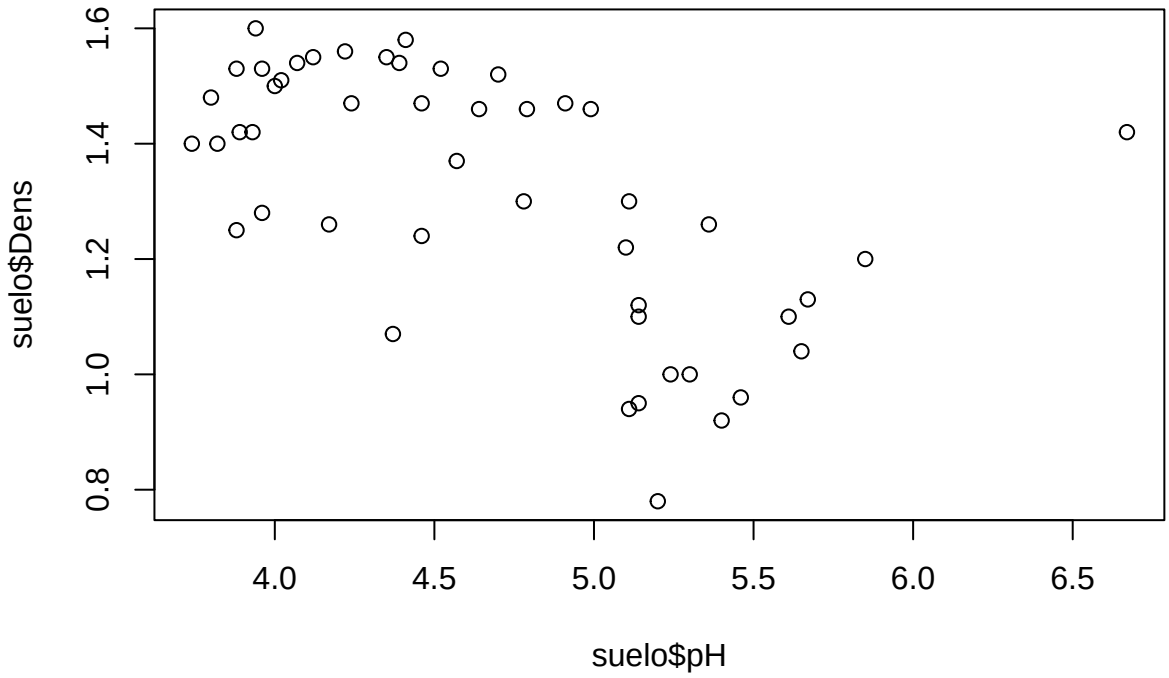
```
CuadroSuelo <- matrix(0,8,3)
colnames(CuadroSuelo) <- (c("Conjunto","r","Valor de P"))
rownames(CuadroSuelo)<- (c("1","2","3","4","5","6","7","8"))

conjunto <- c("pH - N", "pH - Dens", "pH - P", "pH - Ca", "pH - Mg", "pH - K",
              "pH - Na", "pH-Conduc")
CuadroSuelo [, 1] <- conjunto

r <- c("0.636654", "-0.5890264", "0.5910303", "0.8086293", "-0.3957821",
       "0.5795727", "-0.693264","-0.7648104")
CuadroSuelo [, 2] <- r

valordep <- c("0.00000149", "0.00001062", "0.00000974", "0.000000000003614",
              "0.005361", "0.00001585", "0.00000004724","0.0000000002484")
CuadroSuelo [, 3] <- valordep

CuadroSuelo
```

```
##   Conjunto    r            Valor de P
## 1 "pH - N"    "0.636654"   "0.00000149"
## 2 "pH - Dens" "-0.5890264" "0.00001062"
## 3 "pH - P"    "0.5910303"  "0.00000974"
## 4 "pH - Ca"   "0.8086293"  "0.000000000003614"
## 5 "pH - Mg"   "-0.3957821" "0.005361"
## 6 "pH - K"    "0.5795727"  "0.00001585"
## 7 "pH - Na"   "-0.693264"  "0.00000004724"
## 8 "pH-Conduc" "-0.7648104" "0.0000000002484"
```

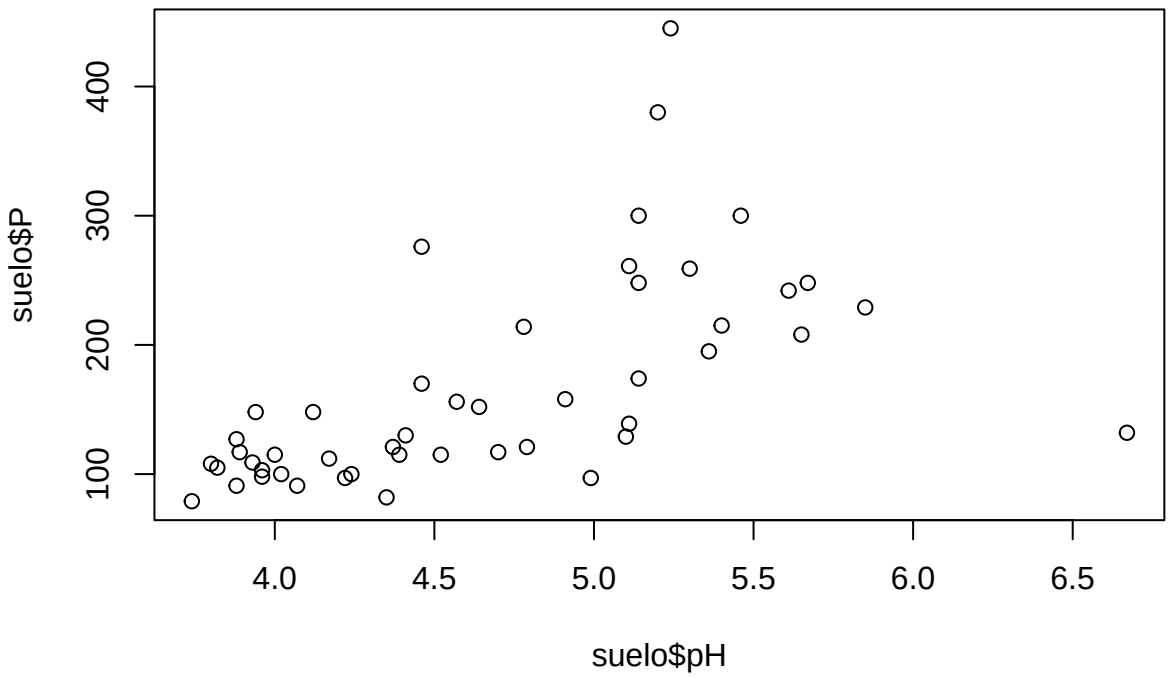
```
plot(suelo$pH, suelo$N)
```



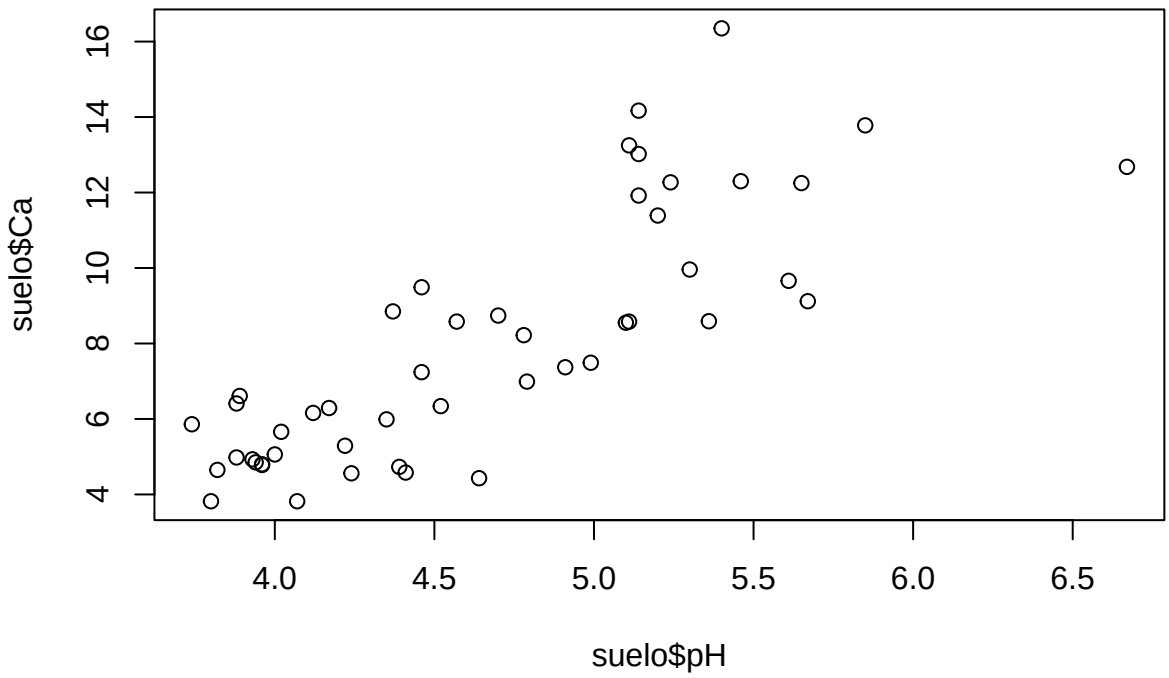

```
plot(suelo$pH, suelo$Dens)
```



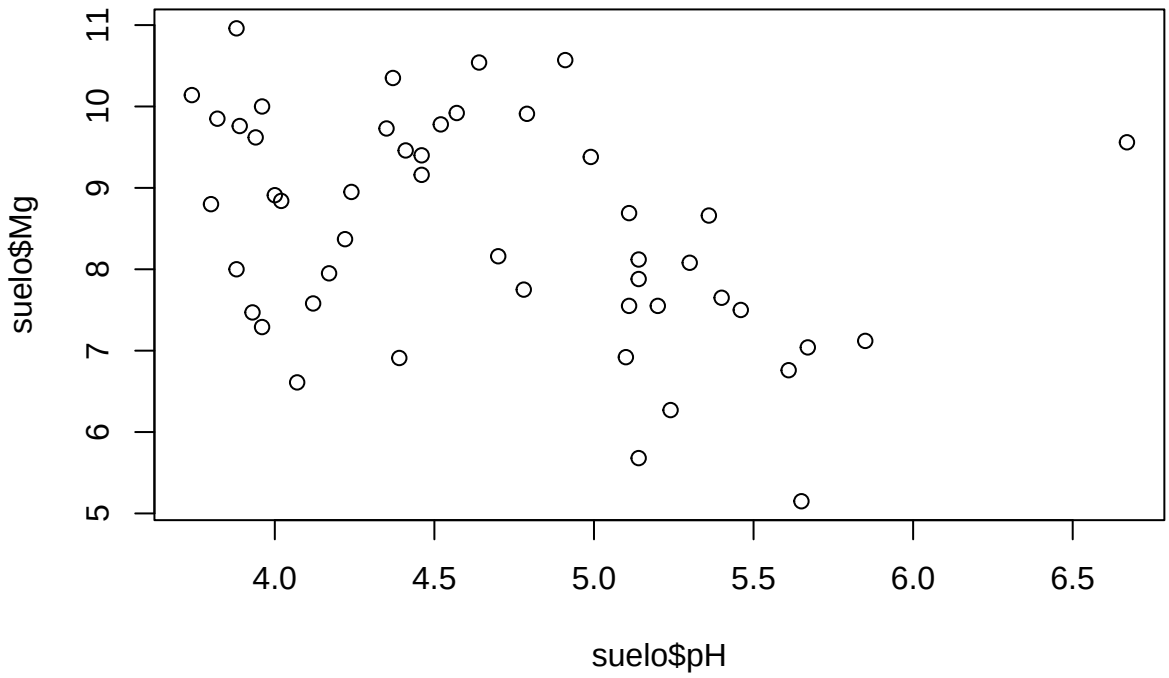

```
plot(suelo$pH, suelo$P)
```



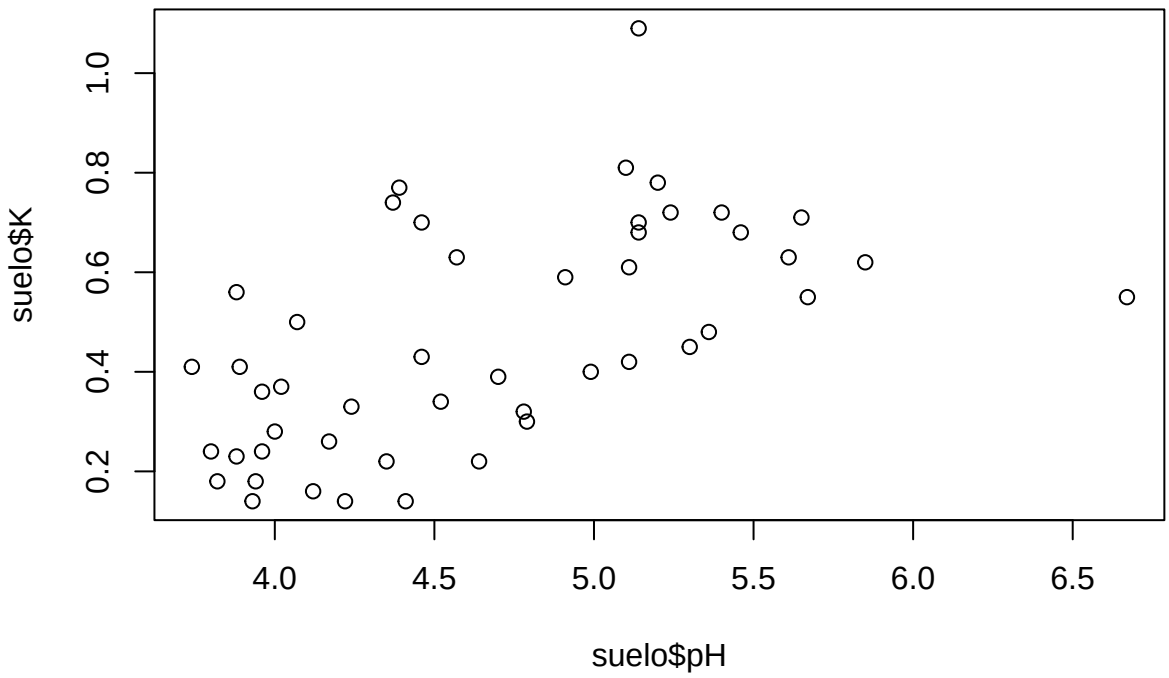

```
plot(suelo$pH, suelo$Ca)
```



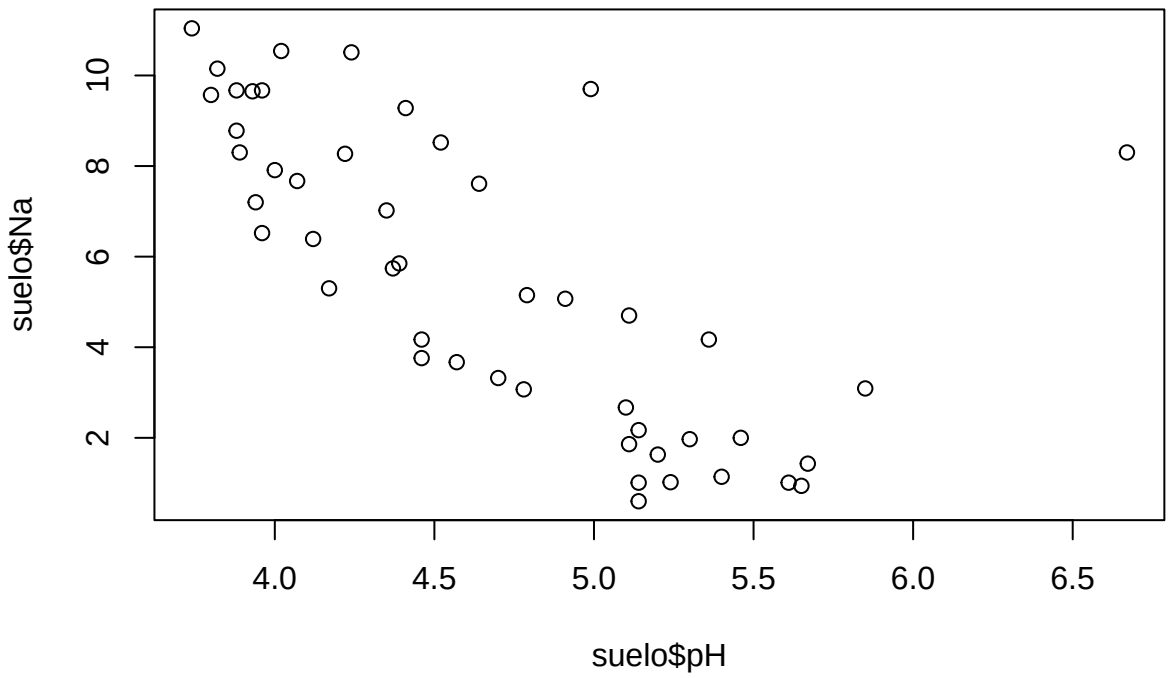

```
plot(suelo$pH, suelo$Mg)
```



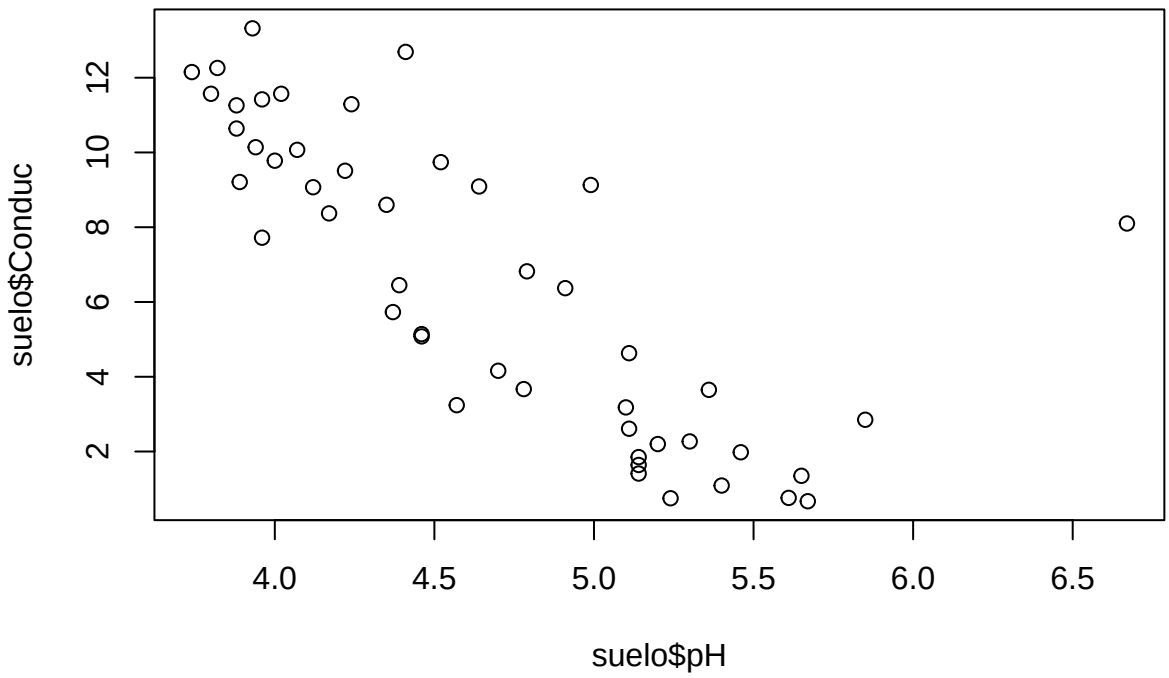

```
plot(suelo$pH, suelo$K)
```




```
plot(suelo$pH, suelo$Na)
```




```
plot(suelo$pH, suelo$Conduc)
```




```
## H0 = No existe una correlacion entre las caracteristicas fisico-quimicas
## del suelo y el pH
## Ha = Existe una correlacion positiva entre las caracteristicas
## fisico-quimicas del suelo y el pH
## Si existe significancia en todos los grupos tratados.
```