Examen-EARM-1685564.R

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```r
#Examen 24032025
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set.seed(42)
n <- 30
altura <- rnorm(n,mean=170, sd=10)
peso <- 0.5 * altura + rnorm(n, mean=0, sd=50)
alturaantes <- rnorm(n, mean = 165, sd=8)
t.test(altura, alturaantes, paired = T)

##
##  Paired t-test
##
## data:  altura and alturaantes
## t = 1.5419, df = 29, p-value = 0.1339
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
##  -1.357901  9.677329
## sample estimates:
## mean difference
##        4.159714

plot(alturaantes)
```
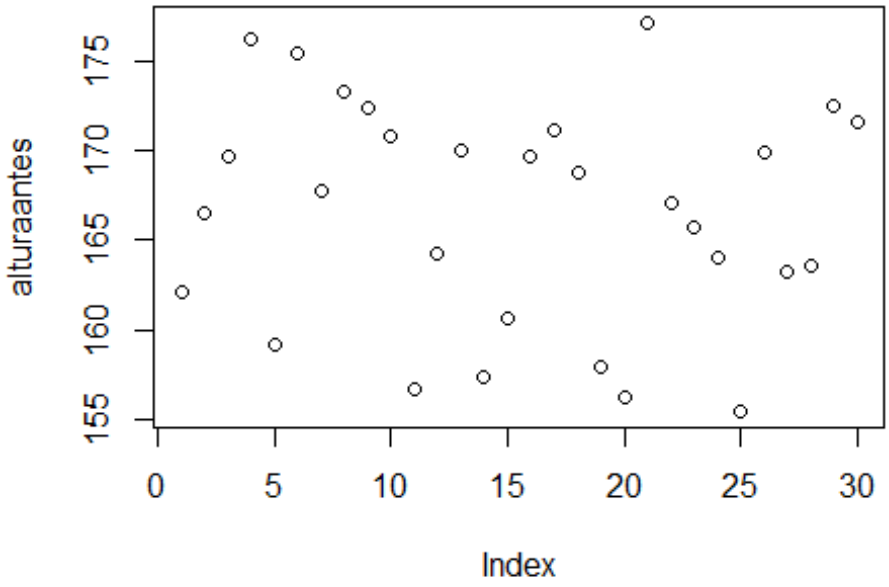
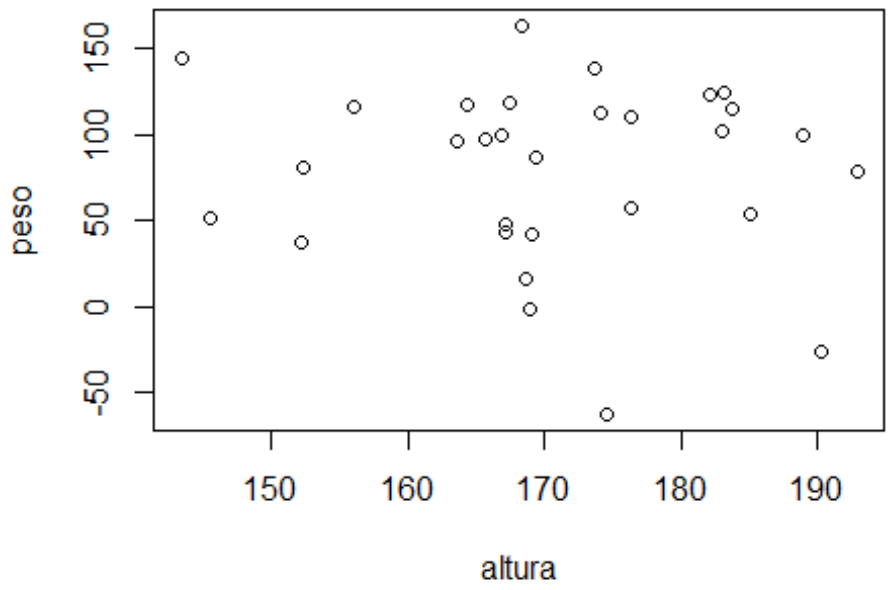




```
# Correlación ------------------------------------------------------------
--

cor.test(altura,peso)

##
##  Pearson's product-moment correlation
##
## data:  altura and peso
## t = -0.45669, df = 28, p-value = 0.6514
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  -0.4328468  0.2830512
## sample estimates:
##         cor
## -0.08598647

plot(altura,peso)
```



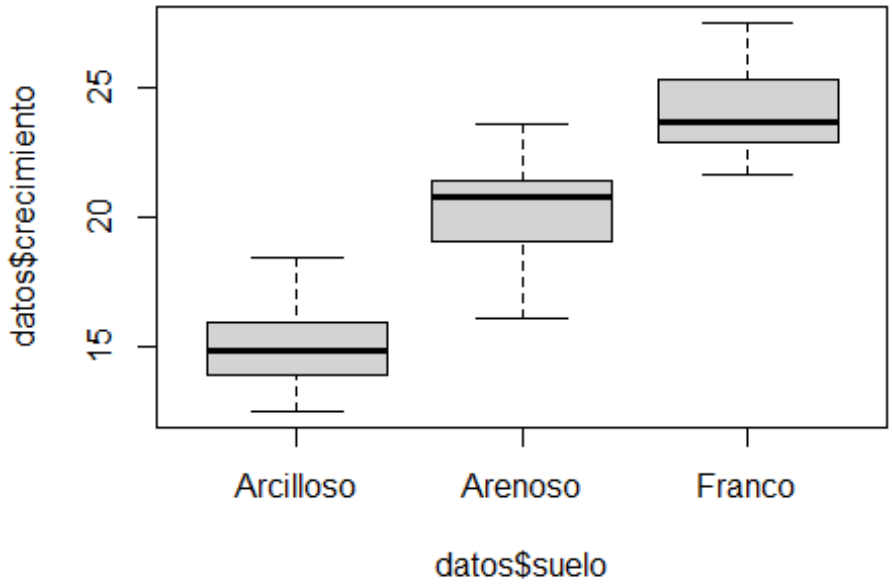

```
# ANOVA ------------------------------------------------------------------
--

set.seed(123)
suelo <- rep(c("Arcilloso","Arenoso", "Franco"), each=10)
crecimiento <- c(
  rnorm(10, mean=15,sd=2),
  rnorm(10, mean=20,sd=2),
  rnorm(10, mean=25,sd=2))

datos <- data.frame(suelo=suelo, crecimiento=crecimiento)
print(datos)

##        suelo crecimiento
## 1  Arcilloso    13.87905
## 2  Arcilloso    14.53965
## 3  Arcilloso    18.11742
## 4  Arcilloso    15.14102
## 5  Arcilloso    15.25858
## 6  Arcilloso    18.43013
## 7  Arcilloso    15.92183
## 8  Arcilloso    12.46988
## 9  Arcilloso    13.62629
## 10 Arcilloso    14.10868
## 11   Arenoso    22.44816
## 12   Arenoso    20.71963
## 13   Arenoso    20.80154
```

```
## 14   Arenoso    20.22137
## 15   Arenoso    18.88832
## 16   Arenoso    23.57383
## 17   Arenoso    20.99570
## 18   Arenoso    16.06677
## 19   Arenoso    21.40271
## 20   Arenoso    19.05442
## 21    Franco    22.86435
## 22    Franco    24.56405
## 23    Franco    22.94799
## 24    Franco    23.54222
## 25    Franco    23.74992
## 26    Franco    21.62661
## 27    Franco    26.67557
## 28    Franco    25.30675
## 29    Franco    22.72373
## 30    Franco    27.50763
```

```
datos.aov<- aov(datos$crecimiento ~ datos$suelo)
summary(datos.aov)
```

```
##             Df Sum Sq Mean Sq F value   Pr(>F)
## datos$suelo  2  409.1   204.5   53.76 3.85e-10 ***
## Residuals   27  102.7     3.8
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
boxplot(datos$crecimiento ~datos$suelo)
```




```
TukeyHSD(datos.aov)

##   Tukey multiple comparisons of means
##     95% family-wise confidence level
##
## Fit: aov(formula = datos$crecimiento ~ datos$suelo)
##
## $`datos$suelo`
##                         diff      lwr       upr     p adj
## Arenoso-Arcilloso 5.267993 3.105081  7.430904 0.0000056
## Franco-Arcilloso  9.001631 6.838720 11.164542 0.0000000
## Franco-Arenoso    3.733638 1.570727  5.896550 0.0005978
```