Universidad Autónoma de Nuevo León

Facultad de Ciencias Forestales

Análisis Estadístico

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Laboratorio 5:

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Primer semestre 21/septiembre/2022

Laboratorio05_JorgeLuna.R

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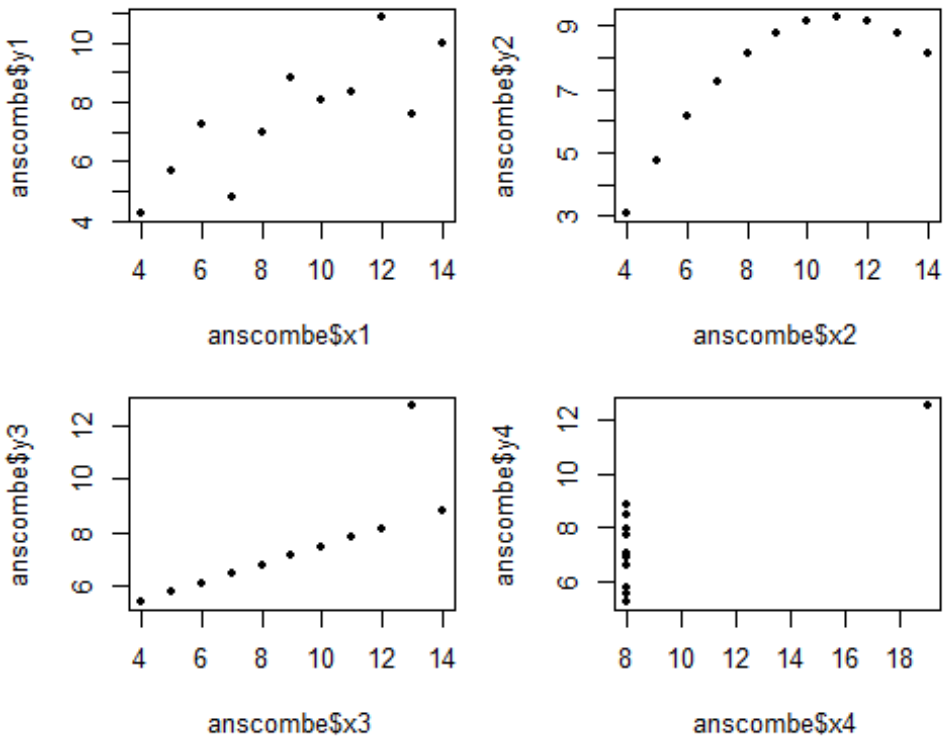
2022-09-21

```
#JORGE ALEXIS LUNA ROBLES
#LABORATORIO 5

# Graficar en un cuadro de 2x2
op = par(mfrow = c(2, 2), mar = c(4.5, 4, 1, 1))
plot(anscombe$x1, anscombe$y1, pch = 20)
plot(anscombe$x2, anscombe$y2, pch = 20)
plot(anscombe$x3, anscombe$y3, pch = 20)
plot(anscombe$x4, anscombe$y4, pch = 20)
```




```
par(op)
op

## $mfrow
## [1] 1 1
##
## $mar
## [1] 5.1 4.1 4.1 2.1

cor.test(anscombe$x1, anscombe$y1)
```

```
##
##  Pearson's product-moment correlation
##
## data:  anscombe$x1 and anscombe$y1
## t = 4.2415, df = 9, p-value = 0.00217
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  0.4243912 0.9506933
## sample estimates:
##       cor
## 0.8164205
```

```
cor.test(anscombe$x2, anscombe$y2)
```

```
##
##  Pearson's product-moment correlation
##
## data:  anscombe$x2 and anscombe$y2
## t = 4.2386, df = 9, p-value = 0.002179
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  0.4239389 0.9506402
## sample estimates:
##       cor
## 0.8162365
```

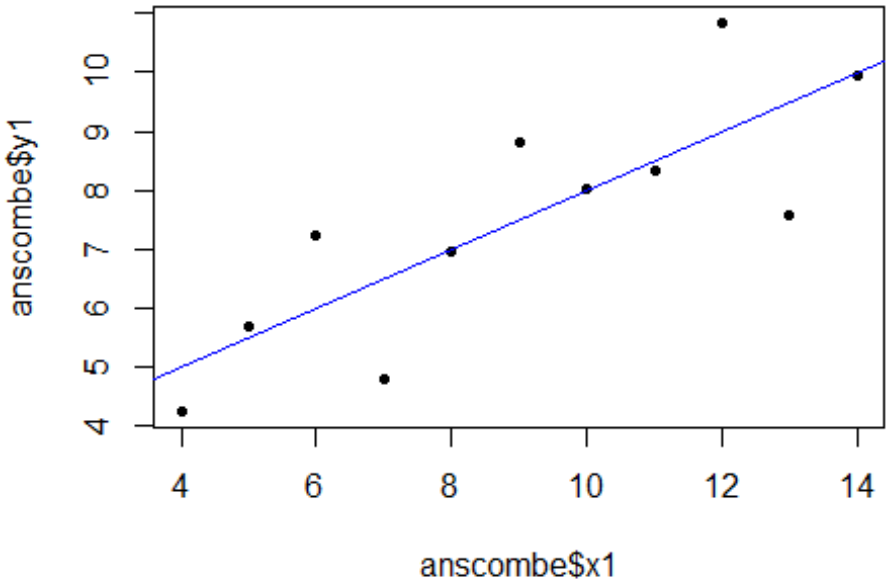
```
cor.test(anscombe$x3, anscombe$y3)
```

```
##
##  Pearson's product-moment correlation
##
## data:  anscombe$x3 and anscombe$y3
## t = 4.2394, df = 9, p-value = 0.002176
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  0.4240623 0.9506547
## sample estimates:
##       cor
## 0.8162867
```

```
cor.test(anscombe$x4, anscombe$y4)
```

```
##
##  Pearson's product-moment correlation
##
## data:  anscombe$x4 and anscombe$y4
## t = 4.243, df = 9, p-value = 0.002165
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  0.4246394 0.9507224
## sample estimates:
```

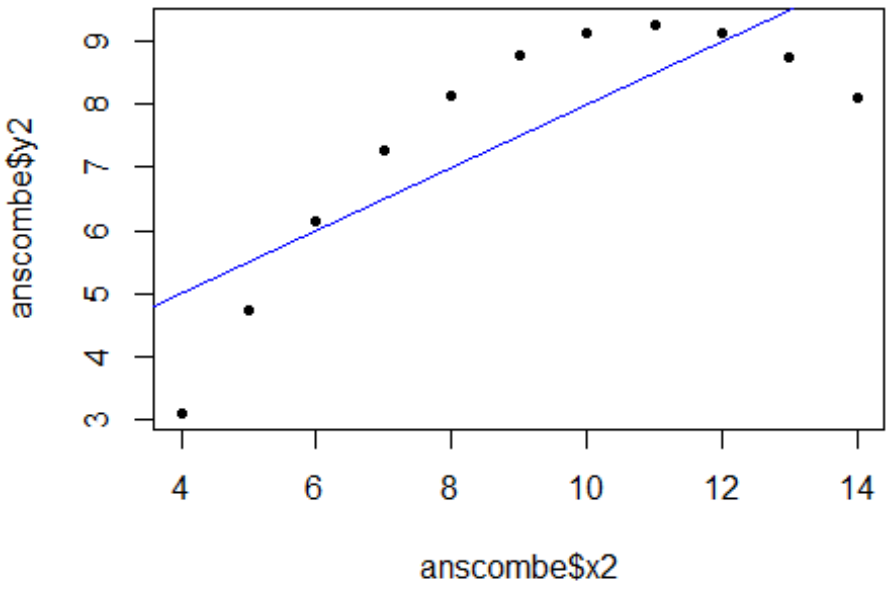
```
##       cor
## 0.8165214

# DATOS 1 ------------------------------------------------------------------
--

datos1 <- matrix(0, length(anscombe$x1),2)
colnames(datos1) <- (c("x","y"))
datos1[,1] <- anscombe$x1
datos1[,2] <- anscombe$y1
datos1

##        x     y
##  [1,] 10  8.04
##  [2,]  8  6.95
##  [3,] 13  7.58
##  [4,]  9  8.81
##  [5,] 11  8.33
##  [6,] 14  9.96
##  [7,]  6  7.24
##  [8,]  4  4.26
##  [9,] 12 10.84
## [10,]  7  4.82
## [11,]  5  5.68

# Modelo lineal (lm)
datos1.lm <- lm(anscombe$y1 ~ anscombe$x1)
plot(anscombe$x1, anscombe$y1, pch= 20)
abline(datos1.lm, col ="BLUE")
```




```
#Examinar la relación que existe entre dos muestras mediante una correlac
ión. R= Se presenta una relacion lineal
#Explore los datos gráficamente y explique. R= en este caso es una correl
acion positiva
# Hipotesis planteadas. R= Hipotesis nula: no se presenta una correlacion
significativa, Hi: si se presenta una correlacion significativa

#Prueba de Shapiro
shapiro.test(anscombe$x1)

##
##  Shapiro-Wilk normality test
##
## data:  anscombe$x1
## W = 0.96839, p-value = 0.8698

#Coeficiente de correlación (r).
cdatos1 <- cor.test(anscombe$x1, anscombe$y1)
cdatos1

##
##  Pearson's product-moment correlation
##
## data:  anscombe$x1 and anscombe$y1
## t = 4.2415, df = 9, p-value = 0.00217
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
```

```
##  0.4243912 0.9506933
## sample estimates:
##       cor
## 0.8164205

summary(datos1.lm)

##
## Call:
## lm(formula = anscombe$y1 ~ anscombe$x1)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.92127 -0.45577 -0.04136  0.70941  1.83882
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)   3.0001     1.1247   2.667  0.02573 *
## anscombe$x1   0.5001     0.1179   4.241  0.00217 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.237 on 9 degrees of freedom
## Multiple R-squared:  0.6665, Adjusted R-squared:  0.6295
## F-statistic: 17.99 on 1 and 9 DF,  p-value: 0.00217

#Reporte los datos
# Respuestas, r=0.8164205; df=9; p-value=0.00217.
# Hipotesis alternativa = se presenta una correlacion si es significativa

# DATOS 2 ------------------------------------------------------------
---
datos2 <- matrix(0,length(anscombe$x2),2)
colnames(datos2) <- (c("x","y"))
datos2[,1] <- anscombe$x2
datos2[,2] <- anscombe$y2
datos2

##        x    y
##  [1,] 10 9.14
##  [2,]  8 8.14
##  [3,] 13 8.74
##  [4,]  9 8.77
##  [5,] 11 9.26
##  [6,] 14 8.10
##  [7,]  6 6.13
##  [8,]  4 3.10
##  [9,] 12 9.13
## [10,]  7 7.26
## [11,]  5 4.74
```

```r
# Modelo lineal (lm)
datos2.lm <- lm(anscombe$y2 ~ anscombe$x2)
plot(anscombe$x2, anscombe$y2, pch= 20)
abline(datos2.lm, col ="BLUE")
```

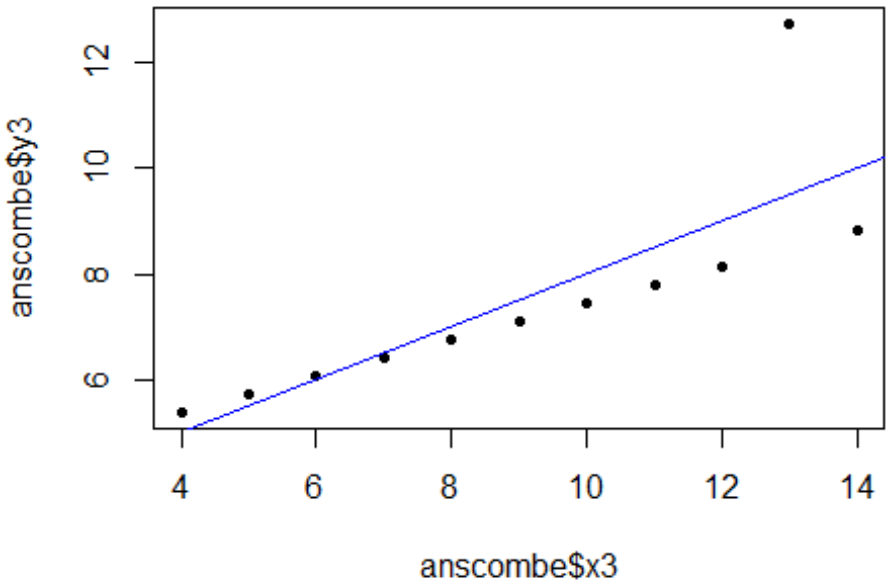



```r
#Examinar la relación que existe entre dos muestras mediante una correlac
ión. R= Se presenta una no relacion lineal
#Explore los datos gráficamente y explique. R= en este caso es una correl
acion no lineal
# Hipotesis planteadas. R= Hipotesis nula: no se presenta una correlacion
significativa, Hi: si se presenta una correlacion significativa

#Prueba de Shapiro
shapiro.test(anscombe$x2)

##
##  Shapiro-Wilk normality test
##
## data:  anscombe$x2
## W = 0.96839, p-value = 0.8698

#Coeficiente de correlación (r).
cdatos2 <- cor.test(anscombe$x2, anscombe$y2)
cdatos2

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

```
## data:  anscombe$x2 and anscombe$y2
## t = 4.2386, df = 9, p-value = 0.002179
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  0.4239389 0.9506402
## sample estimates:
##       cor
## 0.8162365

summary(datos2.lm)

##
## Call:
## lm(formula = anscombe$y2 ~ anscombe$x2)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -1.9009 -0.7609  0.1291  0.9491  1.2691
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)    3.001      1.125   2.667  0.02576 *
## anscombe$x2    0.500      0.118   4.239  0.00218 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.237 on 9 degrees of freedom
## Multiple R-squared:  0.6662, Adjusted R-squared:  0.6292
## F-statistic: 17.97 on 1 and 9 DF,  p-value: 0.002179

#Reporte los datos
# Respuestas, r=0.8162365; df=9; p-value=0.002179.
# Hipotesis alternativa = se presenta una correlacion si es significativa

# DATOS 3 ------------------------------------------------------------
---
datos3 <- matrix(0,length(anscombe$x3),2)
colnames(datos3) <- (c("x","y"))
datos3[,1] <- anscombe$x3
datos3[,2] <- anscombe$y3
datos3

##        x     y
##  [1,] 10  7.46
##  [2,]  8  6.77
##  [3,] 13 12.74
##  [4,]  9  7.11
##  [5,] 11  7.81
##  [6,] 14  8.84
##  [7,]  6  6.08
##  [8,]  4  5.39
```

```
##  [9,] 12  8.15
## [10,]  7  6.42
## [11,]  5  5.73
```

```
# Modelo lineal (lm)
datos3.lm <- lm(anscombe$y3 ~ anscombe$x3)
plot(anscombe$x3, anscombe$y3, pch= 20)
abline(datos3.lm, col ="BLUE")
```

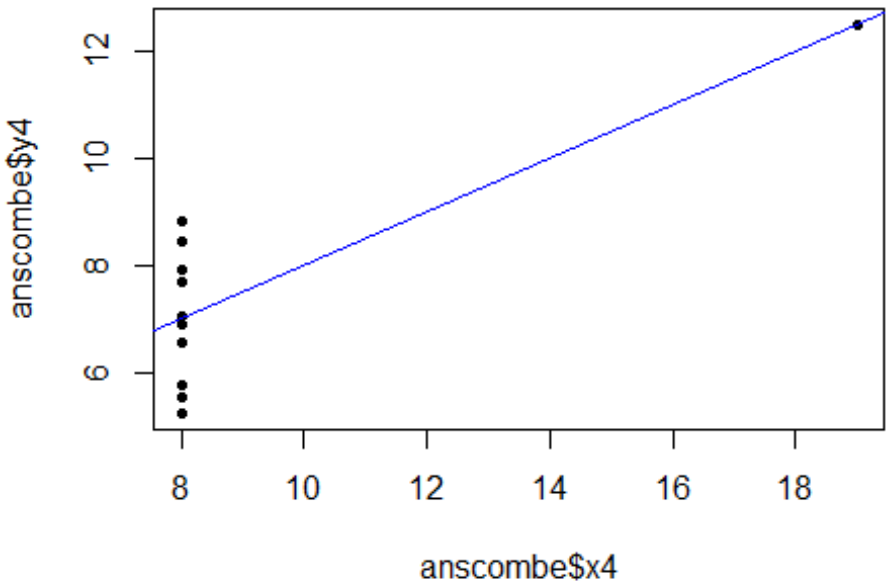



```
#Examinar la relación que existe entre dos muestras mediante una correlac
ión. R= Se presenta una correlacion lineal simple
#Explore los datos gráficamente y explique. R= en este caso es una correl
acion positiva
# Hipotesis planteadas. R= Hipotesis nula: no se presenta una correlacion
significativa, Hi: si se presenta una correlacion significativa

#Prueba de Shapiro
shapiro.test(anscombe$x3)

##
##  Shapiro-Wilk normality test
##
## data:  anscombe$x3
## W = 0.96839, p-value = 0.8698

#Coeficiente de correlación (r).
cdatos3 <- cor.test(anscombe$x3, anscombe$y3)
cdatos3
```

```
##
##  Pearson's product-moment correlation
##
## data:  anscombe$x3 and anscombe$y3
## t = 4.2394, df = 9, p-value = 0.002176
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  0.4240623 0.9506547
## sample estimates:
##       cor
## 0.8162867

summary(datos3.lm)

##
## Call:
## lm(formula = anscombe$y3 ~ anscombe$x3)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -1.1586 -0.6146 -0.2303  0.1540  3.2411
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)   3.0025     1.1245   2.670  0.02562 *
## anscombe$x3   0.4997     0.1179   4.239  0.00218 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.236 on 9 degrees of freedom
## Multiple R-squared:  0.6663, Adjusted R-squared:  0.6292
## F-statistic: 17.97 on 1 and 9 DF,  p-value: 0.002176

#Reporte los datos
# Respuestas, r=0.8162867; df=9; p-value=0.002176.
# Hipotesis alternativa = se presenta una correlacion si es significativa


# Datos 4 ------------------------------------------------------------
--

datos4 <- matrix(0,length(anscombe$x4),2)
colnames(datos4) <- (c("x","y"))
datos4[,1] <- anscombe$x4
datos4[,2] <- anscombe$y4
datos4

##        x     y
##  [1,]  8  6.58
##  [2,]  8  5.76
##  [3,]  8  7.71
```

```
##  [4,]  8  8.84
##  [5,]  8  8.47
##  [6,]  8  7.04
##  [7,]  8  5.25
##  [8,] 19 12.50
##  [9,]  8  5.56
## [10,]  8  7.91
## [11,]  8  6.89
```

```
# Modelo lineal (lm)
datos4.lm <- lm(anscombe$y4 ~ anscombe$x4)
plot(anscombe$x4, anscombe$y4, pch= 20)
abline(datos4.lm, col ="BLUE")
```




```
#Examinar la relación que existe entre dos muestras mediante una correlac
ión. R= Se presenta una correlacion no lineal
#Explore los datos gráficamente y explique. R= en este caso es una correl
acion positiva
# Hipotesis planteadas. R= Hipotesis nula: no se presenta una correlacion
significativa, Hi: si se presenta una correlacion significativa

#Prueba de Shapiro
shapiro.test(anscombe$x4)
```

```
##
##  Shapiro-Wilk normality test
##
```

```
## data:  anscombe$x4
## W = 0.34499, p-value = 2.243e-08
```

```
#Coeficiente de correlación (r).
cdatos4 <- cor.test(anscombe$x4, anscombe$y4)
cdatos4
```

```
##
##  Pearson's product-moment correlation
##
## data:  anscombe$x4 and anscombe$y4
## t = 4.243, df = 9, p-value = 0.002165
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  0.4246394 0.9507224
## sample estimates:
##       cor
## 0.8165214
```

```
summary(datos4.lm)
```

```
##
## Call:
## lm(formula = anscombe$y4 ~ anscombe$x4)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -1.751 -0.831  0.000  0.809  1.839
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)   3.0017     1.1239   2.671  0.02559 *
## anscombe$x4   0.4999     0.1178   4.243  0.00216 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.236 on 9 degrees of freedom
## Multiple R-squared:  0.6667, Adjusted R-squared:  0.6297
## F-statistic:    18 on 1 and 9 DF,  p-value: 0.002165
```

```
#Reporte los datos
# Respuestas, r=0.8165214; df=9; p-value=0.002165.
# Hipotesis alternativa = se presenta una correlacion significativa
```