# Script_Semana5.R

Ramon

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```r
# Script_Semana 5
# 04/09/2025
# Ramón Copado García

# Media movil
data(iris)
head(iris)
```

```
##   Sepal.Length Sepal.Width Petal.Length Petal.Width Species
## 1          5.1         3.5          1.4         0.2  setosa
## 2          4.9         3.0          1.4         0.2  setosa
## 3          4.7         3.2          1.3         0.2  setosa
## 4          4.6         3.1          1.5         0.2  setosa
## 5          5.0         3.6          1.4         0.2  setosa
## 6          5.4         3.9          1.7         0.4  setosa
```

```r
setosa <- subset(iris, Species == "setosa")
setosa
```

```
##    Sepal.Length Sepal.Width Petal.Length Petal.Width Species
## 1           5.1         3.5          1.4         0.2  setosa
## 2           4.9         3.0          1.4         0.2  setosa
## 3           4.7         3.2          1.3         0.2  setosa
## 4           4.6         3.1          1.5         0.2  setosa
## 5           5.0         3.6          1.4         0.2  setosa
## 6           5.4         3.9          1.7         0.4  setosa
## 7           4.6         3.4          1.4         0.3  setosa
## 8           5.0         3.4          1.5         0.2  setosa
## 9           4.4         2.9          1.4         0.2  setosa
## 10          4.9         3.1          1.5         0.1  setosa
## 11          5.4         3.7          1.5         0.2  setosa
## 12          4.8         3.4          1.6         0.2  setosa
## 13          4.8         3.0          1.4         0.1  setosa
## 14          4.3         3.0          1.1         0.1  setosa
## 15          5.8         4.0          1.2         0.2  setosa
## 16          5.7         4.4          1.5         0.4  setosa
## 17          5.4         3.9          1.3         0.4  setosa
## 18          5.1         3.5          1.4         0.3  setosa
## 19          5.7         3.8          1.7         0.3  setosa
## 20          5.1         3.8          1.5         0.3  setosa
## 21          5.4         3.4          1.7         0.2  setosa
```

```
## 22          5.1         3.7          1.5         0.4  setosa
## 23          4.6         3.6          1.0         0.2  setosa
## 24          5.1         3.3          1.7         0.5  setosa
## 25          4.8         3.4          1.9         0.2  setosa
## 26          5.0         3.0          1.6         0.2  setosa
## 27          5.0         3.4          1.6         0.4  setosa
## 28          5.2         3.5          1.5         0.2  setosa
## 29          5.2         3.4          1.4         0.2  setosa
## 30          4.7         3.2          1.6         0.2  setosa
## 31          4.8         3.1          1.6         0.2  setosa
## 32          5.4         3.4          1.5         0.4  setosa
## 33          5.2         4.1          1.5         0.1  setosa
## 34          5.5         4.2          1.4         0.2  setosa
## 35          4.9         3.1          1.5         0.2  setosa
## 36          5.0         3.2          1.2         0.2  setosa
## 37          5.5         3.5          1.3         0.2  setosa
## 38          4.9         3.6          1.4         0.1  setosa
## 39          4.4         3.0          1.3         0.2  setosa
## 40          5.1         3.4          1.5         0.2  setosa
## 41          5.0         3.5          1.3         0.3  setosa
## 42          4.5         2.3          1.3         0.3  setosa
## 43          4.4         3.2          1.3         0.2  setosa
## 44          5.0         3.5          1.6         0.6  setosa
## 45          5.1         3.8          1.9         0.4  setosa
## 46          4.8         3.0          1.4         0.3  setosa
## 47          5.1         3.8          1.6         0.2  setosa
## 48          4.6         3.2          1.4         0.2  setosa
## 49          5.3         3.7          1.5         0.2  setosa
## 50          5.0         3.3          1.4         0.2  setosa
```

```
# Sumatoria acumulativa de la variable longitud
acum <- cumsum(setosa$Sepal.Length)
acum
```

```
##  [1]   5.1  10.0  14.7  19.3  24.3  29.7  34.3  39.3  43.7  48.6  54.0  58.8
## [13]  63.6  67.9  73.7  79.4  84.8  89.9  95.6 100.7 106.1 111.2 115.8 120.9
## [25] 125.7 130.7 135.7 140.9 146.1 150.8 155.6 161.0 166.2 171.7 176.6 181.6
## [37] 187.1 192.0 196.4 201.5 206.5 211.0 215.4 220.4 225.5 230.3 235.4 240.0
## [49] 245.3 250.3
```

```
continuo <- seq(1:length(setosa$Sepal.Length))
continuo
```

```
##  [1]  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
## [26] 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50
```

```
# Crear un data frame con los datos creados
setosa_movil <- data.frame(continuo, acum)
setosa_movil
```

```
##    continuo  acum
## 1         1   5.1
```

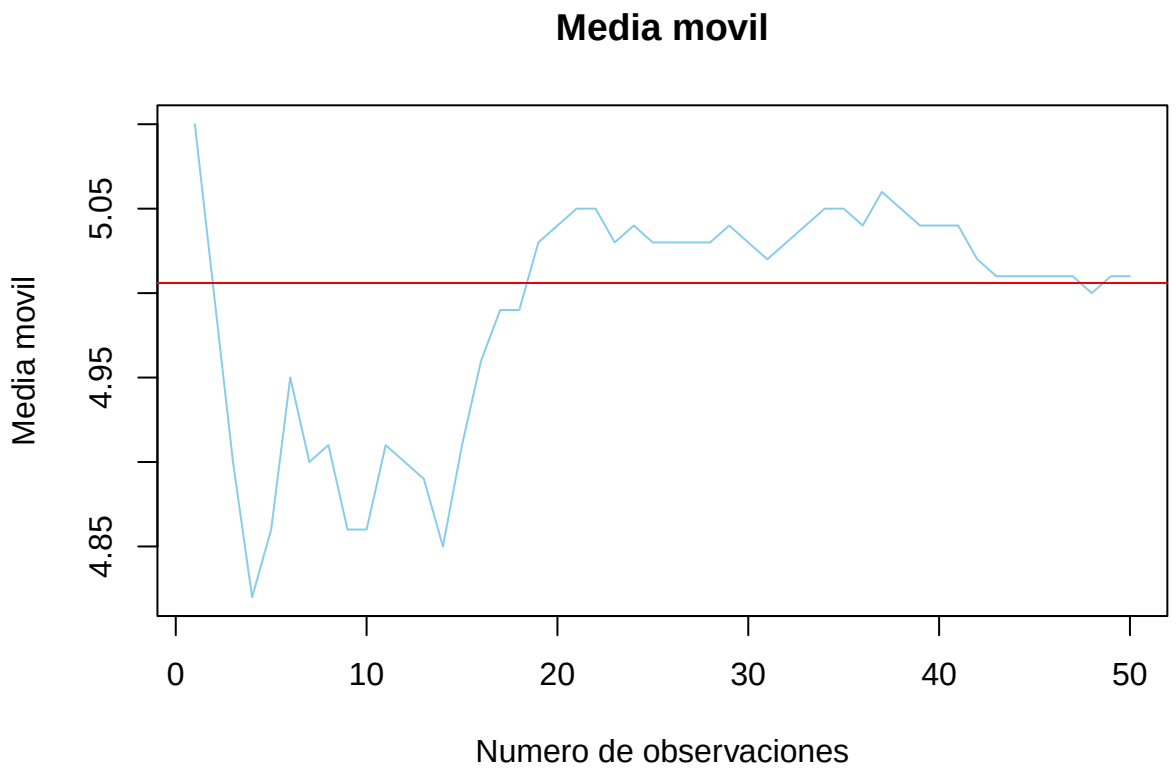
```
## 2         2  10.0
## 3         3  14.7
## 4         4  19.3
## 5         5  24.3
## 6         6  29.7
## 7         7  34.3
## 8         8  39.3
## 9         9  43.7
## 10       10  48.6
## 11       11  54.0
## 12       12  58.8
## 13       13  63.6
## 14       14  67.9
## 15       15  73.7
## 16       16  79.4
## 17       17  84.8
## 18       18  89.9
## 19       19  95.6
## 20       20 100.7
## 21       21 106.1
## 22       22 111.2
## 23       23 115.8
## 24       24 120.9
## 25       25 125.7
## 26       26 130.7
## 27       27 135.7
## 28       28 140.9
## 29       29 146.1
## 30       30 150.8
## 31       31 155.6
## 32       32 161.0
## 33       33 166.2
## 34       34 171.7
## 35       35 176.6
## 36       36 181.6
## 37       37 187.1
## 38       38 192.0
## 39       39 196.4
## 40       40 201.5
## 41       41 206.5
## 42       42 211.0
## 43       43 215.4
## 44       44 220.4
## 45       45 225.5
## 46       46 230.3
## 47       47 235.4
## 48       48 240.0
## 49       49 245.3
## 50       50 250.3
```

```r
# Nueva columna
setosa_movil$movil <- round(acum/continuo, 2)
setosa_movil
```

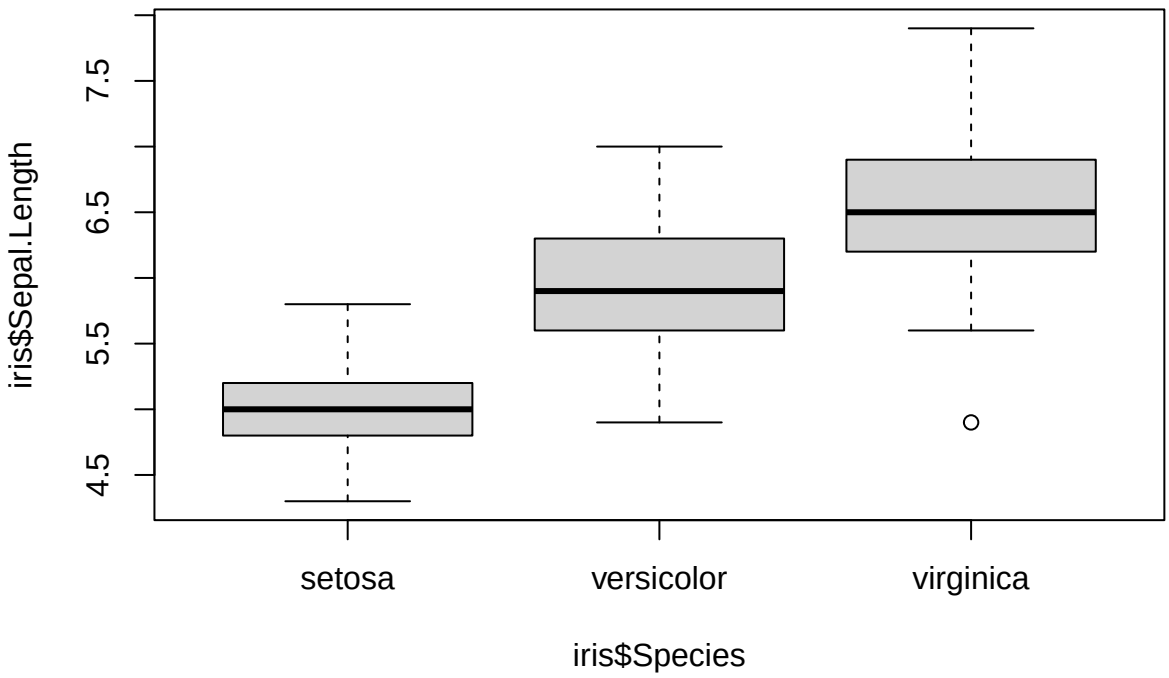
```
##    continuo  acum movil
## 1         1   5.1  5.10
## 2         2  10.0  5.00
## 3         3  14.7  4.90
## 4         4  19.3  4.82
## 5         5  24.3  4.86
## 6         6  29.7  4.95
## 7         7  34.3  4.90
## 8         8  39.3  4.91
## 9         9  43.7  4.86
## 10       10  48.6  4.86
## 11       11  54.0  4.91
## 12       12  58.8  4.90
## 13       13  63.6  4.89
## 14       14  67.9  4.85
## 15       15  73.7  4.91
## 16       16  79.4  4.96
## 17       17  84.8  4.99
## 18       18  89.9  4.99
## 19       19  95.6  5.03
## 20       20 100.7  5.04
## 21       21 106.1  5.05
## 22       22 111.2  5.05
## 23       23 115.8  5.03
## 24       24 120.9  5.04
## 25       25 125.7  5.03
## 26       26 130.7  5.03
## 27       27 135.7  5.03
## 28       28 140.9  5.03
## 29       29 146.1  5.04
## 30       30 150.8  5.03
## 31       31 155.6  5.02
## 32       32 161.0  5.03
## 33       33 166.2  5.04
## 34       34 171.7  5.05
## 35       35 176.6  5.05
## 36       36 181.6  5.04
## 37       37 187.1  5.06
## 38       38 192.0  5.05
## 39       39 196.4  5.04
## 40       40 201.5  5.04
## 41       41 206.5  5.04
## 42       42 211.0  5.02
## 43       43 215.4  5.01
## 44       44 220.4  5.01
## 45       45 225.5  5.01
## 46       46 230.3  5.01
## 47       47 235.4  5.01
## 48       48 240.0  5.00
## 49       49 245.3  5.01
## 50       50 250.3  5.01
```

```r
plot(setosa_movil$continuo, setosa_movil$movil, type= "l",
     main= "Media movil",
```

```
     xlab= "Numero de observaciones",
     ylab= "Media movil",
     col = "skyblue")
abline(h=mean(setosa$Sepal.Length), col= "red2")
```



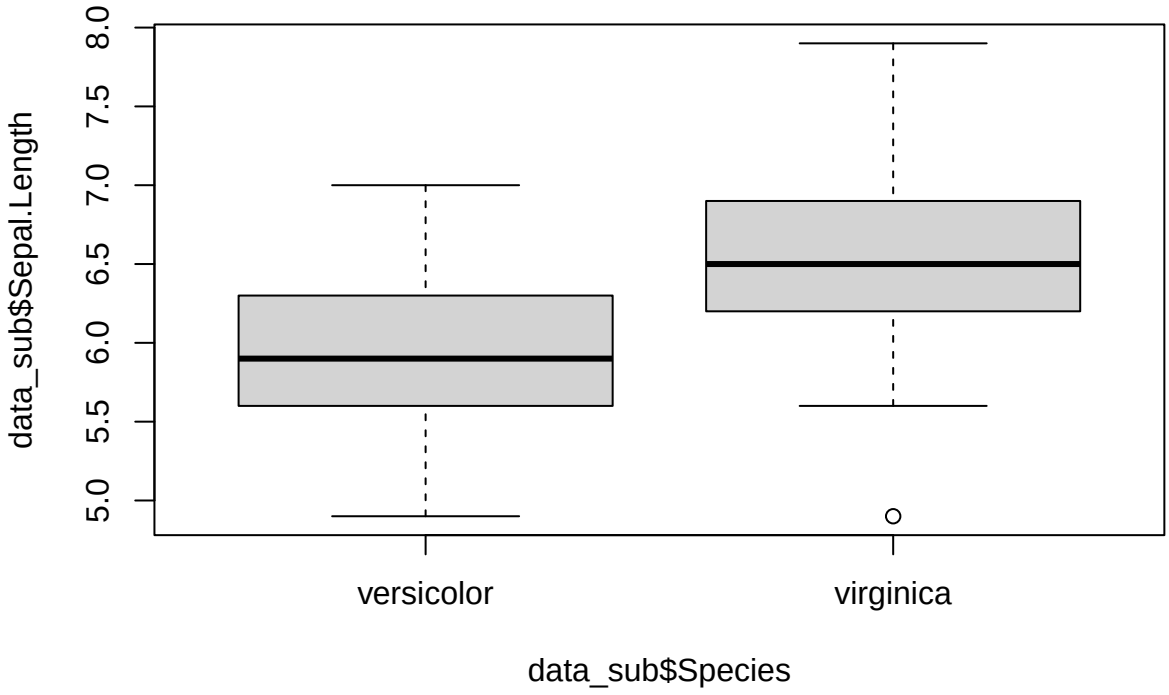

```
# Anlisis iris
boxplot(iris$Sepal.Length ~ iris$Species)
```




```r
data_sub <- subset(iris, Species %in% c("versicolor", "virginica"))

# Eliminar un factor que se desecho de la base de datos original
data_sub$Species <-  droplevels(data_sub$Species)

boxplot(data_sub$Sepal.Length ~ data_sub$Species)
```




```
# HO = La media de SL de virginica es mayor que la media de versicolor
t.test(data_sub$Sepal.Length ~ data_sub$Species,
       alternative = "two.sided", var.equal = T)
```

```
##
##  Two Sample t-test
##
## data:  data_sub$Sepal.Length by data_sub$Species
## t = -5.6292, df = 98, p-value = 1.725e-07
## alternative hypothesis: true difference in means between group versicolor and group virginica is not
## 95 percent confidence interval:
##  -0.8818516 -0.4221484
## sample estimates:
## mean in group versicolor  mean in group virginica
##                    5.936                    6.588
```

```
# p value es = 1, la diferencia es significativa

5.936-6.588
```

```
## [1] -0.652
```

```
tapply(data_sub$Sepal.Length, data_sub$Species, mean)
```

```
## versicolor  virginica
##      5.936      6.588
```

```
tapply(data_sub$Sepal.Length, data_sub$Species, t.test)
```

```
## $versicolor
##
##  One Sample t-test
##
## data:  X[[i]]
## t = 81.318, df = 49, p-value < 2.2e-16
## alternative hypothesis: true mean is not equal to 0
## 95 percent confidence interval:
##  5.789306 6.082694
## sample estimates:
## mean of x
##     5.936
##
##
## $virginica
##
##  One Sample t-test
##
## data:  X[[i]]
## t = 73.259, df = 49, p-value < 2.2e-16
## alternative hypothesis: true mean is not equal to 0
## 95 percent confidence interval:
##  6.407285 6.768715
## sample estimates:
## mean of x
##     6.588
```

```
# datos DE PRODUCCION DE SEMILLA

prod <- read.csv("C:/Users/Ramon/Documents/Posgrado_Estadistica_2025/1_Scripts/mainproduccion.csv")
head(prod)
```

```
##   Tiempo Kgsem BioRama  Germ    H6
## 1  T2012 10.01   47.72 29.16 13.86
## 2  T2012 11.02   52.30 35.59 18.82
## 3  T2012 15.23   50.42 39.79 15.54
## 4  T2012  8.66   52.95 29.61 13.92
## 5  T2012  9.83   52.19 29.77  8.92
## 6  T2012 16.54   49.87 16.49  7.36
```

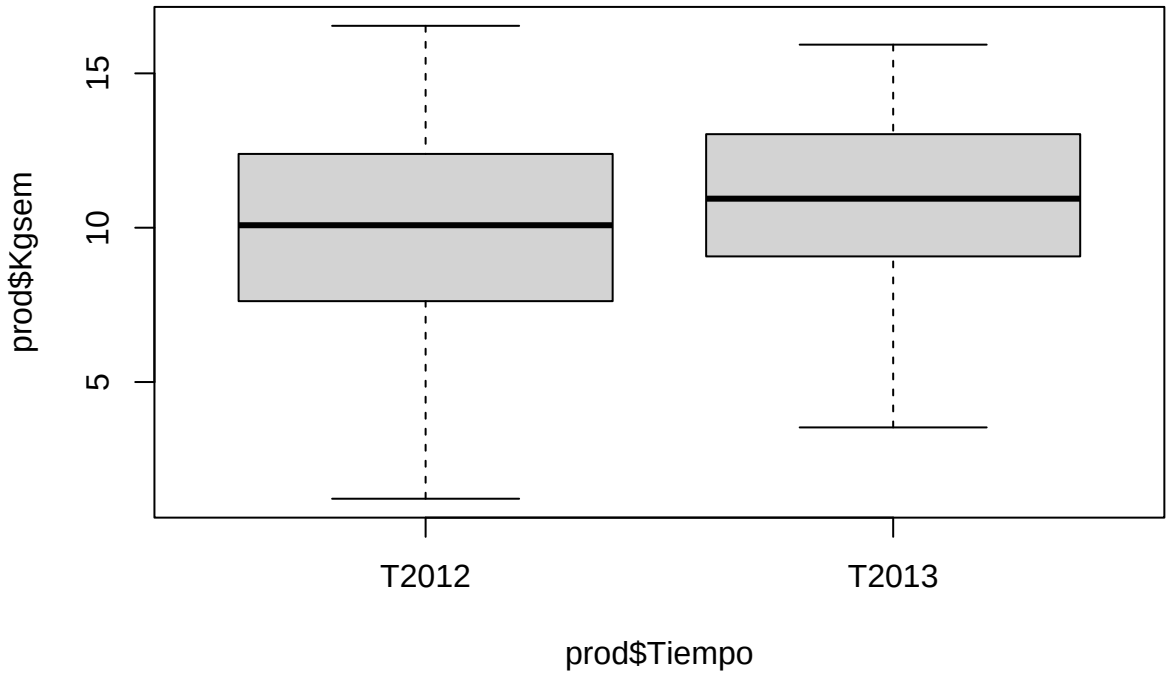
```
getwd()
```

```
## [1] "C:/Users/Ramon/Documents/Posgrado_Estadistica_2025/1_Scripts"
```

```
prod$Tiempo <- as.factor(prod$Tiempo)
head(prod)
```

```
##   Tiempo Kgsem BioRama  Germ    H6
## 1  T2012 10.01   47.72 29.16 13.86
## 2  T2012 11.02   52.30 35.59 18.82
## 3  T2012 15.23   50.42 39.79 15.54
## 4  T2012  8.66   52.95 29.61 13.92
## 5  T2012  9.83   52.19 29.77  8.92
## 6  T2012 16.54   49.87 16.49  7.36
```

```
boxplot(prod$Kgsem ~ prod$Tiempo)
```




```
tapply(prod$Kgsem, prod$Tiempo, mean)
```

```
##   T2012   T2013
## 10.1066 10.8954
```

```
10.1066-10.8954
```

```
## [1] -0.7888
```

```
# Hipotesis nula = no hay diferencias significativas entre las medias de la produccion
# de semilla de cada año

# Hipotesis alternativa = hay diferencias significativas entre las medias
```

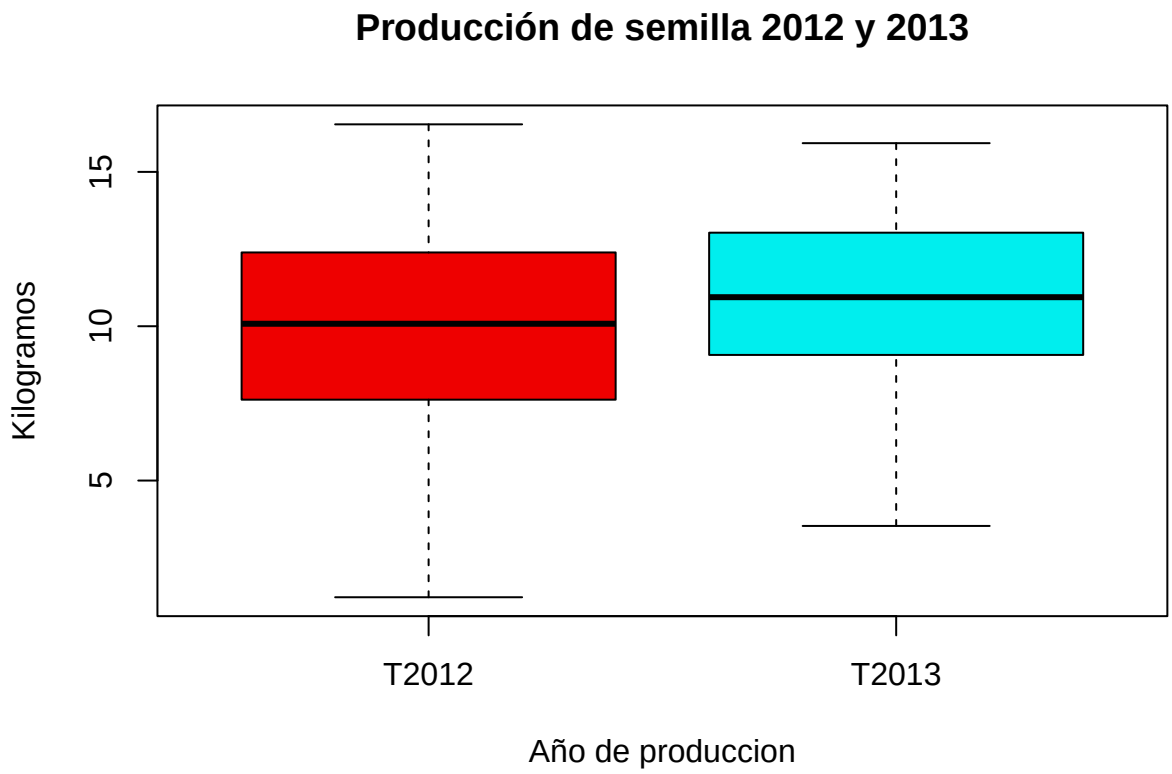
```r
t2012 <- subset(prod$Kgsem, prod$Tiempo == "T2012")
t2013 <- subset(prod$Kgsem, prod$Tiempo == "T2013")

t.test(t2012, t2013,
       alterantive = "two.sided",
       var.equal = T,
       paired = T)
```

```
##
##  Paired t-test
##
## data:  t2012 and t2013
## t = -1.2538, df = 49, p-value = 0.2159
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
##  -2.0530953  0.4754953
## sample estimates:
## mean difference
##         -0.7888
```

```r
# El valor de p es mayor a 0.05, por lo que no se rechaza la hipótesis nula.
# Esto indica que no existen diferencias significativas entre las medias de
# producción de semilla entre los años 2012 y 2013.

boxplot(prod$Kgsem ~ prod$Tiempo,
        main = "Producción de semilla 2012 y 2013",
        xlab= "Año de produccion",
        ylab= "Kilogramos",
        col = c("red2", "cyan2"))
```




```
t.test(t2012, t2013,
       alterantive = "less",
       var.equal = T,
       paired = T)
```

```
##
##  Paired t-test
##
## data:  t2012 and t2013
## t = -1.2538, df = 49, p-value = 0.2159
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
##  -2.0530953  0.4754953
## sample estimates:
## mean difference
##         -0.7888
```

```
# OTRA VEZ SETOSA

mean(setosa$Sepal.Width)
```

```
## [1] 3.428
```

```r
# mu = 3.9 media teorética

# Ho = la diferencia entre las medias es igual a cero o = a 3.9
# H1 = la diferencia entre media teoretica y experimental es diferente a cero
# o difernete a 3.9

t.test(setosa$Sepal.Width, mu = 3.9)
```

```
##
##  One Sample t-test
##
## data:  setosa$Sepal.Width
## t = -8.8047, df = 49, p-value = 1.155e-11
## alternative hypothesis: true mean is not equal to 3.9
## 95 percent confidence interval:
##  3.320271 3.535729
## sample estimates:
## mean of x
##     3.428
```