Plot 3D

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Librerias

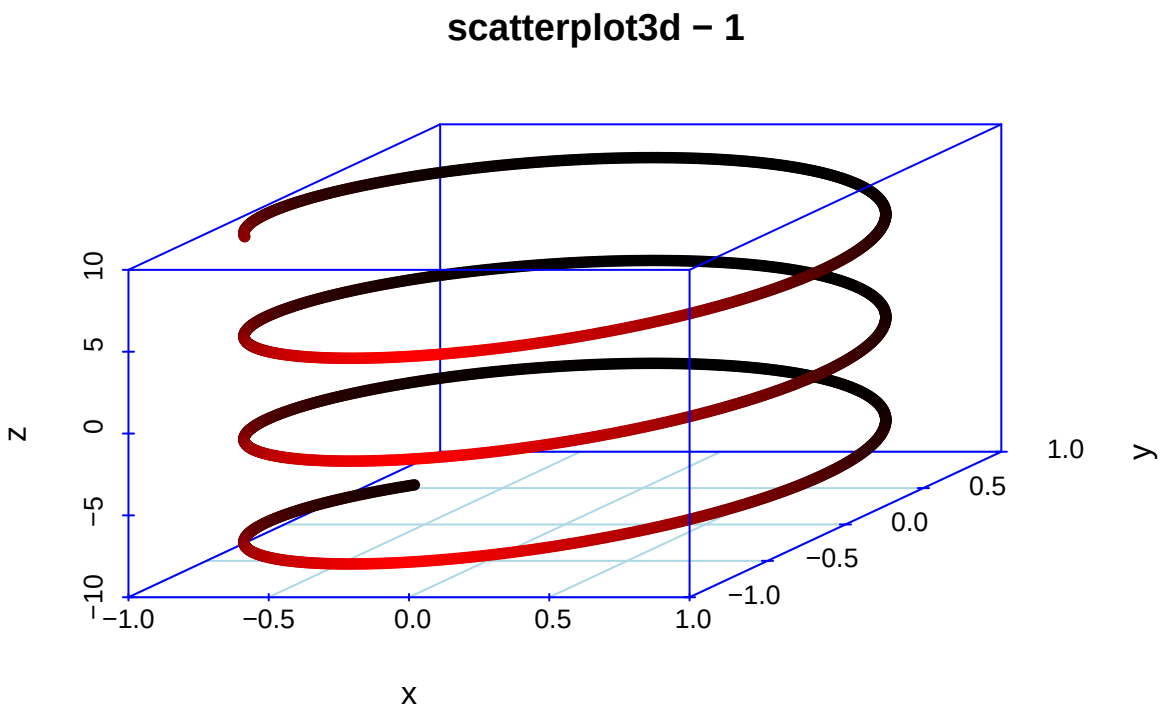
```
library(scatterplot3d)
```

```
## Warning: le package 'scatterplot3d' a été compilé avec la version R 4.2.3
```

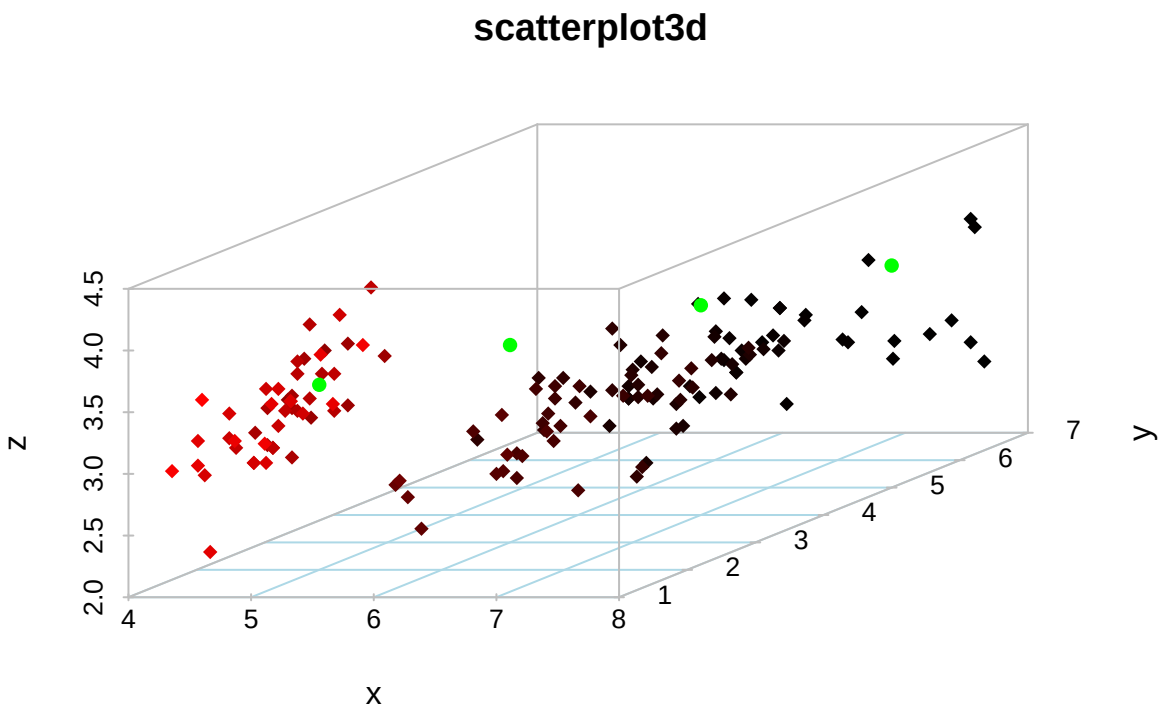
```
library(rgl)
```

```
## Warning: le package 'rgl' a été compilé avec la version R 4.2.3
```

```
z = seq(-10, 10, 0.01)
x = cos(z)
y = sin(z)
scatterplot3d(x, y, z, highlight.3d=TRUE, col.axis="blue",
              col.grid="lightblue", main="scatterplot3d - 1", pch=20)
```



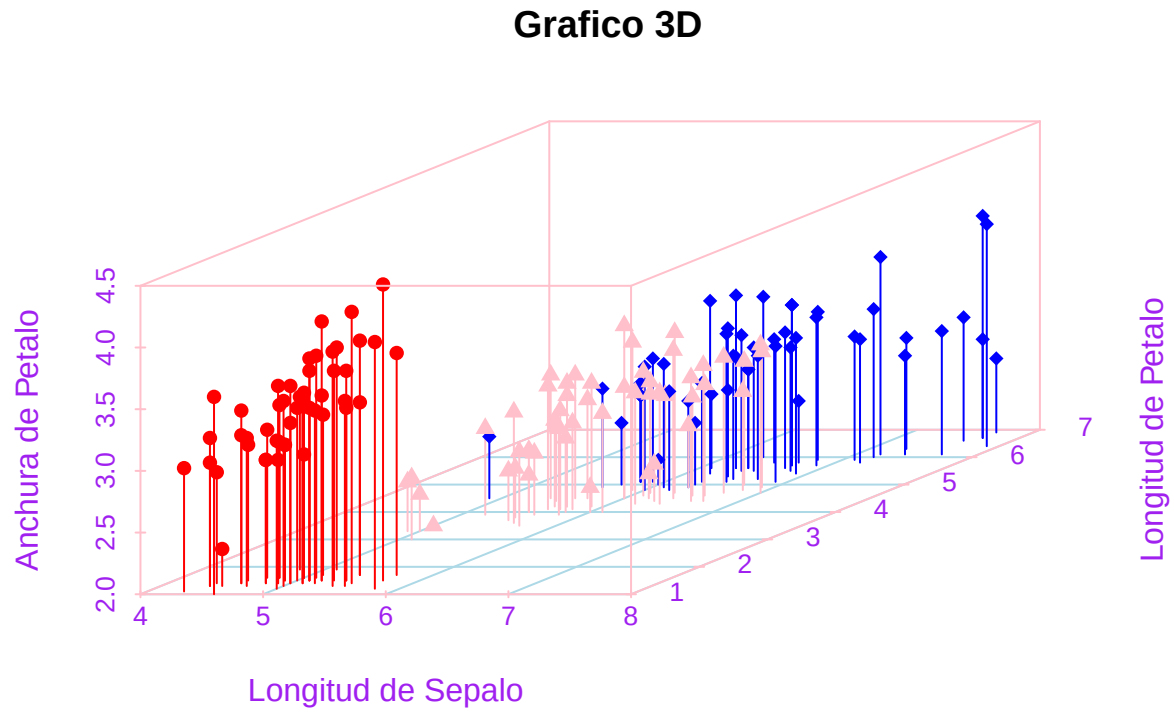

```
data(iris)
x= iris$Sepal.Length
y= iris$Petal.Length
z = iris$Sepal.Width
a = scatterplot3d(x, y, z, highlight.3d = TRUE, col.axis="grey", col.grid="lightblue",
                  main="scatterplot3d ", pch=18)
a$points3d(seq(5,8,1), seq(2,5,1), seq(3.5,3.8,0.1), col="green", pch=16)
```



EJERCICIO 1

```
x= iris$Sepal.Length
y= iris$Petal.Length
z = iris$Sepal.Width

# colores
colors <- c("setosa" = "red", "versicolor" = "pink", "virginica" = "blue")
col_vector <- colors[as.character(iris$Species)]

# shape
shapes = c(16, 17, 18)
shapes <- shapes[as.numeric(iris$Species)]

# Créer le graphique 3D
scatterplot3d(x, y, z, color = col_vector,
              pch = shapes,
              type = "h",
              main = "Grafico 3D",
              sub = "Base de datos iris",
              xlab = "Longitud de Sepalo",
              ylab = "Longitud de Petalo",
              zlab = "Anchura de Petalo",
```

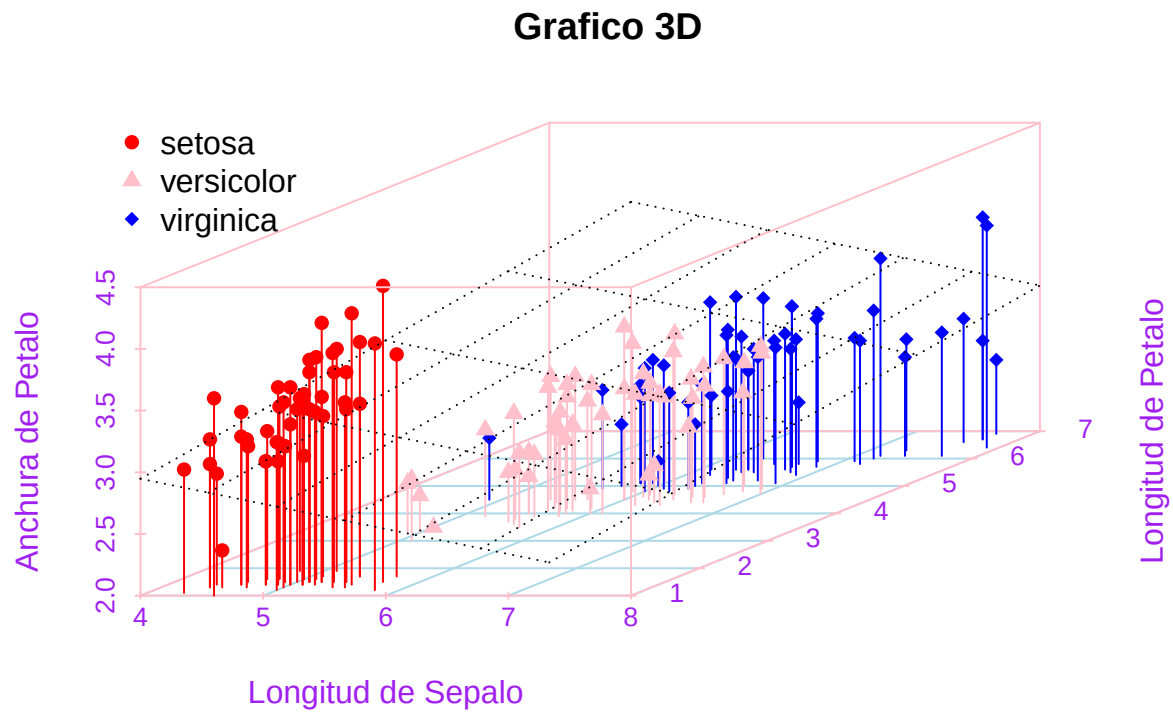
```
              col.axis = "pink",
              col.grid = "lightblue",
              col.lab = "purple")
```



Ejercicio 2

```
lmodel = lm(z~ x +y)
S3D = scatterplot3d(x, y, z, color = col_vector,
                    pch = shapes,
                    type = "h",
                    main = "Grafico 3D",
                    sub = "Base de datos iris",
                    xlab = "Longitud de Sepalo",
                    ylab = "Longitud de Petalo",
                    zlab = "Anchura de Petalo",
                    col.axis = "pink",
                    col.grid = "lightblue",
                    col.lab = "purple")

legend("topleft",
       legend = levels(iris$Species),
       col = c("red", "pink", "blue"),
```

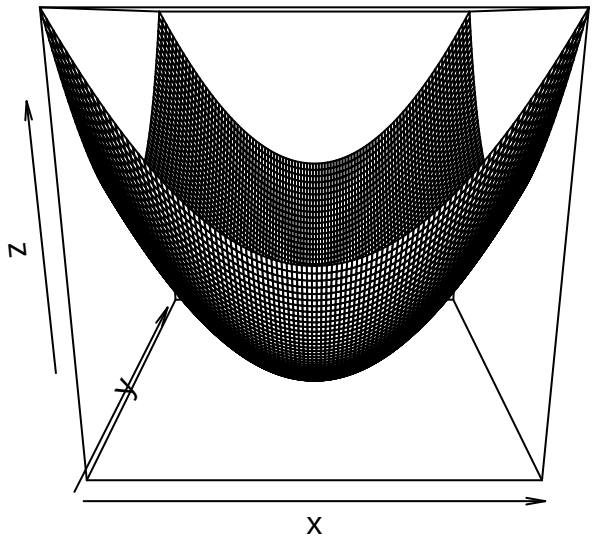
```
       pch = c(16,17,18),
       bty="n")

S3D$plane3d(lmodel, lty = "dotted", col = "black")
```



Base de datos iris

Grafico de funciones

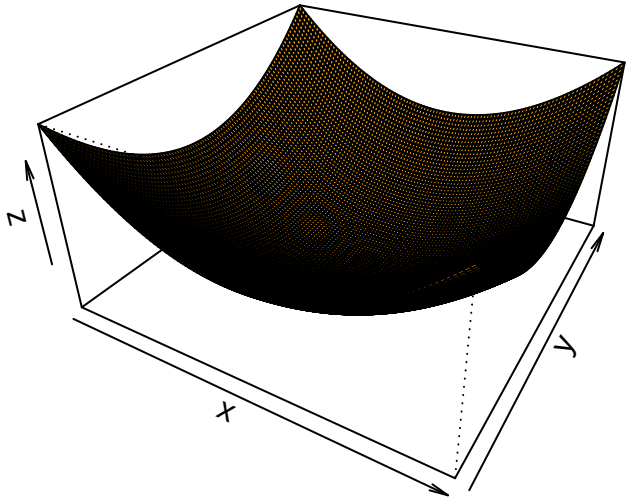
```
x=seq(-3,3,length=100)
y=seq(-3,3,length=100)

parabola = function(x,y) {x^2+y^2}
z=outer(x, y, parabola)
persp(x,y,z)
```



Pour rendre ça un peu plus joli

```
ecuacionParab = expression(z == x^2 + y^2)
persp(x,y,z,theta = 30, phi = 30,expand=0.5, col = "orange",
      main="Paraboloide", sub=ecuacionParab, col.main="blue")
```

Paraboloide



$$z = x^2 + y^2$$

```
persp3d(x,y,z,theta = 30, phi = 30,expand=0.5, col = rainbow(100),
          main="Paraboloide", sub=ecuacionParab, col.main="blue")
```