Máster Universitario en Estadística Computacional y Ciencia de Datos para la Toma de Decisiones

Asignatura: Técnicas de Visualización de Datos

Mapas

Alumna: Laura Rodríguez

Previo a crear el mapa con ggplot…

Librería

Before creating the map with ggplot…

Library

```
library(ggplot2)
library(maps)
library(tidyr)
library(dplyr)
library(paletteer)
```

Create a vector with the names of the European countries

Creamos un vector con los nombres de los países de Europa

```
europa_paises<-c('Portugal', 'Spain', 'France', 'Switzerland', 'Germany','Austria',
                 'UK', 'Netherlands', 'Denmark','Poland', 'Italy','Croatia',
                 'Slovenia','Hungary', 'Slovakia', 'Czech Republic','Sweden','Finland',
                 'Norway', 'Estonia', 'Lithuania', 'Ukraine','Belarus','Romania','Belgium',
                 'Bulgaria','Greece', 'Moldova','Latvia', 'Luxembourg', 'Serbia',
                 'Bosnia and Herzegovina','North Macedonia', 'Montenegro', 'Albania',
                 'Ireland', 'Kosovo')
```

```
datos<-map_data('world', region=europa_paises)
```

Determine the average coordinates per country

Determinamos las coordenadas promedio por país

```
coord=map_data('world', region=europa_paises) %>%
  group_by(region)%>%
  summarize(long = mean(long, na.rm=T), lat=mean(lat, na.rm=T),
            group=group)
coord<-coord %>%
  distinct(region, long, lat, .keep_all=TRUE)
head(coord)
```

Create a dataframe for capitals

Crear un df para capitales.

```
capital_datos <- data.frame (long= c(-9.13333, -3.70256, 2.3488,
                                     11.71819),
                             lat = c (38.7166,40.4165,
                                      48.85341,45.583835),
                             ciudades <- c("Lisboa","Madrid",
                                           "Paris","Roma"))%>% summarise(long = long, lat = lat,region = ciudades, group =c(1,1,1,1))
```

Create a vector for the sea/ocean indicating the image from the exercise

Creamos el vector para mar/océano que señala la imagen del ejercicio.

```
oceano <- data.frame (long= c(-5, -7), lat = c (70, 45),
                      agua <- c('Oceano \n Atlántico', 'Mar Cantábrico'))%>%
  summarise(long = long, lat = lat,region = agua, group = c(1,1))
mar <- data.frame (long= c(0,-1),lat= c (60, 36),
                      agua <- c('Mar del\n Norte','Mar \n Mediterráneo'))%>%
  summarise(long = long, lat = lat,region = agua, group = c(1,1))
```

Create the plot with ggplot:

a) The name of all countries should appear in the corresponding place (size 3).
b) Each country should appear in a different color.
c) The border line of each country should be white.

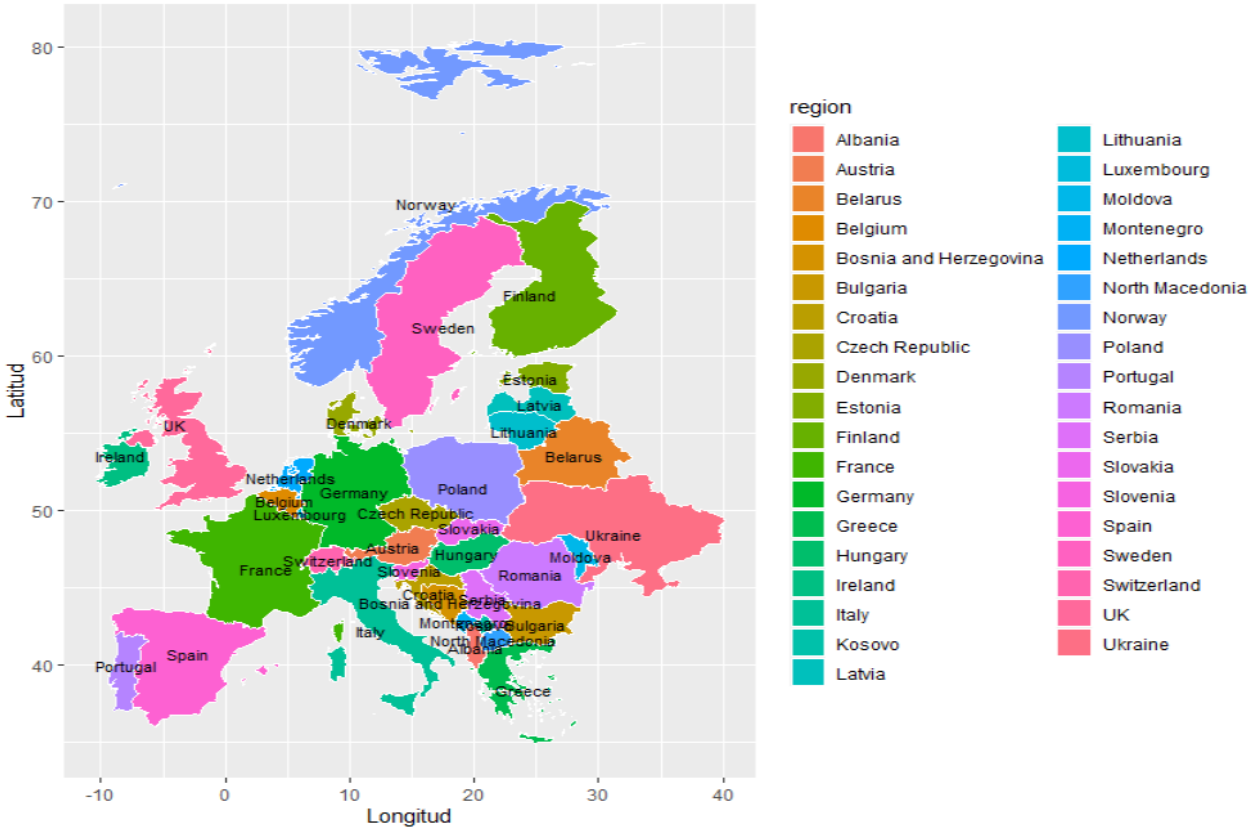
Crear el gráfico con ggplot:

a) Debe aparecer el nombre de todos los países en el lugar correspondiente (tamaño 3).

b) Cada país debe aparecer de un color diferente.

c) La línea de fronteras de cada país debe ser blanca.

```
ggplot(datos,aes(x=long, y = lat, group = group, col = group, fill =region)) +
geom_polygon(color = "white") + xlab("Longitud")+ylab("Latitud")+
geom_text(data = coord, aes(long, lat, label = region, group =group), size = 3, color= "Black")
```



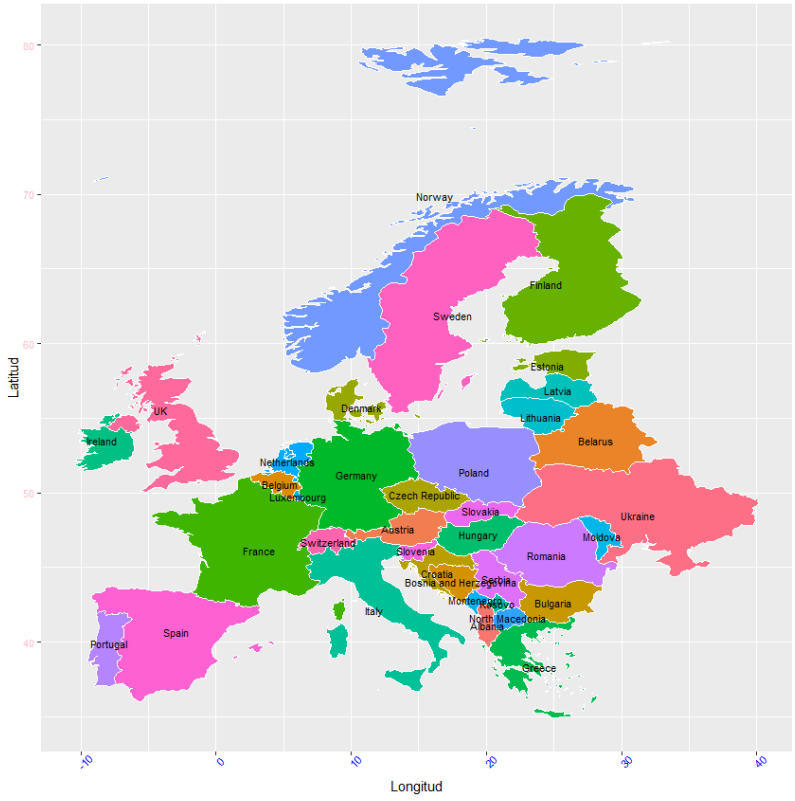
d) X-axis label = Longitude, format: size 8, blue, rotated 45 degrees
e) Y-axis label = Latitude, format: size 8, pink
f) Remove the legend

d) Etiqueta Eje X=Longitud, Formato: Tamaño 8, azul, inclinación 45 grados.

e) Etiqueta Eje Y=Latitud, Formato: Tamaño 8, rosa.

f) Eliminar leyenda.

```
ggplot(datos,aes(x=long, y = lat, group = group, col = group, fill =region)) +
  geom_polygon(color = "white") + xlab("Longitud")+ylab("Latitud")+
  geom_text(data = coord, aes(long, lat, label = region, group =group), size = 3, color= "Black") +
  theme( axis.text.x = element_text(size = 8,colour = "blue",angle =45),
         axis.text.y = element_text(size = 8, colour = "pink")) +
  theme(legend.position = "none")
```



g) Add 4 capitals (size 4 in red): "Lisbon", "Madrid", "Paris", "Rome" with coordinates respectively:
Longitude: -9.1333300, -3.70256, 2.3488, 11.71819
Latitude: 38.71667, 40.4165, 48.85341, 45.58383
Add a red point corresponding to each of the 4 capitals

h) Remove the grid and the map background

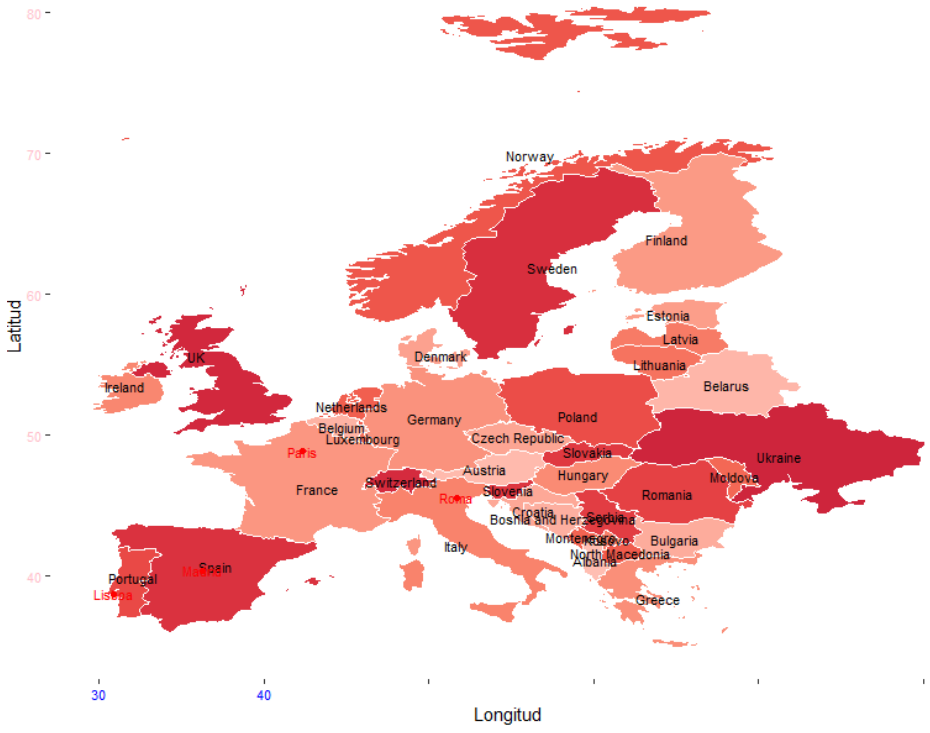
i) Change the color palette

g) Incorporar 4 capitales (tamaño 4 en rojo): "Lisboa", "Madrid", "Paris", "Roma" cuyas coordenadas son respectivamente: Longitud: -9.1333300, -3.70256, 2.3488, 11.71819 Latitud: 38.71667,40.4165, 48.85341,45.58383 Incorpora un punto rojo correspondiente a cada una de las 4 capitales.

h) Elimina la cuadrícula y el fondo del mapa.

i) Cambia la paleta de colores.

```
ggplot(datos,aes(x=long, y = lat, group = group, col = group, fill =region)) +
  geom_polygon(color = "white") + xlab("Longitud")+ylab("Latitud")+
  geom_text(data = coord, aes(long, lat, label = region, group =group), size = 3, color= "Black") +
  theme( axis.text.x = element_text(size = 8,colour = "blue",hjust =45),
         axis.text.y = element_text(size = 8, colour = "pink")) +
  theme(legend.position = "none")+
  geom_point(data=capital_datos, aes(long, lat, group = group),color="red")+
  annotate("text", x=capital_datos$long, y=capital_datos$lat,label=capital_datos$region, size=3, color="Red")+
  theme(panel.background = element_blank())
  scale_fill_manual(values=paletteer_c("ggthemes::Red", 50))
```



To complete the final visualization, add the seas/oceans, the plot title, and color the x-axis title.

Ya para cumplir con la visualización final, se añade los mares/océanos/el título del gráfico/color en título de x.

```
ggplot(datos,aes(x=long, y = lat, group = group, col = group, fill =region)) +
  geom_polygon(color = "white") + xlab("Longitud")+ylab("Latitud")+
  geom_text(data = coord, aes(long, lat, label = region, group =group), size = 3, color= "Black") +
  theme( axis.text.x = element_text(size = 8,colour = "blue",angle =45),
         axis.text.y = element_text(size = 8, colour = "pink"),
         axis.title.x= element_text(colour= "red"))+
  theme(legend.position = "none")+
  geom_point(data=capital_datos, aes(long, lat, group = group),color="red")+
  annotate("text", x=capital_datos$long, y=capital_datos$lat,label=capital_datos$region, size=3, color="Red")+
  theme(panel.background = element_blank())+
  scale_fill_manual(values=paletteer_c("ggthemes::Red", 50)) +
  ggtitle("Mapa de Europa",subtitle = "Algunas capital_datos")+
  annotate("text", x = oceano$long , y = oceano$lat, label= oceano$region, size = 4, fontface = "bold")+
  annotate("text", x = mar$long , y = mar$lat, label= mar$region,size = 4, angle= 45, fontface = "bold")+
  theme(panel.border= element_rect(fill = NA))
```