PPGCOMP - FURG | 23148P - Data Visualization and Exploratory Data Analysis | 02/2024

This notebook contains the solution for Task 06 of the course 23148P - Data Visualization and Exploratory Data Analysis - 02/2024 of the Graduate Program in Computing at FURG (PPGCOMP-FURG).

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The repository with the notebooks can be accessed here!

Solutions:

Verify the installation of necessary packages.

In [1]:
```
if (!requireNamespace("ggplot2", quietly = TRUE)) install.packages("ggplot2")
if (!requireNamespace("tidyverse", quietly = TRUE)) install.packages("tidyverse")
if (!requireNamespace("RColorBrewer", quietly = TRUE)) install.packages("RColorBrewer")
if (!requireNamespace("showtext", quietly = TRUE)) install.packages("showtext")
if (!requireNamespace("scales", quietly = TRUE)) install.packages("scales")
```

Load necessary packages.

In [2]:
```
library(ggplot2)
library(tidyverse)
library(RColorBrewer)
library(showtext)
library(scales)
```

```
── Attaching core tidyverse packages ──────────────────────── tidyverse 2.0.0 ──
✔ dplyr     1.1.4     ✔ readr     2.1.5
✔ forcats   1.0.0     ✔ stringr   1.5.1
✔ lubridate 1.9.3     ✔ tibble    3.2.1
✔ purrr     1.0.2     ✔ tidyr     1.3.1
── Conflicts ────────────────────────────────────────── tidyverse_conflicts() ──
✖ dplyr::filter() masks stats::filter()
✖ dplyr::lag()    masks stats::lag()
ℹ Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to become errors
Carregando pacotes exigidos: sysfonts

Carregando pacotes exigidos: showtextdb


Anexando pacote: 'scales'


O seguinte objeto é mascarado por 'package:purrr':

    discard


O seguinte objeto é mascarado por 'package:readr':

    col_factor
```

Tidy Data:

Reading the Data:

In [3]:
```r
my.data <- data.frame(read.csv("../task-05/data_mortalidade_Regiao.csv"))

head(my.data)
```

A data.frame: 6 × 15

	Região	Menor.1.ano	X1.a.4.anos	X5.a.9.anos	X10.a.14.anos	X15.a.19.anos	X20.a.29.anos	X30.a.39.anos	X40.a.49.anos	X50.a.59.anos	X60.a
	<chr>	<int>	<int>	<int>	<int>	<int>	<int>	<int>	<int>	<int>	
1	Norte	4587	843	428	581	2006	6571	7851	10968	15768	
2	Nordeste	10036	1442	856	1250	5767	18603	23930	36101	54654	
3	Sudeste	11107	1671	917	1230	4767	19943	33991	62972	111710	
4	Sul	3436	577	345	426	1753	7199	11681	20897	38562	
5	Centro-Oeste	2690	488	220	312	1291	4520	7749	13037	19996	
6	Total	31856	5021	2766	3799	15584	56836	85202	143975	240690	

Remove `Total` line:

In [4]:
```
linha<-c(6)
df <- my.data[-linha,]
head(df)
```

A data.frame: 5 × 15

	Região	Menor.1.ano	X1.a.4.anos	X5.a.9.anos	X10.a.14.anos	X15.a.19.anos	X20.a.29.anos	X30.a.39.anos	X40.a.49.anos	X50.a.59.anos	X60.a
	<chr>	<int>	<int>	<int>	<int>	<int>	<int>	<int>	<int>	<int>	
1	Norte	4587	843	428	581	2006	6571	7851	10968	15768	
2	Nordeste	10036	1442	856	1250	5767	18603	23930	36101	54654	
3	Sudeste	11107	1671	917	1230	4767	19943	33991	62972	111710	
4	Sul	3436	577	345	426	1753	7199	11681	20897	38562	
5	Centro-Oeste	2690	488	220	312	1291	4520	7749	13037	19996	

Rename age group columns by range:

In [5]:
```
df <- rename(df, '<1' = 'Menor.1.ano')
df <- rename(df, '1~4' = 'X1.a.4.anos')
df <- rename(df, '5~9' = 'X5.a.9.anos')
df <- rename(df, '10~14' = 'X10.a.14.anos')
df <- rename(df, '15~19' = 'X15.a.19.anos')
df <- rename(df, '20~29' = 'X20.a.29.anos')
df <- rename(df, '30~39' = 'X30.a.39.anos')
df <- rename(df, '40~49' = 'X40.a.49.anos')
df <- rename(df, '50~59' = 'X50.a.59.anos')
df <- rename(df, '60~69' = 'X60.a.69.anos')
df <- rename(df, '70~79' = 'X70.a.79.anos')
df <- rename(df, '>80' = 'X80.anos.e.mais')
df <- rename(df, 'Ignorada' = 'Idade.ignorada')

head(df)
```

A data.frame: 5 × 15

	Região	<1	1~4	5~9	10~14	15~19	20~29	30~39	40~49	50~59	60~69	70~79	>80	Ignorada	Total
	<chr>	<int>	<int>	<int>	<int>	<int>	<int>	<int>	<int>	<int>	<int>	<int>	<int>	<int>	<int>
1	Norte	4587	843	428	581	2006	6571	7851	10968	15768	21996	22996	25750	265	120610
2	Nordeste	10036	1442	856	1250	5767	18603	23930	36101	54654	73504	88836	127921	553	443453
3	Sudeste	11107	1671	917	1230	4767	19943	33991	62972	111710	170579	184709	239754	1276	844626
4	Sul	3436	577	345	426	1753	7199	11681	20897	38562	58271	66363	80627	177	290314
5	Centro-Oeste	2690	488	220	312	1291	4520	7749	13037	19996	25781	27160	30296	106	133646

Remove `Total` column:

In [6]:
```
df$Total <- NULL

head(df)
```

A data.frame: 5 × 14

	Região	<1	1~4	5~9	10~14	15~19	20~29	30~39	40~49	50~59	60~69	70~79	>80	Ignorada
	<chr>	<int>	<int>	<int>	<int>	<int>	<int>	<int>	<int>	<int>	<int>	<int>	<int>	<int>
1	Norte	4587	843	428	581	2006	6571	7851	10968	15768	21996	22996	25750	265
2	Nordeste	10036	1442	856	1250	5767	18603	23930	36101	54654	73504	88836	127921	553
3	Sudeste	11107	1671	917	1230	4767	19943	33991	62972	111710	170579	184709	239754	1276
4	Sul	3436	577	345	426	1753	7199	11681	20897	38562	58271	66363	80627	177
5	Centro-Oeste	2690	488	220	312	1291	4520	7749	13037	19996	25781	27160	30296	106

Transforming the data frame `df` from `wide` to `long` format:

In [7]:
```
df_long <- df %>%
  pivot_longer(cols = -Região, names_to = "FaixaEtaria", values_to = "TotalMortes")

head(df_long)
```

A tibble: 6 × 3

Região	FaixaEtaria	TotalMortes
<chr>	<chr>	<int>
Norte	<1	4587
Norte	1~4	843
Norte	5~9	428
Norte	10~14	581
Norte	15~19	2006
Norte	20~29	6571

Reordering by age group:

In [8]:
```
df_long$FaixaEtaria <- factor(df_long$FaixaEtaria, levels = c(
    "<1", "1~4", "5~9", "10~14", "15~19", "20~29", "30~39", "40~49",
    "50~59", "60~69", "70~79", ">80", "Ignorada"
    ))

head(df_long)
```

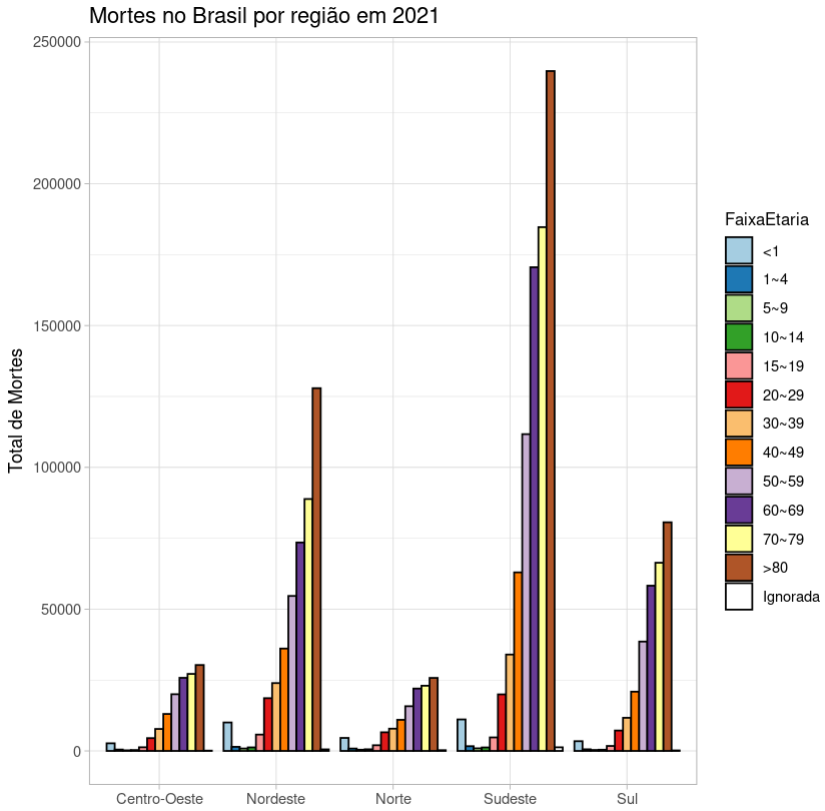
A tibble: 6 × 3

Região	FaixaEtaria	TotalMortes
<chr>	<fct>	<int>
Norte	<1	4587
Norte	1~4	843
Norte	5~9	428
Norte	10~14	581
Norte	15~19	2006
Norte	20~29	6571

Exercise 1:

In [9]:
```
ggplot(df_long, aes(x = Região, y = TotalMortes, fill = FaixaEtaria)) +
  geom_bar(stat = "identity", position = "dodge",color="black") +
  labs(title = "Mortes no Brasil por região em 2021", x = "", y = "Total de Mortes") +
  scale_fill_brewer(palette = "Paired") +
  theme_light() +
  theme(legend.position = "right", legend.title = element_text(size = 10))
```

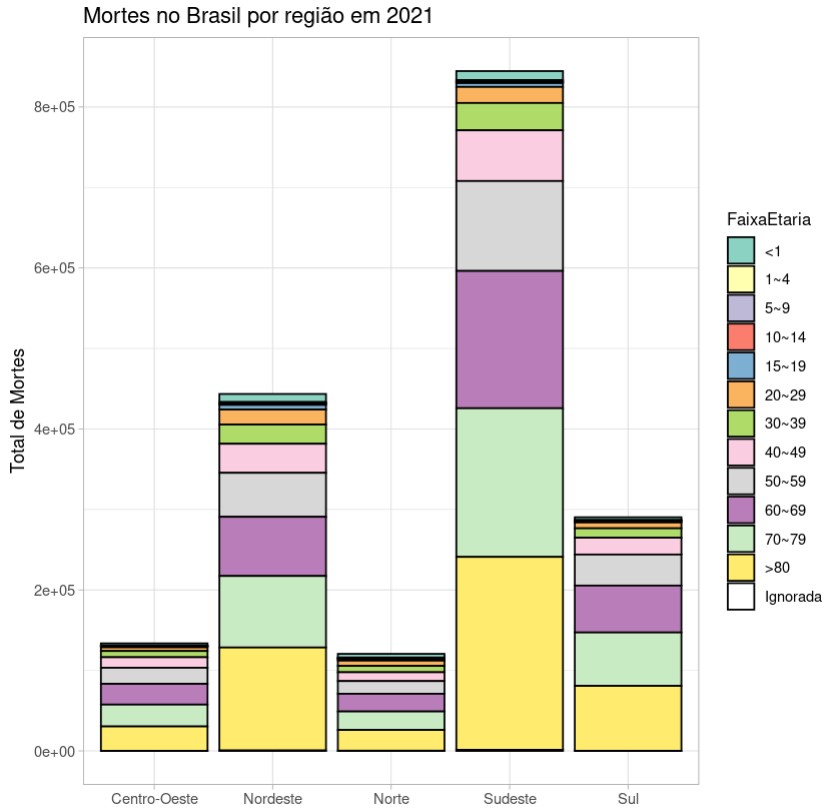
```
Warning message in RColorBrewer::brewer.pal(n, pal):
“n too large, allowed maximum for palette Paired is 12
Returning the palette you asked for with that many colors
”
```



Exercise 2:

In [10]:
```
ggplot(df_long, aes(x = Região, y = TotalMortes, fill = FaixaEtaria)) +
  geom_bar(stat = "identity", position = "stack",color="black") +
  labs(title = "Mortes no Brasil por região em 2021", x = "", y = "Total de Mortes") +
  scale_fill_brewer(palette = "Set3") +
  theme_light() +
  theme(legend.position = "right", legend.title = element_text(size = 10))
```

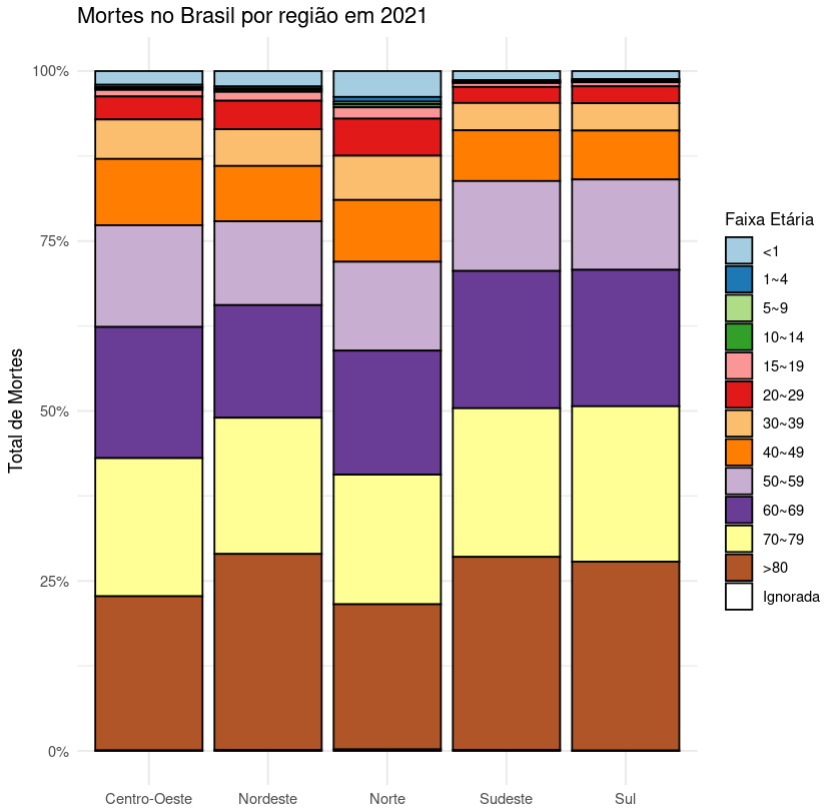
```
Warning message in RColorBrewer::brewer.pal(n, pal):
“n too large, allowed maximum for palette Set3 is 12
Returning the palette you asked for with that many colors
”
```



Exercise 3:

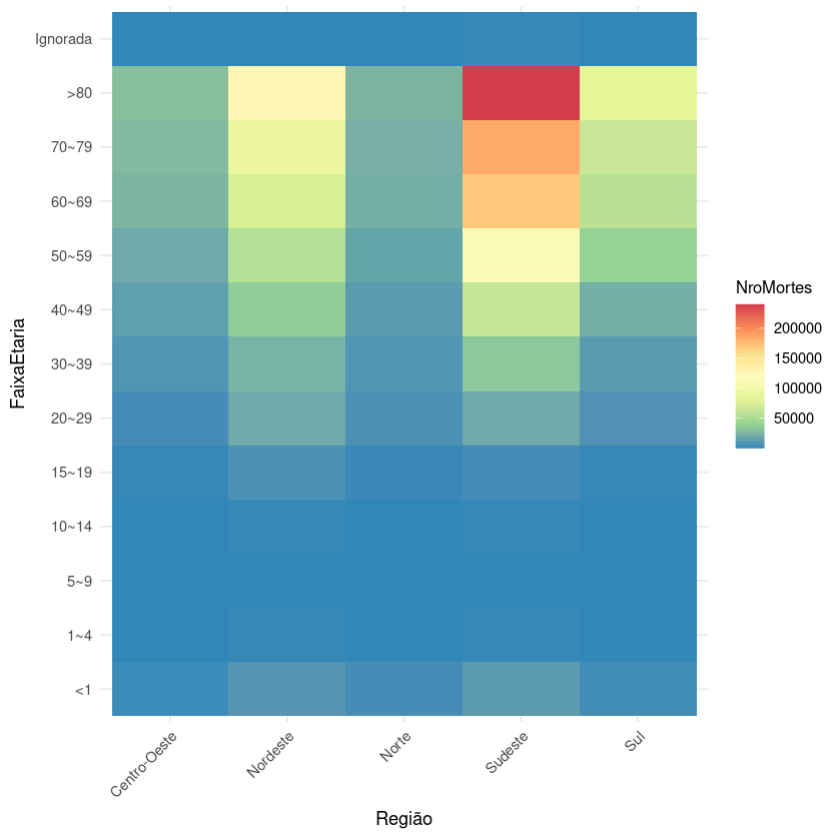
In [11]:
```
ggplot(df_long, aes(x = Região, y = TotalMortes, fill = FaixaEtaria)) +
  geom_bar(stat = "identity", position = "fill", color="black") +
  labs(title = "Mortes no Brasil por região em 2021",
       x = "", y = "Total de Mortes") +
  scale_y_continuous(labels = scales::percent) +
  scale_fill_brewer(palette = "Paired", name = "Faixa Etária") +
  theme_minimal() +
  theme(legend.position = "right", legend.title = element_text(size = 10))
```

```
Warning message in RColorBrewer::brewer.pal(n, pal):
“n too large, allowed maximum for palette Paired is 12
Returning the palette you asked for with that many colors
”
```



Exercise 4:

In [12]:
```
ggplot(df_long, aes(x = Região, y = FaixaEtaria, fill = TotalMortes)) +
  geom_tile() +
  labs(x = "Região", y = "FaixaEtaria") +
  scale_fill_distiller(palette = "Spectral", name = "NroMortes") +
  theme_minimal() +
  theme(legend.position = "right", legend.title = element_text(size = 10),
        axis.text.x = element_text(angle = 45, hjust = 1))
```



Exercise 5:

In [13]:
```
ggplot(df_long, aes(x = Região, y = FaixaEtaria, fill = TotalMortes)) +
  geom_tile(color = "black") +
  geom_text(aes(label = TotalMortes), color = "black", size = 5) +
  labs(x = "Região", y = "Faixa Etária") +
  scale_fill_distiller(palette = "Spectral", name = "NroMortes") +
  theme_minimal() +
  theme(
    legend.position = "right",
    legend.title = element_text(size = 10),
    axis.text.x = element_text(size = 12, angle = 45, hjust = 1),
    axis.text.y = element_text(size = 12),
    axis.title.x = element_text(size = 14),
```

```
    axis.title.y = element_text(size = 14)
  )
```