

```
# funcoes auxiliares dplyr

gapminder %>%
  distinct(continent)

gapminder %>%
  slice(1:10)

gapminder %>%
  slice_head(n = 5)

gapminder %>%
  slice_tail(n = 5)

set.seed(1)
gapminder %>%
  slice_sample(n = 10)

gapminder %>%
  filter(year == 2007) %>%
  slice_max(lifeExp, n = 2)

gapminder %>%
  filter(year == 2007) %>%
  slice_min(lifeExp, n = 2)

gapminder %>%
  filter(year == 2007 | year == 1952) %>%
  group_by(year) %>%
  slice_max(lifeExp, n = 2)

gapminder_united <- gapminder %>%
  unite("country_continent", c(country, continent),
        sep = "_",
        remove = TRUE,
        na.rm = FALSE)
```

```

gapminder_united %>%
  separate_wider_delim(country_continent,
                        delim = "_",
                        names = c("country", "continent"))

## ----warning=FALSE, message=FALSE-----
library(tidyverse)
library(gapminder)

gapminder_2007 <- gapminder %>%
  filter(year == 2007)

ggplot(data = gapminder_2007)

## -----
ggplot(data = gapminder_2007,
       mapping = aes(x = gdpPercap, y = lifeExp))

## -----
ggplot(data = gapminder_2007,
       mapping = aes(x = gdpPercap, y = lifeExp)) +
  geom_point()

## -----
ggplot(data = gapminder_2007,
       mapping = aes(x = gdpPercap, y = lifeExp, color = continent)) +
  geom_point()

## -----
# Filtrar dados para o Brasil
dados_pais <- gapminder %>%
  filter(country == "Brazil")

```

```

# Criar gráfico de linha
ggplot(data = gapminder %>%
  filter(country == "Brazil"),
  aes(x = year, y = lifeExp)) +
  geom_line()

## -----

# Criar gráfico de barras
ggplot(data = gapminder_2007, aes(x = continent, y = gdpPercap)) +
  geom_bar(stat = "summary", fun = "mean")

## -----

ggplot(data = gapminder_2007, aes(x = continent, y = lifeExp)) +
  geom_boxplot()

## -----

gapminder_2007 %>%
  group_by(continent) %>%
  summarise(mean_lifeExp = mean(lifeExp),
    mean_gdpPercap = mean(gdpPercap)) %>%
  ggplot(aes(x = mean_gdpPercap, y = mean_lifeExp, label = continent)) +
  geom_point() +
  geom_text(vjust = -0.5, hjust = 0.5)

## -----

gapminder_anos <- gapminder %>%
  filter(year == 1952 | year == 2007)

ggplot(data = gapminder_anos,
  mapping = aes(x = gdpPercap, y = lifeExp, color = continent)) +
  geom_point() +
  facet_wrap(~year)

```

```
## -----
ggplot(data = gapminder_anos,
       mapping = aes(x = gdpPercap, y = lifeExp, color = continent)) +
  geom_point() +
  facet_wrap(~year) +
  coord_cartesian(ylim = c(40, 83))

## -----
ggplot(data = gapminder_anos,
       mapping = aes(x = gdpPercap, y = lifeExp, color = continent)) +
  geom_point() +
  facet_wrap(~year) +
  scale_x_log10()

## -----
ggplot(data = gapminder_anos,
       mapping = aes(x = gdpPercap, y = lifeExp, color = continent)) +
  geom_point() +
  facet_wrap(~year) +
  scale_x_log10() +
  theme_bw()

## -----
ggplot(data = gapminder_anos,
       mapping = aes(x = gdpPercap, y = lifeExp, color = continent)) +
  geom_point() +
  facet_wrap(~year) +
  scale_x_log10() +
  theme_bw() +
  theme(legend.position = "bottom",
        text = element_text(size = 12))

## -----
ggplot(data = gapminder_anos,
       mapping = aes(x = gdpPercap, y = lifeExp, color = continent)) +
```

```
geom_point() +  
facet_wrap(~year) +  
scale_x_log10() +  
labs(x = "PIB per capita (log)",  
      y = "Expectativa de vida",  
      color = "Continente",  
      title = "Relação entre PIB per capita e Expectativa de Vida") +  
theme_bw() +  
theme(legend.position = "bottom")
```

```
## -----  
ggplot(data = gapminder_anos,  
        mapping = aes(x = gdpPercap, y = lifeExp, color = continent)) +  
geom_point(alpha = 0.5) +  
facet_wrap(~year) +  
scale_x_log10() +  
labs(x = "PIB per capita (log)",  
      y = "Expectativa de vida",  
      color = "Continente",  
      title = "Relação entre PIB per capita e Expectativa de Vida")
```

```
## -----  
ggplot(data = gapminder_anos,  
        mapping = aes(x = gdpPercap, y = lifeExp, color = continent)) +  
geom_point(alpha = 0.5) +  
facet_wrap(~year) +  
scale_x_log10() +  
scale_color_manual(values = c("blue", "green", "orange", "purple", "red")) +  
labs(x = "PIB per capita (log)",  
      y = "Expectativa de vida",  
      color = "Continente",  
      title = "Relação entre PIB per capita e Expectativa de Vida")
```

```
## -----  
ggplot(data = gapminder_anos,  
        mapping = aes(x = gdpPercap, y = lifeExp, color = continent)) +
```

```

geom_point(alpha = 0.5) +
facet_wrap(~year) +
scale_x_log10() +
scale_color_brewer(palette = "Set1")+
labs(x = "PIB per capita (log)",
      y = "Expectativa de vida",
      color = "Continente",
      title = "Relação entre PIB per capita e Expectativa de Vida")

## ----eval=FALSE-----
## # Instalar o pacote patchwork (apenas se ainda não estiver instalado)
## install.packages("patchwork")

## ----message=FALSE-----
library(patchwork)

plot1 <- ggplot(data = gapminder_2007,
               mapping = aes(x = gdpPercap, y = lifeExp)) +
  geom_point(alpha = 0.5) +
  labs(x = "PIB per capita (log)",
       y = "Expectativa de vida em 2007",
       title = "Relação entre PIB per capita e Expectativa de Vida") +
  theme_classic()

plot2 <- ggplot(data = gapminder_2007,
               mapping = aes(lifeExp)) +
  geom_histogram() +
  labs(title = "Histograma da expectativa de vida",
       x = "Expectativa de Vida em 2007",
       y = "Frequência") +
  theme_classic()

plot1 + plot2

## ----eval=FALSE-----
## # Instalar o pacote ggthemes (apenas se ainda não estiver instalado)

```

```
## install.packages("ggthemes")

## -----
# Carregar o pacote ggthemes
library(ggthemes)

plot0 <- ggplot(data = gapminder_2007,
  mapping = aes(x = gdpPercap, y = lifeExp)) +
  geom_point(alpha = 0.5) +
  labs(x = "PIB per capita (log)",
    y = "Expectativa de vida em 2007")

plot1 <- plot0 + theme_economist()
plot2 <- plot0 + theme_excel()
plot3 <- plot0 + theme_stata()

plot1 + (plot2 / plot3)

## ----message=FALSE-----
library(plotly)

grafico <- ggplot(data = gapminder_anos,
  mapping = aes(x = gdpPercap, y = lifeExp,
    color = continent, text = country)) +
  geom_point(alpha = 0.5) +
  facet_wrap(~year) +
  scale_x_log10() +
  labs(x = "PIB per capita (log)",
    y = "Expectativa de vida",
    color = "Continente",
    title = "Relação entre PIB per capita e Expectativa de Vida")

ggplotly(grafico)

## ----echo=FALSE-----
billboard_longer <- billboard %>%
```

```

pivot_longer(
  cols = starts_with("wk"),
  names_to = "week",
  values_to = "rank",
  values_drop_na = TRUE
) %>%
mutate(
  week = parse_number(week)
)

billboard_longer %>%
  ggplot(aes(x = week, y = rank, group = track)) +
  geom_line(alpha = 0.25) +
  scale_y_reverse() +
  labs(y="Rank", x="Semana", color = "Música") +
  theme_bw()

## ----echo=FALSE-----
billboard_longer %>%
  mutate(date = date.entered + lubridate::weeks(week)) %>%
  ggplot(aes(x = date, y = rank, group = track)) +
  geom_line(alpha = 0.25) +
  scale_y_reverse() +
  labs(y="Rank", x="Data", color = "Música") +
  theme_bw()

## ----echo=FALSE-----
billboard_longer %>%
  mutate(date = date.entered + lubridate::weeks(week)) %>%
  filter(track == "Higher" | track == "With Arms Wide Open") %>%
  ggplot(aes(x = date, y = rank, color = track)) +
  geom_line(alpha = 1) +
  scale_y_reverse() +
  labs(y="Rank", x="Data", color = "Música") +
  theme_bw()

```



```
## ----echo=FALSE-----
set.seed(42)
preco_acao <- runif(30, min = 9, max = 15)
media_movel <- numeric(length = 26) # Vetor para armazenar a média móvel

for (i in 5:30) {
  media_movel[i - 4] <- mean(preco_acao[(i - 4):i])
}

ggplot2::ggplot(tidyr::tibble(t=5:30, mm=media_movel), ggplot2::aes(t, mm)) +
  ggplot2::geom_line(linewidth=2) +
  ggplot2::scale_x_continuous(breaks=seq(5,30,5))+
  ggplot2::labs(x="Dia", y="Média móvel", title="Média Móvel do Preço de Fechamento")+
  ggplot2::ylim(10,15)+
  ggplot2::theme_bw()

## ----echo=FALSE-----
# Função para realizar regressão linear simples
regressao_linear <- function(x, y) {
  modelo <- lm(y ~ x) # Criando o modelo de regressão linear
  return(modelo) # Retornando o modelo
}

anos_educacao <- c(10, 12, 14, 16, 18)
salario <- c(2500, 3300, 3550, 3700, 4500)
modelo_regressao <- regressao_linear(anos_educacao, salario)

coefs = data.frame(intercept=coef(modelo_regressao)[1],
                    slope=coef(modelo_regressao)[2],
                    class = "coef")

ggplot2::ggplot(tidyr::tibble(anos_educacao = anos_educacao,
                              salario = salario),
  ggplot2::aes(anos_educacao, salario))+
  ggplot2::geom_point() +
  ggplot2::geom_abline(data=coefs,
    ggplot2::aes(intercept=intercept,slope=slope,color=class),
    show.legend = TRUE)+
```

```
ggplot2::scale_color_manual(breaks=c("coef"),  
                             values="blue", labels=c("Modelo linear"))+  
ggplot2::labs(x="Anos de educação", y="Salário", title="Relação entre escolaridade e salário",color="")+  
ggplot2::theme_bw()+  
ggplot2::theme(legend.position = "bottom")
```