

## Lista 2.2

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### Exercício 1

Importando os pacotes necessários:

```
library(ggplot2)
library(scales)
library(grid)
library(gridExtra)
library(dplyr)
library(ggrepel)
```

Importando as três tabelas que vão ser utilizadas:

```
data(Minard.troops, package = "HistData")
Minard.troops %>% head()
```

```
##   long  lat survivors direction group
## 1 24.0 54.9   340000         A      1
## 2 24.5 55.0   340000         A      1
## 3 25.5 54.5   340000         A      1
## 4 26.0 54.7   320000         A      1
## 5 27.0 54.8   300000         A      1
## 6 28.0 54.9   280000         A      1
```

```
data(Minard.cities, package = "HistData")
Minard.cities %>% head()
```

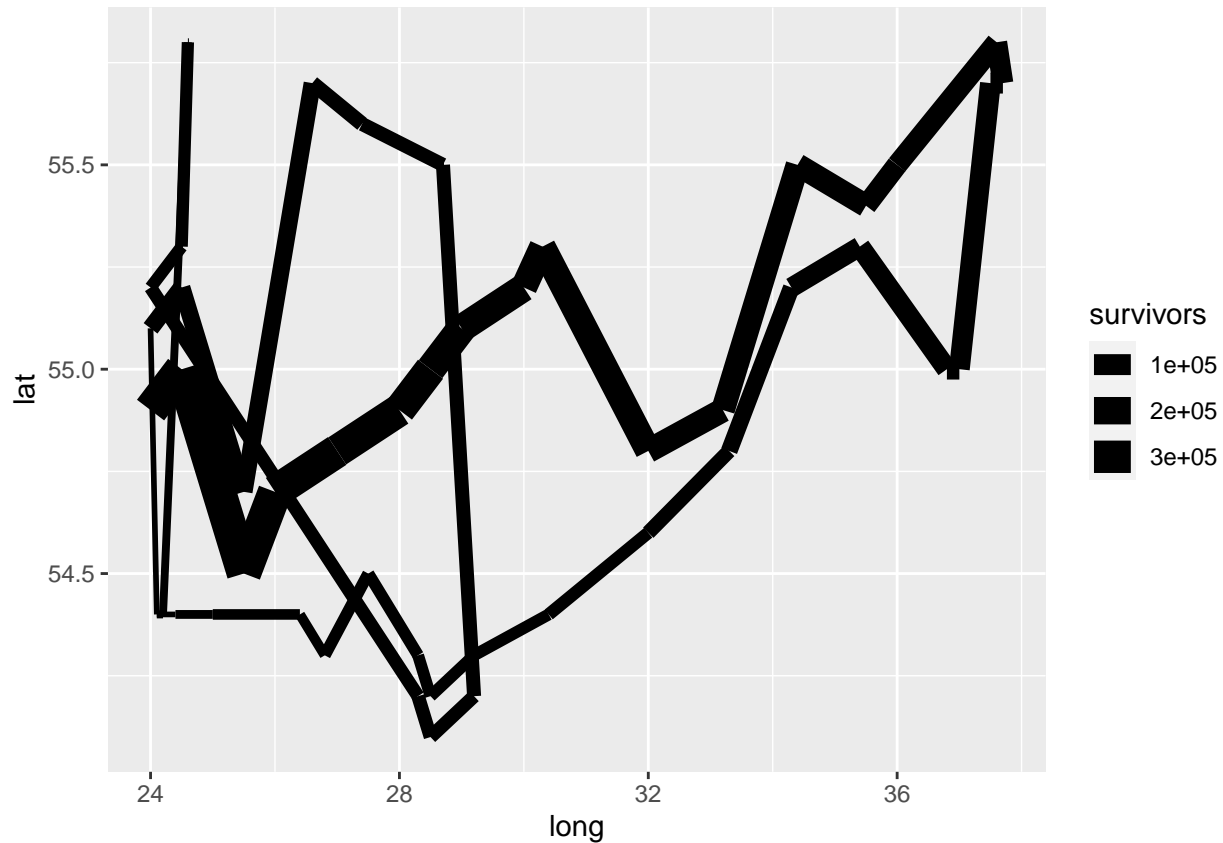
```
##   long  lat      city
## 1 24.0 55.0    Kowno
## 2 25.3 54.7    Wilna
## 3 26.4 54.4 Smorgoni
## 4 26.8 54.3 Moiodexno
## 5 27.7 55.2 Gloubokoe
## 6 27.6 53.9    Minsk
```

```
data(Minard.temp, package = "HistData")
Minard.temp %>% head()
```

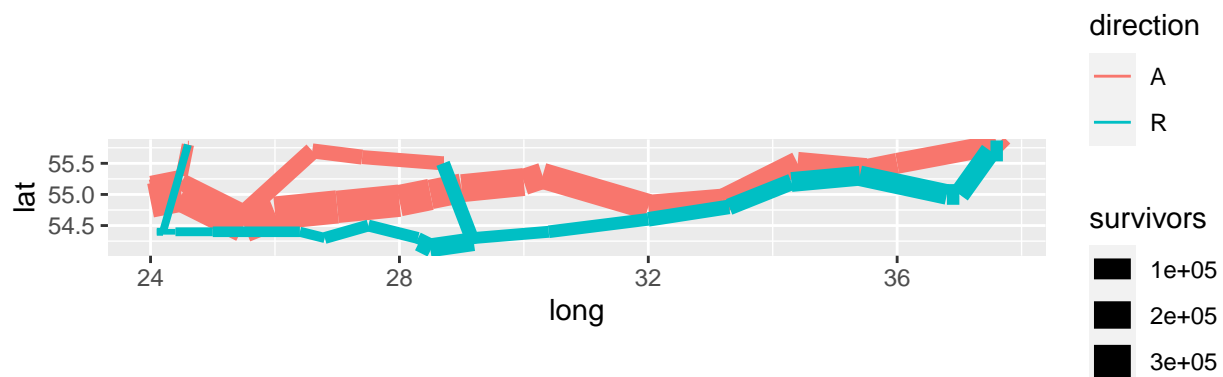
```
##   long temp days  date
## 1 37.6    0   6 Oct18
## 2 36.0    0   6 Oct24
## 3 33.2   -9  16 Nov09
## 4 32.0  -21   5 Nov14
## 5 29.2  -11  10 <NA>
## 6 28.5  -20   4 Nov28
```

## Gráficos do artigo

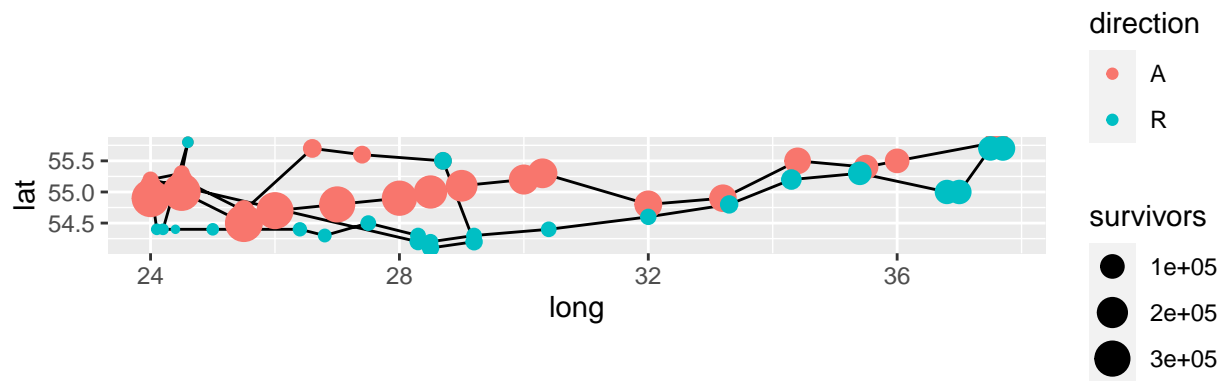
```
ggplot(Minard.troops, aes(long, lat)) +  
  geom_path(aes(size = survivors))
```



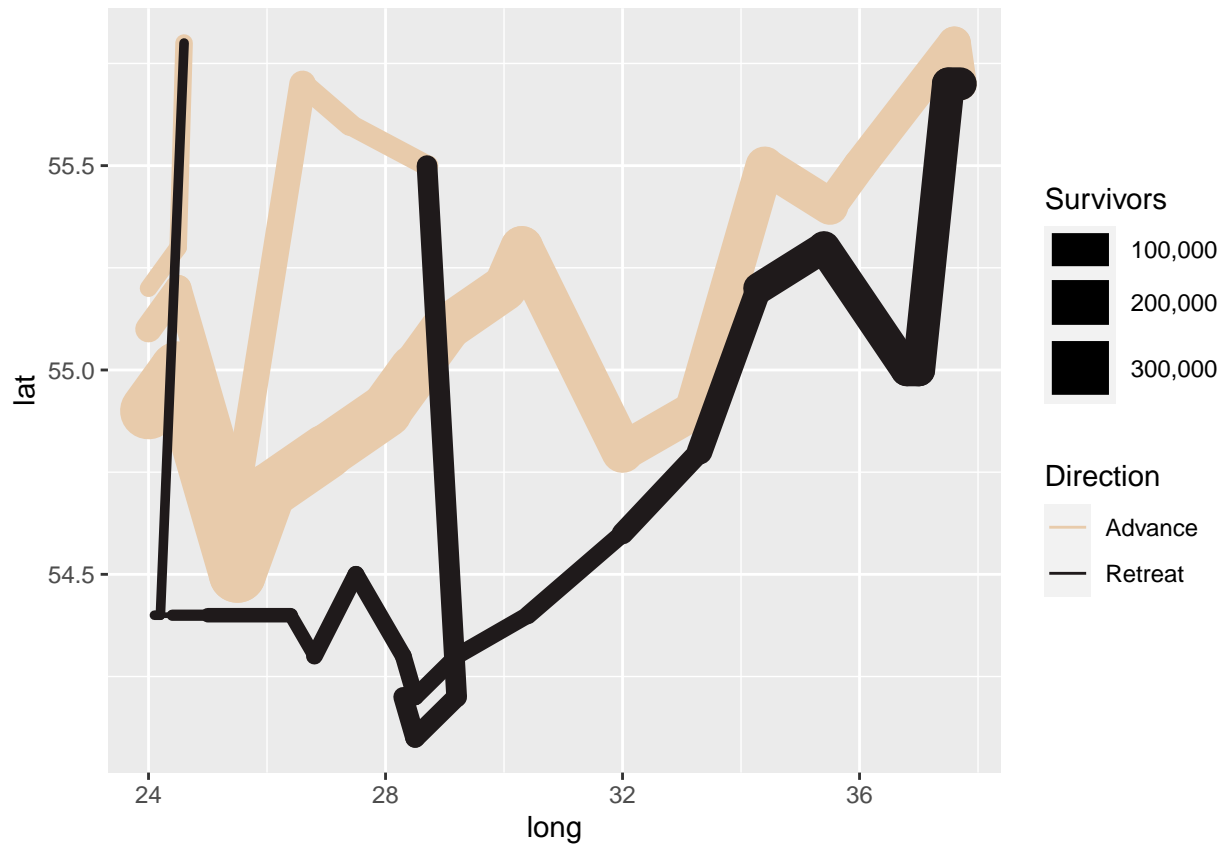
```
ggplot(Minard.troops, aes(long, lat)) +  
  geom_path(aes(size = survivors, colour = direction, group = group)) +  
  coord_fixed()
```



```
ggplot(Minard.troops, aes(long, lat)) +  
  geom_path() +  
  geom_point(aes(size = survivors, color = direction)) +  
  coord_fixed()
```

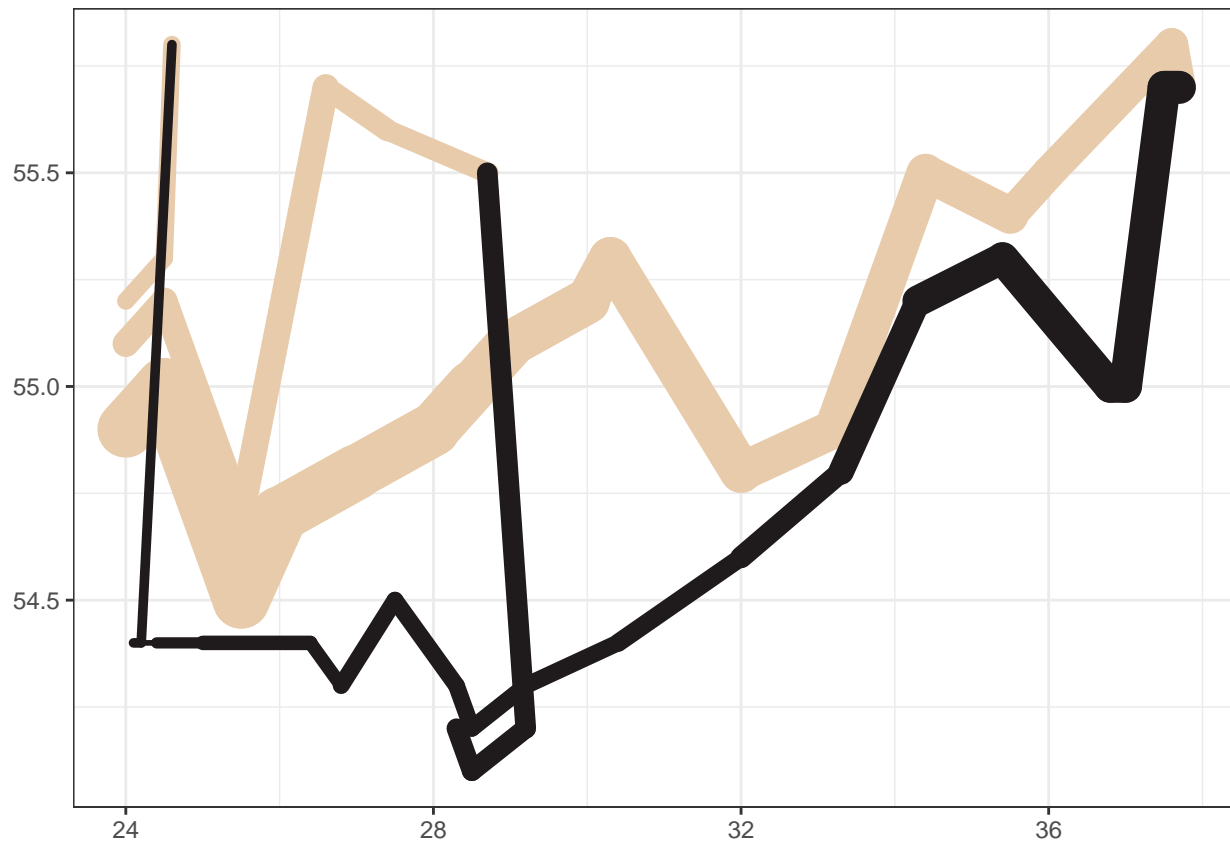


```
breaks <- c(1, 2, 3) * 10^5
ggplot(Minard.troops, aes(long, lat)) +
  geom_path(
    aes(size = survivors, colour = direction, group = group),
    lineend = "round"
  ) +
  scale_size(
    "Survivors",
    range = c(1, 10), #c(0.5, 15),
    breaks = breaks,
    labels = comma(breaks)
  ) +
  scale_color_manual(
    "Direction",
    values = c("#E8CBAB", "#1F1A1B"),
    labels = c("Advance", "Retreat")
  )
```

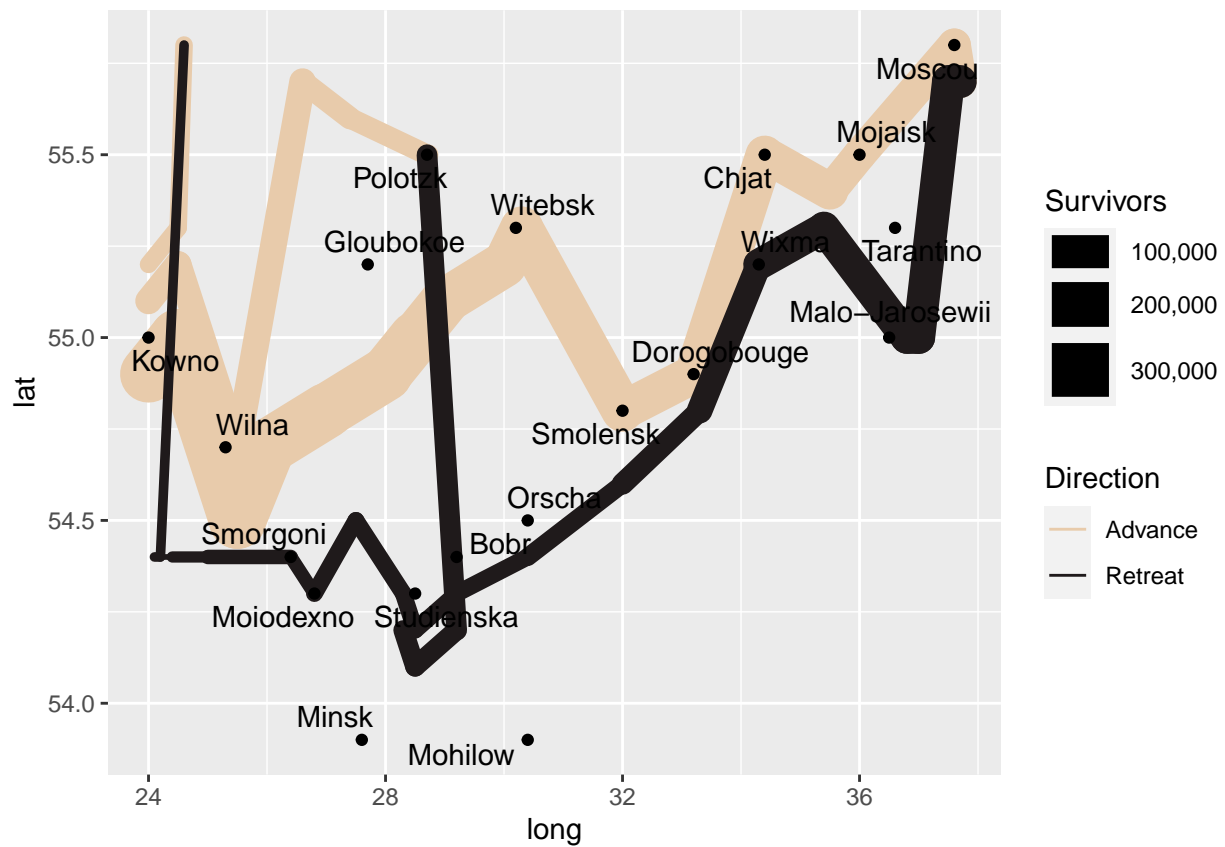


```
plot_troops <- last_plot()
```

```
plot_troops +  
  labs(x = NULL, y = NULL) +  
  guides(color = FALSE, size = FALSE) +  
  theme_bw()
```

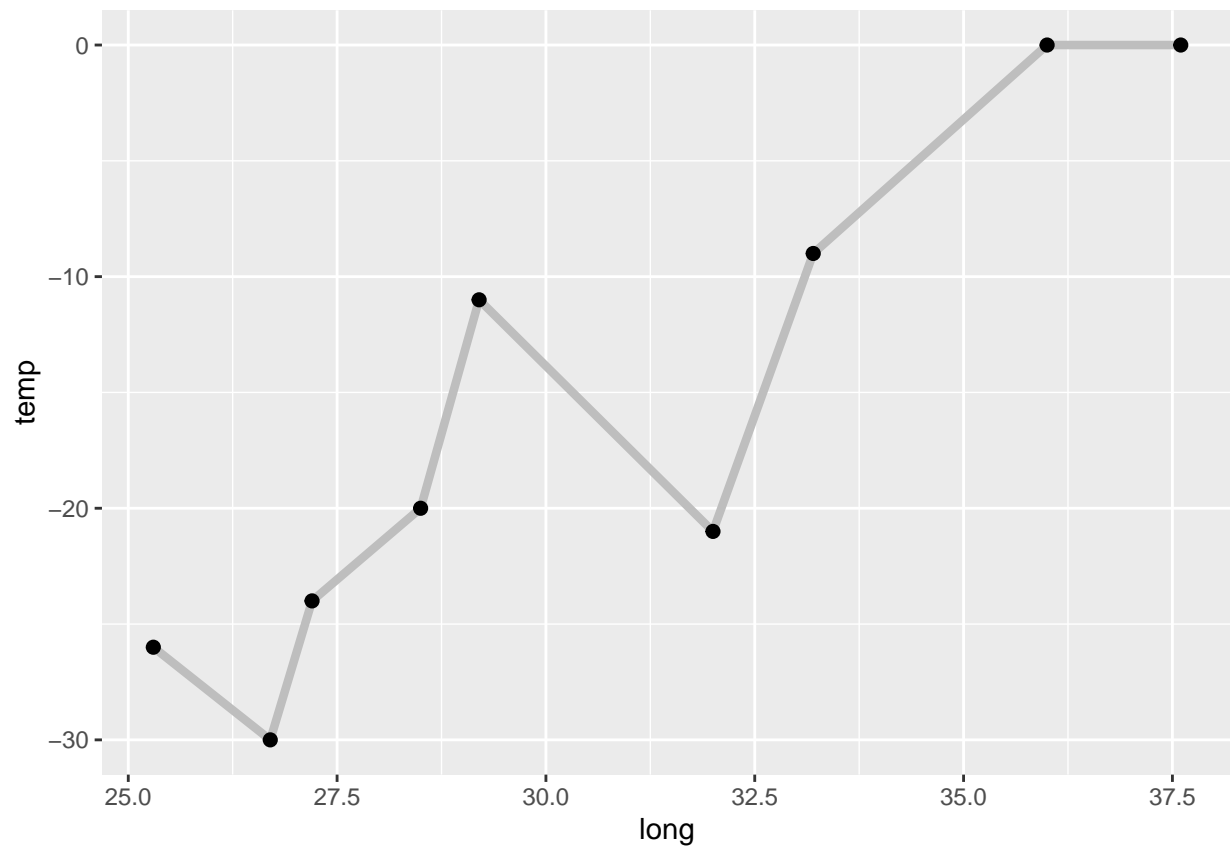


```
plot_troops +  
  geom_point(data = Minard.cities) +  
  geom_text_repel(data = Minard.cities, aes(label = city))
```

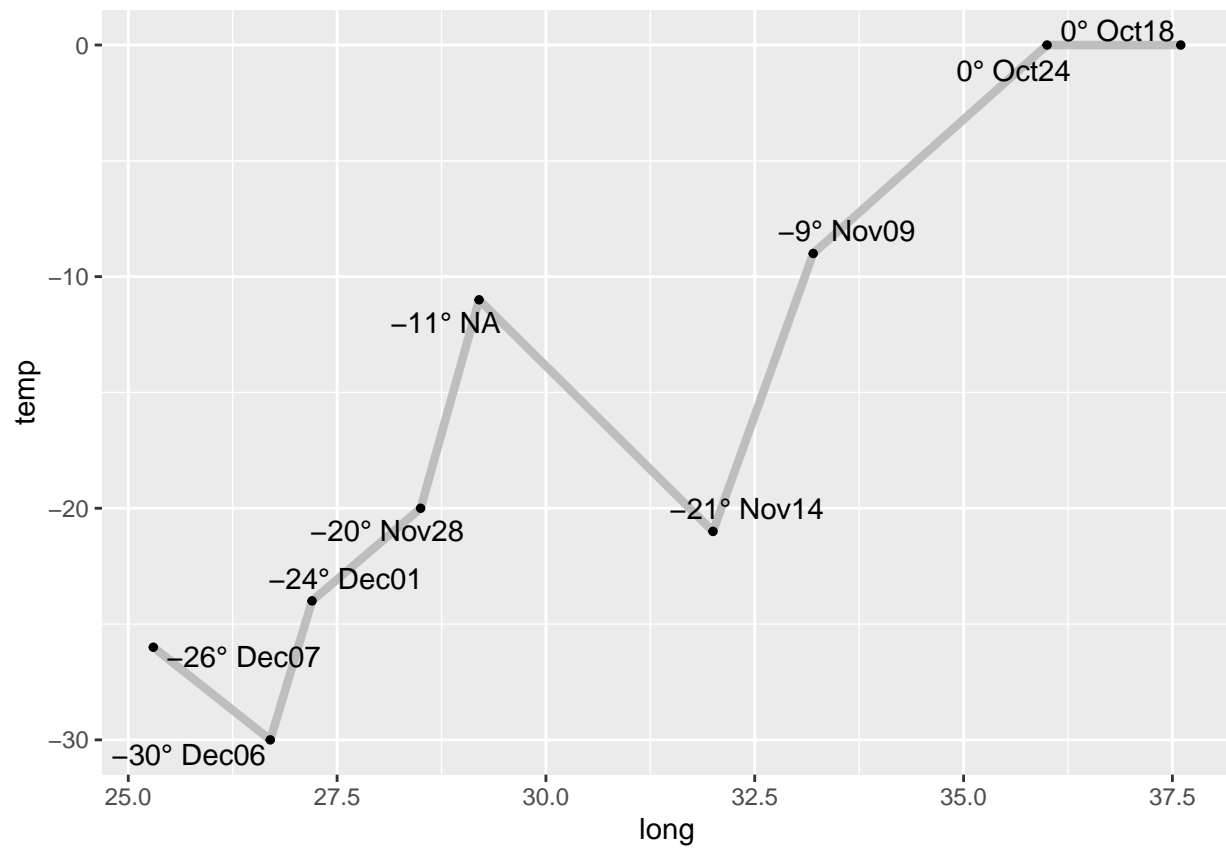


```
plot_troops_cities <- last_plot()
```

```
ggplot(Minard.temp, aes(long, temp)) +
  geom_path(color = "grey", size = 1.5) +
  geom_point(size = 2)
```



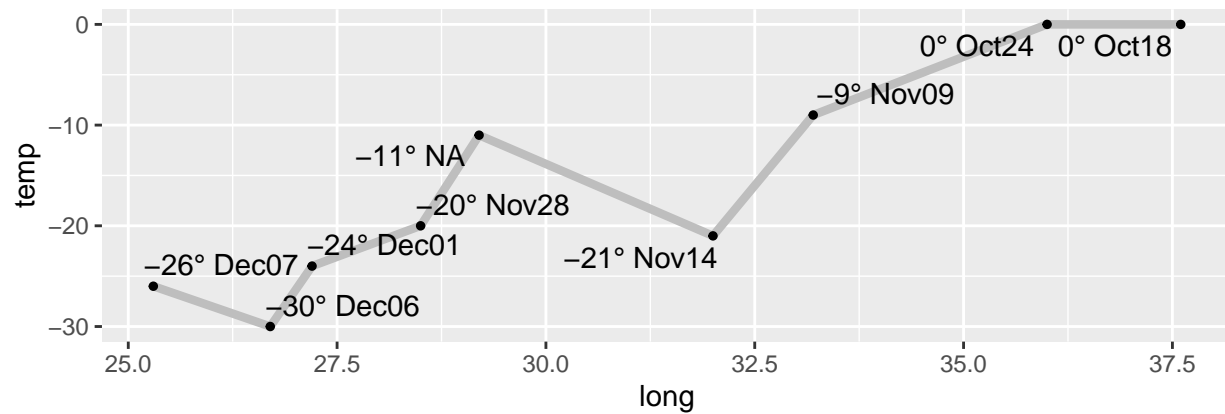
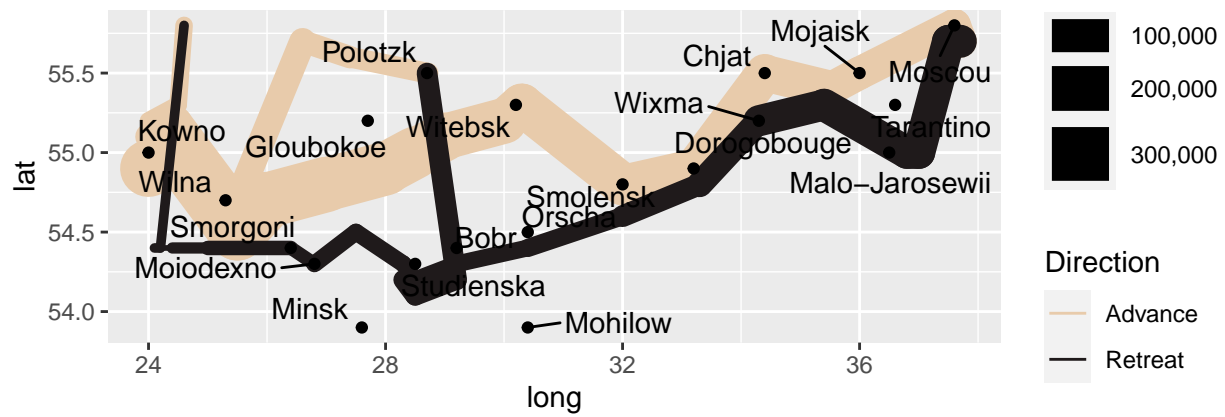
```
Minard.temp <- Minard.temp %>%  
  mutate(label = paste0(temp, "° ", date))  
  
ggplot(Minard.temp, aes(long, temp)) +  
  geom_path(color = "grey", size = 1.5) +  
  geom_point(size = 1) +  
  geom_text_repel(aes(label = label), size = 4)
```



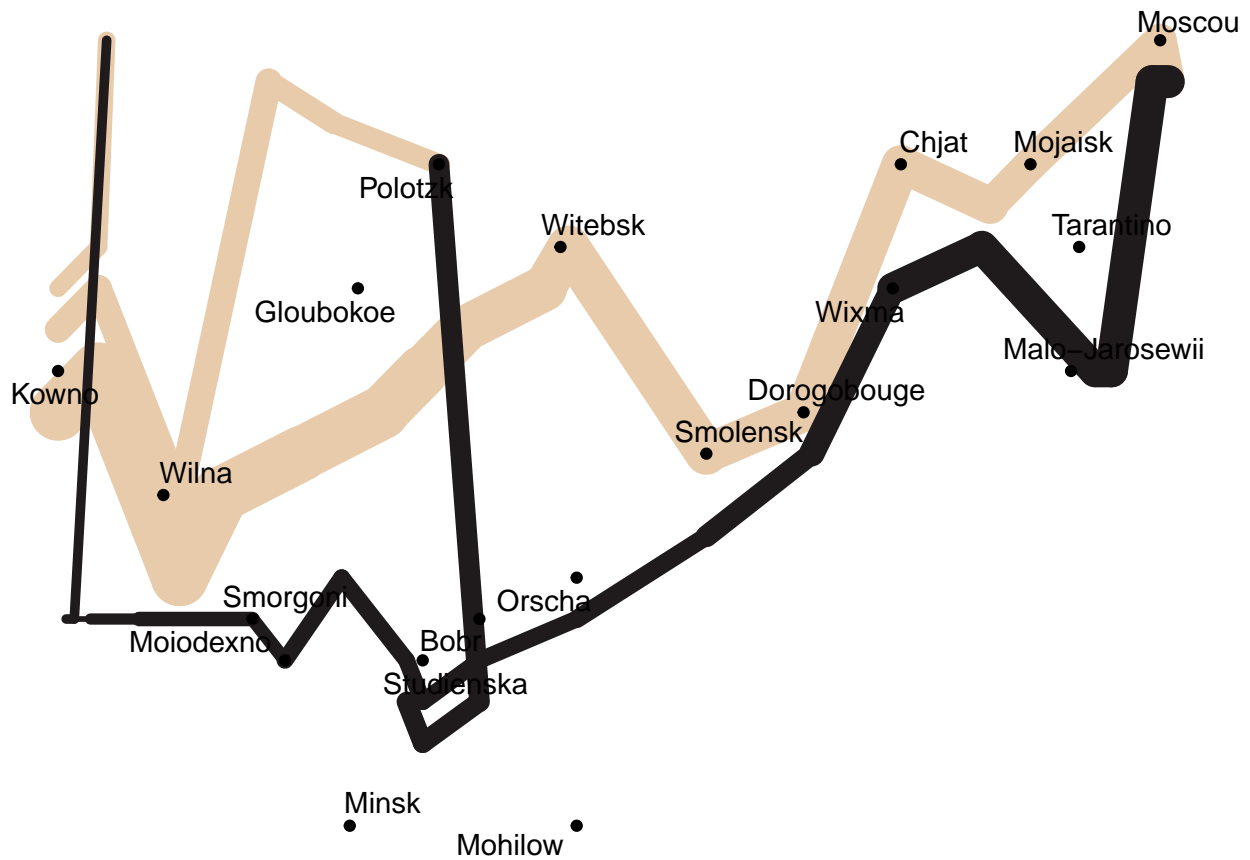
```
plot_temp <- last_plot()
```

```
grid.arrange(plot_troops_cities, plot_temp)
```



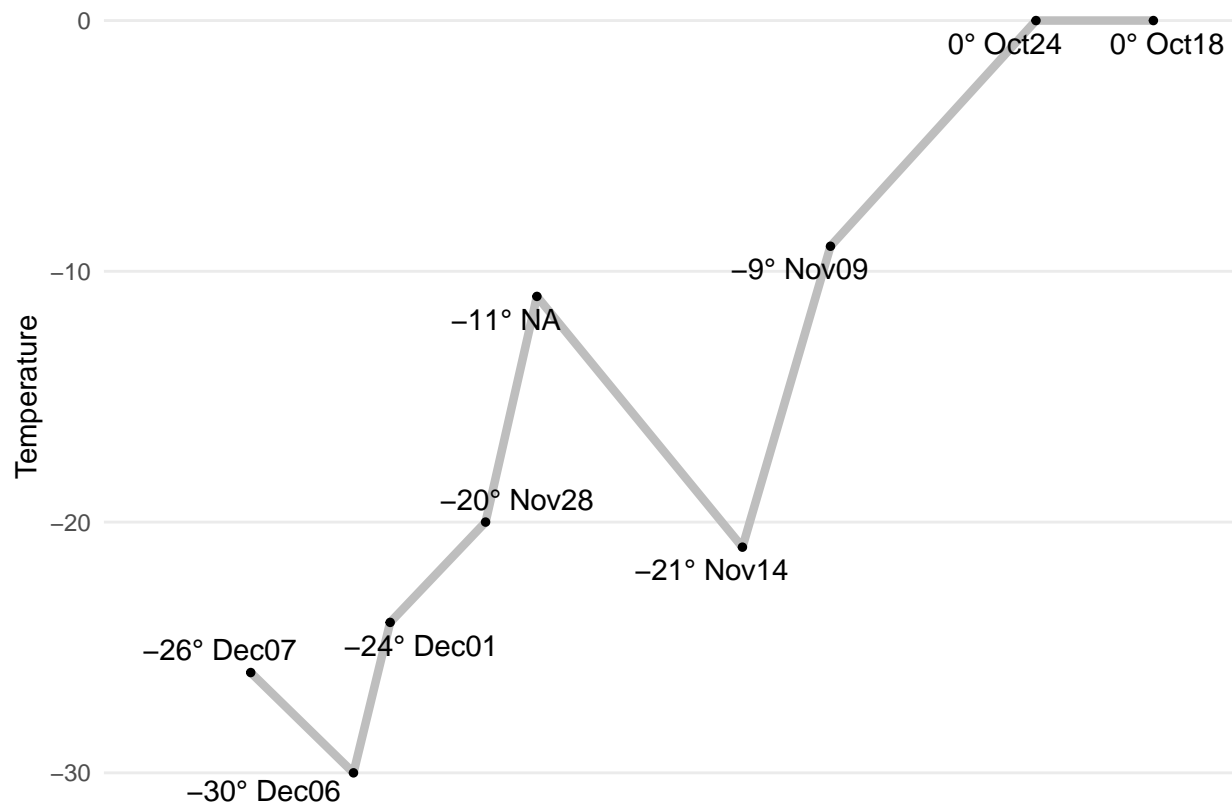


```
plot_troops_cities +
  coord_cartesian(xlim = c(24, 38)) +
  labs(x = NULL, y = NULL) +
  guides(color = FALSE, size = FALSE) +
  theme_void()
```



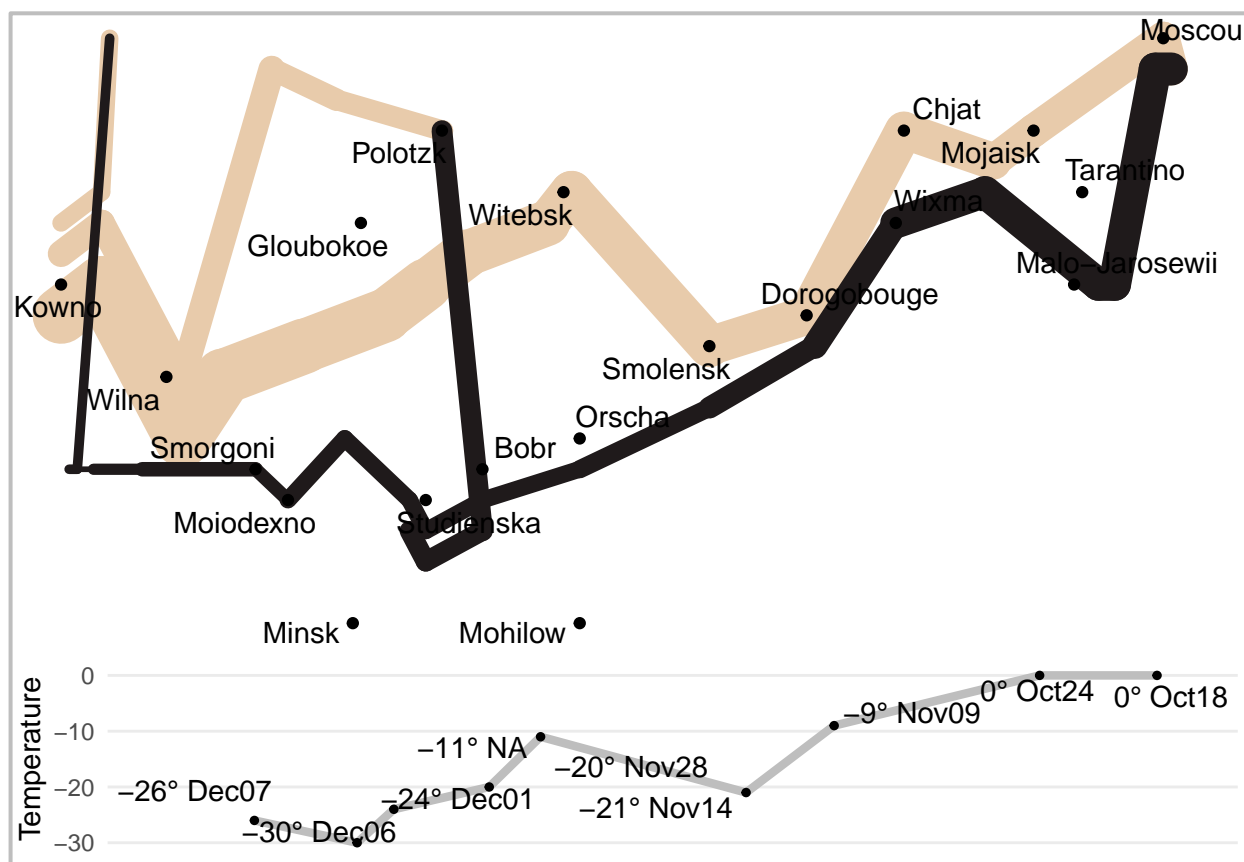
```
plot_troops_cities_fixed <- last_plot()
```

```
plot_temp +
  coord_cartesian(xlim = c(24, 38)) +
  labs(x = NULL, y = "Temperature") +
  theme_bw() +
  theme(
    panel.grid.major.x = element_blank(),
    panel.grid.minor.x = element_blank(),
    panel.grid.minor.y = element_blank(),
    axis.text.x = element_blank(), axis.ticks = element_blank(),
    panel.border = element_blank()
  )
```



```
plot_temp_fixed <- last_plot()
```

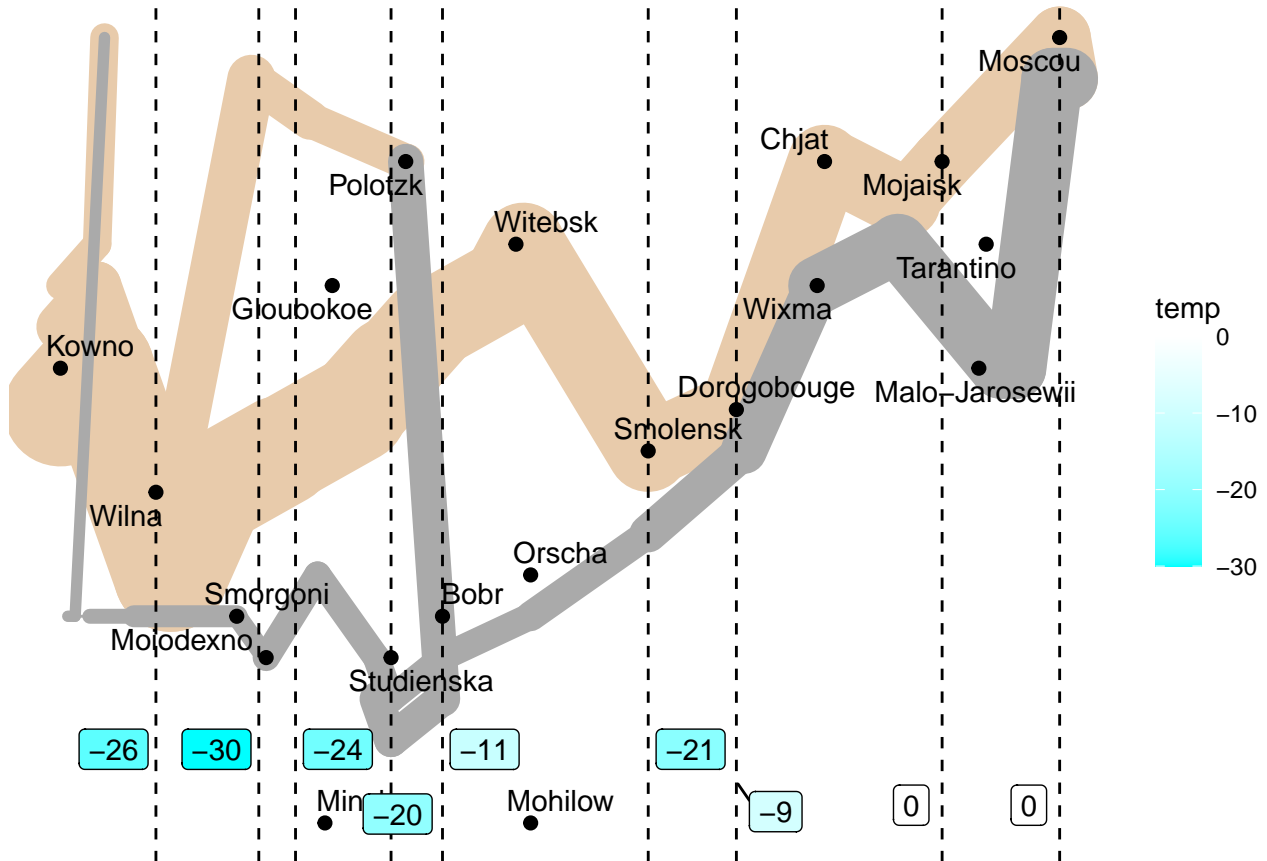
```
grid.arrange(plot_troops_cities_fixed, plot_temp_fixed, nrow = 2, heights = c(3.5, 1.2))
grid.rect(width = .99, height = .99, gp = gpar(lwd = 2, col = "gray", fill = NA))
```



## Gráfico customizado

```
breaks <- c(1, 2, 3) * 10^5
ggplot(Minard.troops, aes(long, lat)) +
  geom_path(
    mapping = aes(size = survivors,
                  colour = direction,
                  group = group),
    lineend = "round"
  ) +
  scale_size(
    "Survivors",
    range = c(0.5, 20),
    breaks = breaks,
    labels = comma(breaks)
  ) +
  scale_color_manual(
    "Direction",
    values = c("#E8CBAB", "#AAAAAA"),
    labels = c("Advance", "Retreat")
  ) +
  geom_point(data = Minard.cities, size = 2) +
  geom_text_repel(data = Minard.cities, mapping = aes(label = city)) +
  geom_vline(data = Minard.temp, mapping = aes(xintercept = long), linetype = "dashed") +
```

```
geom_label_repel(data = Minard.temp, mapping = aes(x = long, y = 54, label = temp, fill = temp)) +
scale_fill_gradient2(low = "cyan", high = "red") +
coord_cartesian(xlim = c(24, 38)) +
labs(x = NULL, y = NULL) +
guides(color = FALSE, size = FALSE) +
theme_void()
```

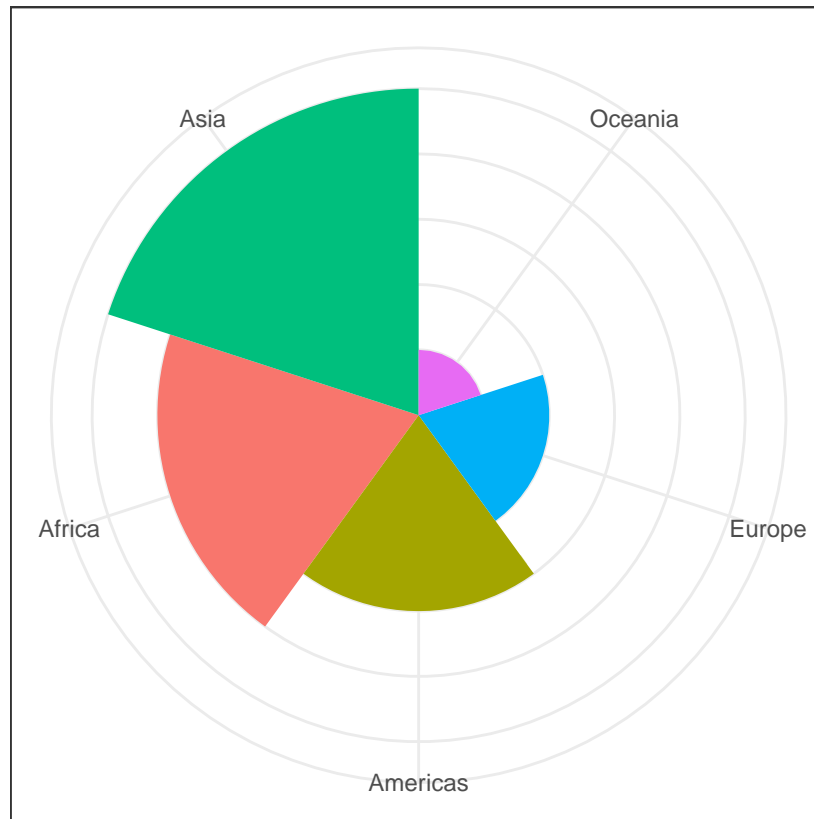


## Exercício 2

```
library("gapminder")

gapminder %>%
  filter(year == 2007) %>%
  group_by(continent) %>%
  summarise(pop = sum(pop)) %>%
  ggplot(aes(x = reorder(continent, pop), y = factor(pop), fill = continent)) +
  geom_col(width = 1) +
  coord_polar() +
  guides(fill = FALSE) +
  labs(x = NULL, y = NULL) +
  theme_bw() +
  theme(
    axis.text.y = element_blank(),
```

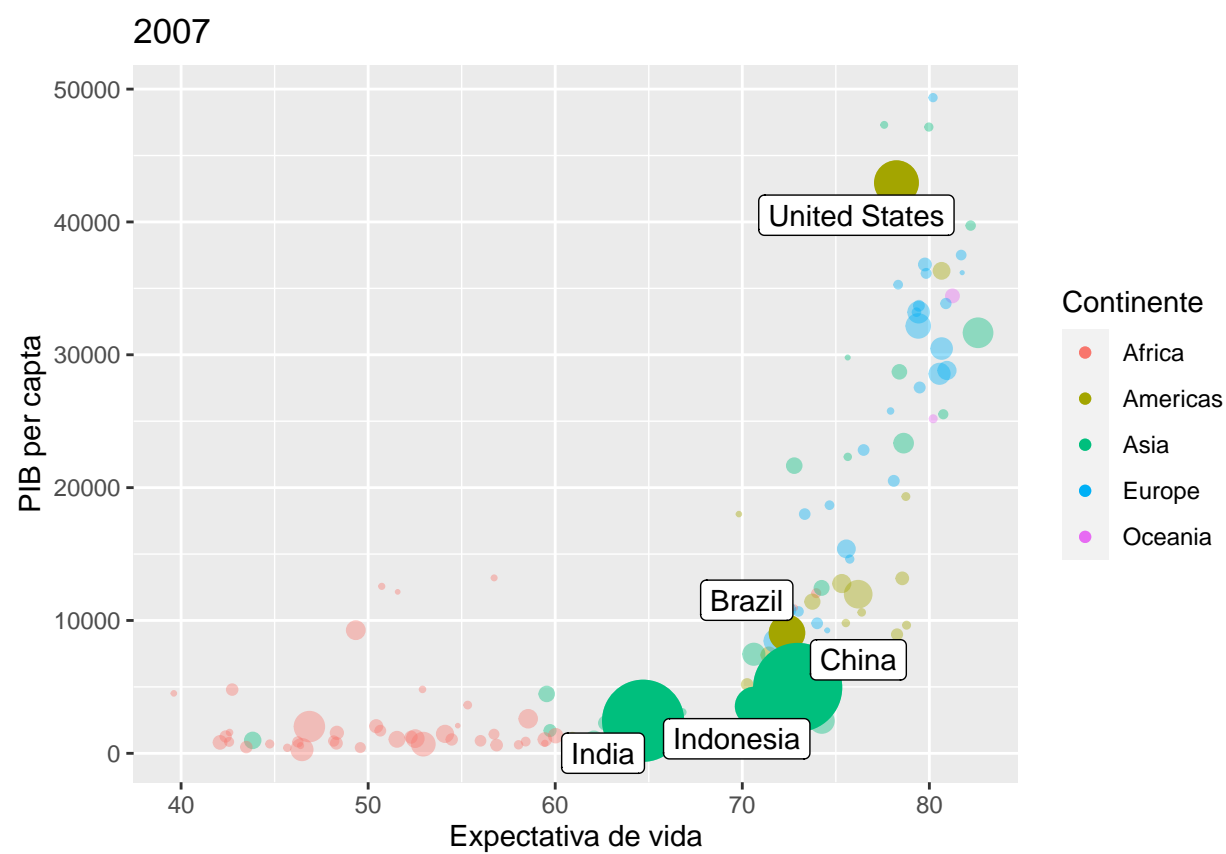
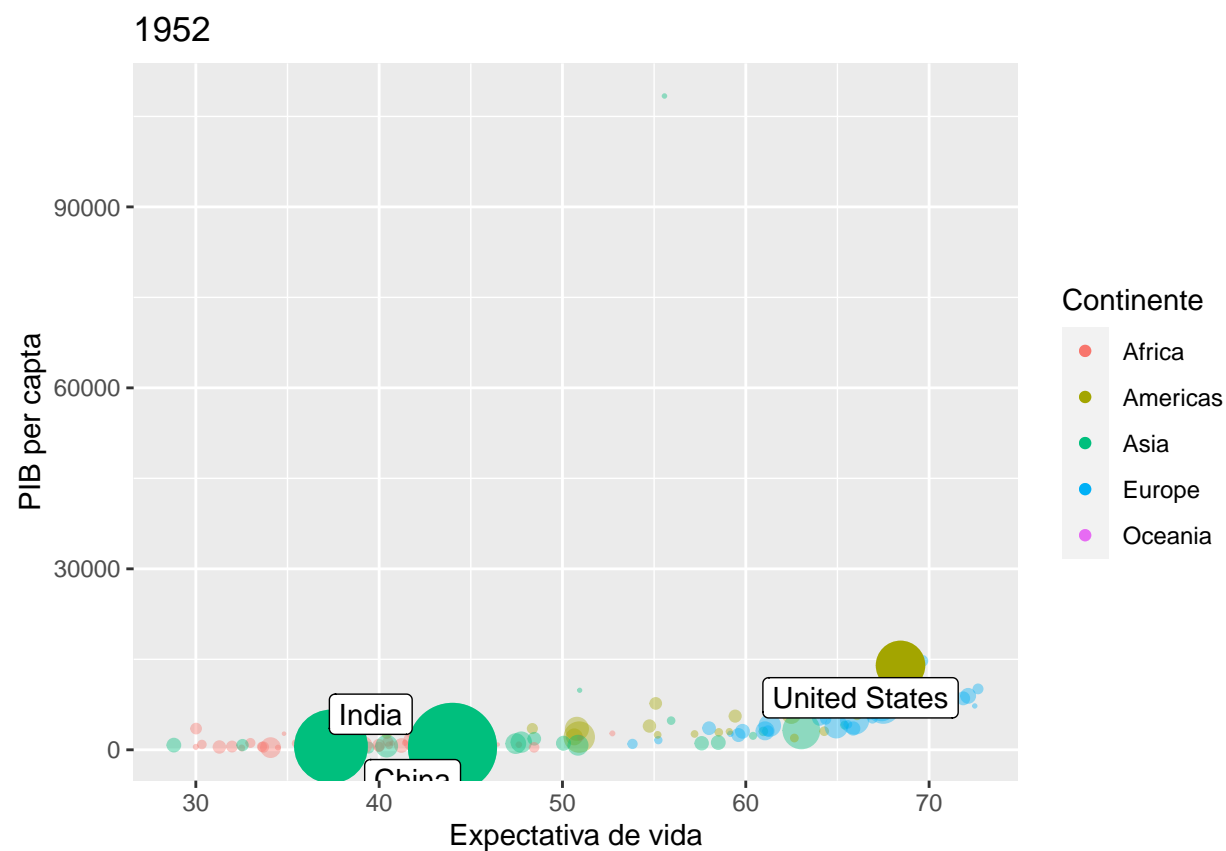
```
axis.ticks.y = element_blank()  
)
```



### Exercício 3: Gapminder

O Gapminder surgiu em 2005 e revolucionou a maneira que enxergávamos a visualização de dados e estatística. No seu primeiro Ted Talk, *The best stats you've ever seen*, Hans Rosling apresenta como a visualização de dados pode contrariar a nossa intuição sobre a realidade, já que muitas vezes temos ideias pré-concebidas sobre o mundo, e que foram formuladas décadas atrás.

O mundo de hoje é bem diferente do que era antigamente, e o Hans exemplifica isso utilizando um gráfico animado que mostra a variação de diversos indicadores pelo tempo. A mesma base de dados pode ser importada no R e ser utilizada para produzir gráficos parecidos ou com outras propostas.



## **Contexto e missão**

A criação do Gapminder se deu após a proposta dos Objetivos do Milênio da ONU, com a missão de oferecer ferramentas de estatística e visualização de dados baseados em fatos, com o fim de gerar um debate mais rico acerca da sociedade.

Para que isso acontecesse, a instituição ofereceu desde o início maneiras inclusivas de se manipular dados, principalmente por meio da Internet. Hoje, é possível acessar uma ferramenta completa de visualização de dados sobre o mundo, muito parecido com o utilizado por Hans Rosling ([www.gapminder.org/tools](http://www.gapminder.org/tools)).