```
library(tidyverse)
library(scales)

unemp_data <- read_csv("unemp-data.csv")
```

Evolution:

1:

```
unemp_data %>%
    ggplot(aes(y = unemployed, x = period)) +
    geom_line() +
    labs(x = "", y = "u")
```

2:

```
unemp_data %>%
  ggplot(aes(y = unemployed, x = period)) +
  geom_line() +
  labs(x = "Year", y = "Number of unemployed persons")
```

3:

```
unemp_data %>%
  ggplot(aes(y = unemployed, x = period)) +
  geom_line() +
  labs(x = "Year",
      y = "Number of unemployed persons",
      title = "Number of unemployed persons",
      subtitle = "United States, 1951-2021",
      caption = "Source: U.S. Bureau of Labor Statistics")
```

4: scales

```
unemp_data %>%
  ggplot(aes(y = unemployed, x = period)) +
  geom_line() +
  labs(x = "Year",
      y = "Number of persons",
      title = "Number of unemployed persons",
      subtitle = "United States, 1951-2021",
      caption = "Source: U.S. Bureau of Labor Statistics") +
```

```
  scale_y_continuous(labels = comma)

unemp_data %>%
  mutate(unemployed_th = unemployed / 1000) %>%
  ggplot(aes(y = unemployed_th, x = period)) +
  geom_line() +
  labs(x = "Year",
       y = "Persons (thousands)",
       title = "Number of unemployed persons",
       subtitle = "United States, 1951-2021",
       caption = "Source: U.S. Bureau of Labor Statistics") +
  scale_y_continuous(breaks = seq(2.5, 14, by=1)) +
  scale_x_continuous(breaks = seq(1955, 2020, by = 5))
```

5. scales with percentages

```
unemp_data %>%
  mutate(un_rate = unemployed / labor_force) %>%
  ggplot(aes(y = un_rate, x = period)) +
  geom_line() +
  labs(x = "", y = "") +
  labs(title = "A title") +
  scale_y_continuous(breaks = seq(0.02, 0.10, by = 0.01),
              labels = percent_format(scale = 100)) +
  scale_x_continuous(breaks = seq(from = 1950, to = 2021, by = 10))
  theme_gray(base_size=16)
```

More complex example

```
unemp_data <- unemp_data %>%
  mutate(un_rate = unemployed / labor_force,
         part_rate = labor_force / non_inst_pop,
         emp_pop_ratio = employed / non_inst_pop)

unemp_data %>%
  summarize(avg_un_rate = mean(un_rate),
         avg_emp_pop_ratio = mean(emp_pop_ratio),
         avg_part_rate = mean(part_rate)) %>%
  pivot_longer(cols = c(avg_un_rate, avg_emp_pop_ratio, avg_part_rate),
         names_to = "measure",
         values_to = "value") %>%
  ggplot(aes(x = value, y = measure)) +
  geom_col() +
```

```
scale_x_continuous(labels = percent_format(scale = 1))
```