Report HW4

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Introduction

I have worked with data set about production of wine in Italy, which consists of a table showing the number of hectoliters of wine produced in each of the Italian regions. I have created a map showing the volume of wine production in each Italian region to show where it is produced the most and where it is the least. Italy is famous for its wine, so I thought it would be interesting to look at the distribution of wine production in this country.
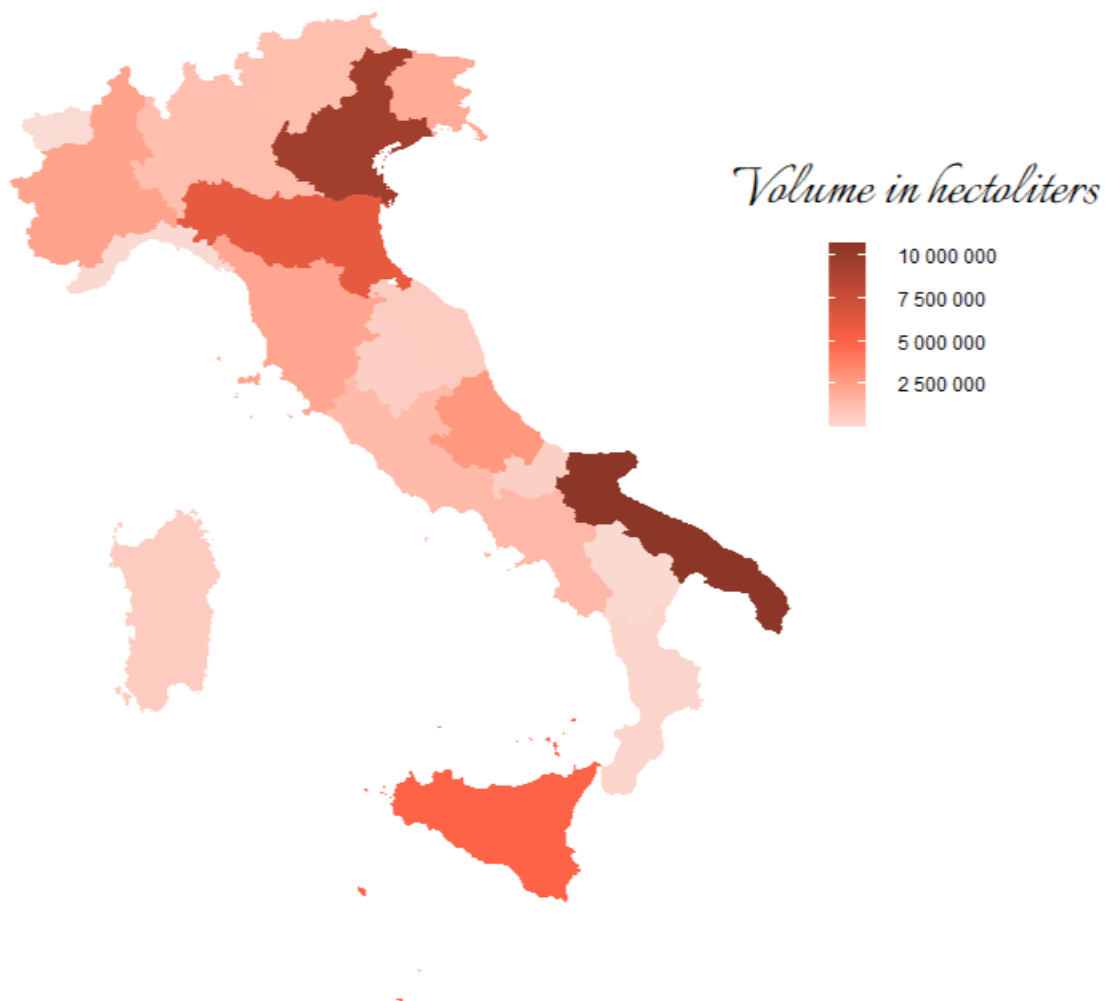
Source

Data sourced from the ITALIAN WINE CENTRAL website from the article:
"Wine Production by Region"

Visualization - map

Code

```r
# Libraries
{
library(ggplot2)
library(maps)
library(mapdata)
library(extrafont)
library(scales)
library(dplyr)
#font_import()
loadfonts(device = "win")
}

# Map of Italy
italy <- map_data("italy")

# Renaming provinces to the regions they are in
{
italy$region[italy$region == "Bolzano-Bozen"] <- "Trentino-Alto Adige"
italy$region[italy$region == "Belluno"] <- "Veneto"
italy$region[italy$region == "Udine"] <- "Friuli-Venezia Giulia"
italy$region[italy$region == "Sondrio"] <- "Lombardia"
italy$region[italy$region == "Trento"] <- "Trentino-Alto Adige"
italy$region[italy$region == "Novara"] <- "Piemonte"
italy$region[italy$region == "Pordenone"] <- "Friuli-Venezia Giulia"
italy$region[italy$region == "Brescia"] <- "Lombardia"
italy$region[italy$region == "Como"] <- "Lombardia"
italy$region[italy$region == "Varese"] <- "Lombardia"
italy$region[italy$region == "Treviso"] <- "Veneto"
italy$region[italy$region == "Bergamo"] <- "Lombardia"
italy$region[italy$region == "Gorizia"] <- "Friuli-Venezia Giulia"
italy$region[italy$region == "Vicenza"] <- "Veneto"
italy$region[italy$region == "Aosta"] <- "Valle d'Aosta"
italy$region[italy$region == "Vercelli"] <- "Piemonte"
italy$region[italy$region == "Venezia"] <- "Veneto"
italy$region[italy$region == "Verona"] <- "Veneto"
italy$region[italy$region == "Trieste"] <- "Friuli-Venezia Giulia"
italy$region[italy$region == "Milano"] <- "Lombardia"
italy$region[italy$region == "Padova"] <- "Veneto"
italy$region[italy$region == "Torino"] <- "Piemonte"
italy$region[italy$region == "Cremona"] <- "Lombardia"
italy$region[italy$region == "Mantova"] <- "Lombardia"
italy$region[italy$region == "Pavia"] <- "Lombardia"
italy$region[italy$region == "Alessandria"] <- "Piemonte"
italy$region[italy$region == "Rovigo"] <- "Veneto"
italy$region[italy$region == "Piacenza"] <- "Emilia Romagna"
italy$region[italy$region == "Asti"] <- "Piemonte"
italy$region[italy$region == "Parma"] <- "Emilia Romagna"
italy$region[italy$region == "Reggio Emilia"] <- "Emilia Romagna"
italy$region[italy$region == "Ferrara"] <- "Emilia Romagna"
italy$region[italy$region == "Modena"] <- "Emilia Romagna"
italy$region[italy$region == "Cuneo"] <- "Piemonte"
italy$region[italy$region == "Bologna"] <- "Emilia Romagna"
italy$region[italy$region == "Genova"] <- "Liguria"
italy$region[italy$region == "Ravenna"] <- "Emilia Romagna"
italy$region[italy$region == "Savona"] <- "Liguria"
italy$region[italy$region == "Massa-Carrara"] <- "Toscana"
italy$region[italy$region == "La Spezia"] <- "Liguria"
italy$region[italy$region == "Forli'"] <- "Emilia Romagna"
italy$region[italy$region == "Lucca"] <- "Toscana"
italy$region[italy$region == "Firenze"] <- "Toscana"
italy$region[italy$region == "Pistoia"] <- "Toscana"
italy$region[italy$region == "Imperia"] <- "Liguria"
italy$region[italy$region == "Pesaro e Urbino"] <- "Marche"
italy$region[italy$region == "Arezzo"] <- "Toscana"
italy$region[italy$region == "Pisa"] <- "Toscana"
```

```r
italy$region[italy$region == "Ancona"] <- "Marche"
italy$region[italy$region == "Livorno"] <- "Toscana"
italy$region[italy$region == "Perugia"] <- "Umbria"
italy$region[italy$region == "Siena"] <- "Toscana"
italy$region[italy$region == "Macerata"] <- "Marche"
italy$region[italy$region == "Ascoli Piceno"] <- "Marche"
italy$region[italy$region == "Grosseto"] <- "Toscana"
italy$region[italy$region == "Terni"] <- "Umbria"
italy$region[italy$region == "Teramo"] <- "Abruzzo"
italy$region[italy$region == "Viterbo"] <- "Lazio"
italy$region[italy$region == "Rieti"] <- "Lazio"
italy$region[italy$region == "L'Aquila"] <- "Abruzzo"
italy$region[italy$region == "Pescara"] <- "Abruzzo"
italy$region[italy$region == "Chieti"] <- "Abruzzo"
italy$region[italy$region == "Roma"] <- "Lazio"
italy$region[italy$region == "Campobasso"] <- "Molise"
italy$region[italy$region == "Foggia"] <- "Puglia"
italy$region[italy$region == "Frosinone"] <- "Lazio"
italy$region[italy$region == "Isernia"] <- "Molise"
italy$region[italy$region == "Latina"] <- "Lazio"
italy$region[italy$region == "Caserta"] <- "Campania"
italy$region[italy$region == "Benevento"] <- "Campania"
italy$region[italy$region == "Bari"] <- "Puglia"
italy$region[italy$region == "Avellino"] <- "Campania"
italy$region[italy$region == "Sassari"] <- "Sardegna"
italy$region[italy$region == "Potenza"] <- "Basilicata"
italy$region[italy$region == "Napoli"] <- "Campania"
italy$region[italy$region == "Brindisi"] <- "Puglia"
italy$region[italy$region == "Nuoro"] <- "Sardegna"
italy$region[italy$region == "Salerno"] <- "Campania"
italy$region[italy$region == "Matera"] <- "Basilicata"
italy$region[italy$region == "Taranto"] <- "Puglia"
italy$region[italy$region == "Lecce"] <- "Puglia"
italy$region[italy$region == "Oristano"] <- "Sardegna"
italy$region[italy$region == "Cosenza"] <- "Calabria"
italy$region[italy$region == "Cagliari"] <- "Sardegna"
italy$region[italy$region == "Catanzaro"] <- "Calabria"
italy$region[italy$region == "Messina"] <- "Sicilia"
italy$region[italy$region == "Palermo"] <- "Sicilia"
italy$region[italy$region == "Reggio Calabria"] <- "Calabria"
italy$region[italy$region == "Trapani"] <- "Sicilia"
italy$region[italy$region == "Catania"] <- "Sicilia"
italy$region[italy$region == "Enna"] <- "Sicilia"
italy$region[italy$region == "Caltanissetta"] <- "Sicilia"
italy$region[italy$region == "Agrigento"] <- "Sicilia"
italy$region[italy$region == "Siracusa"] <- "Sicilia"
italy$region[italy$region == "Ragusa"] <- "Sicilia"
}

# theme_nothing
{
theme_nothing <- theme(
  axis.text = element_blank(),
  axis.line = element_blank(),
  axis.ticks = element_blank(),
  panel.border = element_blank(),
  panel.grid = element_blank(),
  axis.title = element_blank()
)
}

# New column with data about wine production
{
wine <- data.frame(region = c("Puglia","Trentino-Alto Adige","Veneto","Emilia Romagna",
                "Sicilia","Abruzzo","Piemonte","Toscana","Friuli-Venezia Giulia",
                "Campania","Lazio","Lombardia","Sardegna","Marche","Umbria","Molise",
                "Calabria","Basilicata","Liguria","Valle d'Aosta"),
                value = c(10759000,1220000,9610000,6105000,4918000,2883000,2413000,
                2316000,2083000,1518000,1437000,1271000,694000,660000,528000,513000,
                245000,91000,79000,18000))
```

```r
italy %>%
  left_join(wine, by = "region") -> italy
}

# Plot - map
{
italy <- ggplot() +
  geom_polygon(data = italy, aes(x=long, y = lat, fill = value, group = group)) +
  coord_fixed(1.3) +
  scale_fill_gradient2(low = "grey94",
                       mid = "tomato",
                       high = "tomato4",
                       midpoint = 4918000,
                       labels = number) +
  theme_bw() +
  labs(title = "Wine Production in Italy by Region in 2022",
       x = "",
       y = "",
       fill = "Volume in hectoliters") +
  theme(plot.title = element_text(hjust = 0.3, size = 40, family = "Italianno"),
        legend.position = c(1.1, 0.7),
        legend.title = element_text(family = "Italianno", size = 30)) +
  theme_nothing
}
```