

Spatial Economics – Assignment 2

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*The executable code that was used in compiling the assignment is available on GitHub at
<https://github.com/maxmheinze/spatial>.*

Task A

Text

Task B

Nice Maps

We create four maps:

```
# Header -----
pacman::p_load(tidyverse, tmap, haven, foreign, magrittr, sf, extrafont)

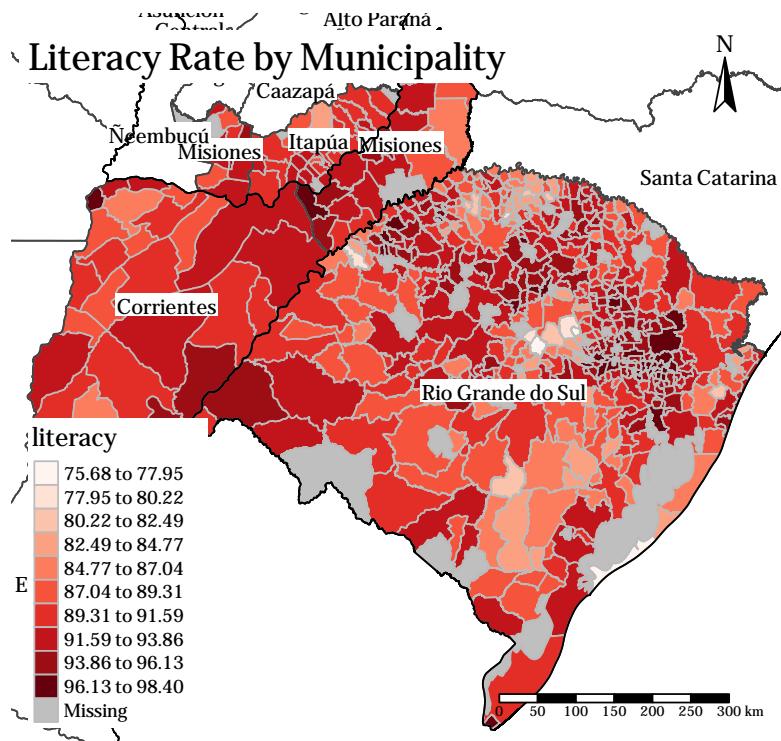
# Prepare Dataframe -----
litr <- read_dta("./assignment2/data/literacy_Arg-Bra-Par.dta", encoding = "ISO-8859-1")

shp0 <- read_sf("./assignment2/data/task_b_shapefile_0.shp")
shp1 <- read_sf("./assignment2/data/task_b_shapefile_1.shp")
shp2 <- read_sf("./assignment2/data/task_b_shapefile_2.shp")

spli <- shp2 %>%
  left_join(litr, by = c(NAME_2 = "muni"))

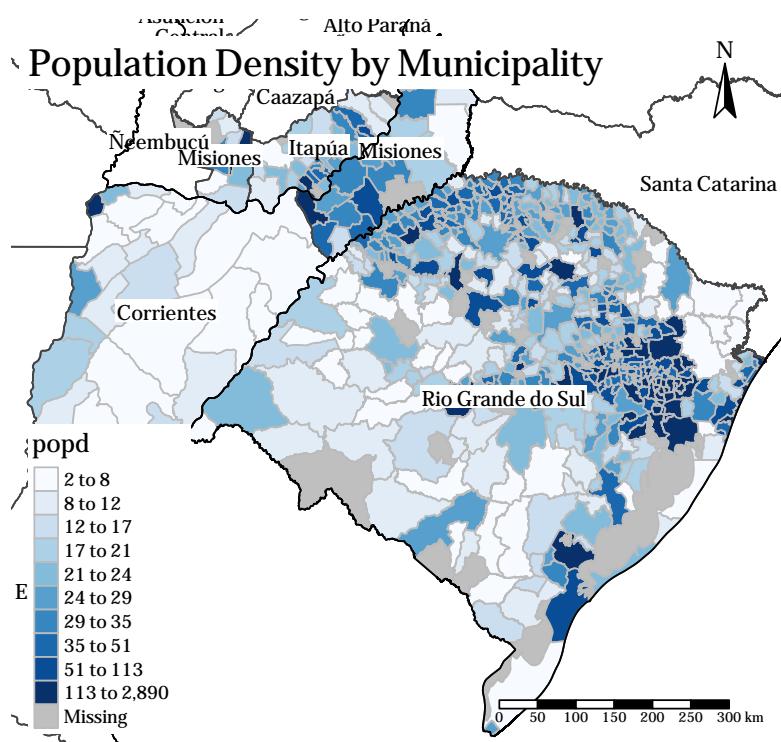
## Warning in sf_column %in% names(g): Detected an unexpected many-to-many relationship between `x` and
## i Row 1 of `x` matches multiple rows in `y`.
## i Row 3 of `y` matches multiple rows in `x`.
## i If a many-to-many relationship is expected, set `relationship =
##   "many-to-many"` to silence this warning.

# Literacy Map -----
tm_shape(spli) + tm_fill("literacy", palette = "Reds", style = "equal", n = 10) +
  tm_borders(col = "#BBBBBB") + tm_shape(shp1) + tm_borders(col = "#444444") +
  tm_text("NAME_1", size = 0.75, col = "black", bg.color = "#FFFFFF") + tm_shape(shp0) +
  tm_borders(col = "#000000") + tm_compass(position = c("right", "top"), size = 2) +
  tm_scale_bar(position = c("right", "bottom"), text.size = 0.5) + tm_layout(title =
  "Literacy Rate by Municipality",
  title.bg.color = "white", legend.position = c("left", "bottom"), legend.bg.color =
  "white",
  frame = FALSE, fontfamily = "Lato")
```

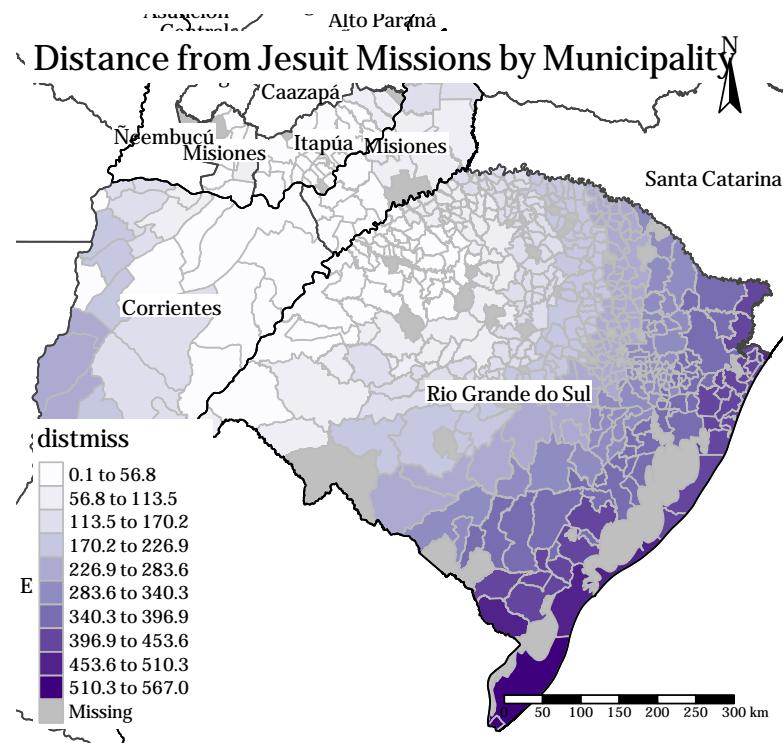


Population Density Map -----

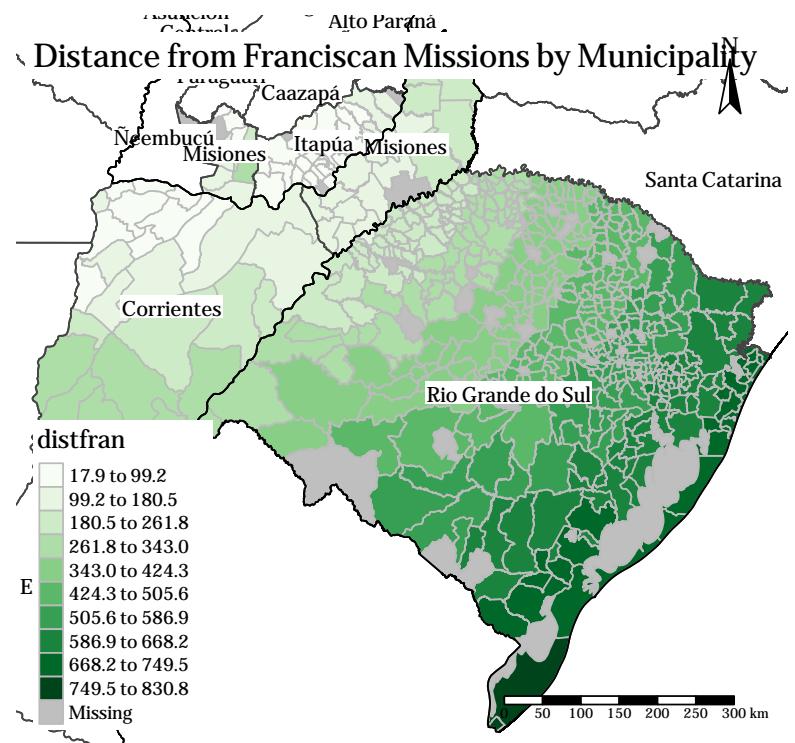
```
tm_shape(spli) + tm_fill("popd", palette = "Blues", style = "quantile", n = 10) +
  tm_borders(col = "#BBBBBB") + tm_shape(shp1) + tm_borders(col = "#444444") +
  tm_text("NAME_1", size = 0.75, col = "black", bg.color = "#FFFFFF") + tm_shape(shp0) +
  tm_borders(col = "#000000") + tm_compass(position = c("right", "top"), size = 2) +
  tm_scale_bar(position = c("right", "bottom"), text.size = 0.5) + tm_layout(title =
  "Population Density by Municipality",
  title.bg.color = "white", legend.position = c("left", "bottom"), legend.bg.color =
  "white",
  frame = FALSE, fontfamily = "Lato")
```



```
# Jesuit Distance Map -----
tm_shape(spli) + tm_fill("distmiss", palette = "Purples", style = "equal", n = 10) +
  tm_borders(col = "#BBBBBB") + tm_shape(shp1) + tm_borders(col = "#444444") +
  tm_text("NAME_1", size = 0.75, col = "black", bg.color = "#FFFFFF") + tm_shape(shp0) +
  tm_borders(col = "#000000") + tm_compass(position = c("right", "top"), size = 2) +
  tm_scale_bar(position = c("right", "bottom"), text.size = 0.5) + tm_layout(title =
  "Distance from Jesuit Missions by Municipality",
  title.bg.color = "white", legend.position = c("left", "bottom"), legend.bg.color =
  "white",
  frame = FALSE, fontfamily = "Lato")
```



```
# Franciscan Distance Map -----
tm_shape(spli) + tm_fill("distfran", palette = "Greens", style = "equal", n = 10) +
  tm_borders(col = "#BBBBBB") + tm_shape(shp1) + tm_borders(col = "#444444") +
  tm_text("NAME_1", size = 0.75, col = "black", bg.color = "#FFFFFF") + tm_shape(shp0) +
  tm_borders(col = "#000000") + tm_compass(position = c("right", "top"), size = 2) +
  tm_scale_bar(position = c("right", "bottom"), text.size = 0.5) + tm_layout(title =
  "Distance from Franciscan Missions by Municipality",
  title.bg.color = "white", legend.position = c("left", "bottom"), legend.bg.color =
  "white",
  frame = FALSE, fontfamily = "Lato")
```



Task C

The perils of ignoring peer effects

Task D

The image is a screenshot, and those are conventionally stored in PNG format. The photo *contained* in the screenshot is a photograph, and it is difficult to guess which format it was originally saved in. Let's say it's JPEG. Then, someone inserted the image into the assignment PDF, meaning it is technically not stored as a PNG anymore. What all those ways of storing the image have in common is that they are **raster formats**, as they consist of individual pixels. And even if we print the document containing the image, it gets printed as dots, which are not exactly pixels, but certainly form a raster rather than a vector.