

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>.*

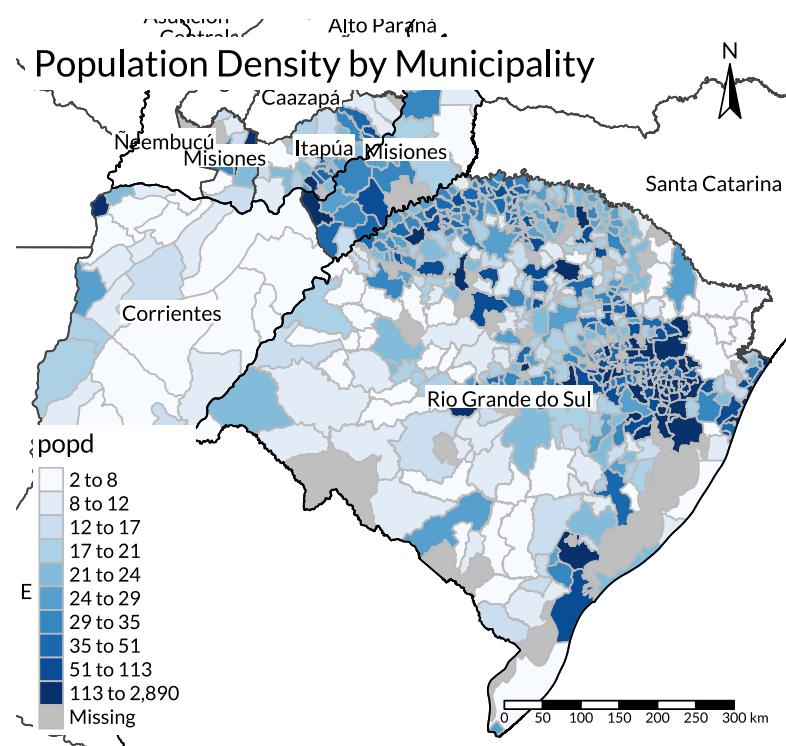
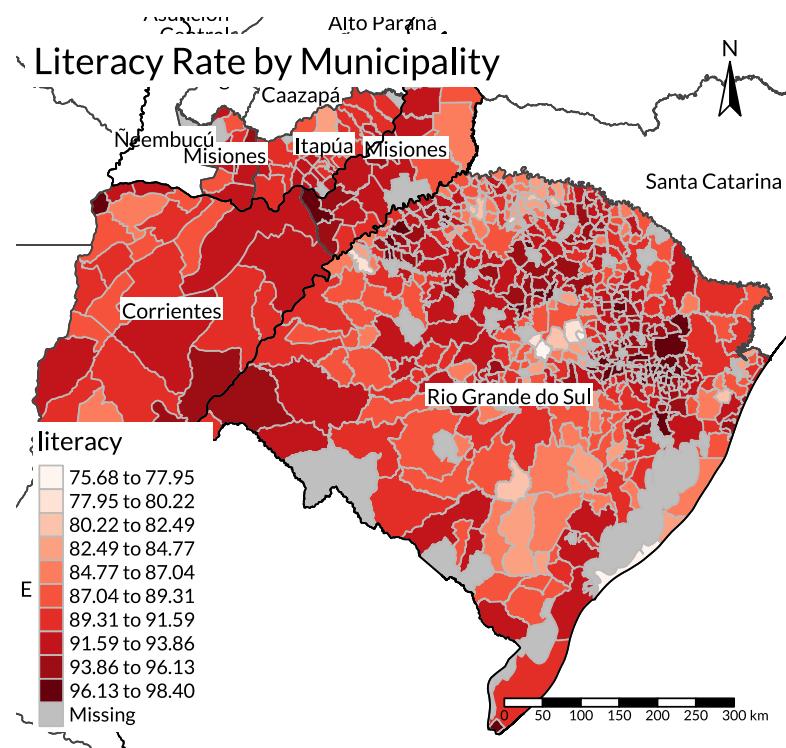
Task A

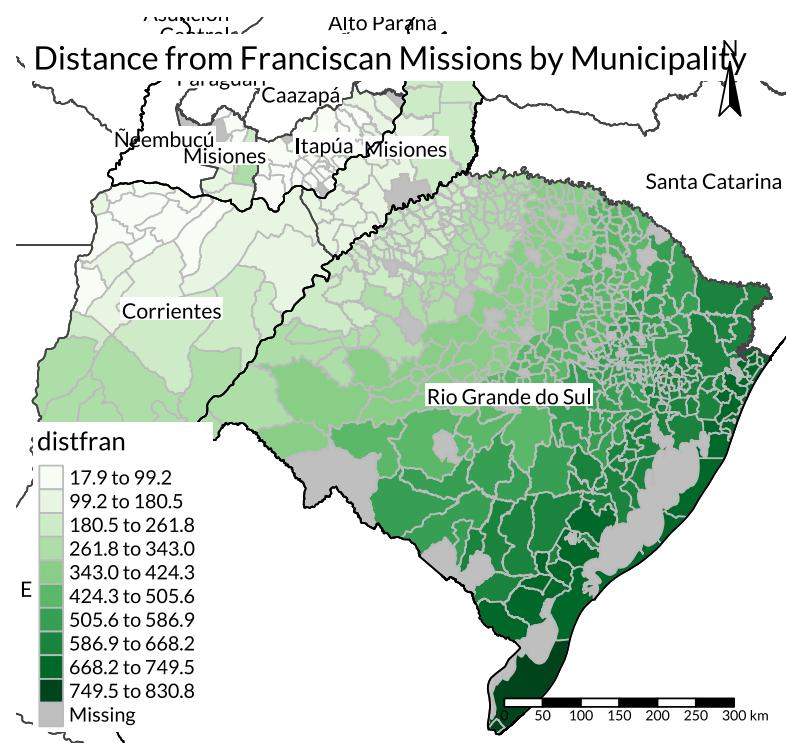
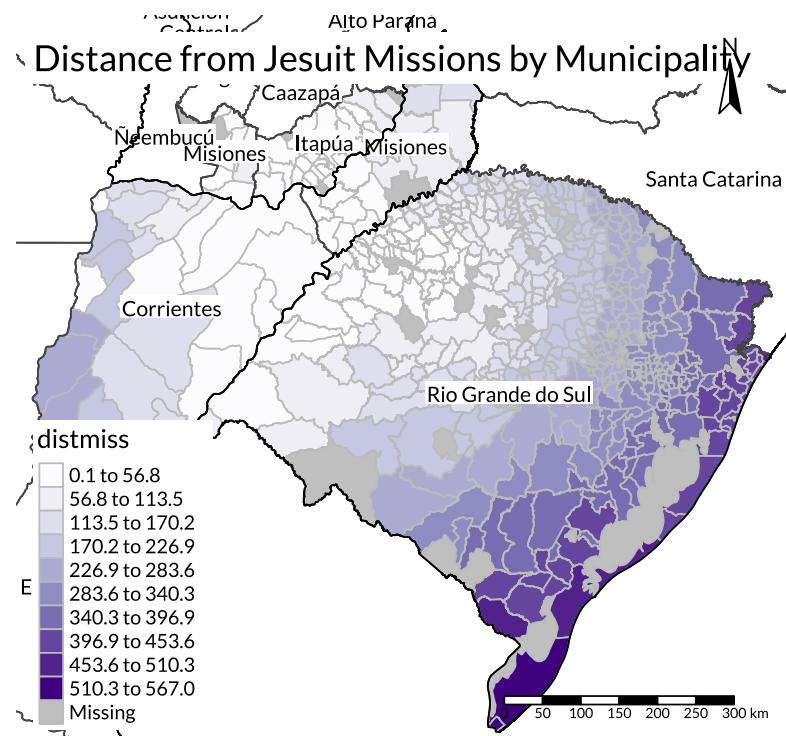
Text

Task B

Nice Maps

We create four maps:





Replication of Table 2

```
# Replicate Results -----
col1 <- lm(illiteracy ~ distmiss + lati + longi + corr + ita + mis + mis1, data = litr)
col2 <- lm(illiteracy ~ distmiss + lati + longi + area + tempe + alti + preci + rugg +
           river + coast + corr + ita + mis + mis1, data = litr)

litr_bra <- subset(litr, country == "BRA")
col3 <- lm(illiteracy ~ distmiss + lati + longi + as.factor(mesorregi), data = litr_bra)
col4 <- lm(illiteracy ~ distmiss + lati + longi + area + tempe + alti + preci + rugg +
           river + coast + as.factor(mesorregi), data = litr_bra)
```

```

litr_arg <- subset(litr, country == "Argentina")
col5 <- lm(illiteracy ~ distmiss + lati + longi + corr, data = litr_arg)
col6 <- lm(illiteracy ~ distmiss + lati + longi + area + tempe + alti + preci + rugg +
    river + coast + corr, data = litr_arg)

litr_pry <- subset(litr, country == "Paraguay")
col7 <- lm(illiteracy ~ distmiss + ita, data = litr_pry)
col8 <- lm(illiteracy ~ distmiss + area + tempe + alti + preci + rugg + river + coast +
    ita, data = litr_pry)

```

	Dependent variable: illiteracy			
	(1)	(2)	(3)	(4)
distmiss	0.011*** (0.004)	0.011** (0.005)	0.016** (0.007)	0.030*** (0.009)
lati	0.556** (0.251)	0.070 (0.778)	0.408 (0.451)	4.575*** (1.499)
longi	-1.108*** (0.269)	-1.007 (0.686)	-1.022* (0.551)	-5.694*** (1.543)
area		0.0001 (0.0002)		-0.0002 (0.0003)
tempe		0.059 (0.077)		-0.062 (0.107)
alti		0.006 (0.004)		0.001 (0.005)
preci		-0.003 (0.002)		0.001 (0.003)
rugg		-0.00000 (0.00000)		-0.00000 (0.00000)
river		1.470** (0.728)		1.723** (0.869)
coast		0.209 (0.989)		-4.976*** (1.854)
corr	-5.341*** (1.521)	-6.032*** (1.792)		
ita	-3.187*** (0.960)	-2.409** (1.057)		
mis	-4.324*** (1.542)	-4.734*** (1.740)		
mis1	-3.279*** (1.082)	-2.299* (1.217)		
as.factor(mesorregi)4302			-2.720*** (0.843)	-2.543*** (0.944)
as.factor(mesorregi)4303			-0.483 (1.049)	-0.383 (1.137)
as.factor(mesorregi)4304			-0.771 (0.918)	0.196 (1.065)
as.factor(mesorregi)4305			-3.023*** (1.051)	-1.290 (1.328)
as.factor(mesorregi)4306			-1.724 (1.650)	-3.421* (1.833)
as.factor(mesorregi)4307			-0.437 (1.995)	0.327 (2.081)
Constant	-35.328*** (12.021)	-53.741 (35.118)	-35.274 (28.034)	-143.869** (59.947)
Observations	549	548	467	467
R ²	0.042	0.073	0.094	0.135
Adjusted R ²	0.029	0.049	0.076	0.104
Residual Std. Error	3.948 (df = 541)	3.912 (df = 533)	4.040 (df = 457)	3.978 (df = 450)
F Statistic	3.370*** (df = 7; 541)	2.998*** (df = 14; 533)	5.270*** (df = 9; 457)	4.382*** (df = 16; 450)

Note:

*p<0.1; **p<0.05; ***p<0.01

	Dependent variable: illiteracy			
	(5)	(6)	(7)	(8)
distmiss	0.016* (0.008)	0.067*** (0.023)	0.005 (0.016)	0.014 (0.026)
lati	0.084 (0.628)	-9.338** (3.626)		
longi	1.095 (0.778)	7.186*** (2.436)		
area		-0.0001 (0.0003)		0.0004 (0.001)
tempe		0.968*** (0.237)		0.360* (0.210)
alti		0.065*** (0.013)		0.016 (0.015)
preci		-0.017** (0.008)		0.0001 (0.005)
rugg		-0.00005** (0.00002)		0.0001 (0.00004)
river		9.795*** (2.837)		0.983 (5.340)
coast		1.889 (3.424)		0.826 (4.247)
corr	3.771* (2.208)	-3.043 (3.338)		
ita			-0.231 (0.803)	0.829 (2.212)
Constant	69.263* (39.015)	-41.058 (67.152)	8.673*** (0.735)	-80.723* (42.309)
Observations	42	42	40	39
R ²	0.165	0.669	0.004	0.251
Adjusted R ²	0.075	0.547	-0.050	0.019
Residual Std. Error	2.924 (df = 37)	2.045 (df = 30)	2.150 (df = 37)	2.101 (df = 29)
F Statistic	1.830 (df = 4; 37)	5.509*** (df = 11; 30)	0.067 (df = 2; 37)	1.082 (df = 9; 29)

Note:

*p<0.1; **p<0.05; ***p<0.01

```

lit1 <- litr %>%
  drop_na(lati, longi) %>%
  mutate(lat = lati, lon = longi)

col1c <- conleyreg(illiteracy ~ distmiss + lati + longi + corr + ita + mis + mis1,
  data = lit1, dist_cutoff = 11.112, lat = "lat", lon = "lon")
col2c <- conleyreg(illiteracy ~ distmiss + lati + longi + area + tempe + alti + preci +
  rugg + river + coast + corr + ita + mis + mis1, data = lit1, dist_cutoff = 11.112,
  lat = "lat", lon = "lon")

lit1_bra <- subset(lit1, country == "BRA")
col3c <- conleyreg(illiteracy ~ distmiss + lati + longi + as.factor(mesorregi), data =
lit1_bra,
  dist_cutoff = 11.112, lat = "lat", lon = "lon")
col4c <- conleyreg(illiteracy ~ distmiss + lati + longi + area + tempe + alti + preci +
  rugg + river + coast + as.factor(mesorregi), data = lit1_bra, dist_cutoff = 11.112,
  lat = "lat", lon = "lon")

lit1_arg <- subset(lit1, country == "Argentina")
col5c <- conleyreg(illiteracy ~ distmiss + lati + longi + corr, data = lit1_arg,
  dist_cutoff = 11.112, lat = "lat", lon = "lon")
col6c <- conleyreg(illiteracy ~ distmiss + lati + longi + area + tempe + alti + preci +
  rugg + river + coast + corr, data = lit1_arg, dist_cutoff = 11.112, lat = "lat",
  lon = "lon")

lit1_pry <- subset(lit1, country == "Paraguay")
col7c <- conleyreg(illiteracy ~ distmiss + ita, data = lit1_pry, dist_cutoff = 11.112,

```

```

lat = "lat", lon = "lon")
col8c <- conleyreg(illiteracy ~ distmiss + area + tempe + alti + preci + rugg + river +
coast + ita, data = lit1_pry, dist_cutoff = 11.112, lat = "lat", lon = "lon")

```

	<i>Dependent variable:</i>			
	(1)	(2)	(3)	(4)
distmiss	0.011*** (0.004)	0.011** (0.005)	0.016* (0.009)	0.030*** (0.010)
lati	0.556** (0.247)	0.070 (0.773)	0.408 (0.570)	4.575** (1.792)
longi	-1.108*** (0.266)	-1.007* (0.549)	-1.022 (0.696)	-5.694*** (1.780)
area		0.0001 (0.0002)		-0.0002 (0.0003)
tempe		0.059 (0.080)		-0.062 (0.130)
alti		0.006 (0.004)		0.001 (0.006)
preci		-0.003 (0.002)		0.001 (0.003)
rugg		-0.00000 (0.00000)		-0.00000 (0.00000)
river		1.470** (0.731)		1.723* (0.904)
coast		0.209 (0.885)		-4.976** (2.125)
corr	-5.341*** (1.325)	-6.032*** (1.612)		
ita	-3.187*** (0.758)	-2.409*** (0.848)		
mis	-4.324*** (1.159)	-4.734*** (1.519)		
mis1	-3.279*** (0.876)	-2.299** (0.980)		
as.factor(mesoreg)4302			-2.720*** (0.896)	-2.543** (1.067)
as.factor(mesoreg)4303			-0.483 (1.150)	-0.383 (1.250)
as.factor(mesoreg)4304			-0.771 (1.215)	0.196 (1.448)
as.factor(mesoreg)4305			-3.023** (1.393)	-1.290 (1.659)
as.factor(mesoreg)4306			-1.724 (2.027)	-3.421 (2.190)
as.factor(mesoreg)4307			-0.437 (2.576)	0.327 (2.654)
Constant	-35.328*** (12.074)	-53.741 (33.356)	-35.274 (38.313)	-143.869** (66.608)

Note:

*p<0.1; **p<0.05; ***p<0.01

	<i>Dependent variable:</i>			
	(5)	(6)	(7)	(8)
dismiss	0.016** (0.007)	0.067*** (0.019)	0.005 (0.011)	0.014 (0.023)
lati	0.084 (0.711)	-9.338*** (3.238)		
longi	1.095 (0.754)	7.186*** (2.262)		
area		-0.0001 (0.0002)	0.0004 (0.001)	
tempe		0.968*** (0.200)	0.360* (0.190)	
alti		0.065*** (0.010)	0.016 (0.012)	
preci		-0.017** (0.007)	0.0001 (0.004)	
rugg		-0.00005*** (0.00002)	0.0001 (0.00004)	
river		9.795*** (1.837)	0.983 (4.738)	
coast		1.889 (2.976)	0.826 (3.941)	
corr	3.771** (1.736)	-3.043 (3.080)		
ita			-0.231 (0.794)	0.829 (1.998)
Constant	69.263* (34.532)	-41.058 (46.169)	8.673*** (0.666)	-80.723** (37.732)

Note:

*p<0.1; **p<0.05; ***p<0.01

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.