Assignment 2

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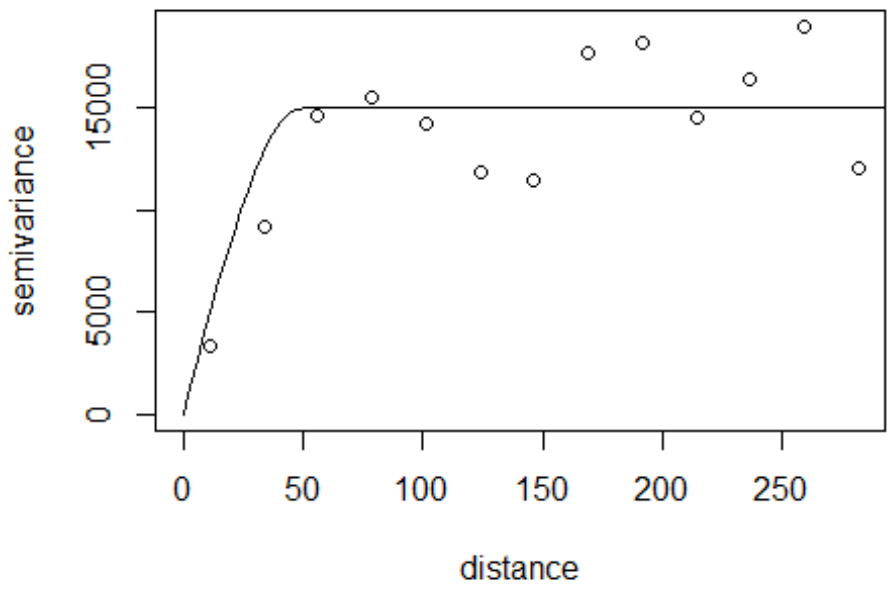
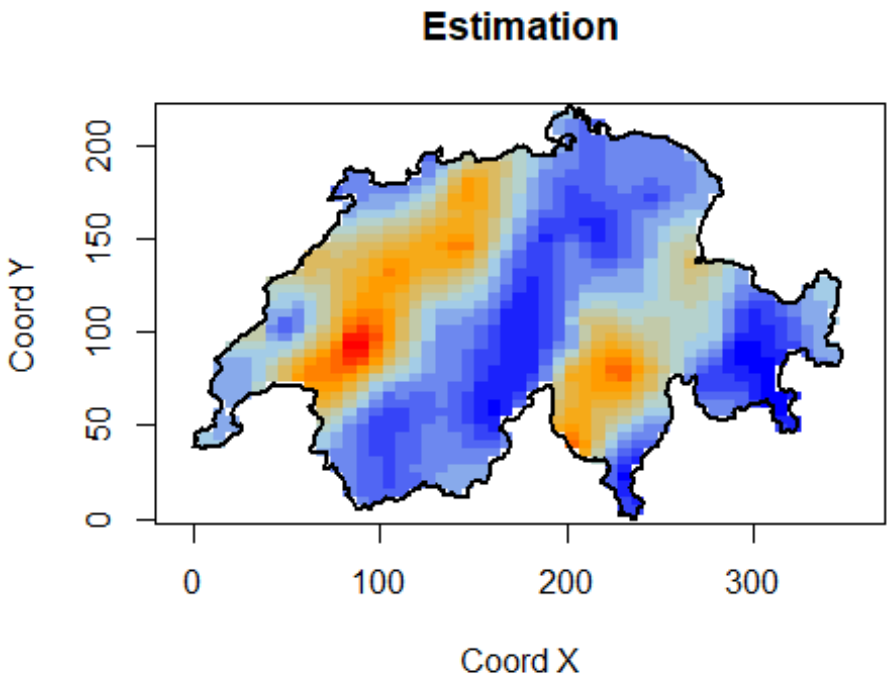
raw data

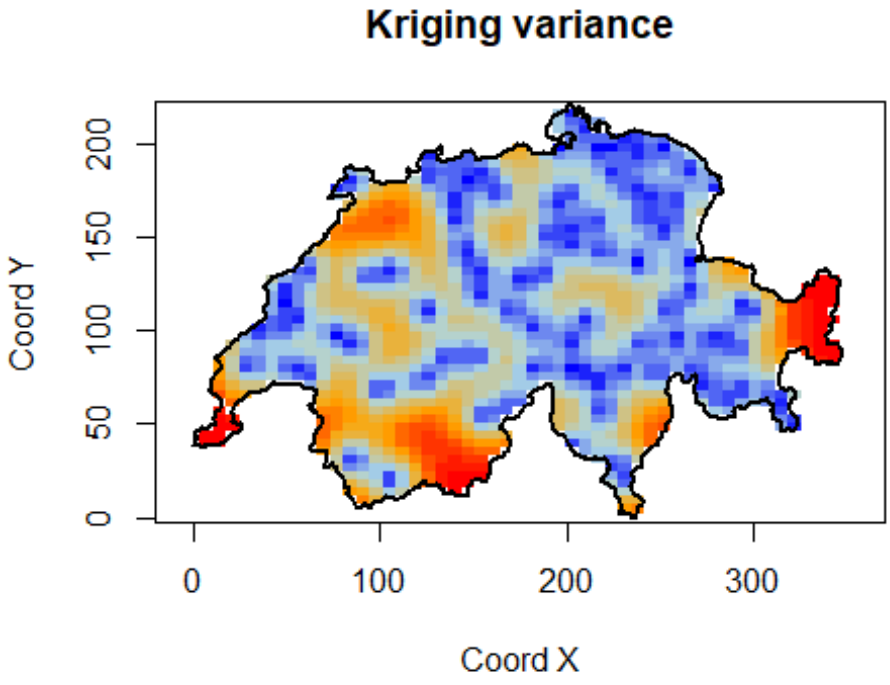
```
library(geoR)

## The legacy packages maptools, rgdal, and rgeos, underpinning the sp
package,
## which was just loaded, will retire in October 2023.
## Please refer to R-spatial evolution reports for details, especially
## https://r-spatial.org/r/2023/05/15/evolution4.html.
## It may be desirable to make the sf package available;
## package maintainers should consider adding sf to Suggests:.
## The sp package is now running under evolution status 2
##      (status 2 uses the sf package in place of rgdal)

## ------------------------------------------------------------
##  Analysis of Geostatistical Data
##  For an Introduction to geoR go to http://www.leg.ufpr.br/geoR
##  geoR version 1.9-2 (built on 2022-08-09) is now loaded
## ------------------------------------------------------------

vario.ex <- variog(sic.100, bin.cloud = TRUE)

## variog: computing omnidirectional variogram

plot(vario.ex, main= "")
lines.variomodel(cov.model = "spher", cov.pars = c(15000, 50), nug = 0,
max.dist= 300)
```



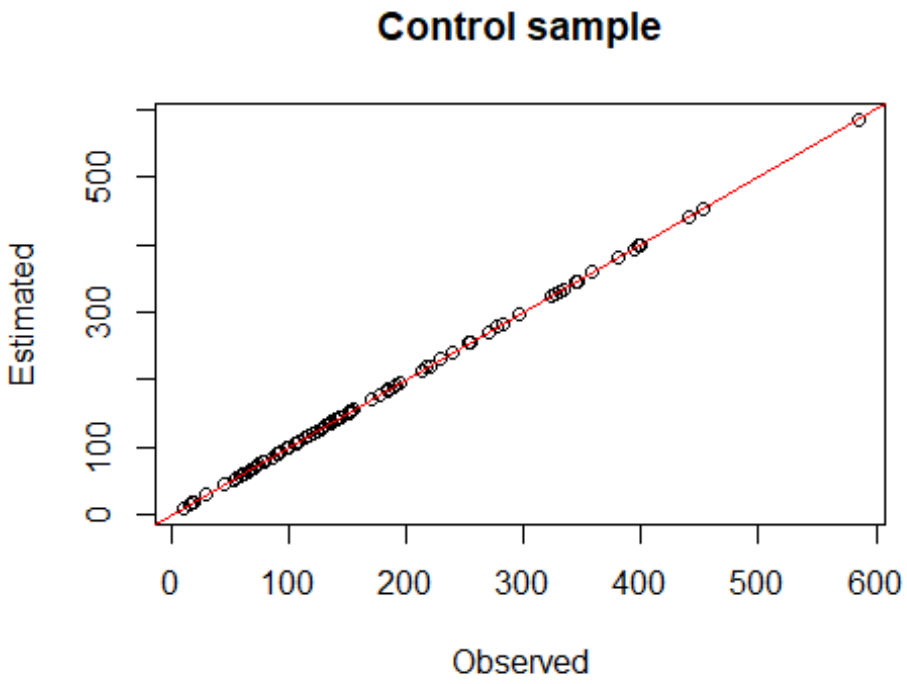

```
library(geoR)
pred.grid <- expand.grid(seq(0,350, l=51), seq(0,220, l=51))
rgb.palette <- colorRampPalette(c("blue", "lightblue", "orange", "red"),
space="rgb")
kc<- krige.conv(sic.100, loc= pred.grid, krige=
krige.control(cov.model="spherical", cov.pars = c(15000,50)))

## krige.conv: model with constant mean
## krige.conv: Kriging performed using global neighbourhood

image(kc, loc= pred.grid, col= rgb.palette(20), xlab= "Coord X", ylab= "Coord
Y", borders= sic.borders, main= "Estimation")
```



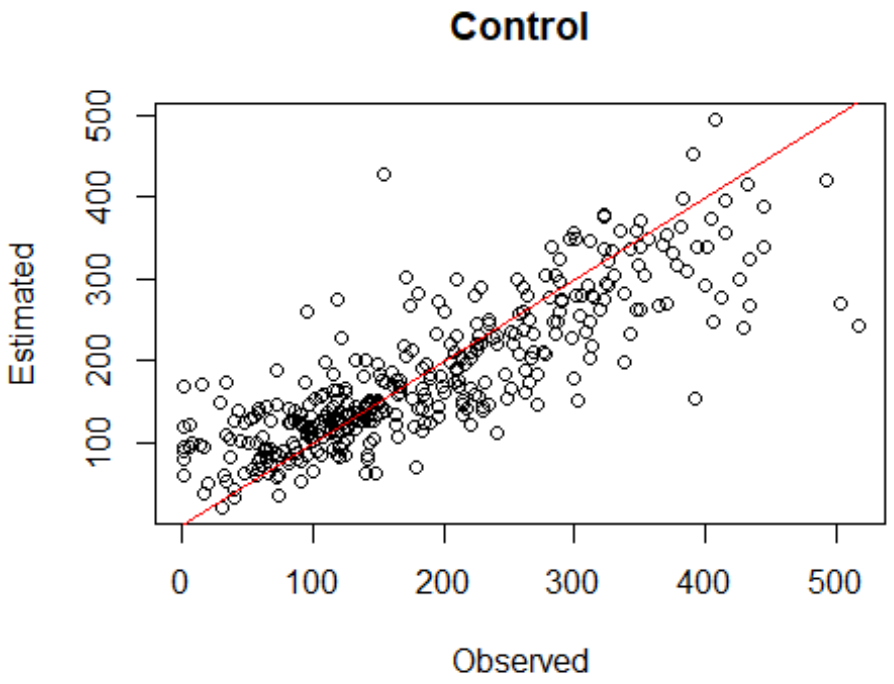

```
krige.var <- kc$krige.var
image(kc, krige.var, loc = pred.grid, col= rgb.palette(20), xlab= "Coord X",
ylab= "Coord Y", borders= sic.borders, main= "Kriging variance")
```



```r
library(geoR)
kc1 <- krige.conv(sic.100, loc=sic.100$coords, krige=krige.control(cov.model
= "spherical", cov.pars = c(16000,47)))

## krige.conv: model with constant mean
## krige.conv: Kriging performed using global neighbourhood

kc2 <- krige.conv(sic.100, loc= sic.367$coords, krige=krige.control(cov.model
= "spherical", cov.pars = c(16000,47)))

## krige.conv: model with constant mean
## krige.conv: Kriging performed using global neighbourhood

plot(sic.100$data, kc1$predict, xlab= "Observed", ylab= "Estimated", main=
"Control sample")
abline(a=0, b=1, col="red")
```

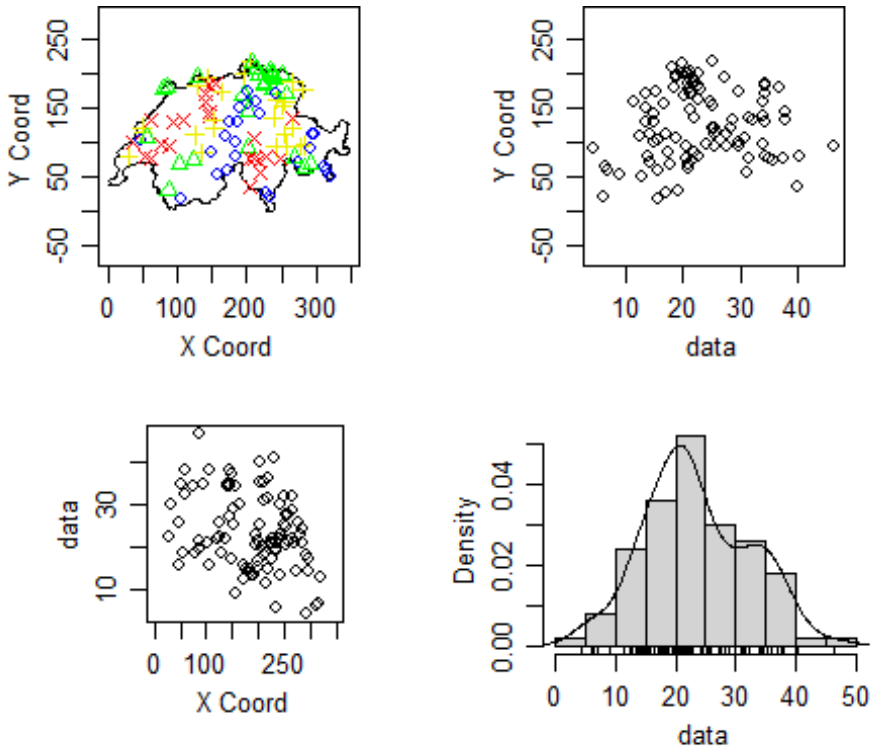



```r
plot(sic.367$data, kc2$predict,xlab= "Observed", ylab= "Estimated", main=
"Control")
abline(a=0, b=1, col= "red")
```

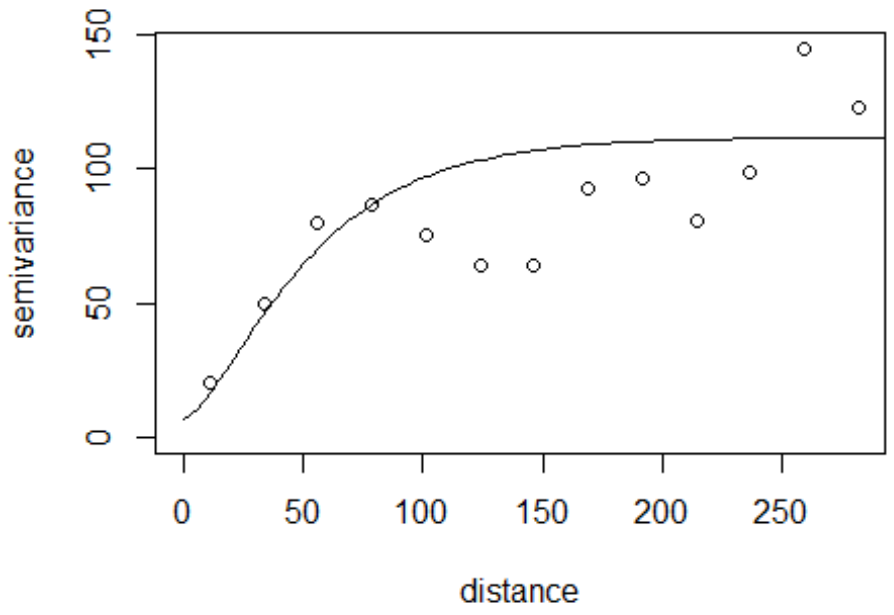


Transformed data

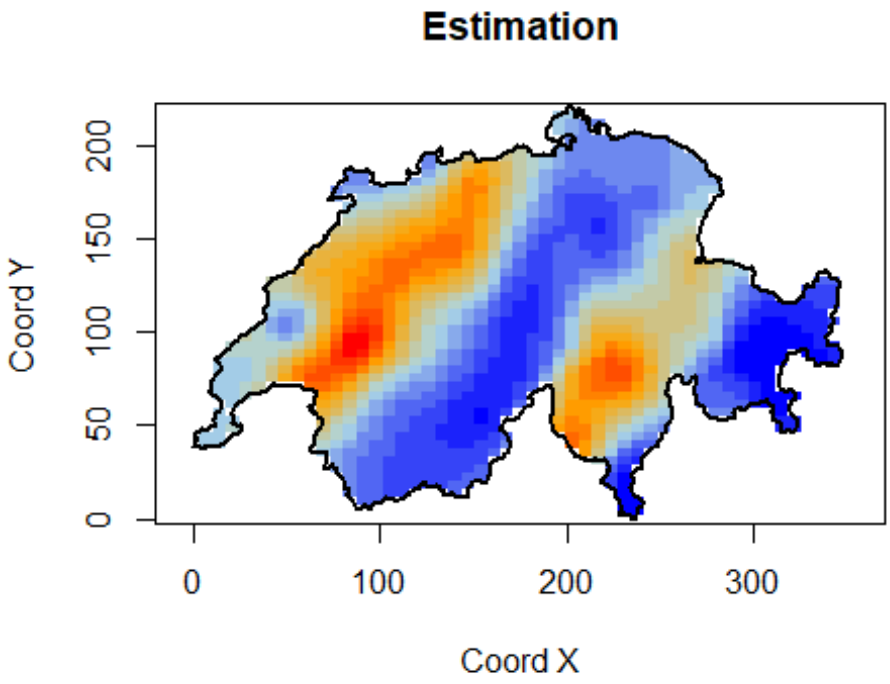
```
library(geoR)
plot.geodata(sic.100, bor=sic.borders, lambda= 0.5)
```



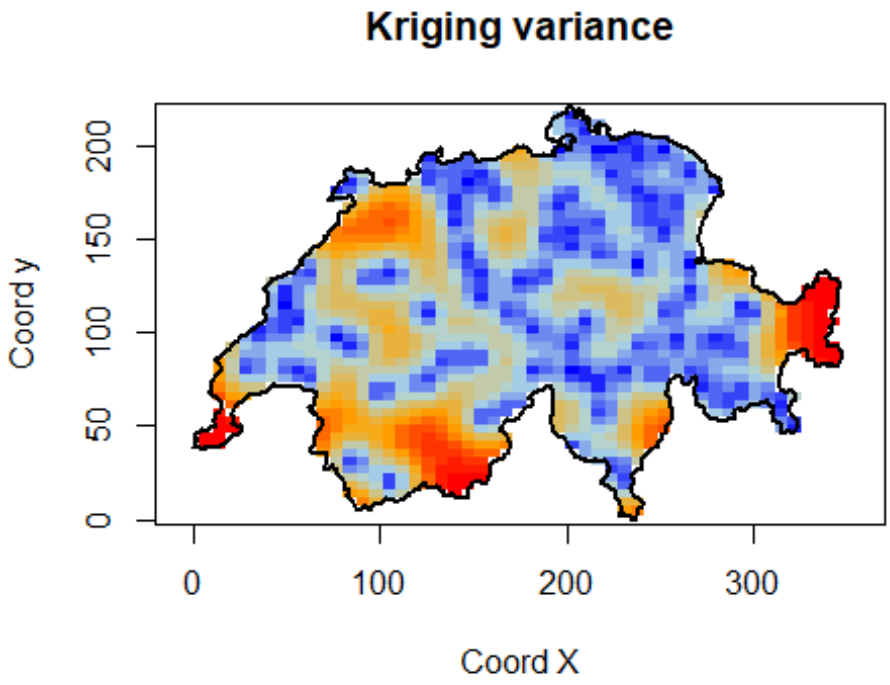
```r
library(geoR)
vario.ext <- variog(sic.100, option= "bin", lambda = 0.5)

## variog: computing omnidirectional variogram

plot(vario.ext)
lines.variomodel(cov.m="mat", cov.p= c(105, 36), nug= 6.9, max.dist= 300,
kappa = 1, lty=1)
```



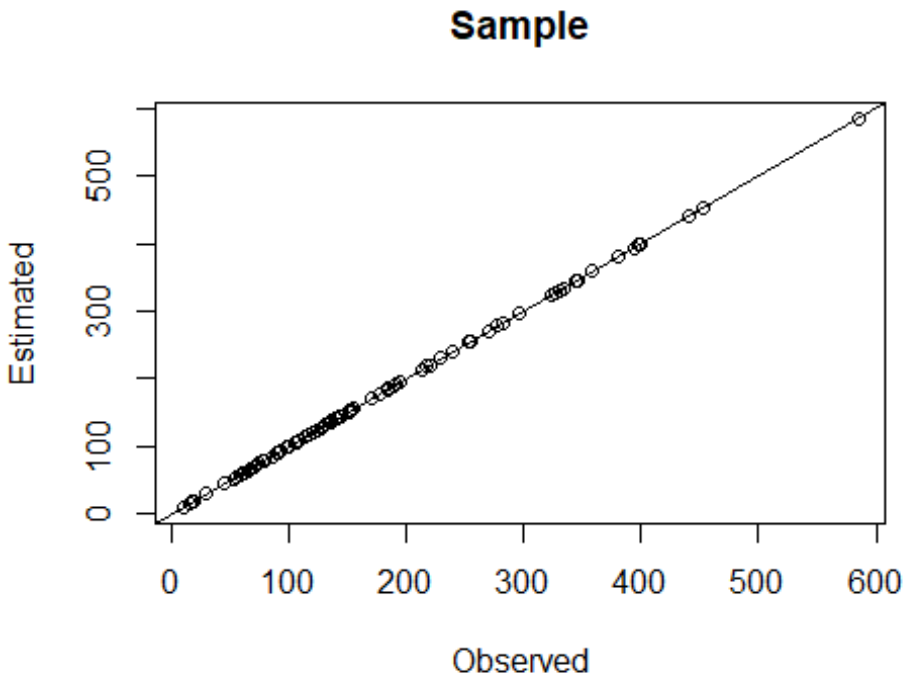

```r
library(geoR)
kct <- krige.conv(sic.100, loc= pred.grid, krige = krige.control(cov.model=
"matern", cov.pars= c(105,36), kappa=1, nugget=6.9, lambda = 0.5))

## krige.conv: model with constant mean
## krige.conv: performing the Box-Cox data transformation
## krige.conv: back-transforming the predicted mean and variance
## krige.conv: Kriging performed using global neighbourhood

pred.grid <- expand.grid(seq(0,350, l=51), seq(0,220, l=51))
rgb.palette <- colorRampPalette(c("blue", "lightblue", "orange", "red"),
space= "rgb")
image(kct, loc= pred.grid, col= rgb.palette(20), xlab= "Coord X", ylab=
"Coord Y", borders= sic.borders, main= "Estimation")
```




```
image(kct, krige.var, loc= pred.grid, col= rgb.palette(20), xlab= "Coord X",
ylab= "Coord y", borders= sic.borders, main= "Kriging variance")
```



```r
library(geoR)
kct1 <- krige.conv(sic.100, loc= sic.100$coords, krige=
krige.control(cov.model ="spherical", cov.pars = c(16000,47), kappa=1,
nugget=6.9, lambda = 0.5))

## krige.conv: model with constant mean
## krige.conv: performing the Box-Cox data transformation
## krige.conv: back-transforming the predicted mean and variance
## krige.conv: Kriging performed using global neighbourhood

kct2 <- krige.conv(sic.100, loc= sic.367$coords,
krige=krige.control(cov.model = "spherical", cov.pars = c(16000,47), kappa=1,
nugget = 6.9, lambda = 0.5))

## krige.conv: model with constant mean
## krige.conv: performing the Box-Cox data transformation
## krige.conv: back-transforming the predicted mean and variance
## krige.conv: Kriging performed using global neighbourhood

plot(sic.100$data, kct1$predict, xlab= "Observed", ylab= "Estimated", main=
"Sample")
abline(a=0, b=1, color="red")

## Warning in int_abline(a = a, b = b, h = h, v = v, untf = untf, ...):
"color" is
## not a graphical parameter
```



```r
plot(sic.367$data, kct2$predict, xlab= "Observed", ylab= "Estimated", main=
"Control sample")
abline(a=0, b=1, col= "red")
```