University of California, Los Angeles
Department of Statistics

Statistics C173/C273 **Instructor: Nicolas Christou**

Lab 3

Exercise 1
Access the following data set from Kruger National Park in South Africa:

```
a <- read.table("http://www.stat.ucla.edu/~nchristo/statistics_c173_c273/
kruger_park_rainfall.txt", header=TRUE)
```

Answer the following questions:

a. Generate spatial data on the coordinates of this data set using the Cholesky decomposition method. Use the spherical variogram model with parameters of your choice.

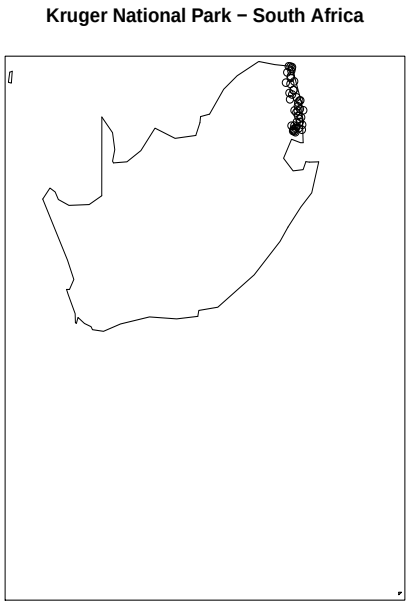
b. Once you generate the data convert them into a geodata object using `geoR` and compute the sample variogram. You can use the classical or the robust estimator.

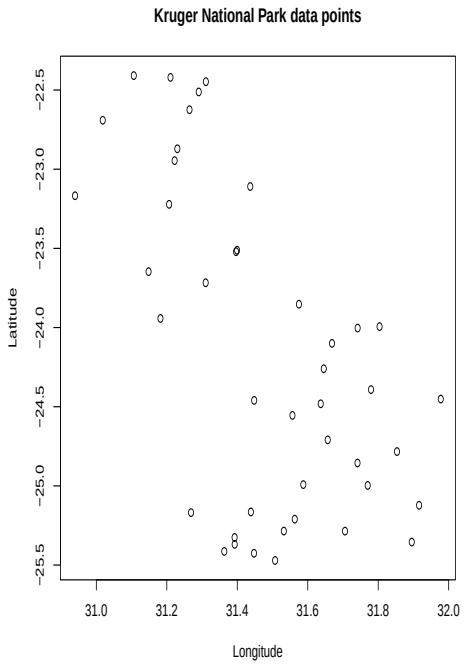
c. Use all the fitting methods we discussed in class to fit the theoretical spherical variogram to the sample variogram you constructed in part (b). Show all of them on the same graph.

d. Finally, plot the spherical variogram with the exact parameters.

e. Repeat a-d using the spectral decomposition method.

f. Use now the `grf` function to generate 5 spatial data sets using the spherical variogram and parameters of your choice. Plot the 5 experimental semivariograms and the model on the same graph.





Exercise 2
Generate data on a map of your choice using the techniques discussed in class.