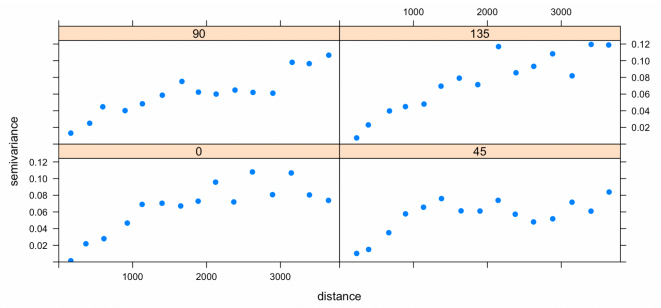
Problem 4

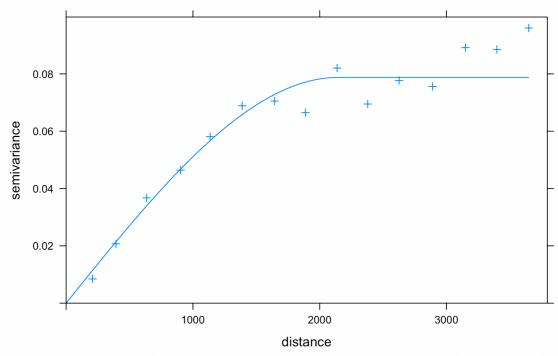
We are going to study the temperature in Milano.

For the first model which consider just the variable year we check the assumption of isotropy and second order stationarity:



The variogram along the difference dimension is similar so we can assume isotropy but since the expected value of the prediction depends on the year and not just on the coordinates, we can't assume second order stationarity.

The resulting fitted variogram has the following parameter and is displayed below:

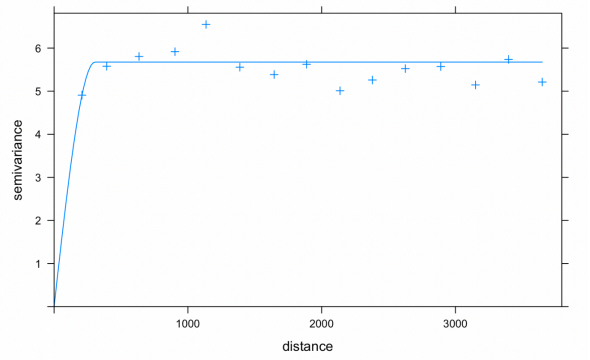


model	psill	range
Sph	0.07875781	2145.213

Fitting the designed model on our training set via generalized least square we obtain the following parameters: a_2003 = 35.66398 and a_2022 = 30.98347

For the second model we consider just the variable park we check the assumption of isotropy and second order stationarity, as before we can assume isotropy but since the expected value of the prediction depends on the year and not just on the coordinates, we can't assume second order stationarity.

The resulting fitted variogram has the following parameter and is displayed below:



model	psill	range
Sph	5.675135	305.2353

Fitting the designed model on our training set via generalized least square we obtain the following parameters: b_no_park = 33.38337 and b_park = 33.21578

The second model is worst because does not explain well the variability of the model, it is al most stationary. We choose the first model which seem good enough.

Predicting the desired location with the first model we get the following prediction 31.24885 with an estimate variance of 0.02190595 wich we cannot trust since we used Universal kriging.