Forecasting with Geospacial Data

Geo-statistics is a subfield of statistics focused on spatial or spatiotemporal datasets, AKA data with location or longitudinal data with location.

In the following case, we have a large set of longitudinal data with location and we want to make guesses about the future in those locations. Not to be confused with **kriging** which is a gaussian process of estimating a variable at an *unobserved* location, based on the estimates of nearby or similar locations.

> **Fun fact**: Many of the techniques we use today originated from mining engineers who desired to know what minerals might lay beyond a surface given a sample.

The following notes aim to provide the fundamentals of creating a network of connected spaces, and forecasting techniques for spatial network data.

Networks

A **network** is a discrete set of items (referred to as **nodes**) with some connection between them (referred to as **edges**). Typically, a graph network is represented mathematically as G = (N, E); with a set of N nodes and E edges.

Time Series

A parametric model can be used to describe a relationship between independent and dependent variables. It's not unusual for a time series to exhibit a trend, such as seasonality.

Think of a time series as a series of components:

1. A trend-cycle component
2. A seasonal component
3. A remainder component

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