



What We Did Not Learn in CEE 110

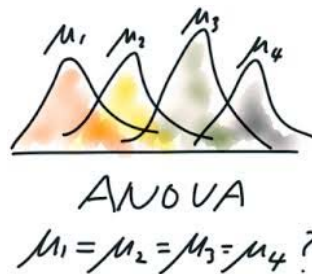


Inferences Based on Two Samples

- z Tests and CI for a Difference between Two Population Means
- The Two-Sample t Test and CI
- Analysis of Paired Data

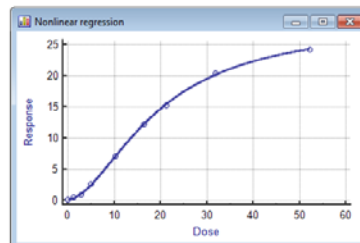
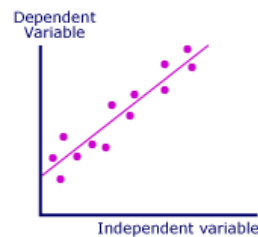
ANOVA

- Analysis of variance
- One-Way ANOVA (Single Factor)
 - F distribution and F test
- Two-Way ANOVA
- Multifactor ANOVA



Regression

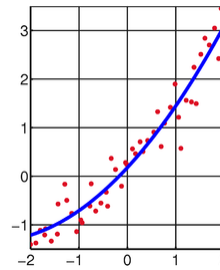
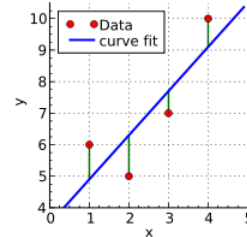
- Linear Regression
- Nonlinear Regression
 - Polynomial
 - Exponential
 - Logarithmic
 - Logistic
 - Piecewise Linear
 - Periodic
- Multiple Regression



$$y = a_0 + a_1x_1 + a_2x_2$$

Model Fitting and Parameter Estimation

- Least squares
- Maximum likelihood
- Method of moments



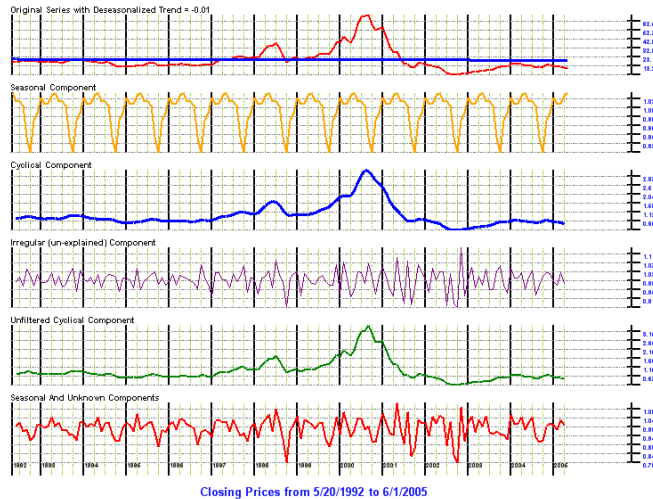
Multivariate Statistics

- Multivariate analysis of variance (MANOVA)
- Principal components analysis (PCA)
- Factor analysis
- Redundancy analysis (RDA)
- Discriminant analysis
- Linear discriminant analysis (LDA)
- Clustering systems
- Correspondence analysis (CA)
- Canonical (or "constrained") correspondence analysis (CCA)



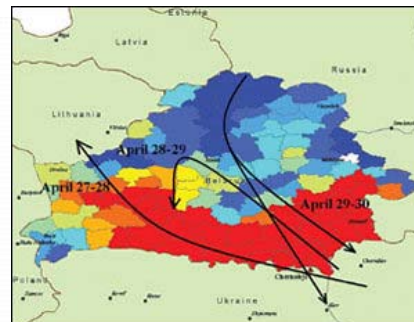
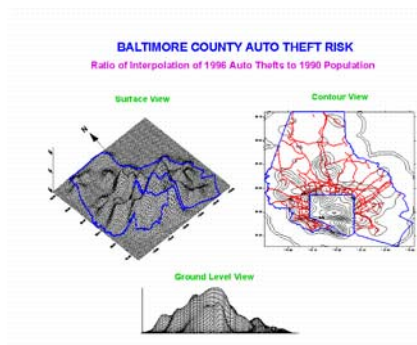
Time Series Analysis

Classical Decomposition of ALA Prices



Spatial Statistics

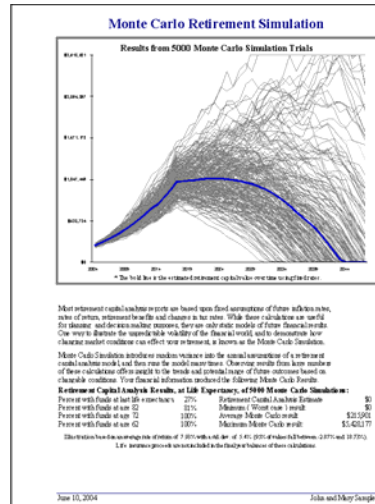
Kriging



Wind direction over the Belarus territory in April 1986. Using filtered kriging, Byelorussian districts are colored according to the probability that thyroid cancer rates in children exceeded one case per 10,000. Red represents the highest probability and cycles through the spectrum to blue, the lowest probability. (Data: the Sakharov Institute of Radioecology, Minsk, Belarus)

Simulation/Resampling

- Monte Carlo
- Bootstrap



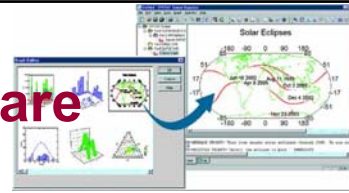
Other Topics

- Statistics of censored data
 - Detection limits
 - Missing values
- Quality assurance
- Data assimilation and optimal estimation
 - Kalman filters





Statistics Software



S/W	URL
R	https://www.r-project.org/
SAS	https://www.sas.com/en_us/software/stat.html
SPSS	https://www.ibm.com/analytics/data-science/predictive-analytics/spss-statistical-software
Stata	https://www.stata.com/
Systat	https://systatsoftware.com/
Minitab	http://www.minitab.com/en-US/default.aspx