# Creation:

## bmc | Science

# Topics:

## R

* Introduction
  + My background
  + A need for R to Science!
* Intro to dplyr
  + Verbs
  + Capability
  + Examples
* Intro to ggplot2
  + Themes
  + How to ask good questions, and answer them by visualizations
* Multi-Attribute Decision Making in R
  + Setting up a decision matrix
    - Row names
    - Col names
  + Normalizing
  + Running Algorithm
    - TOPSIS
    - SAW
* Simulations in R
  + Queueing
  + Point Processes?

## Python

<http://scikit-learn.org/stable/index.html>

* Data Mining
  + Essentials
    - Data matrix, prediction
    - Examples of the major fields in data mining
      * Audio
        + How to get this into normal table form
      * Image
        + 1 hot encoding for label, flatten for row
      * Text
        + Document by vocab matrix
        + Svd and word frequencies
      * Standard data tables
        + Basic algorithms
  + Advanced Topics – Reference sklearn for all of this.
    - Dimensionality Reduction
      * PCA
      * SVD
    - Clustering
      * KNN
      * EM Clustering
      * K-means
    - Classifiers
      * Bayes
        + Objective Function
        + Dependent – includes interactions
        + Example
      * Naïve Bayes
        + Objective Function
        + Independent
        + Example
      * Support Vector Machines
        + Objective Function
        + Assumptions
        + Example
      * Adaptive Boosting
    - Pattern Mining
      * Frequent Pattern Mining
      * Sequence Mining
    - Model Selection
      * Grid search
      * Cross validation
      * metrics