Multivariate Statistical Analysis

2017 Spring

School of Industrial Management Engineering, Korea University

1. Course Description
   - This module aims to provide students with the theoretical and practical knowledge and skills to obtain, modify, and analyze a large amount of data from various sources.
   - Topics covered in this module include basic association rules, supervised learning algorithms (classification & regression) such as k-nearest neighbor, decision tree, artificial neural networks, and unsupervised learning algorithms (clustering) such as K-Means clustering and hierarchical clustering.
   - This module comprises lectures and lab exercises with R to develop the practical skills.

2. Lecturer
   - Pilsung Kang, Innovation Hall 801A, 02-3290-3383, pilsung_kang@korea.ac.kr
   - Course homepage: https://github.com/pilsung-kang/multivariate-data-analysis

3. Time, Place, and Textbook
   - Time & Place
     1. Tue 10:30~11:45 (To be noticed)
     2. Thu 10:30~11:45 (To be noticed)
   - Textbook: No single textbook is required. Lecture slides and associated materials (R script, data sets, etc.) will be provided through the blackboard and course homepage.

4. Introduce Yourself
   - ✓ Submit your self-introduction slide (max. 5 pages) to the lecturer via E-mail by the end of the 2nd week.
   - ✓ Required information: Name, department, e-mail, cell phone number, recent photo(s)

5. Assessments
   - 1 final exam (40%): 3 pages of cheating papers are allowed
   - 2 R open courses (10%)
     1. Introduction to R by Data Camp
        1. https://www.datacamp.com/courses/free-introduction-to-r
     2. Try R by Code School
        1. http://www.skilledup.com/courses/try-r.5245
   - 5 data analysis assignments (50%)

6. Schedule

Week	Topics
1	Orientation
2	Introduction to R: Data Types in R
3	Introduction to R: Conditions, Functions, and Graphics
4	Association Rule Mining
5	Clustering: K-Means Clustering, Hierarchical Clustering
6	Multiple Linear Regression
7	Logistic Regression
8	Midterm Exam Break
9	k-Nearest Neighbor Learning
10	Naïve Bayesian Classification
11	Classification and Decision Tree: Classification Tree
12	Classification and Decision Tree: Regression Tree
13	Artificial Neural Network 1
14	Artificial Neural Network 2
15	Artificial Neural Network 3: Bagging ANN
16	Final Exam