Multivariate Statistical Analysis

2018 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: Tue 14: 00~15:15 (75 min.), Thu 14:00~15:15 (75 min.)
   - Place:
     1. New Engineering Hall 224 (산업경영공학부 전산실)
   - 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. Lecture Module
   - 3~4 lecture units consists one module
   - 1~2 unit: classroom lecture(s)
   - 1 unit: R exercise
   - 1 unit: Q & A session
   - Attendance is not checked for the third unit

5. 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)

6. Assessments
   - 1 final exam (40%): 3 pages of cheating papers are allowed
   - 6 Data analysis assignments (60%)

7. Schedule

Date	Topics
Mar. 06/08	Orientation
Mar. 13	Association Rule Mining: Classroom lecture
Mar. 15	Association Rule Mining: R exercise
Mar. 20	Association Rule Mining: Q & A session
Mar. 22	Multiple Linear Regression: Classroom lecture
Mar. 27	Multiple Linear Regression: R exercise
Mar. 29	Multiple Linear Regression: Q & A session
Apr. 3	Logistic Regression: R exercise
Apr. 5	No class (IE conference)
Apr. 10	Logistic Regression: Q & A session
Apr. 12	Dimensionality reduction: Classroom lecture 1
Apr. 17	Dimensionality reduction: Classroom lecture 2
Apr. 19	Dimensionality reduction: R exercise
Apr. 24	No class (Midterm preparation)
Apr. 26	Dimensionality reduction: Q & A session
May. 01	Classification and Decision Tree: Classroom lecture
May. 03	Classification and Decision Tree: R exercise
May. 08	Classification and Decision Tree: Q & A session
May. 10	Artificial Neural Network: Classroom lecture 1
May. 15	Artificial Neural Network: Classroom lecture 2
May. 17	Artificial Neural Network: R exercise
May. 22	No class (National holiday)
May. 24	Artificial Neural Network: Q & A session
May. 29	Ensemble: Classroom lecture 1
May. 31	Ensemble: Classroom lecture 2
Jun. 05	Ensemble: R exercise
Jun. 07	Ensemble: Q & A session
Jun. 12	Q & A session for the final exam
Jun. 14	Final Exam