Certificate in Recommender System

Qualifying Participants

Individuals with 1+ year data science related experience or equivalent knowledge in data science fundamentals. Certified professionals are capable of leveraging data science with Python and other programming languages. They will be able to implement successful data products through assessing and designing recommendation systems and build accurate data models based on different business scenarios.

Testing Standards

Basic Theory: Statistics, Probability, Data Mining, machine learning, basic algorithm and program coding

Tools and Software Requirements: Python and related tool kits, Excel

Prerequisite Skills: Ability to analyze the requirements for recommender system, from design to the full lifecycle implementation. Additional specialization in structuring optimize data model for recommender system to address various business problems.

Exam Topics

Knowledge Summary

- linear algebra, vector, matrix completion / factorization
- statistics，probabilities
- classification, regression
- information retrieval & filtering

Approach Summary

Approach	Conceptual Goal	Input
Collaborative	Give me recommendations based on a collaborative approach that leverages the ratings and actions of my peers/myself	User ratings + community ratings
Content-based	Give me recommendations based on the content (attributes) I have favored in my past ratings and actions	User ratings + item attributes
Knowledge-based	Give me recommendations based on my explicit specification of the kind of content (attributes) I want	User specification + item attributes + domain knowledge

Non-Personalized & Content-Based Filtering

• TFIDF, n-grams, Bayes Classifier, Regression

Collaborative Filtering

• Neighborhood-Based

    ◦ user-based, item-based

• Model-based methods

    ◦ decision trees, rule-based, Bayesian methods, Latent factor model

• Improve

    ◦ clustering, dimensionality reduction

Evaluating Recommender System

• Accuracy Metrics

• Error Metrics

    ◦ MAE, RMSE, MSE

• Decision-support metrics

    ◦ ROC AUC, Breese score, later precision/recall

• User and Usage-centered Metrics

    ◦ coverage, user retention, recommendation uptake, satisfaction

• Error meets decision-support/user experience:

    ◦ "Reversals", A/B test

Grading Standards & Process

• This online test consists of a section of 20 multiple-choice questions, 15 subjective questions and 2 coding challenges.

• Test will be marked by examiners, and the results will be available one week after the test.

• The grading is based on a pass or no pass system. A minimum score of 80% is required to pass the test and receive the verified certificate.

Textbook

Recommender Systems -- Charu C.Aggarwal

Programming Collective Intelligence -- Toby Segaram