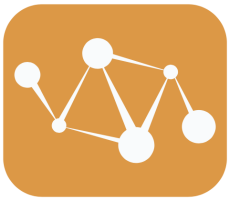

DataScienceWorks
Training Institute

Recommender Systems

Available from **Feb 2020**

Instructor:	Dr. Nayyar Zaidi	**Time/Place:**	TBA
		Duration:	1-2 Days
		Price:	Ask for the quote
		Contact:	info@datascience-works.com

Description:

This unit provides you with an excellent introduction to Recommender Systems. Recommender Systems is one of the great example of Machine Learning technology that has matured over the years and now plays a significant role in each of our daily lives. For example, Netflix tracks our watch history and based on that recommends new movies – google reads your cookies to see which websites you have visited and based on those shows you an Ad, dating companies routinely use Recommender Systems to match two individuals. The list of examples goes on and on. The course covers the breadth and depth of topics in Recommender Systems. Not only main approaches to the recommendation problems such as Collaborative Filtering, Content-based methods, will be discussed, but online-advertisement placement algorithms such as multi-arm bandits and its variants will be covered. It also covers topics in Search and Information Retrieval to cover strategies underlying effective recommendations.

Training Learning Outcome (TLO):

After the training, you are expected to:

- Have an excellent understanding of various topics in Recommender Systems.
- Be able to comprehend, communicate, disseminate complex Recommender Systems concepts.
- Have a basic to expert understanding of inner workings of various Recommender Systems algorithms.
- Be able to scope a Data Science project involving Recommender Systems.

Target Audience:

The training is for any aspiring or seasoned data scientists, and is perfect for:

- Computer Scientists and I.T Professionals,
- Engineers (Electrical, Mechanical, Industrial, etc),
- First year Ph.D. students in any field looking to break in Data Science,
- Post-doc fellows and Early Career Researchers in any field.

Duration:

The course is expected to be delivered in 2 days (9-5pm), but the duration can be adjusted based on audience experience and background.

Outline:

The following outline is tentative, and can be customized based on audience demand.

	Day 1	Day 2
Session 1	Introduction to Machine Learning	Search and Information Retrieval
Session 2	Recommender Systems Basics	Marketing Analytics
Session 3	Collaborative Filtering	RS Lab II
Session 4	RS Lab I	Further Topics in RS

Table 1: 2 Days – Training Outline.

Let us delve deep into the details (outline of topics covered) of each session in the following.

Introduction

- Machine learning, Artificial Intelligence, Statistics, Data Mining and More
- Linear/Logistic Regression
- Optimization
  - Gradient Descent, Stochastic Gradient Descent, etc.
- Model Selection
  - Regularization
  - Feature Engineering

Recommender Systems Basics

- Recommender Systems Examples
- Evaluating Recommendations
- Contents-based Recommendations
  - Neighbourhood-based
  - Similarity-based
  - Model-based

Collaborative Filtering

- Introduction to Collaborative Filtering
  - Baseline Estimates
  - Neighbourhood-based
  - Model-based
- Singular Value Decomposition (SVD)
  - Matrix Factorization
  - Constrained Matrix Factorization (Non-negative Matrix Factorization)
  - SVD++

  - Collaborative Filtering meets Content-based Filtering

Search and Information Retrieval

- Search vs. Recommendations
- Representing Text
- Relevance Metrics
- Representation Learning
  - PCA
  - Latent Semantic Analysis
  - Word2Vec
- Topic Modelling
- Learning to Rank

Marketing Analytics

- Typical Advertising
  - Lift vs. Uplift Modelling
- Online Advertisement Placement
  - Multiarm Bandits
  - Contextual Multi-arm Bandits
  - Reinforcement Learning for Placing Ads
- Effectiveness of Advertising

Further Topics in Recommender Systems

- Context-aware recommendations
- Hybrid Approaches
- Deep Learning for Recommendation Engines

About the Instructor:

Dr. Nayyar Zaidi is the lead Data Scientist at DataScienceWorks and a Senior Lecturer of Computer Science at Deakin University. He received the B.S. degree in computer science and engineering from the University of Engineering and Technology, Lahore, in 2005, and the Ph.D. degree in Artificial Intelligence from Monash University, Melbourne, Australia, in 2011. He worked as a Research Fellow, a Lecturer, and a Research Fellow, from 2011 to 2013, from 2013 to 2014, and from 2014 to 2017, respectively, at the Faculty of Information Technology, Monash University. From 2017 to 2019, he worked as Research Scientist at Credit AI (Trusting Social) Melbourne Lab. His research interests include feature engineering, data generation explainable models and ethical AI. He is also interested in practical (applied) data science, machine learning engineering, and data science training.

About this Document: