LEARNING ANALYTICS TOOLS

PROF. RAMKUMAR RAJENDRAN

Department of Educational Technology
IIT Bombay

INTENDED AUDIENCE : Any Interested Learner

COURSE OUTLINE :

Learning analytics is a method to collect, measure, analysis and reporting of data about learners and their interactions with a learning environment. Learning analytics is applying analytics on educational data to infer the student learning process and to provide support. Learning analytics is important course in the data era and it will help the learner to apply analytics on data from education domain and help the students to learn.

ABOUT INSTRUCTOR :

Prof.Ramkumar Rajendran is an Assistant Professor in IDP in Educational Technology at Indian Institute of Technology Bombay, Mumbai. He obtained his Ph.D. in Computer Science and Engineering from IITB-Monash Research Academy, IIT Bombay and Postdoctoral training at Vanderbilt University, USA and NEC Central Research Laboratories, Japan.

COURSE PLAN :

Week 1: Lecture 1:Intro To Data Analytics
Lecture 2:What is LA! Definition
Lecture 3:Academic Analytics, and Educational Data Mining
Lecture 4:Four Levels of Analytics
Lecture 5:Descriptive, Diagnostic, Predictive and Prescriptive Analytics

Week 2: Lecture 1:Data Collection from Different learning environment
Lecture 2:Technology Enhanced Learning, Classroom and MOOC environment
Lecture 3:Preprocessing
Lecture 4:Ethics in Learning Analytics, Student Privacy

Week 3: Lecture 1:Intro to Machine Learning
Lecture 2:Supervised and Unsupervised learning
Lecture 3:Regression, Clustering and Classification
Lecture 4:Metrics for ML algorithms –Recall, Precision, Accuracy, F-Score and Kappa
Lecture 5:Demo of ML algorithms using Orange

Week 4: Lecture 1:Descriptive Analytics
Lecture 2:Data Visualization
Lecture 3:Data visualization using Excel
Lecture 4:Dashboard Analytics
Lecture 5:Dashboard of Youtube, MOOC

Week 5: Lecture 1:Intro to iSAT
Lecture 2:iSAT Demo with example
Lecture 3:Diagnostic Analysis
Lecture 4:Correlation

Week 6: Lecture 1:Sequential Pattern Mining
Lecture 2:SPM tool Demo
Lecture 3:Process Mining
Lecture 4:ProM Tool Demo

Week 7: Lecture 1:Predictive Analytics
Lecture 2:Modeling – Feature Selection
Lecture 3:Linear Regression
Lecture 4:Demo of Linear Regression using Weka

Week 8:Lecture 1:Decision Tree
Lecture 2:Demo of Decision Tree using Orange
Lecture 3:Naïve Bayes algorithm
Lecture 4:Demo of Naïve Bayes

Week 9: Lecture 1:Clustering in predictive algorithm
Lecture 2:K-Means clustering
Lecture 3:Demo of K-Means clustering

Week 10: Lecture 1:Text analytics
Lecture 2:Words, Token, Stem and lemma
Lecture 3:Minimum edit distance
Lecture 4:Develop algorithm to automatically grade subjective answers
Lecture 5:Demo of Word embedding
Week 11: Lecture 1:Intro Multimodal Learning Analytics
Lecture 2:Eye-gaze data collection
Lecture 3:Affective computing
Lecture 4:Aligning and analyzing data from Multiple sensors
Week 12: Lecture 1:Advanced topics in LA
Lecture 2:How to apply LA in our class
Lecture 3:Data repos, Research papers to read, and where to present your work