DBA3803/DSC3216: PREDICTIVE ANALYTICS IN BUSINESS

NUS Business School
Department of Analytics & Operations (DAO)

ADMINISTRATIVE INFORMATION

Instructor:	QUEK Ser Aik	**Office:**	BIZ1 7-44
Office Hours:	As per LumiNUS Consultation	**Email:**	seraik@nus.edu

Prerequisite: DAO2702 Programming for Business Analytics
Evaluation: Assignment 30%, quiz 30 %, project 30%, class participation 10%
Optional References:

A Whirlwind Tour of Python, by Jake VanderPlas.
https://s3-us-west-2.amazonaws.com/python-notes/a-whirlwind-tour-of-python-2.pdf
Classification and Regression in a Weekend
https://datasciencecentral.com/profiles/blogs/free-book-classification-and-regression-in-a-weekend
The Elements of Statistical Learning, by Hastie, Tibshirani and Friedman (more advanced).
https://web.stanford.edu/~hastie/ElemStatLearn

COURSE OUTLINE

The objective of this course is to develop an understanding of data science with an emphasis on forecasting as a powerful tool for analyzing complex issues and solving business problems. We will make productive use of analytics tools available in Python. While the class focuses on simplified models, it aims to bridge classroom knowledge and business applications. Topics will be dynamically adjusted/accelerated, depending on students' level of preparation.

References are to Hastie et al, unless otherwise indicated.

Week	Topic	Reference	Remark
1	Introduction to Machine Learning	Chapter 1	
2	Python Revision	Whirlwind Tour	
3	Predicting Numerical Values: Linear Methods for Regression 1	Section 2.3, 3.1-3.3	
4	Predicting Numerical Values: Linear Methods for Regression 2	Section 3.4-3.5	HW1 Due
5	Finding Temporal Patterns: Time Series Forecasting 1	Notes	
6	Finding Temporal Patterns: Time Series Forecasting 2	Notes	Quiz 1
7	Predicting Categorical Values: Neighbors and Clusters	Section 4.1-4.3	
8	Predicting Categorical Values: Classification Tree	Section 9.3	HW2 Due
9	Understanding Model Complexity and Over Fitting	Section 7.1-7.6	
10	Resampling Methods 1	Section 7.10-7.11	HW3 Due
11	Resampling Methods 2	As above	
12	Other Machine Learning Methods & Project Discussion		Quiz2
13	Project Presentations & Peer Assessments		

ASSIGNMENT (30%)

Assignment will generally be due the night before class. Everyone should turn in **individual soft copies** via LumiNUS (unless otherwise stated). ***LATE ASSIGNMENT WILL RESULT IN A LOWER GRADE.***

QUIZ (30%)

There will be 2 quizzes. The quiz will be cumulative and comprehensive. They will be Open book. The quiz duration will be 30 minutes in class. Dates will be on LumiNUS.

TEAM PROJECT (30%)

The project for this class is to do a careful data analysis of real-world data. A dataset will be assigned. Data preparation, analytic model, and solution supported by performance evaluation will be assessed.

The project is a group effort, to be done in groups of 4-5 students, depend on class enrollment. Each group member will evaluate the participation of the other members of the group, and this will be considered in grading.

Assessment of the group project will include the following aspects:

a. Innovation: is the identified issue interesting?
b. Rigor: are the methods used appropriate?

Everyone will also evaluate other groups' project presentations.

Team Project Part I – Presentation (10%):
Each group will have 15-min presentation. The presentation can be from preliminary results.

Team Project Part II – Final report (20%):
The final report should contain the main results and details in the project. You may update any preliminary results after the project presentation.

ATTENDANCE

If there is more than one weekly session, students may always attend either session without notice, except when there is a quiz or project presentation.

QUESTIONS

For questions regarding course materials, please post on LumiNUS Forum. Posting and answering on the Forum will be counted towards class participation. Questions during consultations may be re-posted and answered on the Forum.