BC2407 Analytics II
Advanced Predictive Techniques

Session 1

Course Overview

Assessment Components and Rubrics

Team Project Brainstorm

Sit together with your team members in every class

- Randomly assigned by system.
- Check NTULearn class site > Teams
- Ideally 5 students per team, min 4, max 6.
- Team composition might change due to:
  - Add/Drop
  - Some students away on internship until week 2/3/4.

- Bring your laptop with Excel, R and Python installed in every class.

BC2407 Classes This Semester

Class	Day and Time	Venue	Instructor
1	Mon, 9:30am – 12:30pm.	S3-SR4	Neumann Chew C. H.
2	Wed, 9:30am – 12:30pm.	S4-SR9	Neumann Chew C. H.
3	Wed, 2:30pm – 5:30pm.	S4-SR11	Neumann Chew C. H.
4	Mon, 6:30pm – 9:30pm.	S3-SR2	Liu Peng
5	Thu, 2:30pm – 5:30pm.	S3-SR2	Liu Peng
6	Sat, 9:30am – 12:30pm.	S3-SR3	Kevin Ngui

BC2407 Instructors

- Course Coordinator and Instructor:
  - Neumann Chew C. H. | neumann.chew@ntu.edu.sg
    - Office: S3 B2C 104.

- Co-Instructors:
  - Liu Peng | peng.liu@ntu.edu.sg
  - Kevin Ngui | kevin.ngui@ntu.edu.sg

BC2407 Materials on NTULearn

- NTULearn Main Site:
  - Standardized Course Materials for all classes.
  - Course announcements for all classes.
  - CBA Question Paper and Dataset(s).
- NTULearn Class Site:
  - Each class has a specific class site. Restricted to the class only.
  - For class-specific announcements.
  - Team based activities.
  - All Graded Submissions:
    - Team Assignment submission
    - Team Project submission
    - Individual CBA submission

Course Schedule (1st half)

Wk	Session[1]	Remarks
1	Course Overview, Assessment Components and Team Project Brainstorm.	System random assigned team. Check NTULearn class site.
2	Review of Basic Analytics and Software.	
3	Association Rules.	
4	Quantile Regression.	
5	ELearning: Visualization and dashboard using Power BI.	Due to CNY. eLearn at home.
6	Multivariate Adaptive Regression Splines (MARS).	
7	Neural Network.	Proj Proposal due end of wk.
Mid Term Break		

[1] Wef AY2020 semester 2, the 4 hr class session is converted to 1 hr pre-class learning activities followed by 3 hrs in-class session for each major topic. The pre-class learning activities will be announced in NTULearn Main site.

Course Schedule (2nd half)

8	Bootstrap for Analytics.	
9	Random Forest.	
10	Time Series Forecasting.	
11	CBA Revision and final week for Project work.	Proj submission due end of wk.
12	Project Presentation according to randomly assigned slot.	CBA[2] paper released mid of wk.
13	Project Presentation according to randomly assigned slot.	CBA submission due end of wk.

[2] Wef AY2019 semester 2, CBA is a do-at-home assignment, to be submitted into NTULearn Class site > CBA Submissions. CBA question paper and dataset will be available in NTULearn Main Site > CBA Paper.

Assessment Components and Rubrics

Assessment Components

	Components	Weightage	Individual/Team
C01	Class Participation & Individual Presentation	30	Individual
C02	Assignment (Project Proposal)	10	Team
C03	Project	30	Team
C04	Computer Based Assessment	30	Individual
	Total	**100**	

Note:

- Detailed Assessment Rubrics and Measures are in a PDF file in NTULearn Main site.

Class Participation 15% (Individual)

- Participation and Q&A in class.
- Attendance in class.
  - Capped at 70% of total marks for Class Participation.
  - 10% deducted for each absence without valid reason.
  - Team based activities and Q&A are done in class.
    - You cannot participate in these if you are not in class.
  - Sign the attendance sheet. Headcount will be checked. Do not sign for anyone else.
  - If you are absent, please email your instructor asap with a photo of your MC or LOA.
  - Submit your MC to your designated admin office* for official record.

*: UPO for most NBS UG modules.

Individual Presentation (15%)

- Presentations and Q&A.
  - Project Presentation.
  - Each student must present their slides.
  - In a corner at each and every slide, state the name of the presenting student.

- Rubric for Class Participation & Indiv Presentation: Critical Thinking
  - Identifies and summarizes the issue at hand?
  - Identifies and considers key assumptions and the influence of the context on the issue?
  - Identifies and assesses conclusions, implications and consequences?

Assignments 10% (Team Project Proposal)

- Complete the Project Proposal Document Template.
- Submit by end of week 7 in NTULearn Class site > Team.
  - Refer to How do Students submit team assignments and project in NTULearn.PDF
- Rubric: Problem Solving & Decision Making
  - How well does your team:
    - Define the Problem
    - Devise Analytics Strategies to Solve the Problem
    - Review Results/Findings & Evaluate Outcomes

Project 30% (Team)

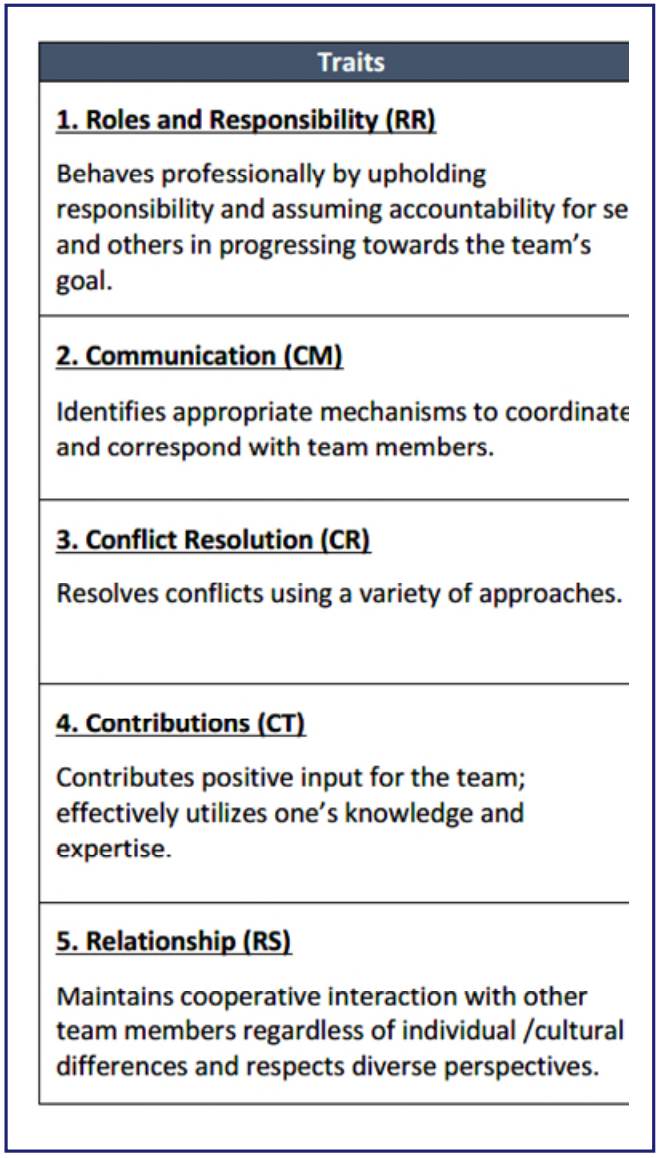
- Refer to proposal requirements document for requirements, guidelines, deliverables and deadline.
- Team presentations scheduled over last 2 weeks.
  - Submission in NTULearn class site > Teams > File Upload.
  - Come to class at your randomly assigned presentation time slot.
  - Each and every student must present their slides
- Grading Policy based on quality of response.
  - Rubric: Written & Oral Communication.
    - Presents relevant information.
    - Supports main points & substantiate claims with strong evidence.
    - Has a clear message for audience.
    - Maximizes likelihood of audience accepting the message.

Computer Based Assessment 30% (Individual)

- Do at home assignment.
- You may consult internet resources & textbooks but quote and cite your references, and write all answers in your own words.
- Do not commit academic dishonesty as defined in NTU Academic Integrity policy.
  - Refer to NTU Honour Code and Academic Integrity Policy.PDF
  - You will submit a declaration together with your CBA submission.
  - Inform your class instructor and course coordinator if you know of someone who committed academic dishonesty.
- Rubric: Problem Solving & Decision Making.

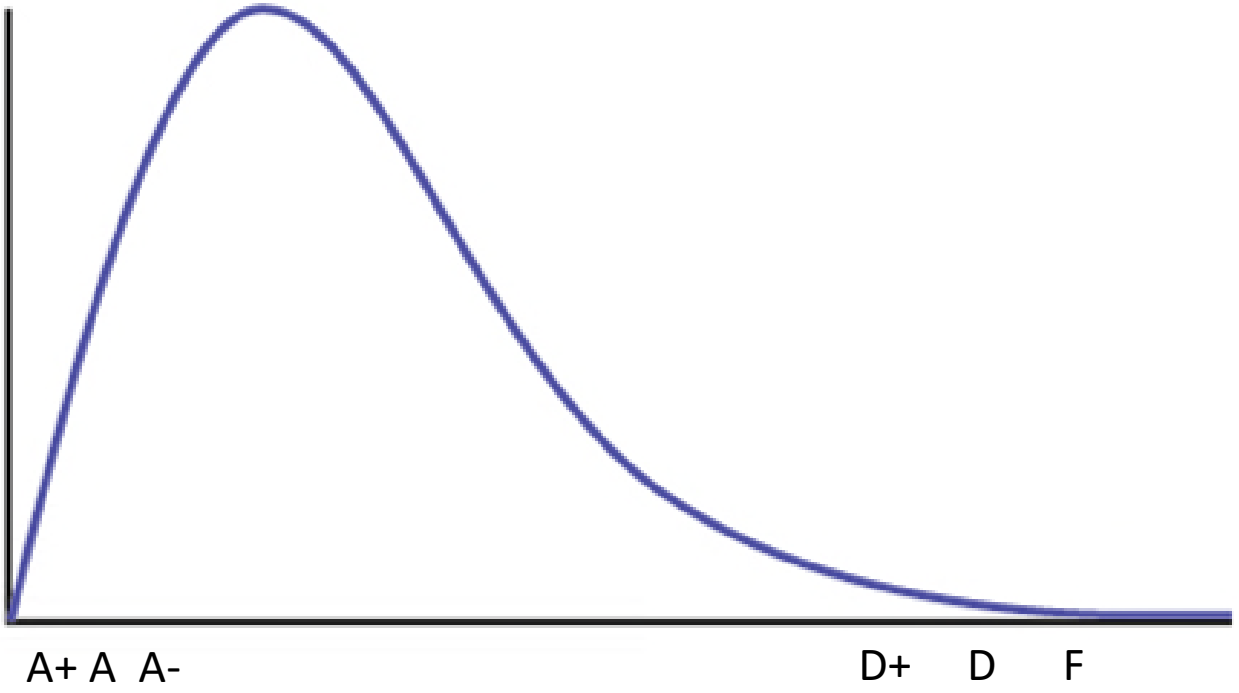
Peer Evaluation

- Team Assignment.
- Team Project.
- Peer Evaluation Form to be completed at end of semester.
- Read Peer Evaluation Rubrics.PDF and sample Peer Evaluation form.
  - Include conditions to downgrade team mate marks for team submitted work!



Traits
1. Roles and Responsibility (RR) Behaves professionally by upholding responsibility and assuming accountability for se and others in progressing towards the team's goal.
2. Communication (CM) Identifies appropriate mechanisms to coordinate and correspond with team members.
3. Conflict Resolution (CR) Resolves conflicts using a variety of approaches.
4. Contributions (CT) Contributes positive input for the team; effectively utilizes one's knowledge and expertise.
5. Relationship (RS) Maintains cooperative interaction with other team members regardless of individual /cultural differences and respects diverse perspectives.

The Grading Curve



- Hard and Competitive to get A or A+ due to moderation.
- The majority could be B+.

Note: Above image not drawn to scale. Exact distribution is confidential.

Intention of the Assessment Components

- Class Participation & Individual Presentation
  - To think deeper and learn how to express your analysis concisely and clearly.
- Assignment (Project Proposal)
  - Project is flexible, open-ended and to be proposed by team.
  - Proposal template word doc provides a framework to plan ahead and consider important issues early.
  - Allows your class instructor to provide feedback about your proposed project during mid-term break.
- Project
  - Work with your randomly assigned team to co-define and achieve a common goal.
  - Team members have different strengths, weakness, interests, motivation. Learn how to work together.
- Computer Based Assessment
  - To test your individual skills and ability to analyse and solve a specific problem.

Brainstorm Project Proposal

In-Class Activity

Project: Research and explain a successful/potential application of Analytics/Data Science/Machine Learning/AI

- Research and explain a real world application of Analytics in Business, Government or Social Good.
- Refer to BC2407 Project Requirements and Guidelines.PDF.
- Possible data sources:
  - Kaggle
  - Company, Govt, institutions' websites.
- You may use similar data elsewhere to demo the technique.
  - Submit the dataset or link to dataset.
- You may use any techniques in the permitted techniques list.
- Do not write any cases from the exclusion list (unless approved by instructor).
- You may use Python or/and R. Submit your scripts.

Example Case 1: Guarantee Interviews with Leap AI https://leap.ai

- 22 Oct 2016: Headhunters promise better job fits with artificial intelligence. Source: http://www.todayonline.com/business/better-job-matching-ai-and-data-analytics
- 19 May 2017: How AI Is Changing Your Job Hunt. Source: http://fortune.com/2017/05/19/ai-changing-jobs-hiring-recruiting/
- 22 Aug 2017: Leap.ai launches job matching platform after raising $2.4 million. Source: https://venturebeat.com/2017/08/22/leap-ai-launches-job-matching-platform-after-raising-2-4-million/
- 26 Aug 2017: Two ex-Googlers are using AI to guarantee interviews for tech job seekers. Source: https://techcrunch.com/2017/08/26/two-ex-googlers-are-using-leap-ai-guaranteed-job-interviews-tech-companies/

Example Case 2: Forced to Change AI Strategy for Job Search – JobTech

https://jobtech.sg/

- 7 Oct 2017: Find Your Dream Job, Thanks To JobTech. Source: http://www.asiaone.com/corporate-news-media-outreach/find-your-dream-job-thanks-to-jobtech
- 26 Oct 2017: Job-matching website Jobseeker [JobTech] shut down after legal warning. Source: http://www.straitstimes.com/tech/job-matching-website-jobseeker-shut-down-after-legal-warning
- 6 Nov 2017: How AI helps job seekers land their dream job. Source: https://venturebeat.com/2017/11/06/how-ai-helps-job-seekers-land-their-dream-job/

Example Case 3: Analytics-Optimised Scheduling saves $2 million per year at DBS

https://www.dbs.com/newsroom/DBS_awarded_most_innovative_use_of_infocomm_technology

Leverages analytics to reduce ATM out-of-cash occurrences by over 90%

SINGAPORE, 24 November 2014 - DBS has received top honours in the National Infocomm Awards ("NIA") for the "Most Innovative Use of Infocomm Technology (Private Sector – General)".

FAQ about Project Requirements

- Is it necessary to interview the company or persons involved?

Ans: Good but not necessary. It will be good if they are willing to share via zoom or email interview Q&A, but it is fine to use publicly available sources. But remember to quote your sources properly.

- Is it necessary to get datasets?

Ans: Highly recommended. You need to show how the Analytics work on a sample dataset. You can use similar datasets from another org to illustrate the techniques. If you do not have any datasets to demo, it will be very hard to get high marks.

Class Activity: Brainstorm and shortlist a few cases for Project

1. Read websites, news or browse thru the Kaggle for datasets and good applications.
2. Brainstorm with your team mates on potential cases.
3. Shortlist a few cases for further exploration.
   - Each student can research on one application/case of interest and then try to convince all teammates that it is the best case.
4. Start drafting the Project Proposal document.

- In subsequent weeks:
  - Decide on the final case to be used for Project.
  - Update Project Proposal Document (template provided).
  - Submit the Project Proposal by end of wk 7 in NTULearn Class site.
  - If there are major changes after week 7, please inform instructor and submit latest version. Do not delete the previously submitted version on NTULearn.

If you are away on internship…

- Inform instructor and all your teammates on expected date of return to class.
- Check and follow up on the Project brainstorm and exploration activities now.
  - What can you do to contribute now even if you are still away on internship?

Summary

- Attendance is important for class participation.
- Assessment components and rubrics.PDF
- BC2407 Course Schedule.PDF and Submission Deadlines.
- Project Requirements and Guidelines.PDF
- Project Proposal
  - Brainstorm and shortlist a few potential cases.
  - Project Proposal (template word document provided) to submit by end of week 7.
    - This is graded assignment 10%.