

MSBA7003 Quantitative Analysis Methods

Course Introduction



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What Is This Course About?

- Decision modelling and analysis
 - New product pricing
 - Hotel room allocation
 - Pharmacy store inventory control
 - Game AI
 - Asset allocation
 - Map navigation
 - Delivery network optimization
 - Salespeople compensation
 - ...

Course Schedule

- Session 1: Probability & Bayesian Learning
- Session 2: Decision Making under Risk
- Session 3: Monte Carlo Simulation & Dynamic Decisions
- Session 4: Monte Carlo Tree Search
- Session 5: Linear Programming & Applications I
- Session 6: Linear Programming & Applications II
- Session 7: Mixed Integer Programming & Applications
- Session 8: Causal Inference I
- Session 9: Causal Inference II
- Session 10: Group Competition & Course Review

Teaching & Learning Activities

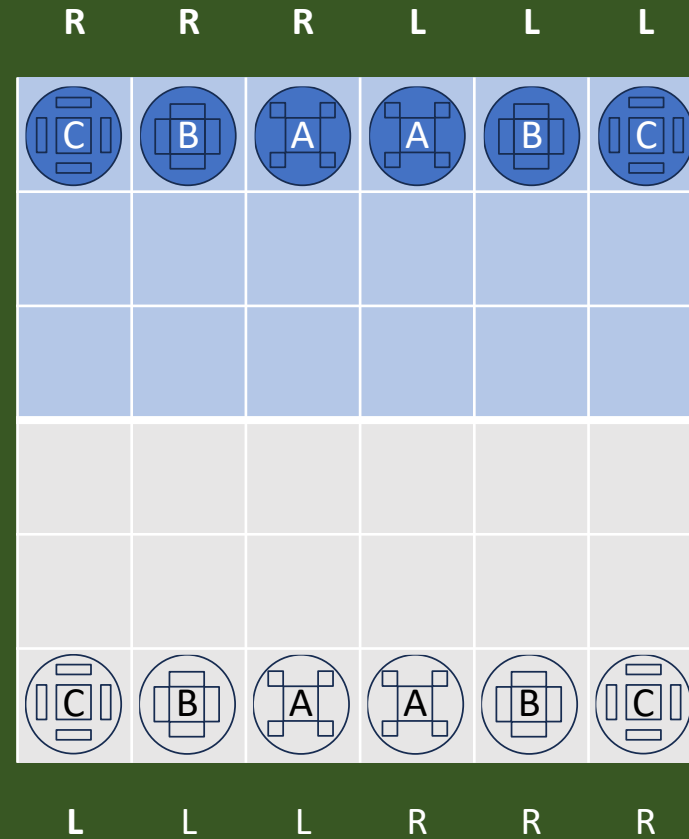
- Interactive Lectures
 - Questions (from both sides)
 - In-class exercises (including pop quizzes)
- Reference Book (not required)
 - ***Quantitative Analysis for Management***, 12th Edition, Global Edition by B.E. Render, M.E. Hanna, and R.M. Stair. Prentice Hall, 2012.
 - ***Bayesian Statistics for Beginners: A Step-by-Step Approach***, Illustrated Edition, by Therese M. Donovan and Ruth M. Mickey. Oxford University Press, 2019.
 - ***Counterfactuals and Causal Inference: Methods and Principles for Social Research***, 2nd Edition, by Stephen L. Morgan and Christopher Winship. Cambridge University Press, 2015.
- Extra Readings and Exercises
 - Extra reading materials will be posted on Moodle (optional or required)
 - Extra Exercises can be found in the reference book and on Moodle (optional)
- Assignments and Tutorials
 - 4 individual assignments (weekly) + 1 group assignment (competition; group formed by the end of week 2)
 - Submission with soft copies on Moodle by respective due dates
 - Tutorials will mainly cover assignments and some lecture examples

Pop Quizzes



Group Competition

- The Tank War Game



Assessment

Assessment Methods	Brief Description (Optional)	Weight
A1. In-class & forum participation	Attendance & discussions	20%
A2. Assignments	Effort and accuracy	40%
A3. Final exam	Effort and accuracy	40%

Questions

- MOODLE
 - You are encouraged to post questions in the discussion forum; excellent questions and answers will be awarded for participation
- Office Hours
 - Consultations by appointment welcomed
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