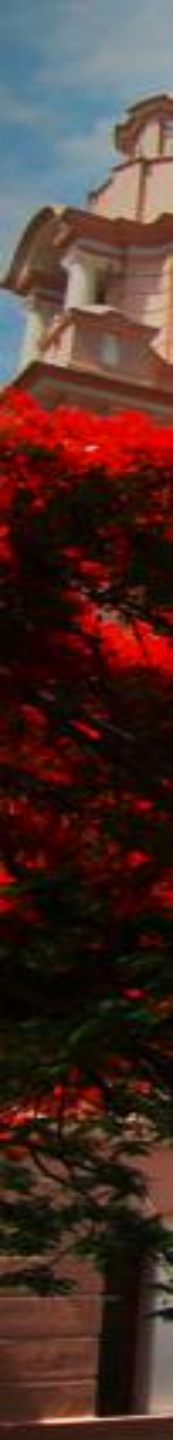
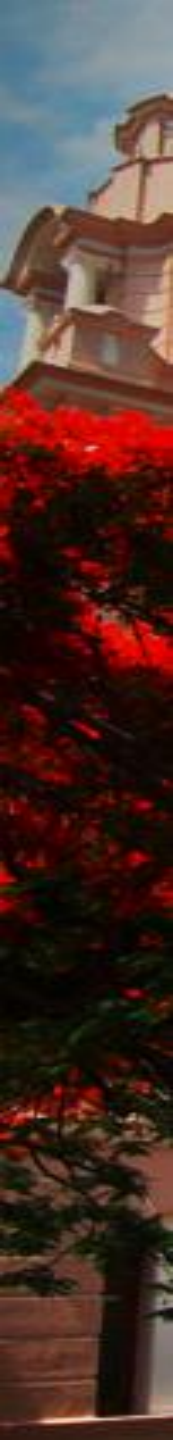
MSBA7003 Decision Analytics

10 Course Review



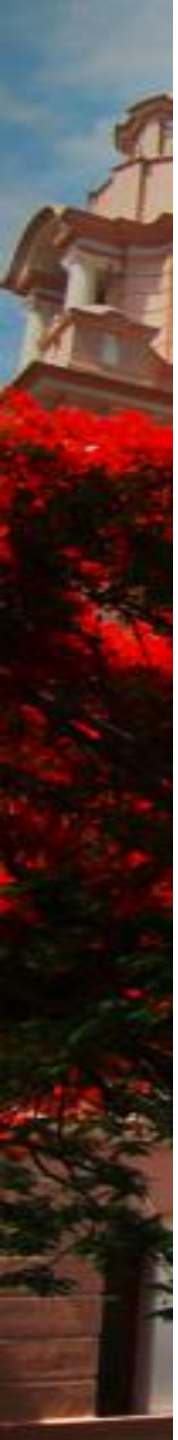
Review: Chapter 01

- Venn diagram
- Conditional probability
- Random variable (MECE events; discrete & continuous)
- Joint distribution
- Conditional distribution
- Conditional expectation
- Bayesian updating (tabular way)



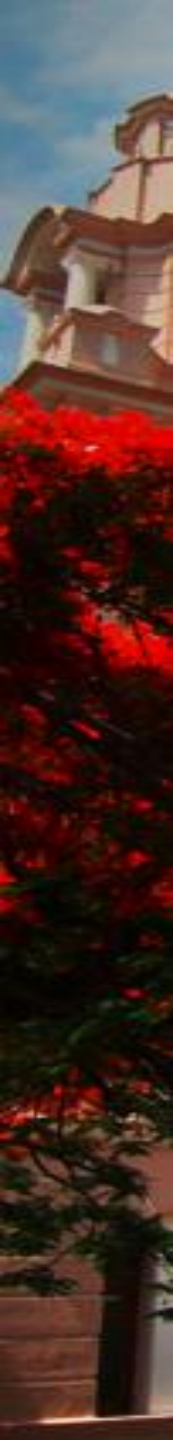
Review: Chapter 02

- Basic concepts
  - Bayesian Inference
  - Naïve Bayes
- Applications not required for the exam



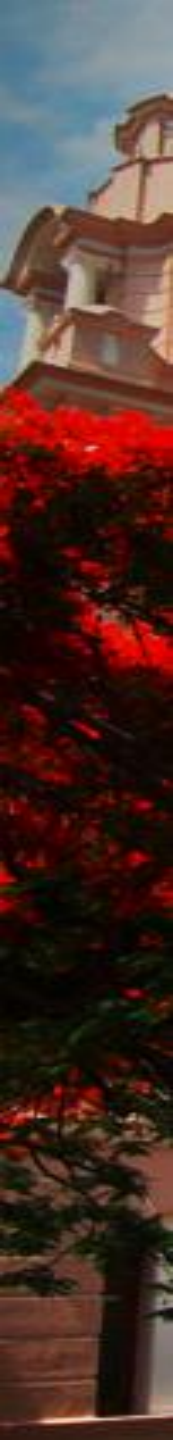
Review: Chapter 03

- Decision table
- Decision tree
- Expected value of perfect information
- Decision making with belief updating
- Value of sample information
- The use of historical data for decision making
- Decision policy for multiple-stage decision making is not required for the exam



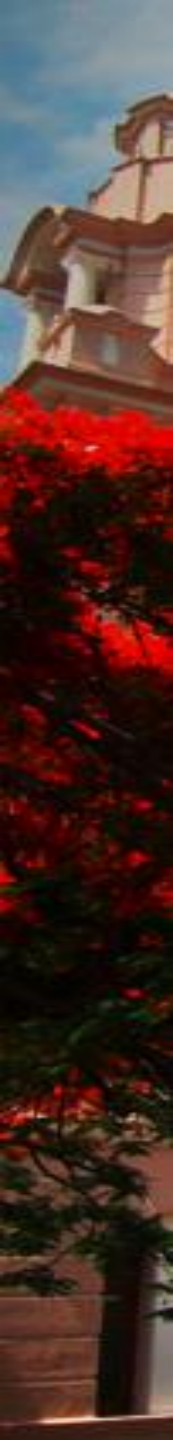
Review: Chapter 04

- The basic idea of Monte Carlo simulation
- Generating random numbers
  - Discrete distribution
  - Binomial distribution
  - Poisson distribution
  - Exponential distribution
- Simulation model for inventory systems
- Simulation model for service systems



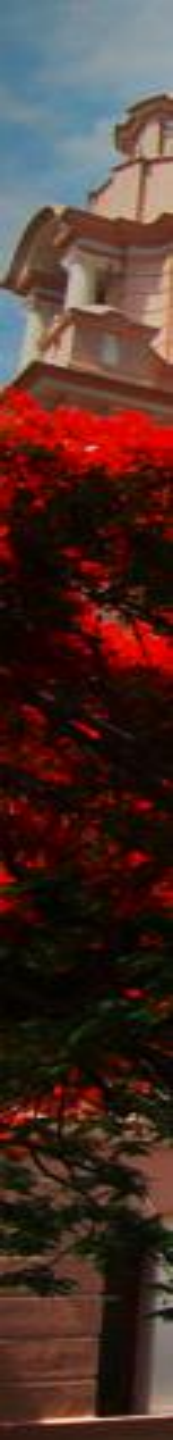
Review: Chapter 05

- Graphical solution method
- Sensitivity analysis (shadow price; allowable increase/decrease)
- The four special cases
- Excel output table
- Python code not required for the exam



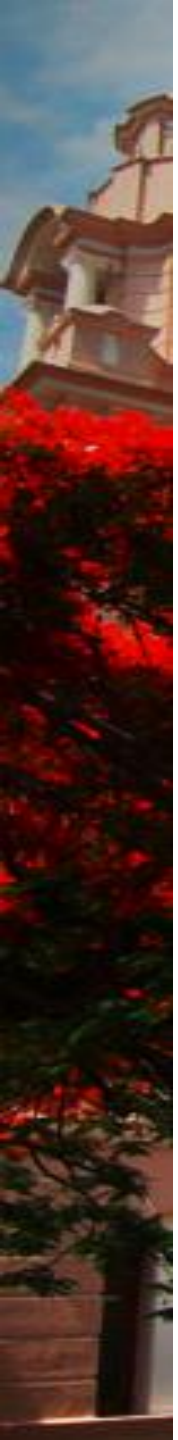
Review: Chapter 06

- Mathematical formulation of linear programming
- Dealing with max() or min() functions
- Binary (0-1) variables
- Model-building skills with binary variables
- Applications



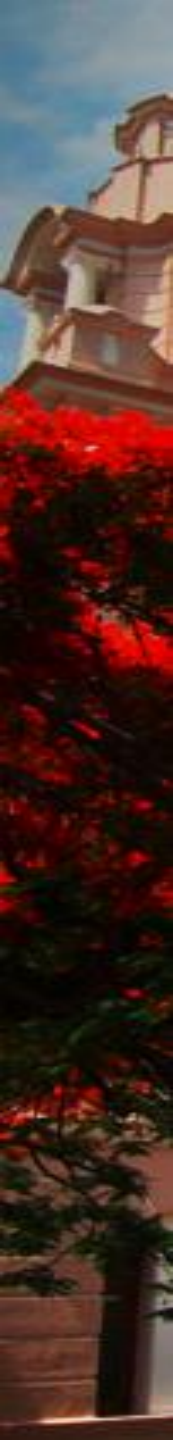
Review: Chapter 07

- JD.com case is not required



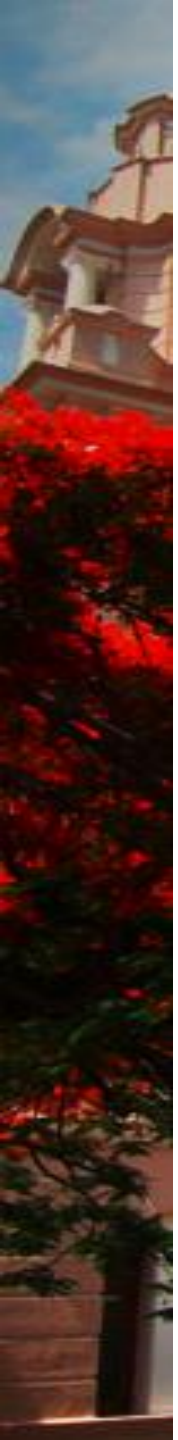
Review: Chapter 08

- Counterfactual model
- Naïve estimator and its bias
- Random assignment and independence assumption
- Conditional independence and matching
- Conditional treatment effect



Review: Chapter 09

- How to interpret coefficients in a regression model
- Model specification is not required for the exam
- Causal graphs
- 3 basic causal structures among 3 variables
- Conditioning strategy and “back-door” blocking
- Conditions for valid instrumental variables
  - Exogeneity: Z cannot be correlated with Y unless through D’s effect on Y



Final Exam

- Schedule: Oct 14 from 2:30 – 4:30 p.m.

- You may bring an A4-sized cheat sheet (prepared by yourself – no restrictions; typed or handwritten; double sided).
- You are allowed to use a calculator permitted by the University. Other calculators which are non-programmable and not able to plot graph are also acceptable.
- Please bring your required stationery (e.g., pen, pencil, eraser, ruler, etc.).