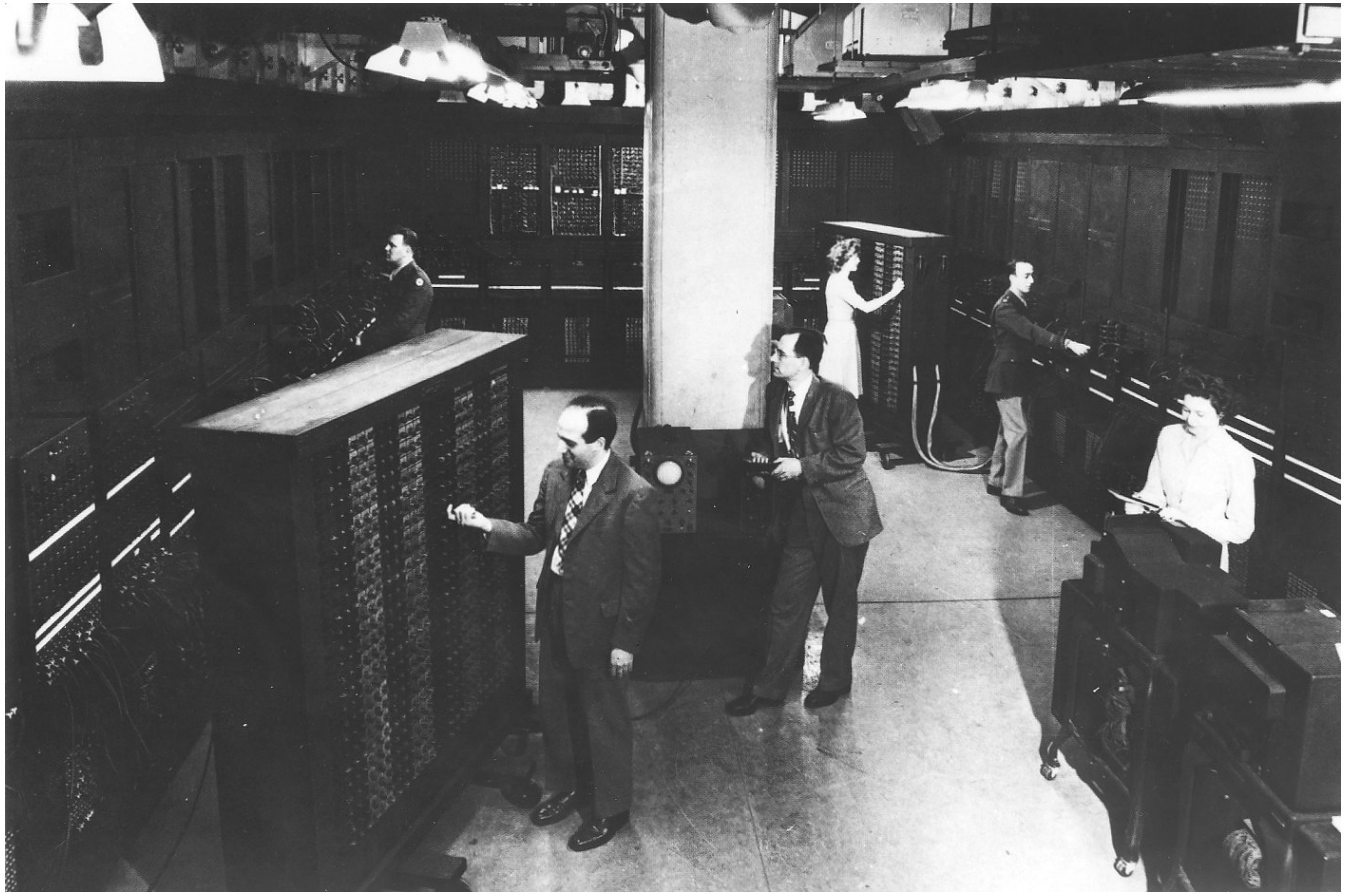
INTRODUCTION TO SPREADSHEETS & MODELS

Don Huesman

Module 4: Using spreadsheets to implement Monte Carlo simulations and linear programs for optimization

Wharton
University of Pennsylvania
ONLINE



Module topics

- Purpose of Monte Carlo simulations
- Implementing Monte Carlo simulations in spreadsheets
- Types of problems addressed by linear programs
- Implementing linear programs in spreadsheets
- Summarizing course modules

Resources

- Software used in this Specialization
  - Excel
  - Google sheets
  - Data analysis toolpak for Excel
  - XLMiner Analysis Toolpak for Sheets

INTRODUCTION TO SPREADSHEETS & MODELS

Don Huesman

Module 4: Using spreadsheets to implement Monte Carlo simulations and linear programs for optimization

Lecture 1 Monte Carlo simulations

Wharton
University of Pennsylvania
ONLINE

Module 2 Lecture 1 Learning objectives

- Purpose of Monte Carlo simulations
- Implementing Monte Carlo simulations in spreadsheets

Module 2 Lecture 1 Learning objectives

- Problems addressed by Monte Carlo simulations
  - Uncertainty in assumptions about environment
  - Complex interactions among variables
  - High levels of accuracy important in assessing risk
- Implementing Monte Carlo simulations in spreadsheets
  - Identify type of probability distribution for key variables
  - Apply distribution to random number generation
  - Run simulation model a large number of times
  - Assess probable outcomes & compare to risk
- Available add-ins to simplify and add-value (no endorsements!)

INTRODUCTION TO SPREADSHEETS & MODELS

Don Huesman

Module 4: Using spreadsheets to implement Monte Carlo simulations and linear programs for optimization

Lecture 2 Linear programming

ONLINE

Module 2 Lecture 2 Learning objectives

- Types of problems addressed by linear programs
- Implementing linear programs in spreadsheets
- Incorporating constraints
- Using the Solver plug in to achieve an optimal solution

INTRODUCTION TO SPREADSHEETS & MODELS

Don Huesman

Module 4: Using spreadsheets to implement Monte Carlo simulations and linear programs for optimization

Lecture 3 Next steps, Differences between Excel and Sheets

Wharton
University of Pennsylvania
ONLINE

Module 3 Learning objectives

- Other courses in the Business and Financial Modeling Specialization
- Reviewing differences between Excel and Sheets

Module 4 Summary

- Using simulations to model uncertainty and risk in spreadsheets
- As an example of linear programs, using Excel's solver to identify optimal allocations of resources to reach a desired outcome
- Identifying similarities and differences between Excel and Sheets
- Other courses in the Business and Financial Modeling Specialization