# INTRODUCTION TO SPREADSHEETS & MODELS

Don Huesman

*Module 3: Addressing uncertainty and probability in models*

Wharton
University of Pennsylvania
ONLINE

# Module topics

- Random variables
- Probability distributions in spreadsheets
- Power, exponential and log functions in model formulas
- Models for calculating probability trees and decision trees
- Correlations between variables and spreadsheet statistical functions
- Regression tools in spreadsheets for making predictions
- Multiple regression

# Resources

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

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*Module 3: Addressing uncertainty and probability in models*
*Lecture 1 Random variables and probability distributions in spreadsheet models*

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# Module 3 Lecture 1 Learning objectives

- Implementing random variables using the functions rand() and randbetween()
- Developing forecasts using historical data to project future events
- Understanding probability distributions as they affect models
- Using built-in spreadsheet statistical functions

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*Module 3: Addressing uncertainty and probability in models*

*Lecture 2 Changes in discrete and continuous time*

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# Module 3 Lecture 2 Learning objectives

- Calculating change in variables in discrete and continuous time
- Redesigning model objective functions to accommodate continuous time.

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*Module 4: Addressing uncertainty and probability in models*

*Lecture 3 Power, exponential and log functions in model formulas*

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# Module 3 Learning objectives

- Using power, exponential and log functions in model formulas
- Applications of non-linear functions

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*Module 3: Addressing uncertainty and probability in models*

*Lecture 4 Models for calculating probability trees and decision trees*

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# Module 4 Learning objectives

- Designing models for calculating probability trees
- Implementing decision trees

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*Module 3: Addressing uncertainty and probability in models*
*Lecture 5 Using spreadsheet statistical functions for correlation and regression*

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# Module 5 Learning objectives

- Using spreadsheet statistical functions to measure correlations between model variables
- Understanding the meaning of the results of spreadsheet functions for calculating correlations
- Using regression tools in spreadsheets for making predictions
- Improving forecasts with multiple regression

# Module 5 Summary

- Random variables
- Probability distributions in spreadsheets
- Power, exponential and log functions in model formulas
- Models for calculating probability trees and decision trees
- Correlations between variables and spreadsheet statistical functions
- Regression tools in spreadsheets for making predictions