



# Data Science for Business

Data Science for Business moves beyond the spreadsheet and provides a hands-on approach for demystifying the data science ecosystem and making you a more conscientious consumer of information. Starting with the questions you need to ask when using data for decision-making, this course will help you know when to trust your data and how to interpret the results.

| Modules   | Case Studies                        | Takeaways  | Key Exercises   |
|---|-------------------------------------|--|---|
| <b>Module 1</b><br><b>The Data Science Shift</b>  | Carvana:<br>Good Data and Bad Buys  | <ul style="list-style-type: none"> <li>Apply the steps of the Data Driven Decision Framework</li> <li>Identify the benefits that data science brings to business problems</li> </ul>   | <ul style="list-style-type: none"> <li>Translate business problems into data hypotheses</li> <li>Explore and describe datasets</li> <li>Use visualizations to generate hypotheses</li> </ul>                |
| <b>Module 2</b><br><b>Data Wrangling</b>          | Fannie Mae: Identifying Investments | <ul style="list-style-type: none"> <li>Relate the quality of data with the quality of the conclusions</li> <li>Assess the quality of data</li> <li>Guide decisions for merging tables and managing missing data</li> </ul>   | <ul style="list-style-type: none"> <li>Prepare and clean data for analysis</li> <li>Examine data dictionaries</li> <li>Design table joins</li> <li>Identify solutions for managing missing data</li> </ul>  |
| <b>Module 3</b><br><b>Visualization</b>           | StockX: Drawing Demand              | <ul style="list-style-type: none"> <li>Incorporate visualizations throughout the data science process</li> <li>Interpret charts and graphs</li> <li>Develop questions from visualizations</li> <li>Design visualizations for clear communication with maximal impact</li> </ul>        | <ul style="list-style-type: none"> <li>Critique existing charts and identify methods of improvement</li> <li>Generate insight with graphs</li> <li>Design visualizations to express data clearly</li> </ul> |
| <b>Module 4</b><br><b>Time Series Forecasting</b> | NICU beds: Creating Capacity        | <ul style="list-style-type: none"> <li>Connect yesterday's data with tomorrow's prediction</li> <li>Evaluate temporal patterns in data</li> <li>Match the time scale with the business problem</li> <li>Select appropriate smoothing techniques for time series forecasting</li> </ul> | <ul style="list-style-type: none"> <li>Determine when time series analysis is useful and informative</li> <li>Select appropriate methods for exponential smoothing</li> </ul>                               |

| Modules  |   | Case Studies                           | Takeaways   | Key Exercises   |
|----------|---|--|---|---|
| Module 5 | Linear Regressions                        | Bark Gift Shop:<br>Motivating Managers | <ul style="list-style-type: none"> <li>• Interpret linear regression results</li> <li>• Extend intuition into analysis</li> <li>• Apply advanced methods to gain sophistication and insight to your understanding.</li> </ul> | <ul style="list-style-type: none"> <li>• Identify relationships between variables</li> <li>• Write hypotheses</li> <li>• Explain the parts of a linear model, including interaction and dummy variables</li> <li>• Interpret linear regression results</li> </ul> |
|          |   | ATO Pictures: Marketing Movies         |   |   |
| Module 6 | Logistic Regressions and Machine Learning | Carvana and Fannie Mae                 | <ul style="list-style-type: none"> <li>• Differentiate linear and logistic regression</li> <li>• Conceptualize Machine Learning</li> <li>• Evaluate model fit</li> </ul>  | <ul style="list-style-type: none"> <li>• Complete a confusion matrix</li> <li>• Interpret results from logistic regression, CART, random forest, lasso, and neural networks</li> <li>• Select a model to guide decisions</li> </ul>                               |
|          |   |  |   |   |

**Learning requirements:** In order to earn a Certificate of Completion from Harvard Online and Harvard Business School Online, participants must thoughtfully complete all 6 modules, including satisfactory completion of the associated quizzes, by stated deadlines.