Reading: Course 6 overview

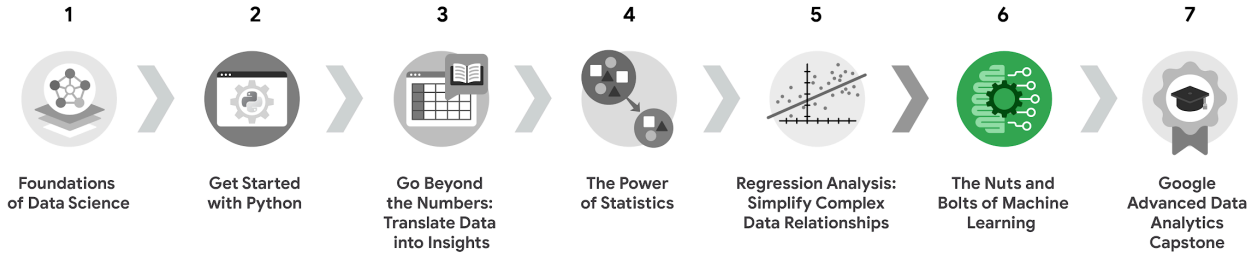
to Course 6

Hello, and welcome to **The Nuts and Bolts of Machine Learning**, the sixth course in the Google Advanced Data Analytics Certificate. You've made wonderful progress on this journey!

In previous courses, you've learned how to use Python to solve data-driven problems. You've worked with statistics to analyze and interpret data, as well as regression models to gain even further insight into the data. In this course, you'll explore machine learning. You'll learn the different types of machine learning, understand the purpose of each type of machine learning, and build several of your own machine learning models.

Course descriptions

The Google Advanced Data Analytics Certificate has eight courses. **The Nuts and Bolts of Machine Learning** is the sixth course.



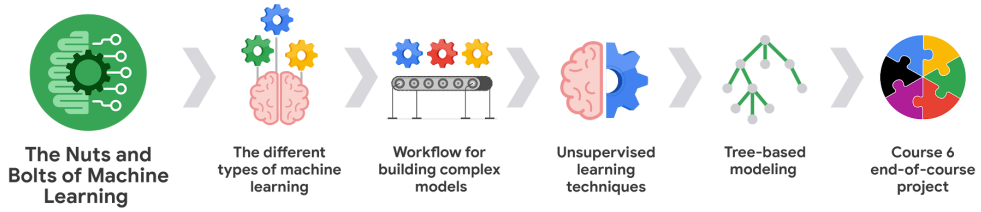
1. **Foundations of Data Science** — Learn how data professionals operate in the workplace and how different roles in the field of data science contribute to an organization's vision of the future. Then, explore data science roles, communication skills, and data ethics.
2. **Get Started with Python** — Discover how the programming language Python can power your data analysis. Learn core Python concepts, such as data types, functions, conditional statements, loops, and data structures.

3. **Go Beyond the Numbers: Translate Data into Insights** — Learn the fundamentals of data cleaning and visualizations and how to reveal the important stories that live within data.
4. **The Power of Statistics** — Explore descriptive and inferential statistics, basic probability and probability distributions, sampling, confidence intervals, and hypothesis testing.
5. **Regression Analysis: Simplify Complex Data Relationships** — Learn to model variable relationships, focusing on linear and logistic regression.
6. **The Nuts and Bolts of Machine Learning** — **(*current course*)** Learn unsupervised machine learning techniques and how to apply them to organizational data.
7. **Google Advanced Data Analytics Capstone** — Complete a hands-on project designed to demonstrate the skills and competencies you acquire in the program.
8. **Accelerate Your Job Search with AI** — Gain practical job search strategies and learn how to leverage AI tools (like Gemini and NotebookLM) to uncover your most valuable skills, create a job search plan, manage your applications, and practice for interviews as you navigate your path to your next role.

Course 6 content

Each course of this certificate program is broken into modules. You can complete courses at your own pace, but the module breakdowns are designed to help you finish the entire Google Advanced Data Analytics Certificate in about six months.

What's to come? Here's a quick overview of the skills you'll learn in each module of this course.



Module 1: The different types of machine learning

In this section of the course, you will learn about the high-level landscape of machine learning and explore two of its main types: supervised and unsupervised learning. You'll also analyze different types of data, determining whether they are categorical or continuous variables. You'll learn about a type of modeling called a recommendation system. Finally, you'll consider the ethical issues related to machine learning and learn some best practices for building ethical models.

Module 2: Workflow for building complex models

In this section of the course, you will learn about the whole process of machine learning, from starting out with a business problem and creating a model to solve it. You'll understand more of the

preparatory steps that are needed to create a successful model, create a model of your own, and analyze the performance of the model in relation to the business need.

Module 3: Unsupervised learning techniques

This section of the course focuses on unsupervised learning. You'll learn how to build a K-means clustering model and explore several other clustering techniques. You'll understand how unsupervised and supervised learning methods are different, and when and why to apply each type of model.

Module 4: Tree-based supervised learning

In this section of the course, you will learn about tree-based modeling. Tree-based models are more advanced predictive techniques that fall under the umbrella of supervised learning. You will learn about decision trees and how they can be used to approach classification problems, as well as complex models, such as random forests, adaptive boosting, and gradient boosting. Finally, you'll learn how tuning hyperparameters can help you get the best performance out of your model.

Module 5: Course 6 end-of-course project

As you conclude this part of the Advanced Data Analytics Certificate, you will put everything you've learned into one end-of-course project. You'll be tasked with solving a business problem using the provided data. The concepts and skills you will learn in this part of the course will be critical to your success as a data professional.

What to expect

Each course offers many types of learning opportunities:

- **Videos** led by Google instructors teach new concepts, introduce the use of relevant tools, offer career support, and provide inspirational personal stories.
- **Readings** build on the topics discussed in the videos, introduce related concepts, share useful resources, and describe case studies.
- **Self-review activities** and **labs** give you hands-on practice in applying the skills you are learning and allow you to assess your own work by comparing it to a completed example.
- **Practice quizzes** allow you to check your understanding of key concepts and provide valuable feedback.
- **Graded quizzes** demonstrate your understanding of the main concepts of a course. You must score 80% or higher on each graded quiz to obtain a certificate, and you can take a graded quiz multiple times to achieve a passing score.

Tips for success

- It is strongly recommended that you go through the items in each lesson in the order they appear because new information and concepts build on previous knowledge.
- Participate in all learning opportunities to gain as much knowledge and experience as possible.

- If something is confusing, don’t hesitate to replay a video, review a reading, or repeat a self-review activity.
- When you encounter useful links in this course, bookmark them so you can refer to the information later for study or review.
