

Introduction to Data Science and Machine Learning

COMP-1702

Module 1: Introduction

Course Description

- ▶ In this course, students will be introduced to the fields of Data Science and Machine Learning (DSML) and how they are used in real business applications. Students will get an introduction to the industry standard tools and technologies used in this field and learn definitions and meanings of common terms. They will analyze real case studies of how industry has applied the tools of DSML to improve their performance. By the end of this course, students will be able to contrast how DSML tools have impacted performance metrics in industry, compared to conventionally used methods.

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Learning Outcomes

- Define data science and machine learning industry terminology.
- Identify tools and technologies used to perform data science and machine learning operations.
- Use industry standard tools to build notebooks.
- Use a plot to visualize and gain insights into data.
- Explain the importance of data science and machine learning in extracting insights for business intelligence.
- Contrast the benefits of data science and machine learning against traditional methods to improve business intelligence.

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Learning Outcomes

- Choose resources required to develop a research plan.
- Investigate how data science and machine learning can improve an existing process.
- Evaluate data science and machine learning tools to determine which are suitable for use for a specific project implementation.
- Construct an implementation plan to summarize the steps and resources required to implement a data science and machine learning project.
- Present implementation plan recommendations to stakeholders.

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Course Structure

- ▶ No tests or exams
- ▶ Lectures in the first class of the week
- ▶ Work periods the rest of the week to:
 - ▶ Get help
 - ▶ Have assignments evaluated face to face
 - ▶ Work on group projects
- ▶ Multiple assignment attempts (only if time permits)
- ▶ Open book quizzes

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Why & How

- ▶ In this course, we're going to focus on the "why" of data science and machine learning, instead of the "how".
- ▶ You'll have plenty of time to learn the "how" in other courses in this program.
- ▶ Understanding why and when to apply data science and machine learning is important so you can identify opportunities for improvement in different business situations.

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Peer Study Groups

- ▶ If you look in the Learn menus under "Groups", please find the peer study group you've been assigned.
- ▶ We're going to split into breakout rooms for 5 minutes so you can get to know your partner.
- ▶ When you come back, you'll tell the class two interesting facts about your partner, which could include:
 - ▶ Hobbies
 - ▶ Where they were born
 - ▶ Favorite food
 - ▶ Why they are taking this course
 - ▶ How many brothers and sisters
 - ▶ Etc...

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Peer Study Groups

- ▶ Your peer study group is a resource for you to take advantage of throughout this course, even when you are working on projects in a different group
- ▶ You can bounce ideas off each other, ask for help and generally support each other through the course
- ▶ Get to know each other so you can help each other, just like you'd get to know your co-workers at a new job

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What is DSML?

Stealing Baseball Signs with a Phone (Machine Learning)



<https://youtu.be/PmIRbfSavbl>

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Discussion

- ▶ What was your favorite part of the video?
- ▶ Were any parts confusing?
- ▶ What other areas can you think of where you could apply machine learning in a similar way?
 - ▶ Group breakout rooms to discuss for 5 minutes.
 - ▶ When you come back we'll have a class discussion.

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Skills

Skills Needed to Become a Data Scientist



<https://youtu.be/q2Ruz1dHnow>

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Jobs

Top Jobs in Data Science



<https://youtu.be/VrdnBxx8BBI>

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Salary

Data Science Salaries Around the World



<https://youtu.be/rN5qNsofGVE>

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Skills

- ▶ Were the skills, jobs and salaries what you expected?
- ▶ Remember, these are just examples in a constantly changing industry and can vary dramatically across different regions and companies

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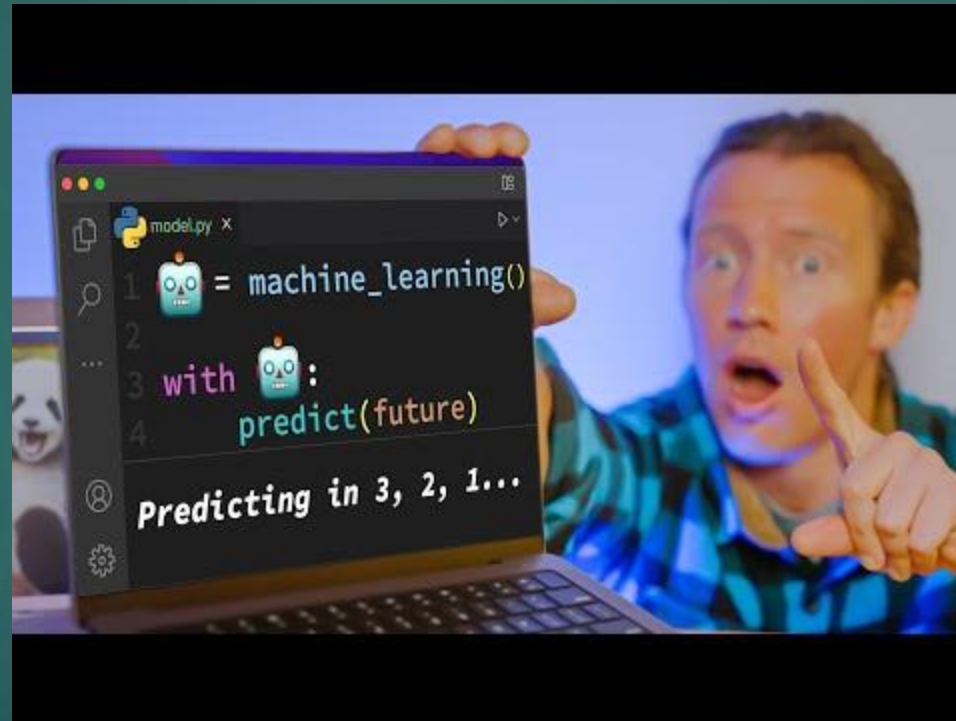
Data Analyst

- ▶ This program will prepare you for data analyst type jobs, which as you may have noticed in the videos, can lead directly into data scientist positions.
- ▶ Let's look at the data analyst role a little further and take a peak at a day in the life in this role...

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What is DSML?

How I use Machine Learning as a Data Analyst



<https://youtu.be/AopGnnPPczY>

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Discussion

- ▶ What was your favorite part of the video?
- ▶ After seeing what's involved to work in this industry, do you think it would be a good career fit for you?

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Assignment

- ▶ For this week's assignment you'll be introducing yourself to the class.
- ▶ Please review the instructions and the rubric in Learn.