

# An Introduction to Machine Learning

## Description

According to a source from MIT, machine learning is a “...subfield of artificial intelligence, which is broadly defined as the capability of a machine to imitate intelligent human behavior.” 🤖

Computers learning to think!? Whether it be predicting weather trends or changes in the stock market, machine learning is the future. First, we'll discuss what machine learning is and applications of machine learning to differing career paths and college majors (e.g. economics, health, technology), before then delving into learning the basics of commonly utilized models. At the end of this workshop, you'll have a basic understanding of machine learning concepts in a code-free environment. Everyone is welcome! No math prerequisite required, but basic algebra and graphing skills preferred.

## Learning Outcomes

After this workshop, you will be able to:

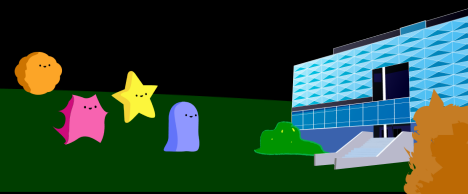
- Understand what machine learning is, and its applications in varying fields.
- Discern the importance of data in machine learning.
- Recognize the difference between artificial intelligence, machine learning, and deep learning.
- Distinguish between different types of machine learning: supervised, unsupervised, and reinforcement learning.
- Learn about different modeling techniques, and different scenarios in which each might be best applied.

## Prerequisite Knowledge

No math or other prerequisite required, but basic algebra and graphing skills preferred. Beginner friendly course environment, all welcome regardless of major or technical experience!

## Pre-Workshop Checklist

Got questions? Bring 'em! :D



## Timeline (60 minutes)

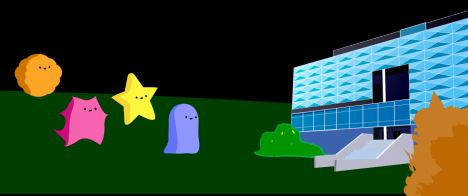
Time	Module	Description
5 mins	Definition: Machine Learning	What is Machine Learning?
5 mins	DATA!!	What is data? Why's it important?
5 mins	Applications of Machine Learning	How can machine learning be applied to different topics (ie. economics, health, technology)?
5 mins	Cross-Comparison: <ul style="list-style-type: none"><li>• Artificial Intelligence (AI)</li><li>• Machine Learning (ML)</li><li>• Deep Learning (DL)</li></ul>	AI/ML/DL → What are they? → What's the difference?
10 mins	Types of Machine Learning	What's the difference between supervised, unsupervised, and reinforcement learning?
5 mins	Model Mayhem?!	What are the basics of creating a machine learning model? Which model should I choose?
5 mins	Model Example #1: Linear Regression	How can a linear regression model be applied in a real world scenario?
5 mins	Model Example #2: Decision Tree	How can a decision tree model be applied in a real world scenario?
10-15 mins	Whiteboard Activity: Your Turn! 🚨	Practice collecting data, and whiteboard a model in teams of 1-4 people.

## Workshop Lead Contact

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## Additional Resources

### Hack the North Resources

#### Hack the North 2022 Event Schedule

Check this out to stay up-to-date on activities, workshops, and other key happenings this weekend.

### Workshop-Specific Resources

#### Python? Statistical Modeling in Python?

- “Python Tutorial For Beginners – A Complete Guide | Learn Python Easily” posted on Great Learning, by Great Learning Team.
  - <https://www.mygreatlearning.com/blog/python-tutorial-for-beginners-a-complete-guide/>
- “Python Tutorial: A Complete Beginners Guide” posted on Digital Ocean, by Pankaj.
  - <https://www.kite.com/blog/python/statistical-modeling-python-libraries/>
- “Statistical Modeling with Python: How-to & Top Libraries” posted on Kite, by Tirtha Sarkar.
  - <https://www.kite.com/blog/python/statistical-modeling-python-libraries/>

#### Data Processing?

- “Discovering Numpy, Pandas and SciKit Learn.” posted on Medium, by NR.
  - <https://medium.com/personal-project/numpy-pandas-and-scikit-learn-explained-e7336baecedc>

#### ML Libraries in Python?

- “Your first Machine Learning Program using StatsModels and Scikit\_Learn!” posted on Medium, by Stephen Joel.
  - <https://stephenjoel2k.medium.com/write-your-first-machine-learning-program-using-statsmodels-and-scikit-learn-bf0c14c9e3d9>
- “Scikit-learn vs. StatsModels: Which, why, and how?” posted by The Data Incubator.
  - <https://www.thedataincubator.com/blog/2017/11/08/scikit-learn-vs-statsmodels/>
- “Scikit-learn cheat sheet: methods for classification & regression” posted on educative.io, by Aman Anand.
  - <https://www.educative.io/blog/scikit-learn-cheat-sheet-classification-regression-methods>

