# Machine Learning Course Workbook

- Before the Course -

### Introduction

## ML is everywhere!

Where (else) do you use ML in your everyday life incl. work?

# ML history: Why now?

What accelerated the rise of ML in the last few years?

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What is the difference between ANI and AGI?

- Day 1 -

# The Basics

### Data is the new oil!?

What does Goodhart's Law warn us about?

With what KPI could your department's performance be quantified? What would be the target state, alert threshold, and what could be possible corrective actions?

### What is ML?

What is the difference between Machine Learning, Artificial Intelligence, and Deep Learning?

What are the benefits of ML compared to traditional software?

When should you <u>not</u> use ML?

Which kind of ML problems have a high chance of success and when is the outcome uncertain?

# How do machines "learn"?

Describe the different learning strategies and what their requirements (in terms of data) are:

- → Unsupervised Learning:
- → Supervised Learning:
- → Reinforcement Learning:

What are "features" and what are "labels"?

- → Features:
- → Labels:

#### ML use cases

What does structured and unstructured data look like?

- → Structured Data:
- → Unstructured Data:

Take another look at the <u>ML algorithm cheat sheet</u> & try to find examples where you could be using each of these algorithms to improve your organization's products or processes.

- Anomaly Detection:
- Clustering:
- Regression:
- Classification:
- Deep Learning:
- Recommender Systems/Information Retrieval:

What is the drawback of unsupervised learning methods?

What are the benefits of breaking down a complex input-output problem into simpler subproblems?

What is the downside of a system composed of multiple ML models?

# Solving problems with ML

Which tasks take up most of a Data Scientist's time?

What are the two deployment options for an ML model and when should you use which?

# Data Analysis & Preprocessing

## **Data Analysis**

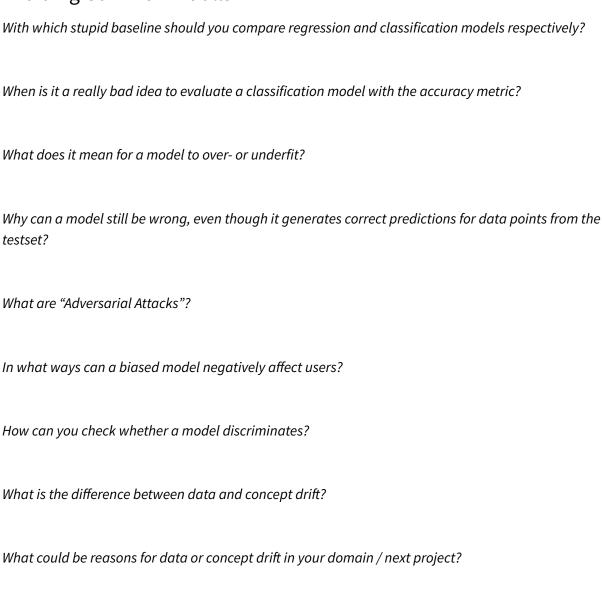
You want to pick a restaurant for dinner. Your data source is Google Maps. What information do you consider when making a decision and what makes you choose one restaurant over another?

# Garbage in, garbage out!

What do you think are the most common ways in which datasets in your organization are messy?

Which concrete next steps could your organization take to improve their data quality?

# **Avoiding Common Pitfalls**



# Conclusion

According to Andrew Ng, what are the 5 steps for a successful AI transformation of a company and where do you think your organization stands in this process?

- 1.
- 2.
- 3.
- 4.
- 5.