Apprentice Bootcamp Schedule

MLG-07

## Day 1: Foundations (10/5)

* 8:00 am - 8:30 am Introductions & Welcome
* 8:30 am - 9:30 am [Machine Learning 101](#_337717pwedjz)
* 9:30 am - 9:45 am Tea & Coffee Break
* 9:45 am - 10:45 am [Machine Learning 101 Notebook](#_7wbav48suhk5)
* 10:45 am - 11:00 am [Model Validation Discussion](#_fmn87ctau8xi)
* 11:00 am - 12:00 pm [Math & Computer Science Fundamental](#_p35rzxnlstiu)s
* 12:00 pm - 1:00 pm [Introduction to Feature Engineering](#_unmpkeocmmuf)
* 1:00 pm - 2:00 pm Lunch
* 2:00 pm - 4:00 pm [Group Activity - Feature Engineering Exercise](#_tn5mokgwwejc)

### Machine Learning 101

Learning Objectives:

1. Describe the motivations of machine learning
2. Identify common machine learning pitfalls
3. Validate a model’s performance

Classroom Resource(s): [01\_ml101.pptx](https://drive.google.com/file/d/1CNJVz5CLKzBWWotwDQqxtXnUyxZNCIem/view?usp=sharing)

Knowledge Check / Activity:

Take 3-5 minutes to consider a product or service that either you use daily or your client offers. Consider the following questions:

1. How can or does machine learning enhance that product or service?
2. How would you approach validating a model for that feature of a product/service?

Jot down your answers to those questions. In your breakout room, talk about the product/service you thought about and your answers to the previous questions. Ask your break group if they agree with your validation approach. Pick one person to report on their product/service enhanced with machine learning back to the larger class.

### Machine Learning 101 Notebook

Learning Objectives:

1. Define algorithms, evaluation, and optimization in the context of machine learning
2. Compare the performance of machine learning algorithms on validation data

Classroom Resource(s): [01\_machine\_learning\_101.ipynb](https://drive.google.com/file/d/1mT9DyUvRyauE0Gd5aOLUG1PtmK2WhP10/view?usp=sharing)

### Model Validation Discussion

Learning Objectives:

1. Compare the differences between statistical evaluation and practical evaluation

Knowledge Check / Activity:

Let’s consider how to validate a couple of the following models:

* Predicting bike share usage
* Classifying Dogs Versus Cats

Classroom Resource(s): [Sample Google Model Card](https://modelcards.withgoogle.com/face-detection)

### Math & Computer Science Fundamentals

Learning Objectives:

1. Refresh core calculus and probability concepts
2. Discuss computer hardware relevant to machine learning

Classroom Resource(s): [02\_fundamentals.pptx](https://drive.google.com/file/d/1ADJ9J3zo-MPyDjzSLRIpll9Xyvnw_iQ8/view?usp=sharing)

Knowledge Check / Activity: [Fundamentals Quiz](https://jcsokoll.typeform.com/to/TajugeLv)

### Introduction to Feature Engineering

Learning Objectives:

1. Emphasize the importance of feature engineering for machine learning
2. Process categorical and continuous data
3. Discuss how to handle missing data

Classroom Resource(s): [02\_feature\_engineering.ipynb](https://drive.google.com/file/d/1dngQeNpDKryTevvsluFv_BkX-C55kLkM/view?usp=sharing)

<https://jcsokoll.typeform.com/to/ofCGoG1R>

### Group Activity - Feature Engineering Exercise

Guild masters will guide this activity; however, you are expected to follow along individually and submit your own Google Colab notebook for review.

Assignment: [03\_feature\_exercise.ipynb](https://drive.google.com/file/d/1mKLNCnxnThZCIt3Sx9ToPdT7HfwWJWFC/view?usp=sharing)

Submission: [Fill this out](https://jcsokoll.typeform.com/to/ofCGoG1R)