week-2_preparation

September 2, 2020

1 To-do Before Week-2

- Create Github account
- Make sure that you joined slack channel: Link to channel

1.1 Readings

We will make an introduction to ML: So the following material will be relevant to our discussion:

- Chapter-1 of Python Machine Learning: Giving Computers the Ability to Learn from Data
- Chapter-1 of Hands-on Machine Learning with Scikit-Learn, Keras and TensorFlow: Machine Learning Landscape

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Note: As you are reading Python Machine Learning keep these questions in your mind:

- What are supervised, unsupervised and reinforcement learning? Give examples for each of these types of machine learning.
- What are the subcategories of supervised learning type machine learning? Give examples for each subcategory.
- What are the some common problems of unsupervised learning?
- Define: Sample, feature, label, instance.
- According to the notation introduced in the book, what

$$x^{(15)} = \left[x_1^{(15)}, x_2^{(15)}, x_3^{(15)}, x_4^{(15)} \right]$$

represents in the context of Iris dataset.

- Define training, training example, target, loss function.
- What are the 4 main steps in machine learning roadmap?
- For many machine learning algorithms to get optimal performance what should be the range of features?
- If the features are highly correlated what might be a good solution? (What is correlation?)

Note: As you are reading Hands-On Machine Learning with Scikit-Learn, Keras and TensorFlow keep these questions in your mind:

- Make a comparison of traditional programming approach and machine learning approach.

- What are the benefits of machine learning approach compared to traditional programming approach?

- Give some examples of applications of ML.

- How might one classify machine learning systems?

- Check the uses of features and attributes.

- What are the some most important supervised learning algorithms?

- What are the some most important unsupervised learning algorithms?

- Note that in this book, they mention also semi-supervised learning algorithms too. Can you tell the difference between semi-supervised learning and supervised one?

- What are the two things that can go wrong in a machine learning tast?

- What is sampling bias?

- Why do we need testing and validating? How are they different?

- What is "no free lunch theorem"?

1.2   Extra Resources

Cornell CS4780 - Machine Learning for Intelligent Systems - Lecture-1

Cornell CS4780 - Machine Learning for Intelligent Systems - Lecture-2

Andrew Ng - Supervised Learning

Andrew Ng - Unsupervised Learning