Machine Learning Refined Spring 2025

Topic: Introduction — 2/28 2025

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1 Overview

There are four main categories of concepts in the book.

- Predictive learning: The goal is to predict a continuous and valued phenomenon (this can also be a form of distinguishing of different objects)
- Feature Design: Using tools and techniques to make more successful predictive models
- Function approximation: The goal is to approximate a function that is not known (implying there is little to learn from the proper features themselves)
- Numerical Optimization - powering the first three and makes machine learning run

1.1 Toy Example: Cats and Dogs

Problem 0. Sample TitleThis is a sample problem. Add more details here.1

2 Main Section

We begin by describing the problem .... Make sure to use sections and subsections.

2.1 Blah blah blah

Here is a subsection.

2.1.1 Blah blah blah

Here is a subsubsection. You can use these as well.

2.2 Using Boldface

Make sure to use lots of boldface.

Question: How would you use boldface?

Example: This is an example showing how to use boldface to help organize your topics.

Some Formatting. Here is some formatting that you can use in your notes:

- *Item One* – This is the first item.
- *Item Two* – This is the second item.
- ... and here are other items.

If you need to number things, you can use this style:

1. *Item One* – Again, this is the first item.
2. *Item Two* – Again, this is the second item.
3. ... and here are other items.

Bibliography. Please give real bibliographical citations for the papers that we mention in class. See below for how to include a bibliography section. If you use BibTeX, integrate the .bbl file into your .tex source. You should reference papers like this: "The FKS dictionary originates in a paper by Fredman, Komlós and Szemerédi [1]." In general, the name of the authors should appear in text at most once (for the first citation); further citations look like: "Our proof follows that of [1]".

Take a look at previous topics (TeX files are available) to see the details. A excellent source for bibliographical citations is DBLP. Just Google DBLP and an author's name.

References

[1] M. Fredman, J. Komlós, E. Szemerédi, *Storing a Sparse Table with $O(1)$ Worst Case Access Time*, Journal of the ACM, 31(3):538-544, 1984.