MATH3001: ANALYSIS I

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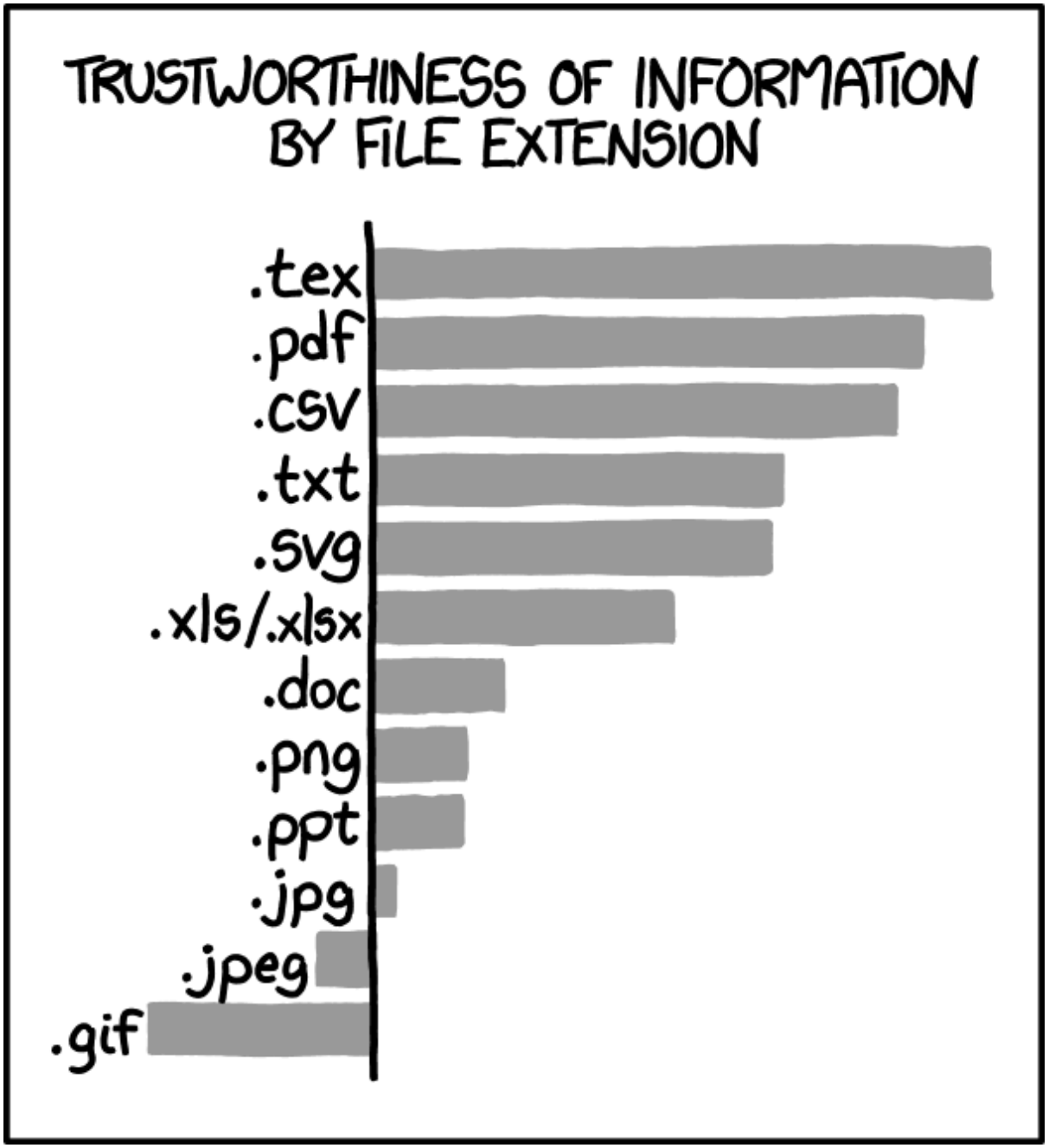
EDITION 1



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Preface

To the interested reader,

This document is a compilation of lecture notes taken during the Fall 2023 semester for MATH3001: Analysis I at the University of Colorado Boulder. The course used *Analysis With an Introduction to Proof*[1] by Steven Lay as its primary text. Supplemental texts included Walter Rudin's *Principles of Mathematical Analysis*[2] and Stephen Abbott's *Understanding Analysis*[3]. As such, many theorems, definitions, and content may be quoted or derived from the aforementioned books. This course was taught by Carla Farsi, Ph. D.

In addition to the aforementioned supplemental texts, the author would like to provide the following resources for students currently taking an analysis course:

1. Casey Rodriguez' MIT OpenCourseWare Real Analysis Course
2. Terrence Tao's *Analysis I* and *Analysis II*.

While much effort has been put in to remove typos and mathematical errors, it is very likely that some errors, both small and large, are present. Please keep in mind that the author wrote this resource during his undergraduate studies. If an error needs to be resolved, please contact Adithya Bhaskara at adithya.bhaskara@colorado.edu.

Best Regards,
Adithya Bhaskara

REVISED: August 28, 2023

[1] Lay, S. R. (2014). Analysis With an Introduction to Proof (5th ed.). Pearson.
[2] Rudin, W. (1976). Principles of Mathematical Analysis (3rd ed.). McGraw-Hill, Inc.
[3] Abbott, S. (2016). Understanding Analysis (2nd ed.). Springer.

1 The Real Numbers

1.1 Lecture 1: August 28, 2023

1.1.1 ...

Appendices