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Teaching Data Science

An open-source repository for teaching material, open-free to all



Yogesh Haribhau Kulkarni (PhD)

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yogeshhk Added info in llm evaluation			f064796 · 3 days ago	867 Commits		Course notes for Data Science related topics, prepared in LaTeX
LaTeX	Added info in llm evaluation		3 days ago			python open-source data-science
Notebooks	Made decks		4 days ago			machine-learning
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Screenshot of the GitHub repository

Are you passionate about data science? Do you dream of unraveling hidden patterns in vast datasets, creating predictive models, and contributing to cutting-edge research? If so, you're in the right place!

Welcome, data enthusiasts, to a treasure trove of knowledge — the “Teaching Data Science” [repository](#) by [Yogesh H Kulkarni](#). This GitHub repository is a rich collection of LaTeX course notes covering a spectrum of topics including Python, Machine Learning, Deep Learning, Natural Language Processing, and more. In this blog, we’ll explore the purpose, how to use, steps to contribute, and other essential aspects of this invaluable resource.

Purpose: Spreading the Light of Data Science

The Teaching Data Science repository serves a noble purpose: to spread the gospel of data science far and wide. Our mission is simple yet powerful — to make data science accessible to everyone. Whether you're a student, an industry professional, or an enthusiast, we believe that knowledge should flow freely. By sharing our insights, code, and expertise, we hope to empower individuals to harness the power of data. The values driving this endeavor are rooted in giving back to the community and paying knowledge forward. The ultimate goal is to propel the industry from automation to autonomy.

How to Use: Navigating the Maze of Knowledge

The core content is presented as Beamer slides — a dynamic format that combines visuals, text, and equations. These slides cover a wide range of topics, including:

- Python fundamentals
- Machine learning algorithms
- Deep learning architectures
- Natural language processing techniques

But that's not all! We've also transformed these slides into two-column course notes PDFs. Whether you're preparing for a seminar, workshop, or a semester-long course, you'll find valuable material here. The structure of this repository is well thought out, divided into three main directories: LaTeX, Code, and References.

LaTeX Directory

In the LaTeX directory, you'll discover TeX sources alongside essential images. Here's how it's organized:

- **Naming Convention:** Each TeX file follows a consistent naming convention, such as `maths_linearalgebra_matrices.tex`. Clear, concise names make navigation a breeze.
- **Driver Files:** For different event durations, we have driver files like `Main_Seminar_Presentation.tex`, `Main_Workshop_CheatSheet.tex`, and `Main_Course_Notes.tex`. These files compile the relevant sources seamlessly.

Code Directory

Data science isn't complete without hands-on practice. Our code directory houses Python and IPython notebook files. Here's what you'll find:

- **Naming Consistency:** Each code file corresponds to a specific LaTeX topic. We believe in connecting theory with practice.
- **Library-Based TeX Files:** For instance, `sklearn_intro.ipynb` accompanies the `sklearn_intro.tex` lecture. Dive into real-world examples and experiment with libraries.

References Directory

A treasure chest of papers, code, and presentations used as base material for content preparation. This directory acknowledges the importance of building on existing knowledge and resources.

Requirements: Setting Up

To utilize this repository, ensure you have LaTeX installed (tested with MikTex 2.9 on Windows 7, 64bit). Additional LaTeX packages may need installation based on warnings/suggestions. The recommended IDE is TexWorks.

How to Run LaTeX

To embark on your data science journey with Kulkarni's notes, you'll need a few essentials:

- **LaTeX:** We recommend MikTex 2.9 on Windows 7 (64-bit).
- **LaTeX packages:** Install them as prompted to ensure smooth compilation.
- **TexWorks IDE:** This user-friendly editor streamlines your LaTeX workflow.

Running the LaTeX files is straightforward. Driver files are named intuitively, and you can even compile individual files using your preferred LaTeX system. Alternatively, feel free to create your own main files and include the content files for a customized learning experience.

Steps to Contribute

The beauty of open source lies in collaboration, and this repository welcomes contributions with open arms.

1. Navigate to the ‘LaTeX’ folder.
2. Copy your images into the ‘images’ folder and source code to the ‘src’ folder.
3. Sample files are provided for copying and modification:
`Main_Sample_Presentation.tex`, `Main_Sample_CheatSheet.tex`, both calling
`sample_content.tex`.
4. Fill your material directly in the content file or organize it into multiple files and then `input` them in the content file.

Disclaimer

As with any valuable resource, the Teaching Data Science repository comes with a disclaimer:

- No guarantee of the correctness of the content.
- Notes are built using publicly available material.
- Citing original sources is a priority, but some may be missing.
- Continuous improvements are underway, and feedback is encouraged.
- Suggestions, comments, corrections, and pull requests are not just welcome; they are actively sought.

In conclusion, the Teaching Data Science repository is a beacon of knowledge in the vast ocean of data science. It empowers you to learn, contribute, and grow in this dynamic field. As we collectively strive for “From Automation to Autonomy,” let’s leverage this resource to illuminate our path in the world of data science. Dive in, explore, and let the journey to autonomy begin!

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Written by **Yogesh Haribhau Kulkarni (PhD)**

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Input Settings

Assistant Role Name: Accountant

User Role Name: Entrepreneur

Task: Preparing and filing tax returns.

Word Limit for Task Brainstorming: 100

CAMEL-Langchain-VertexAI Agent

Conversation

AI User (Entrepreneur):

Instruction: Gather all the financial records for the year. Input: None

AI Assistant (Accountant):

Solution: The accountant will gather all necessary financial records, such as receipts, invoices, and bank statements, for the year. Next request.

AI User (Entrepreneur):

Instruction: What tax forms need to be filed? Input: None

AI Assistant (Accountant):

Solution: The accountant will determine which tax forms need to be filed based on the type of business and the income that was generated. Next request.



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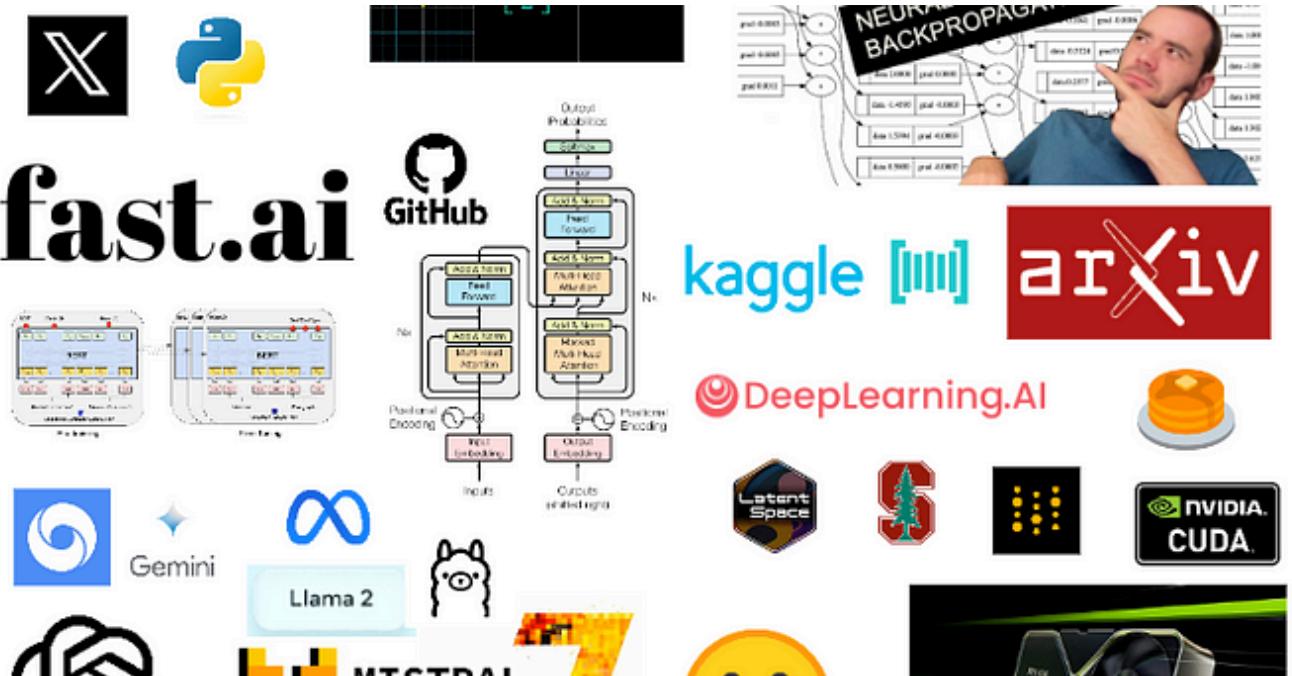


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Mark 1/UNIVAC history

- Lovelace excerpt
- Invention of the GUI
- Babbage intro
- + New

Week Two: Ada Lovelace

Ada Lovelace was a British mathematician and writer who is considered to be the first computer programmer. She was born in 1815 to the poet Lord Byron and his wife Annabella Milbanke.

Showed an early aptitude for mathematics, and she was tutored by some of the leading mathematicians of her day. In 1833, she met Charles Babbage, a mathematician and inventor who was working on a machine that he called the Analytical Engine. The Analytical Engine was designed to be a programmable computer.

Contributions to Computing:

Ada Lovelace made several important contributions to the development of computing. She translated an article about the Analytical Engine from French to English. In her translation, she added a series of notes that outlined how the Analytical Engine could be used to solve mathematical problems. These notes are considered to be the first example of computer programming.

Ada Lovelace also wrote about the potential of the Analytical Engine to be used for creative purposes, such as composing music. She believed that the Analytical Engine would have a profound impact on society; one of the first people to envision this potential of computers to be used for more than just

Document guide

Class notes containing information about women in computing, including the British mathematician Ada Lovelace, the computer scientist Grace Hopper, and the NASA mathematician Katherine Johnson. These women were all pioneers in the field of computing, and their work has helped to pave the way for women in STEM fields.

Key topics

- STEM and Diversity
- Alan Kay's Dynabook
- Katherine Johnson at NASA

Questions to try

- How did Grace Hopper's work on the Mark I contribute to modern computing?
- What challenges did Johnson face as an African American woman at NASA?

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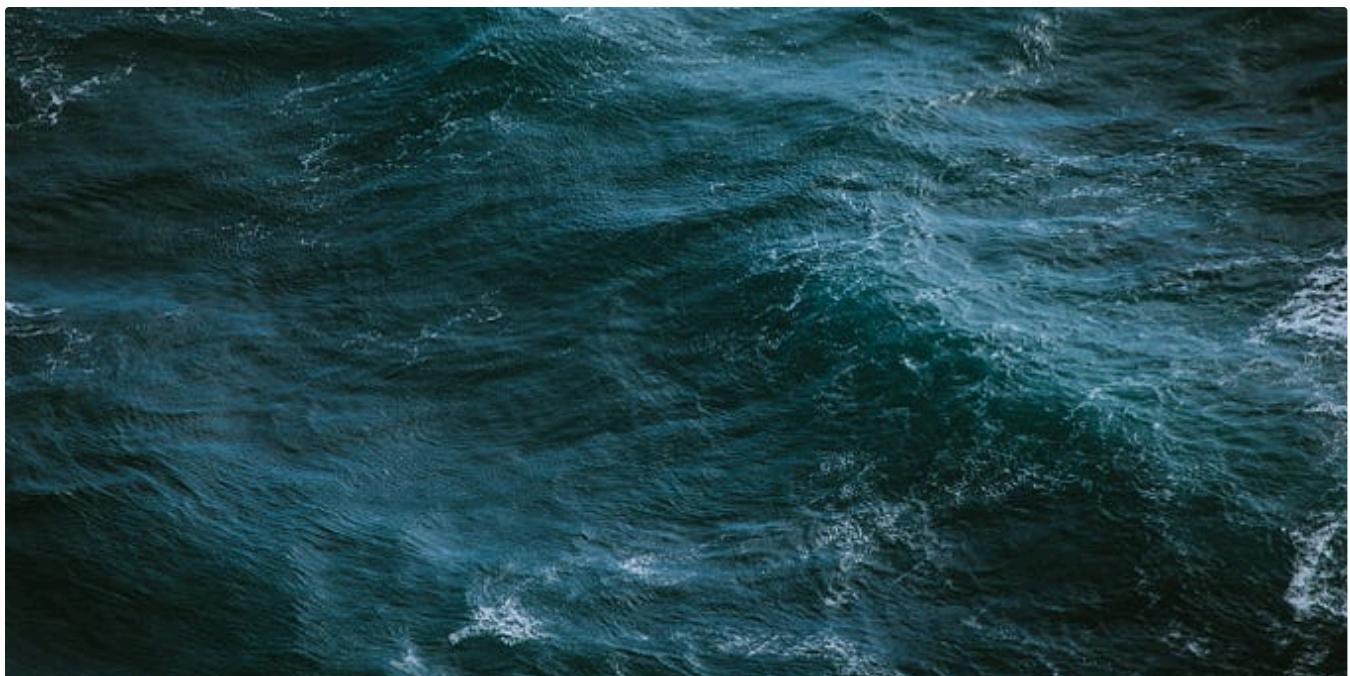
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