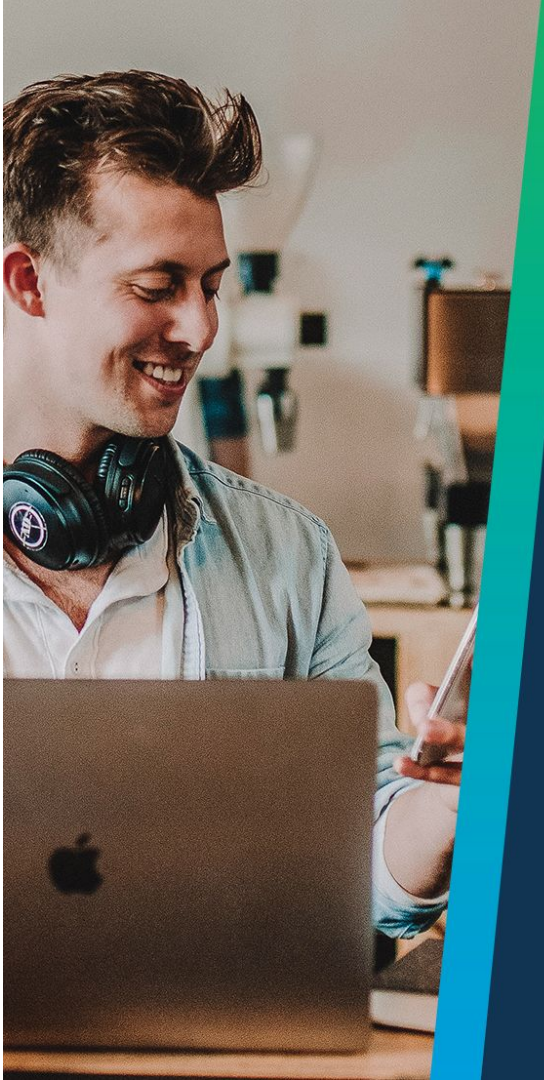

DS Bootcamp

Hyperiondev

Recent Developments in Data Science and Artificial Intelligence

Welcome

Your Lecturer for this session

Sanana Mwanawina

Lecture - Housekeeping

- The use of disrespectful language is prohibited in the questions, this is a supportive, learning environment for all - please engage accordingly.
- No question is daft or silly - **ask them!**
- There are Q/A sessions midway and at the end of the session, should you wish to ask any follow-up questions.
- You can also submit questions here: hyperiondev.com/sbc4-ds-questions
- For all non-academic questions, please submit a query: hyperiondev.com/support
- Report a safeguarding incident: hyperiondev.com/safeguardreporting
- We would love your feedback on lectures: https://hyperionde.wufoo.com/forms/zsgv4m40ui4i0g/

Lecture - Code Repo

Go to: github.com/HyperionDevBootcamps

Then click on the "**C4_DS_lecture_examples**" repository, do view or download the code.

Objectives

1. Discuss what is happening in the world of Data Science and Artificial Intelligence

One-stop solution

https://github.com/HyperionDevBootcamps/HyperionDev-Data-Science-Development-Environment-Setup

- Follow the simple instructions
- Set up your computer for the whole bootcamp

Drug discovery

- https://www.bbc.com/news/health-65709834
- Focussed one of the most problematic species of bacteria, *Acinetobacter baumannii* - classified critical threat by WHO
- Supervised learning: they took thousands of drugs whose chemical structures were known and tested how effective they were at killing the bacterium

Drug discovery

- The AI learnt the chemical structure of compounds that were effective at killing the bacteria
- 6,680 compounds whose levels of effectiveness were unleashed to the AI
- This narrowed down the list of compounds to 240, which the researchers tested and shortlisted to 9 potential antibiotics
- An incredibly potent antibiotic was revealed

Transformer Models

- Attention is All You Need: https://arxiv.org/abs/1706.03762
- A paper discussing the field of natural language processing (NLP) introducing the neural network architecture called the Transformer
- Replaces the traditional sequential processing of recurrent neural networks with a self-attention mechanism

Transformer Models

- The Transformer architecture is what Chat GPT, Bard and LLaMa use.
- What makes them different?
- Comparisons of models on code generation: https://twitter.com/mplappert/status/1663892732652273664

Transformer Models

anthropic-claude	0.512195
anthropic-claude-instant	0.542683
llama-7b	0.103659
openai-gpt35	0.469512
openai-gpt4	0.731707
openai-text-davinci-002	0.463415
openai-text-davinci-003	0.628049
replit-3b	0.164634

Language Models

- Speculations about the safety around language models? https://twitter.com/HeidyKhlaaf/status/1634173714055979010
- “Toward Comprehensive Risk Assessments and Assurance of AI-based Systems” by Heidy Khlaaf
- Highlights the lack of robustness, difficulty in measuring performance, and inadequate risk analyses in machine learning models

Ethics

- Meta Lawsuit: https://edition.cnn.com/2022/12/23/tech/meta-cambridge-analytica-settlement/index.html
- Private information of 87 million Facebook users was obtained by Cambridge Analytica
- Meta agreed to pay $725 million to settle the class action lawsuit
-

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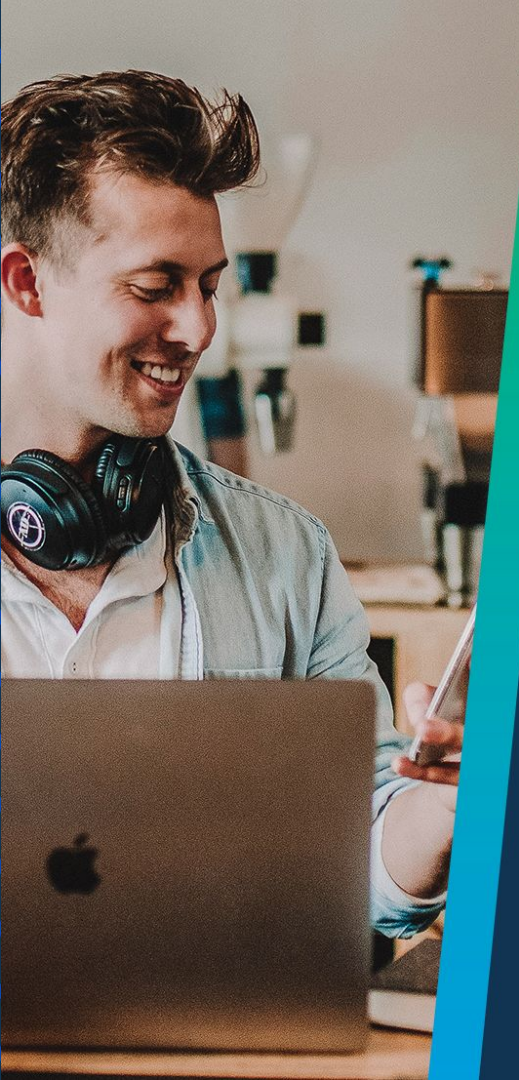
Q & A/Discussion Section

Please use this time to ask any questions relating to the topic explained, should you have any



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Thank you for joining us