NTPU
國立臺北大學
National Taipei University

Introduction to Python for Accounting Applications

1141PAA01
ACC2, NTPU (U2004) (Fall 2025)
Wed 6, 7, 8, (14:10-17:00) (9:10-12:00) (B3F10)

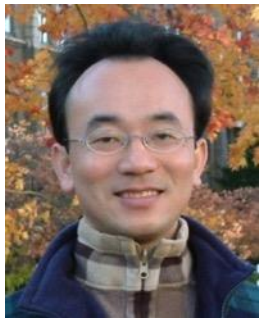
NVIDIA University Ambassador Certified Instructor

aws educate Cloud Ambassador 2020 Cohort

aws academy Accredited Educator

aws certified Cloud Practitioner

aws certified Solutions Architect Associate



Min-Yuh Day, Ph.D,
Professor and Director
Institute of Information Management, National Taipei University
https://web.ntpu.edu.tw/~myday

2025-09-10

NTPU
國立臺北大學
National Taipei University

AACSB ACCREDITED

aws educate | Cloud Ambassador
2020 Cohort

aws academy
Accredited Educator

aws certified
Solutions Architect
Associate

aws certified
Cloud Practitioner

Prof. Min-Yuh Day

NVIDIA
University Ambassador
Certified Instructor

Director, Information Management, NTPU

Director, Intelligent Financial Innovation Technology, IFIT Lab, IM, NTPU

Director, Fintech and Green Finance Center (FGFC), NTPU

Division Director, Sustainable Development, Sustainability Office, NTPU

Visiting Scholar, IIS, Academia Sinica

Ph.D., Information Management, NTU

Artificial Intelligence, Agentic AI, ESG and Green Financial Technology, Big Data Analytics, Electronic Commerce

NTPU
國立臺北大學
National Taipei University

中央研究院 ACADEMIA SINICA 1928

Course Syllabus
National Taipei University
Academic Year 114, 1st Semester (Fall 2025)

- **Course Title: Python for Accounting Applications**
- **Instructor: Min-Yuh Day**
- **Course Class: ACC2, NTPU (3 Credits, Elective)**
- **Details**
  - **EMI Course**
    (3 Credits, Elective, One Semester) (U2004)
- **Time & Place: Wed. 6, 7, 8, 14:10-17:00(B3F10)**
- **Google Meet:** https://meet.google.com/ofh-iosa-ehd

Course Objectives

1. Understand the fundamental concepts of Python for Accounting Applications.
2. Equip with Hands-on practices of Python for Accounting Applications.

Course Outline

- This course introduces the fundamental concepts and hands-on practices of Python for Accounting Applications.
- Topics include
  1. Introduction to Python for Accounting Applications,
  2. Python Programming and Data Science,
  3. Foundations of Python Programming,
  4. Data Structures,
  5. Control Logic and Loops,
  6. Functions and Modules,
  7. Files and Exception Handling,
  8. Data Analytics and Visualization with Python,
  9. Obtaining Data From the Web with Python,
  10. Statistical Analysis with Python,
  11. Machine Learning with Python,
  12. Text Analytics with Generative AI and Python,
  13. Applications of Accounting Data Analytics with Python, and
  14. Applications of ESG Data Analytics with Python.

Syllabus

Week	Date	Subject/Topics
1	2025/09/10	Introduction to Python for Accounting Applications
2	2025/09/17	Python Programming and Data Science
3	2025/09/24	Foundations of Python Programming
4	2025/10/01	Data Structures
5	2025/10/08	Control Logic and Loops
6	2025/10/15	Functions and Modules; Files and Exception Handling
7	2025/10/22	Data Analytics and Visualization with Python
8	2025/10/29	Self-Learning

Syllabus

Week	Date	Subject/Topics
9	2025/11/05	Midterm Project Report
10	2025/11/12	Obtaining Data From the Web with Python
11	2025/11/19	Statistical Analysis with Python
12	2025/11/26	Machine Learning with Python
13	2025/12/03	Text Analytics with Generative AI and Python
14	2025/12/10	Applications of Accounting Data Analytics with Python
15	2025/12/17	Applications of ESG Data Analytics with Python
16	2025/12/24	Final Project Report

Teaching Methods and Activities

- Lecture
- Discussion
- Practicum

Evaluation Methods

- Individual Presentation 30 %
- Group Presentation 30 %
- Case Report 20 %
- Class Participation 10 %
- Assignment 10 %

Required Texts

- **Allen B. Downey (2016), Think Python: How to Think Like a Computer Scientist, 2nd Edition, O'Reilly Media**

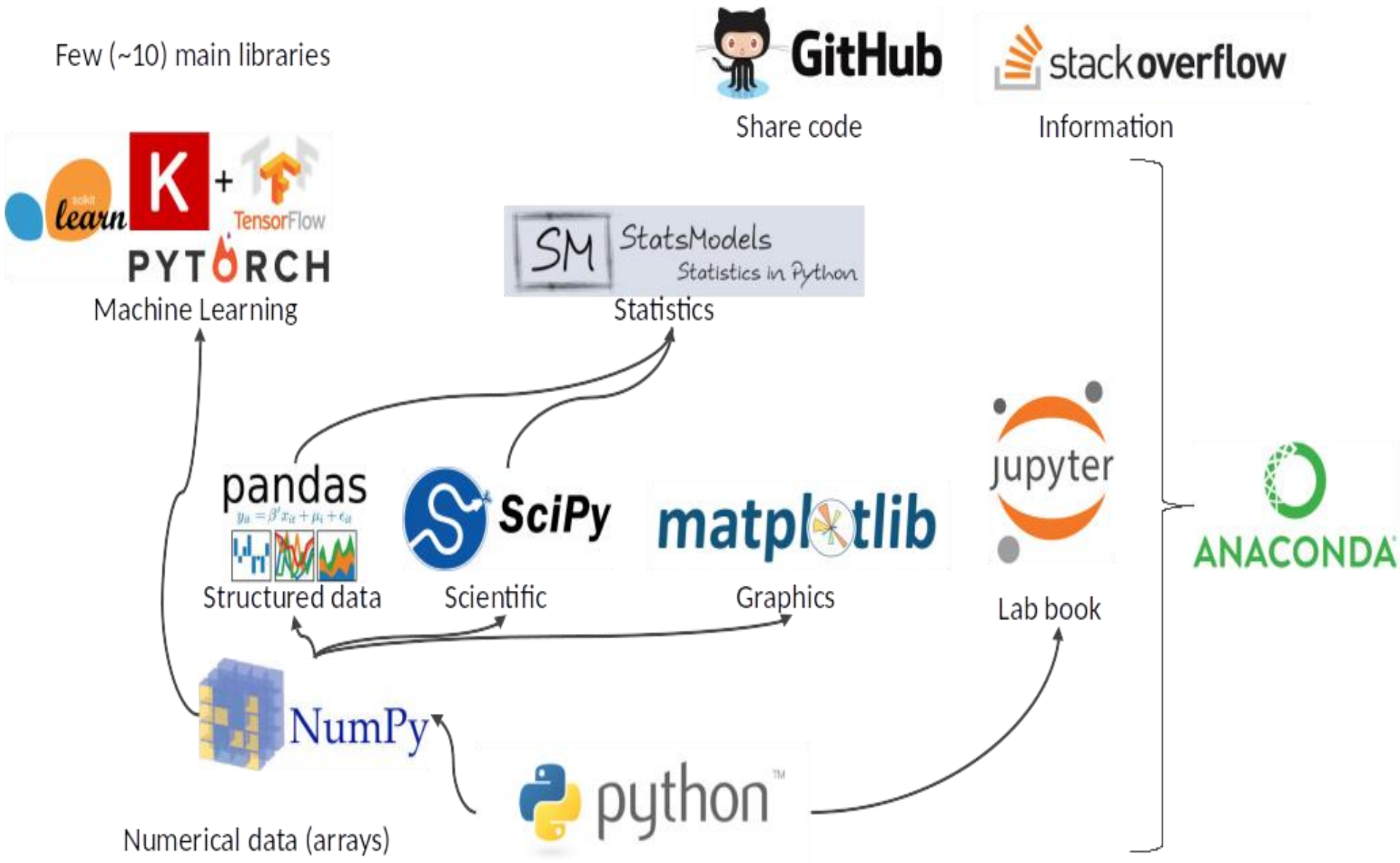
Reference Books

1. Frederick Kaefer and Paul Kaefer (2020), Introduction to Python Programming for Business and Social Science Applications, SAGE Publications
2. Abdullah Karasan (2021), Machine Learning for Financial Risk Management with Python: Algorithms for Modeling Risk, O'Reilly Media
3. Vic Anand, Khrystyna Bochkay, and Roman Chychyla (2020), Using Python for Text Analysis in Accounting Research, Now Publishers
4. Aurélien Géron (2022), Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems, 3rd Edition, O'Reilly Media.
5. Numa Dhamani and Maggie Engler (2024), Introduction to Generative AI, Manning
6. Denis Rothman (2024), Transformers for Natural Language Processing and Computer Vision - Third Edition: Explore Generative AI and Large Language Models with Hugging Face, ChatGPT, GPT-4V, and DALL-E 3, 3rd ed. Edition, Packt Publishing
7. Ben Auffarth (2023), Generative AI with LangChain: Build large language model (LLM) apps with Python, ChatGPT and other LLMs, Packt Publishing.
8. Thomas R. Caldwell (2025), The Agentic AI Bible: The Complete and Up-to-Date Guide to Design, Build, and Scale Goal-Driven, LLM-Powered Agents that Think, Execute and Evolve, Independently published.

Other References

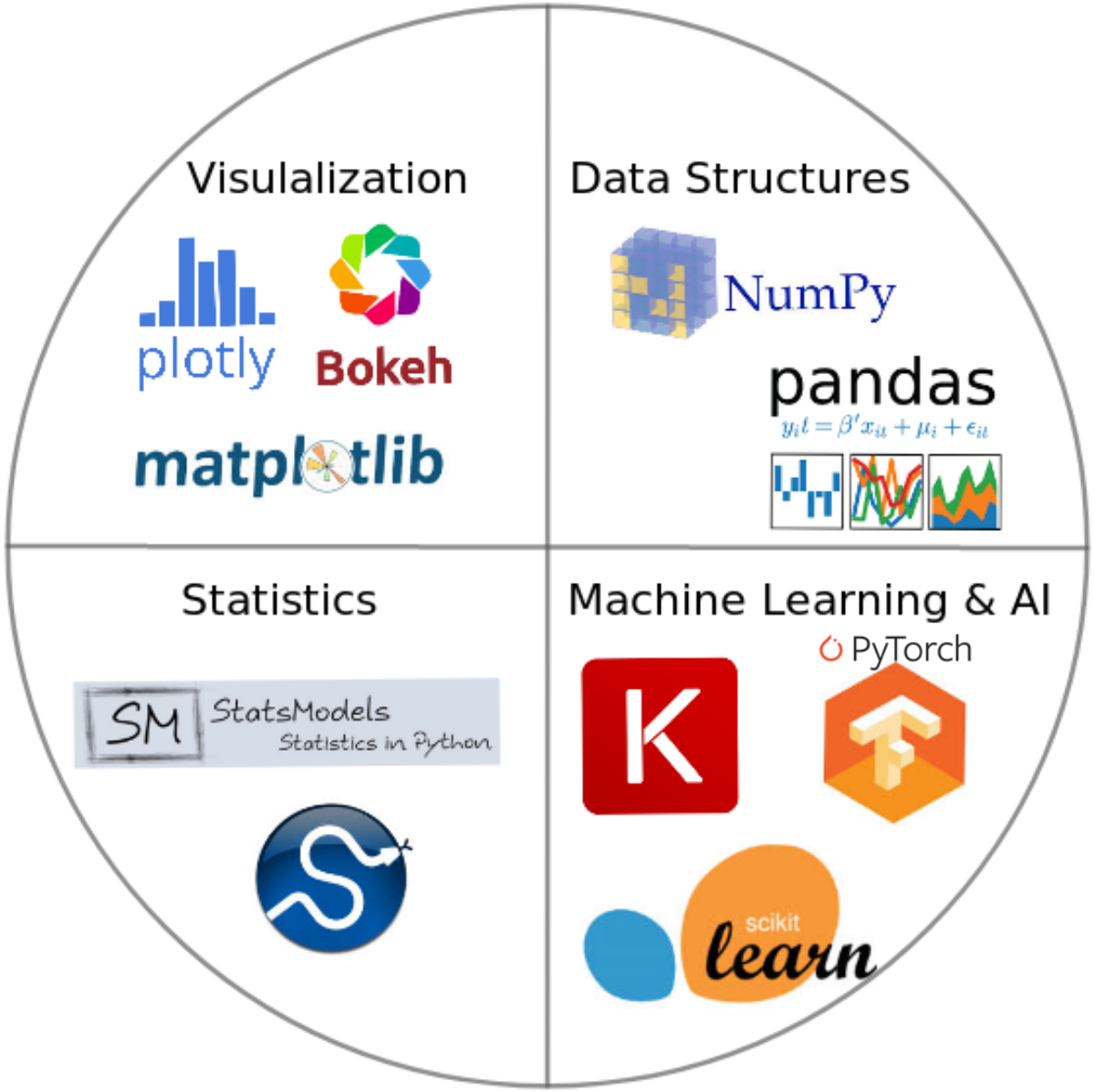
- Python, https://www.python.org/
- GRI (Global Report Initiative): https://www.globalreporting.org/
- CDP (Carbon Disclosure Project): https://www.cdp.net/
- SASB (Sustainability Accounting Standards Board): https://sasb.org/
- ISSB (International Sustainability Standards Board): https://www.ifrs.org/groups/international-sustainability-standards-board/
- TCFD (Task Force on Climate-related Financial Disclosures): https://www.fsb-tcfd.org/

Python Ecosystem for Data Science



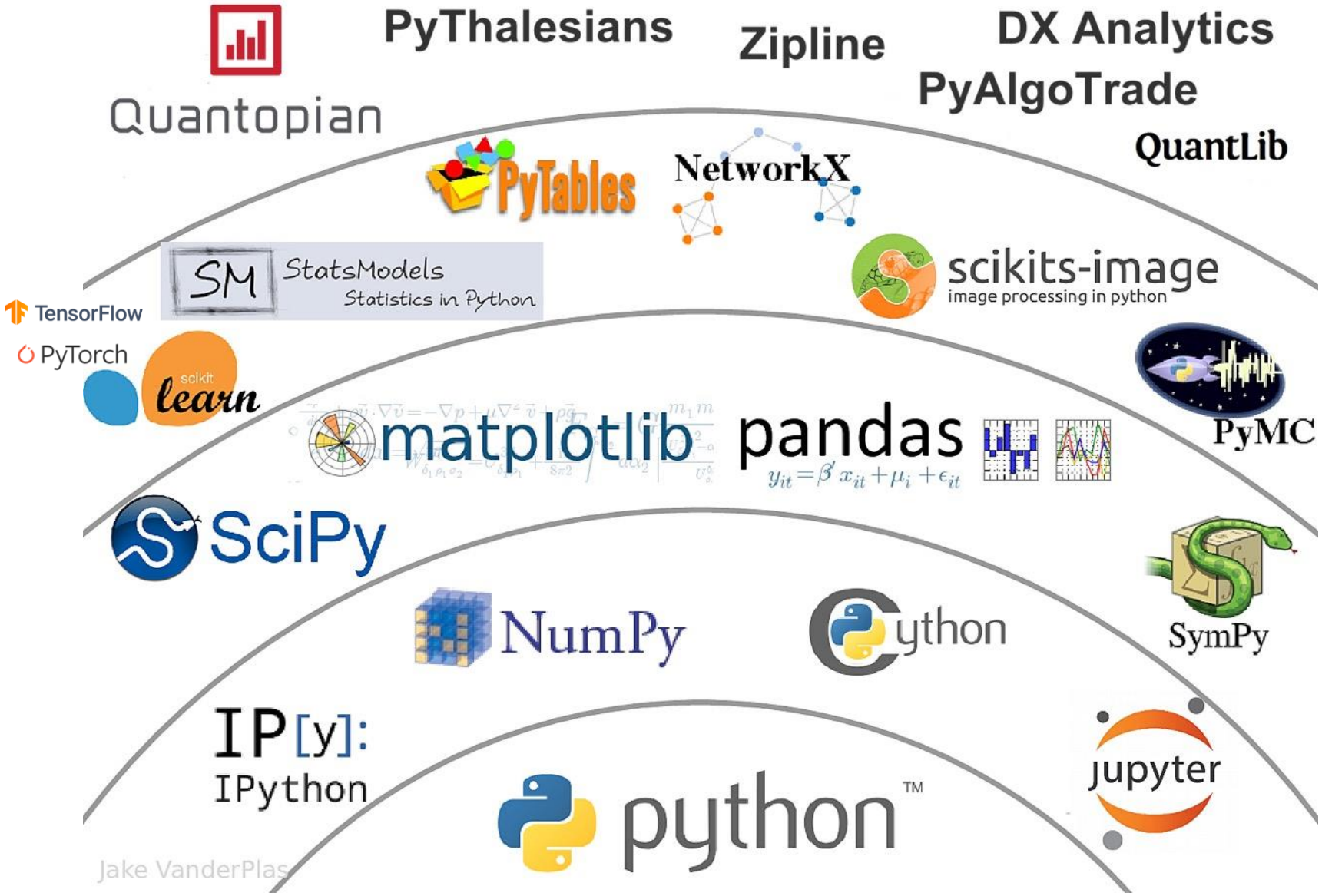
Source: https://medium.com/pyfinance/why-python-is-best-choice-for-financial-data-modeling-in-2019-c0d0d1858c45

Python Ecosystem for Data Science



Source:https://duchesnay.github.io/pystatsml/introduction/python_ecosystem.html

The Quant Finance PyData Stack

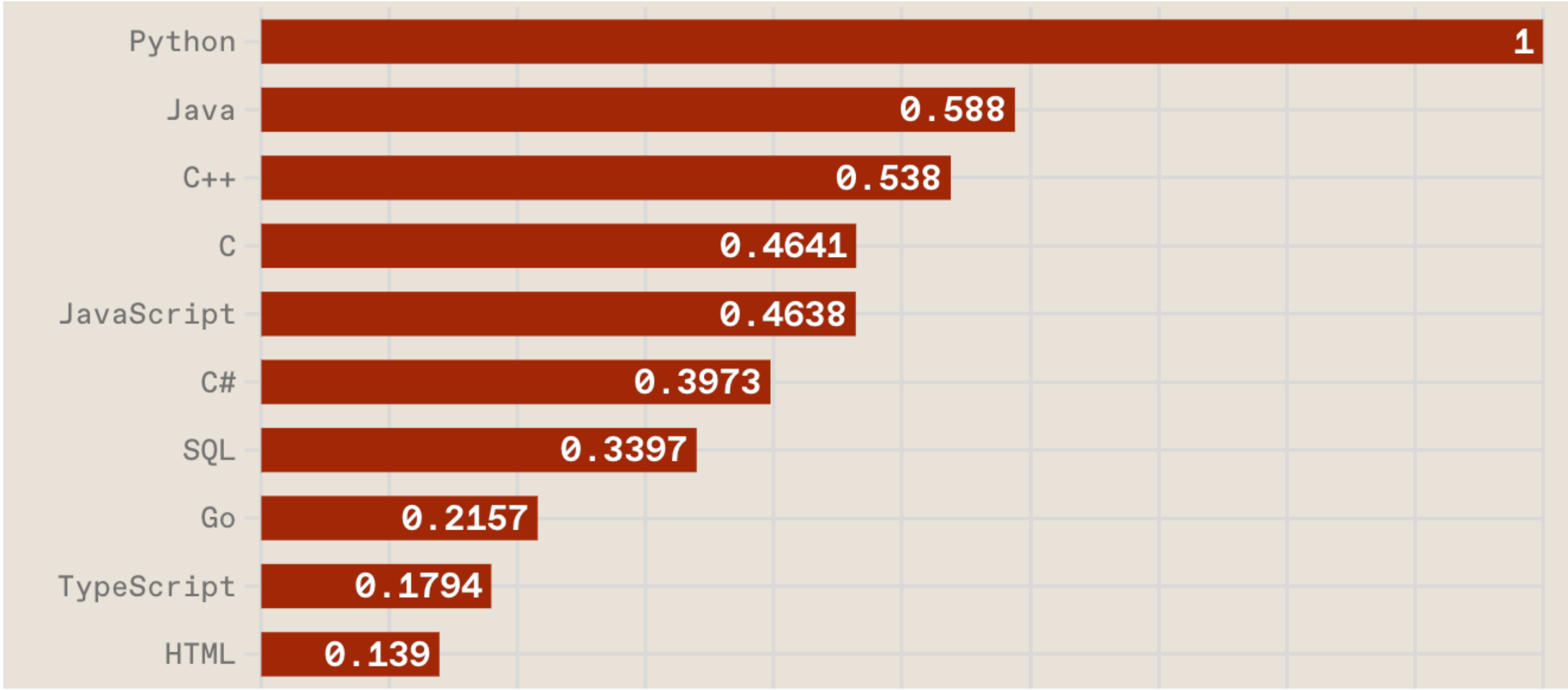


Source: http://nbviewer.jupyter.org/format/slides/github/quantopian/pyfolio/blob/master/pyfolio/examples/overview_slides.ipynb#/5

Python

Programming

Top Programming Languages



https://spectrum.ieee.org/the-top-programming-languages-2023

python™

Python is an interpreted, object-oriented, high-level programming language with dynamic semantics.

Source: https://www.python.org/doc/essays/blurb/

Numpy

NumPy

Base

N-dimensional array

package

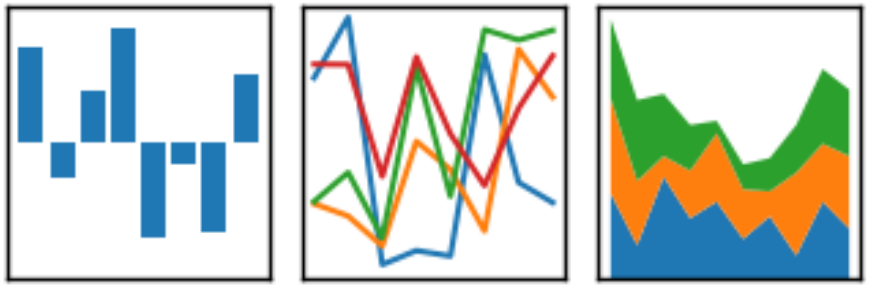
Python matplotlib

Source: https://matplotlib.org/

Python Pandas

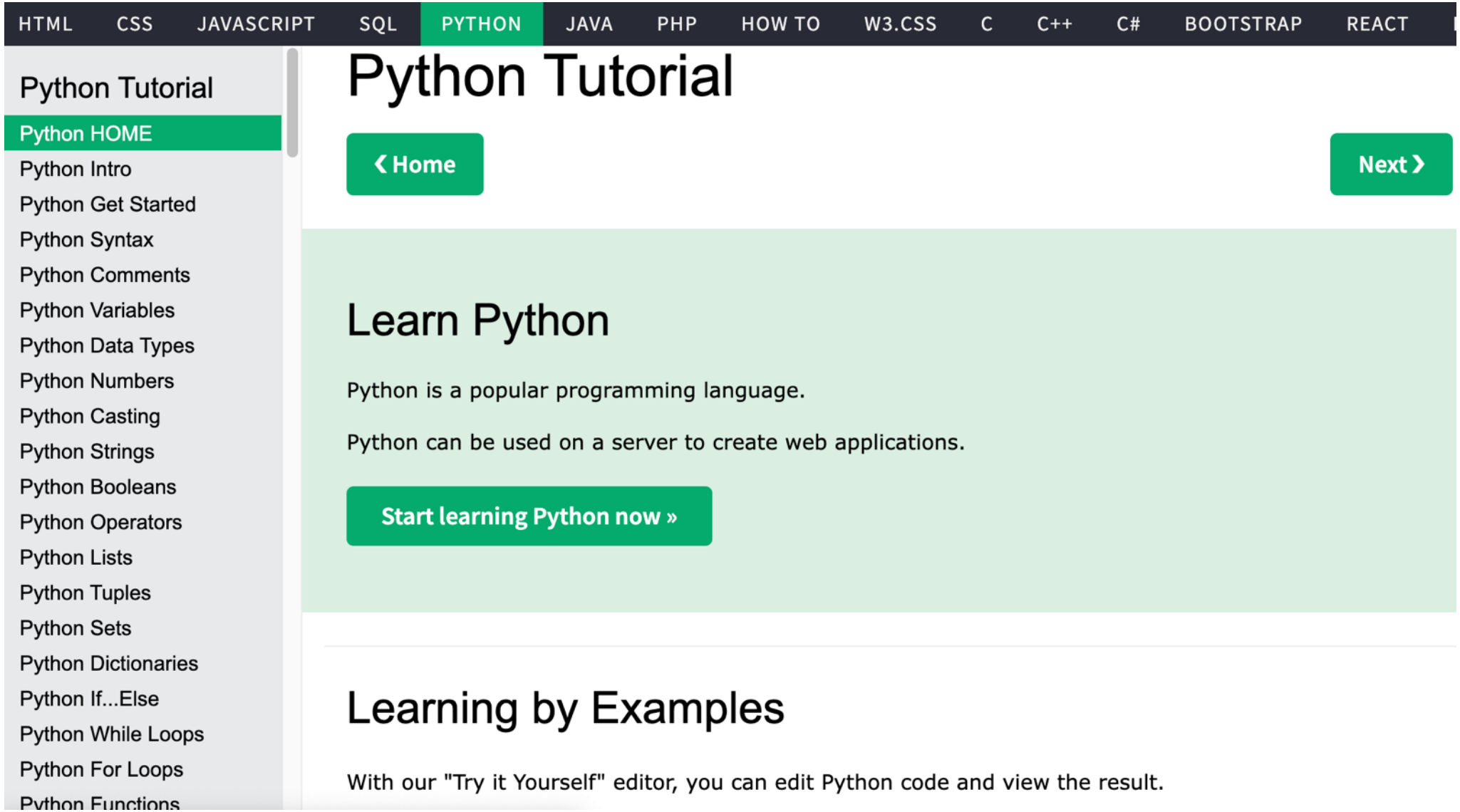
pandas

$$y_{it} = \beta' x_{it} + \mu_i + \epsilon_{it}$$



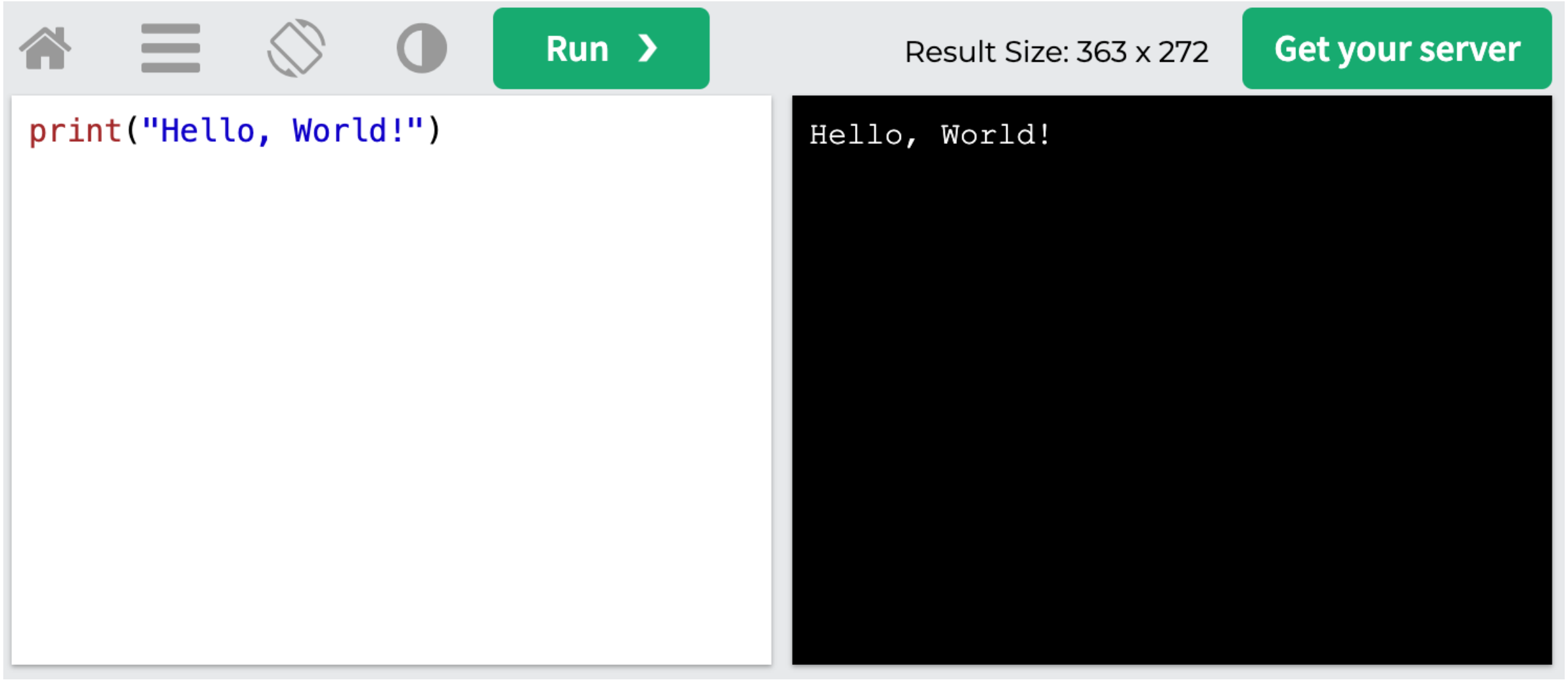
http://pandas.pydata.org/

W3Schools Python



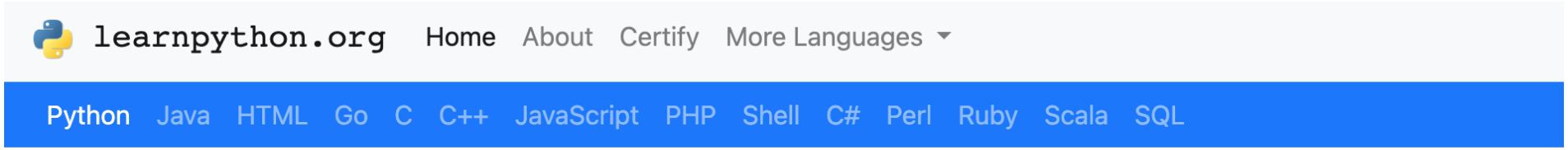
https://www.w3schools.com/python/

W3Schools Python: Try Python



https://www.w3schools.com/python/trypython.asp?filename=demo_default

LearnPython.org



Get started learning Python with DataCamp's free Intro to Python tutorial. Learn Data Science by completing interactive coding challenges and watching videos by expert instructors. Start Now!

Ready to take the test? Head onto LearnX and get your Python Certification!

This site is generously supported by DataCamp. DataCamp offers online interactive Python Tutorials for Data Science. Join **11 millions** other learners and get started learning Python for data science today!

Good news! You can save 25% off your Datacamp annual subscription with the code LEARNPYTHON23ALE25 - Click here to redeem your discount!

Welcome

Welcome to the LearnPython.org interactive Python tutorial.

Whether you are an experienced programmer or not, this website is intended for everyone who wishes to learn the Python programming language.

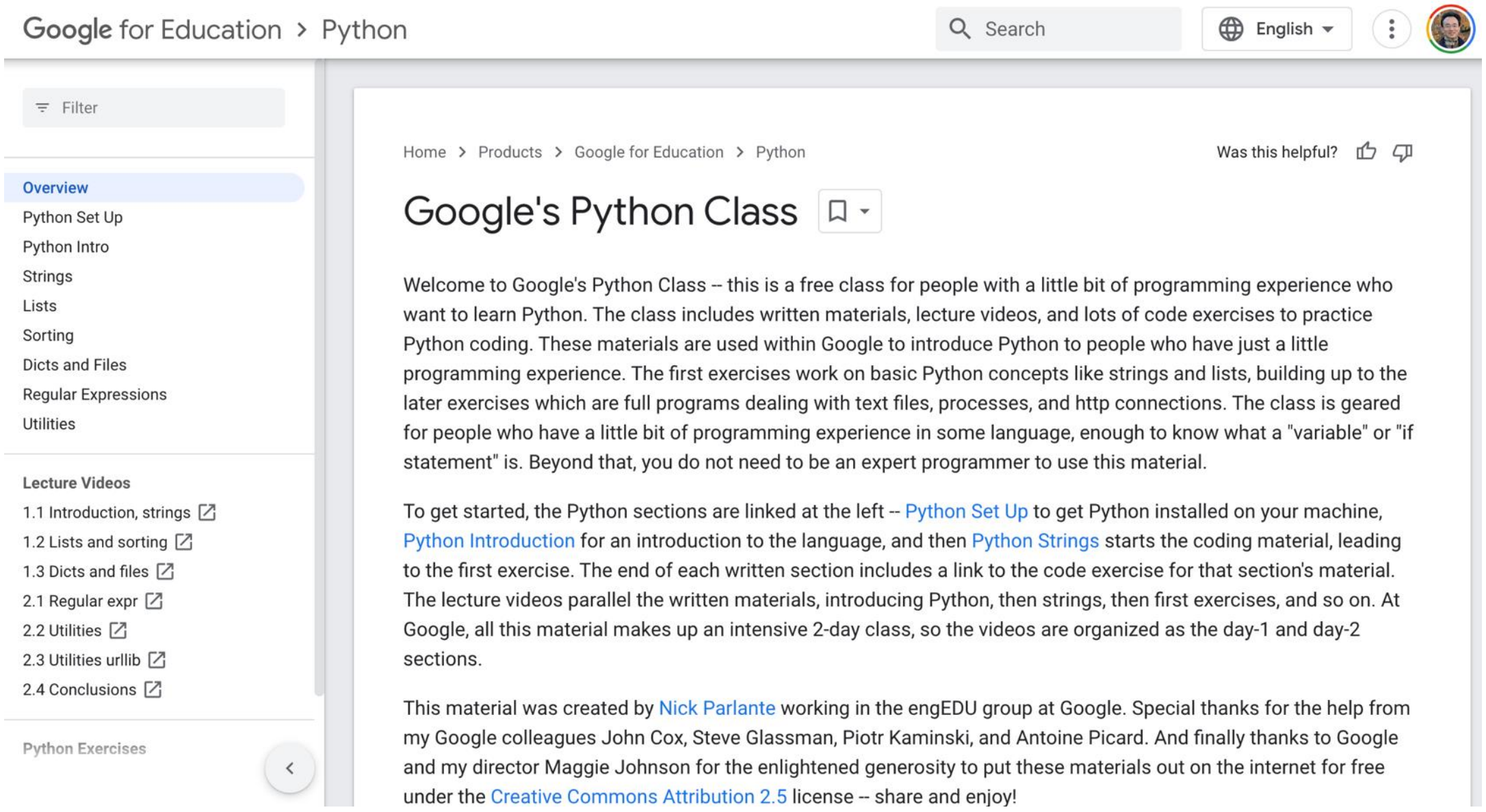
You are welcome to join our group on Facebook for questions, discussions and updates.

After you complete the tutorials, you can get certified at LearnX and add your certification to your LinkedIn profile.

Just click on the chapter you wish to begin from, and follow the instructions. Good luck!

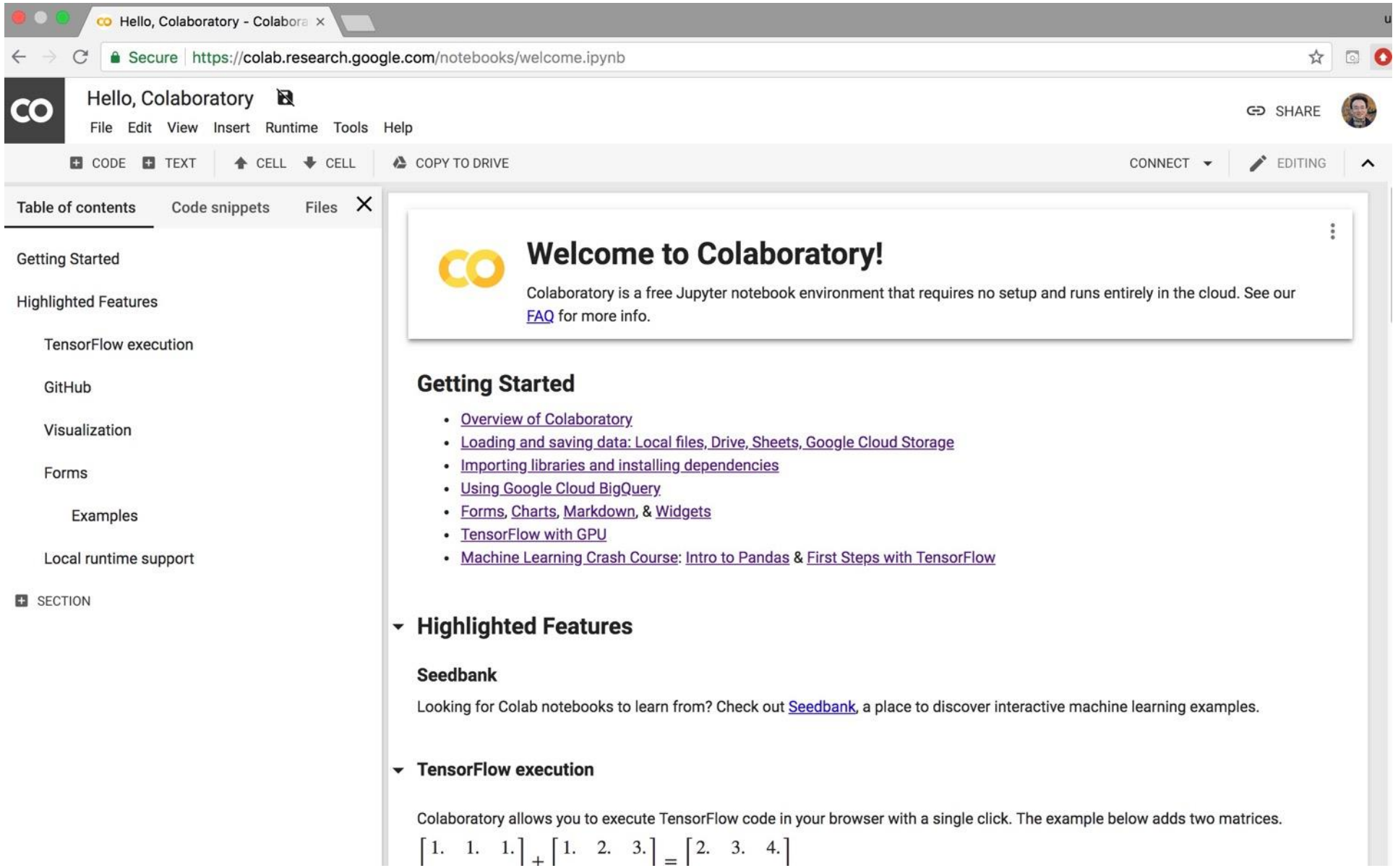
https://www.learnpython.org/

Google's Python Class



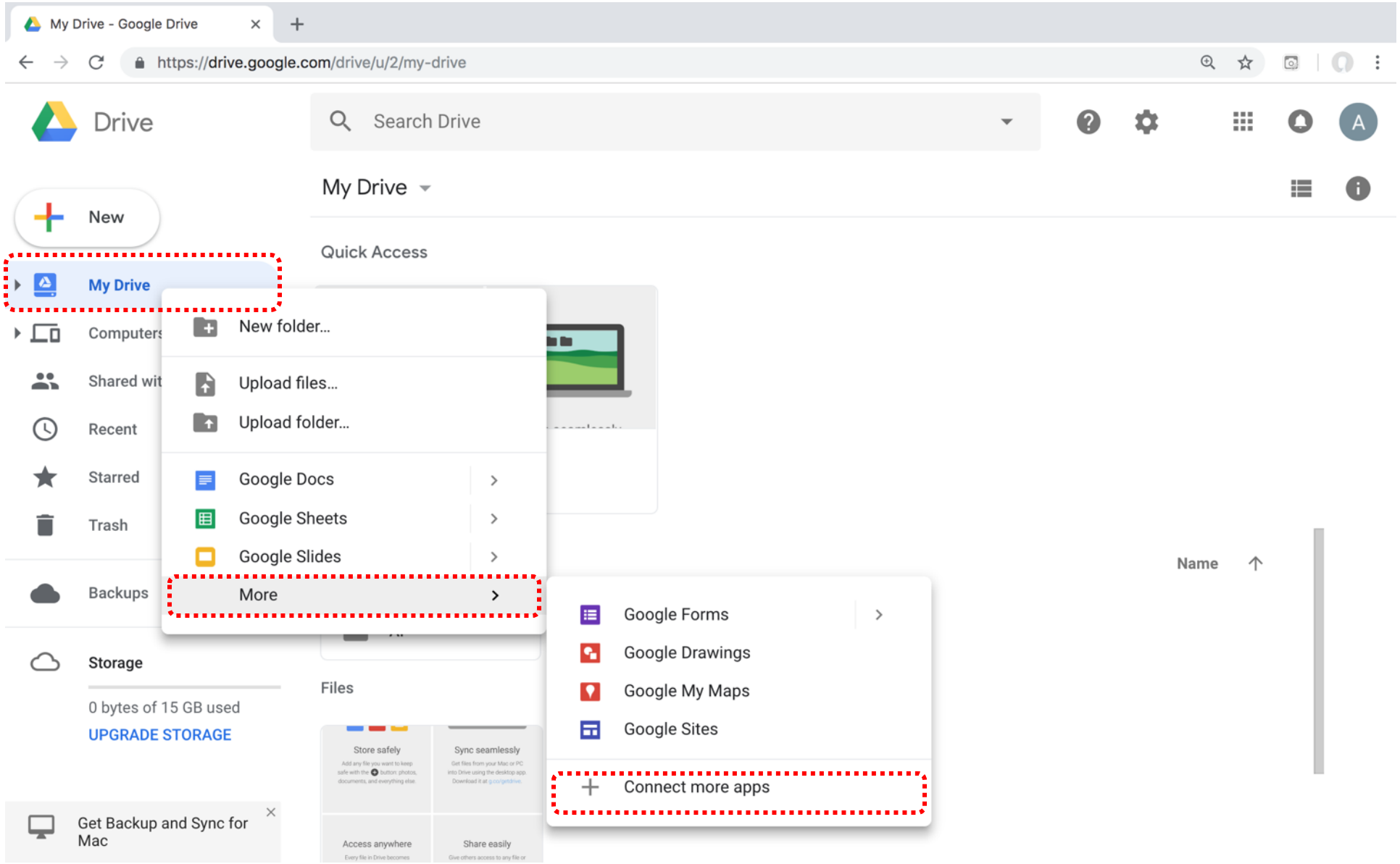
https://developers.google.com/edu/python

Google Colab

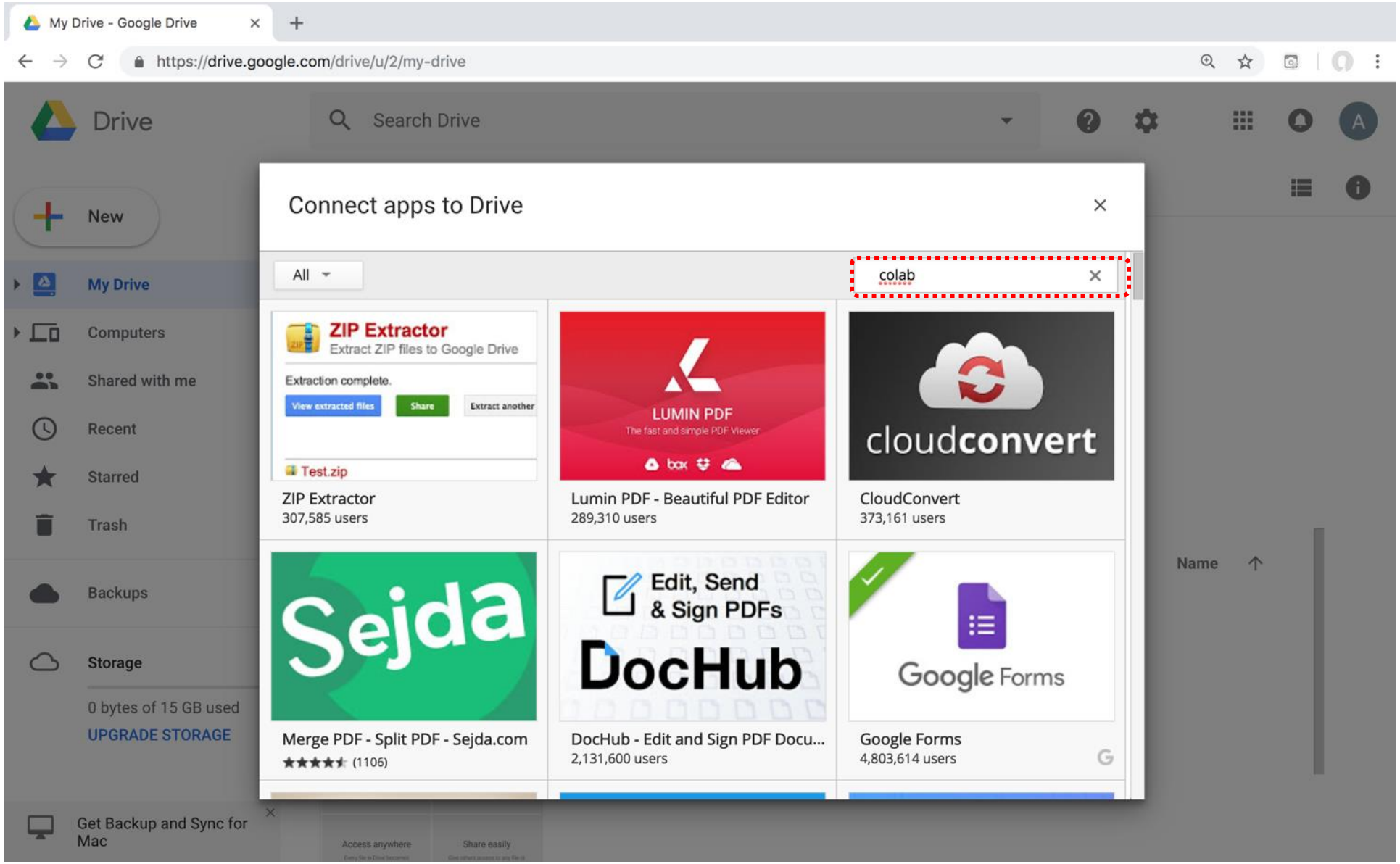


https://colab.research.google.com/notebooks/welcome.ipynb

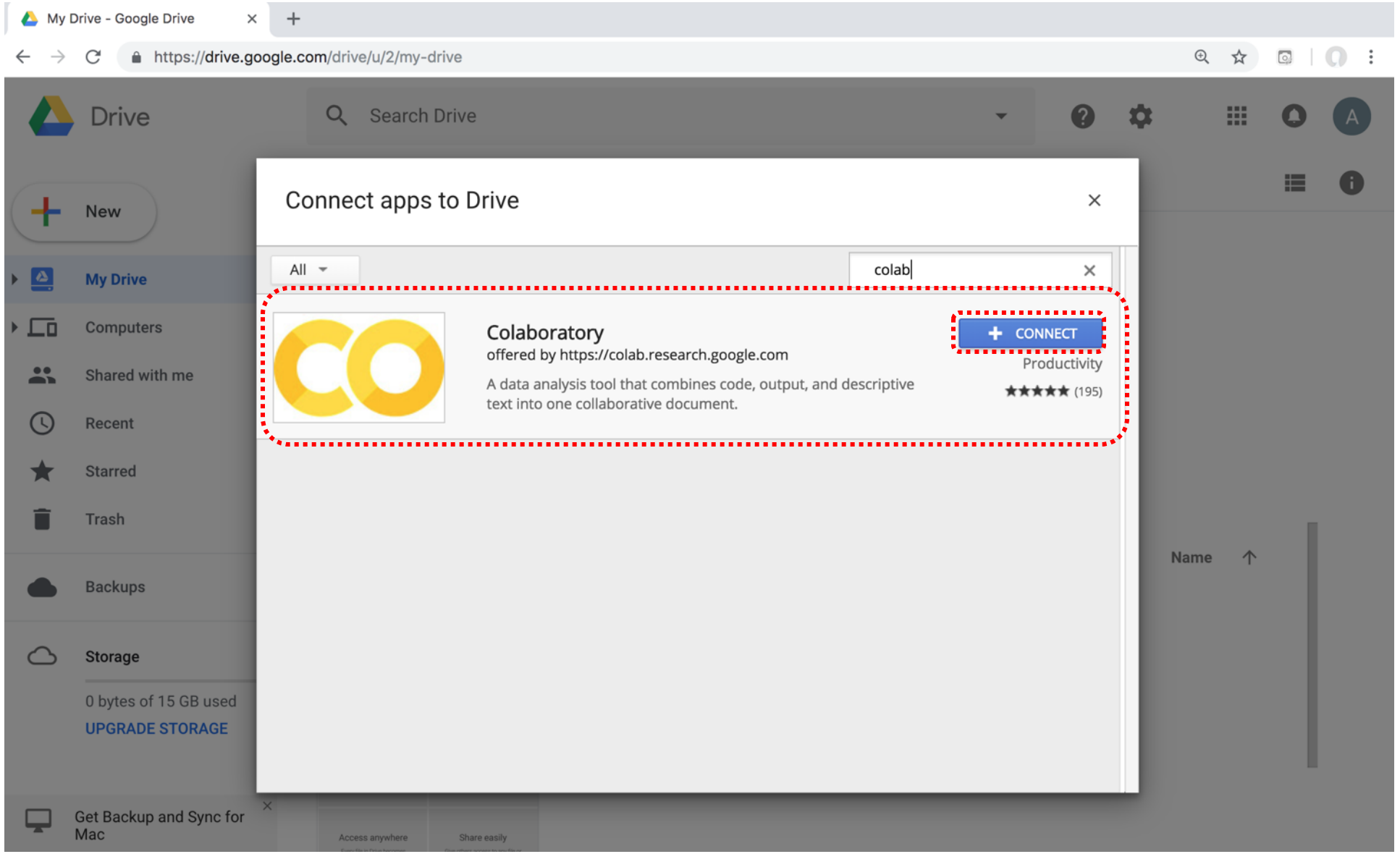
Connect Google Colab in Google Drive



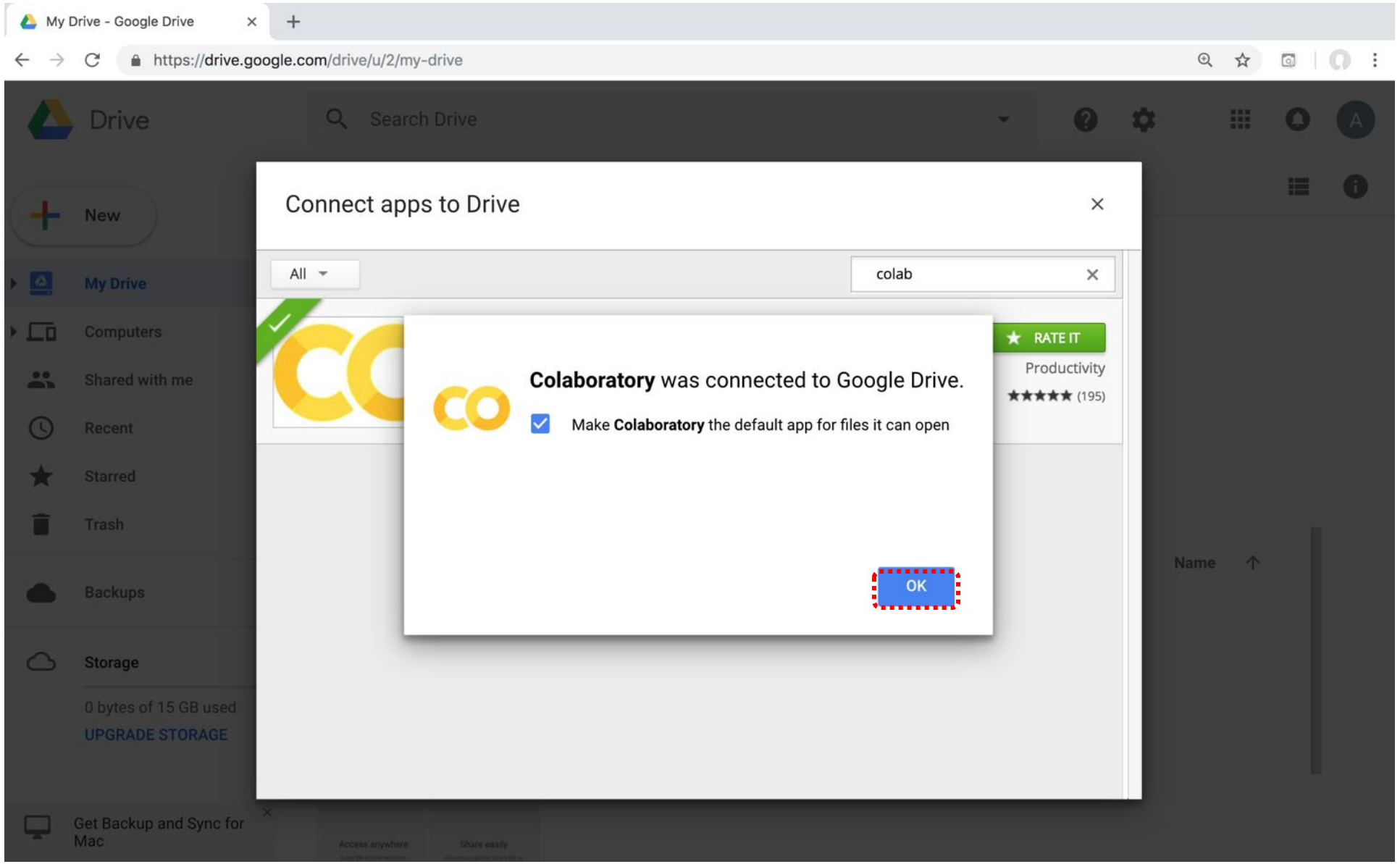
Google Colab



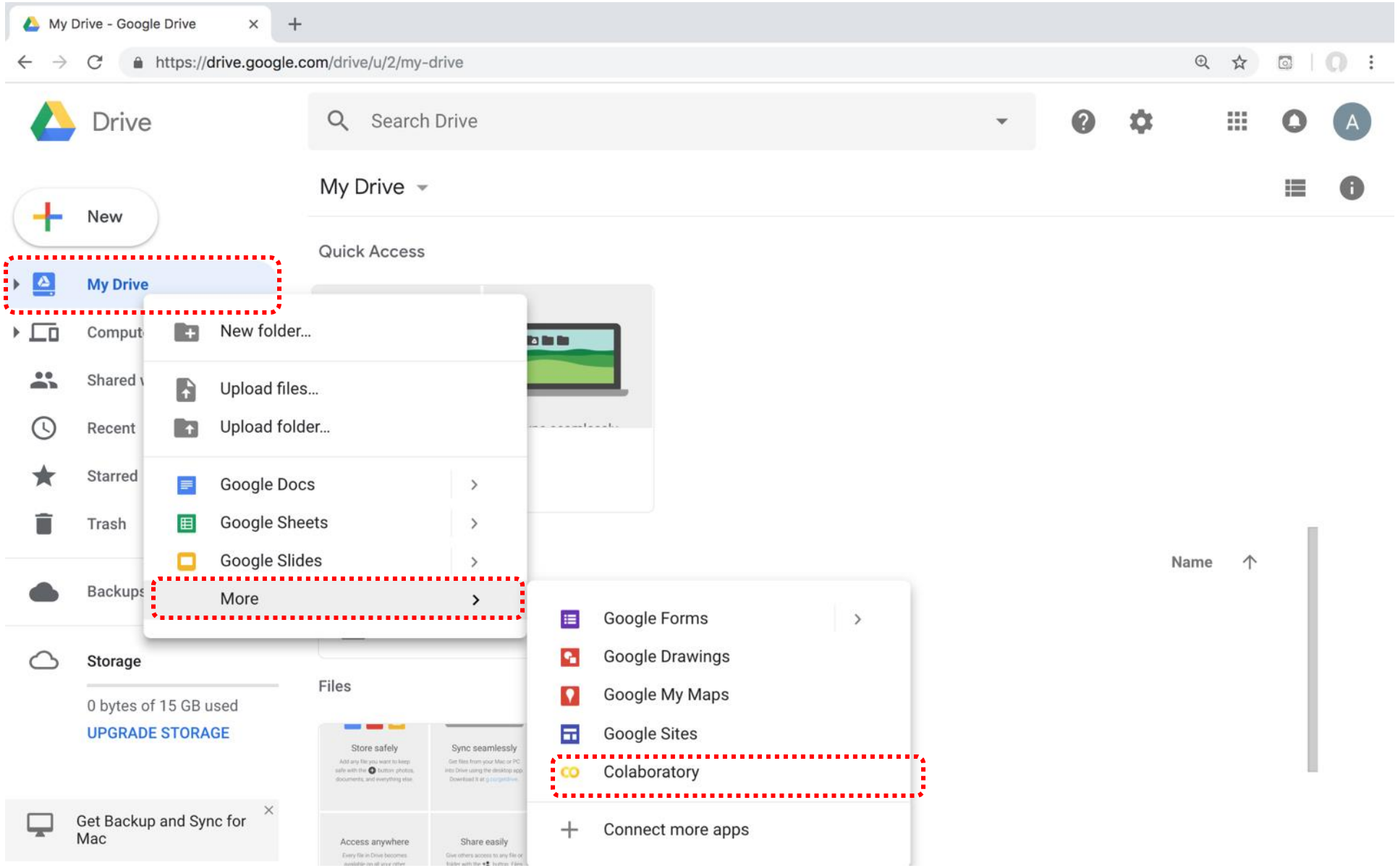
Google Colab



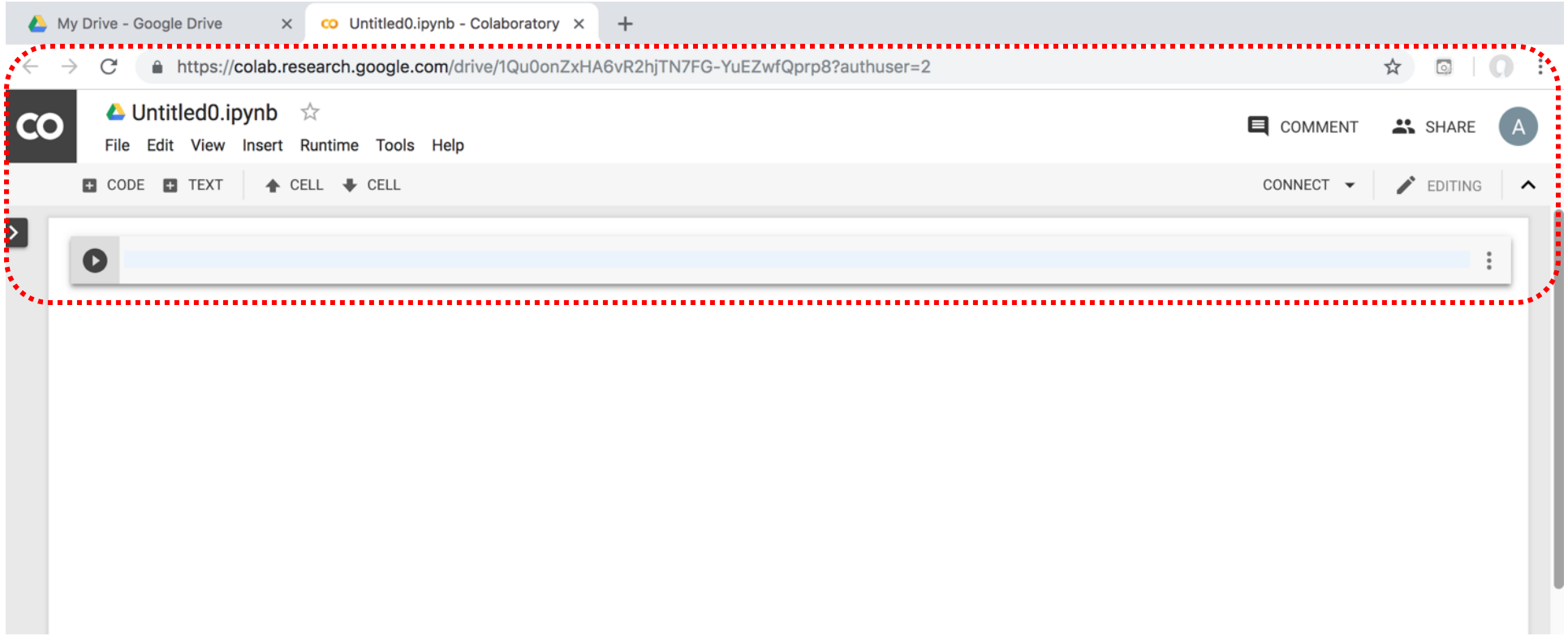
Connect Colaboratory to Google Drive



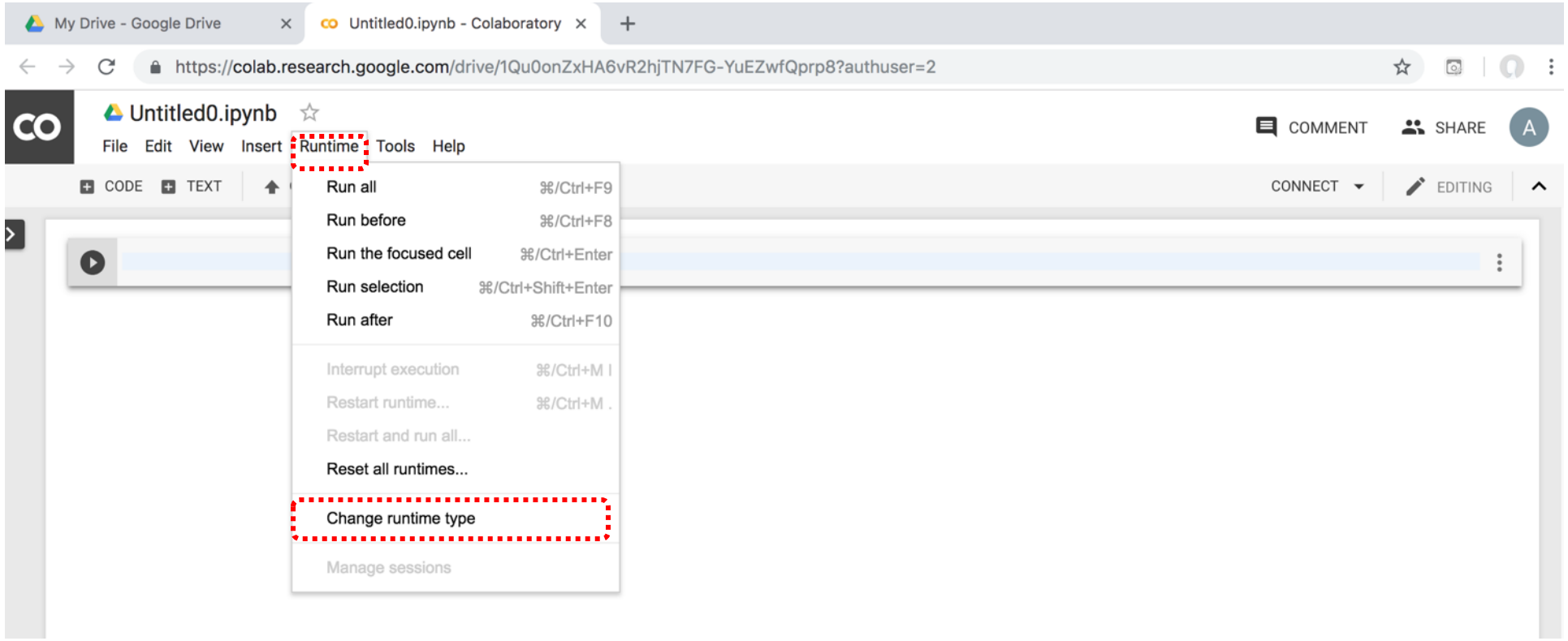
Google Colab



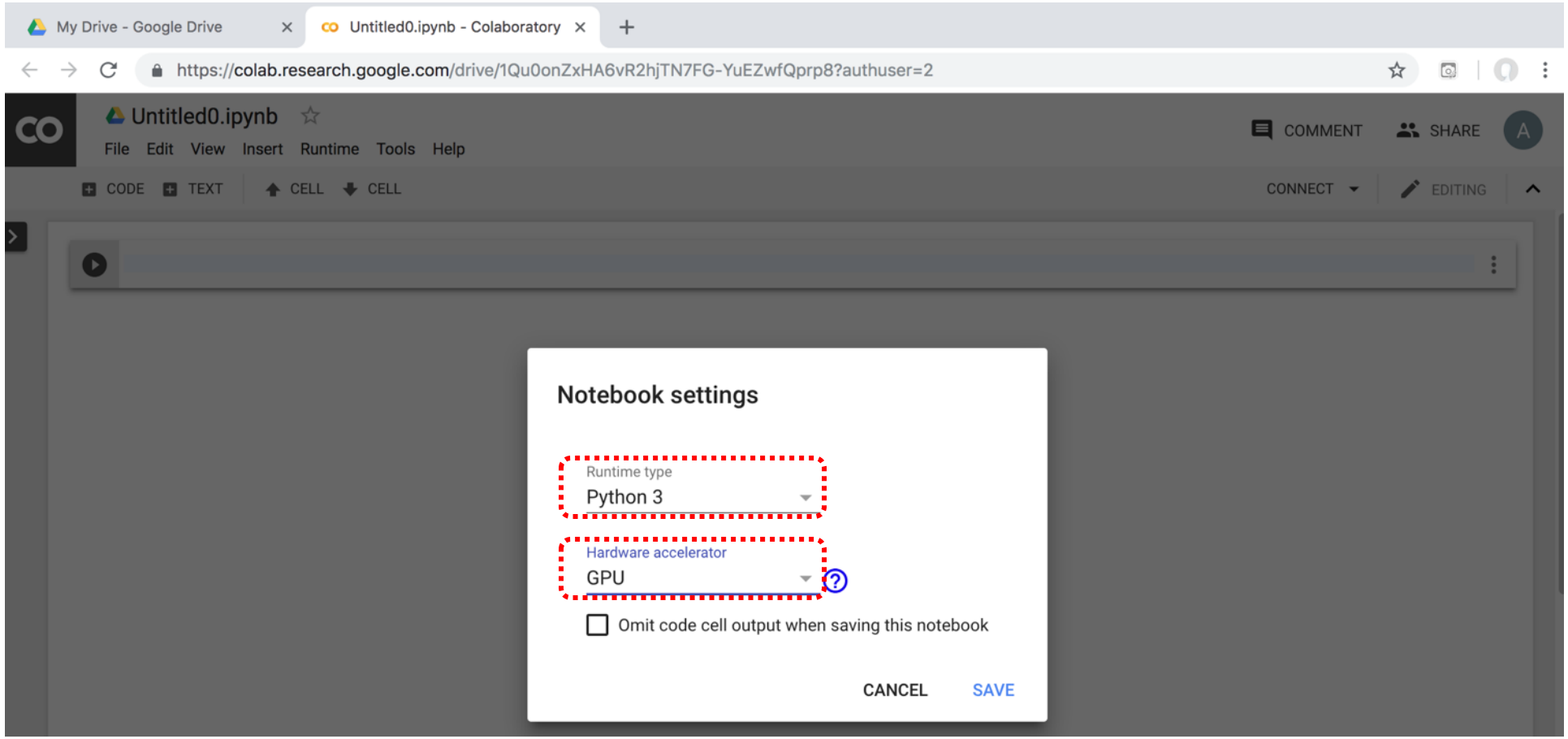
Google Colab



Google Colab



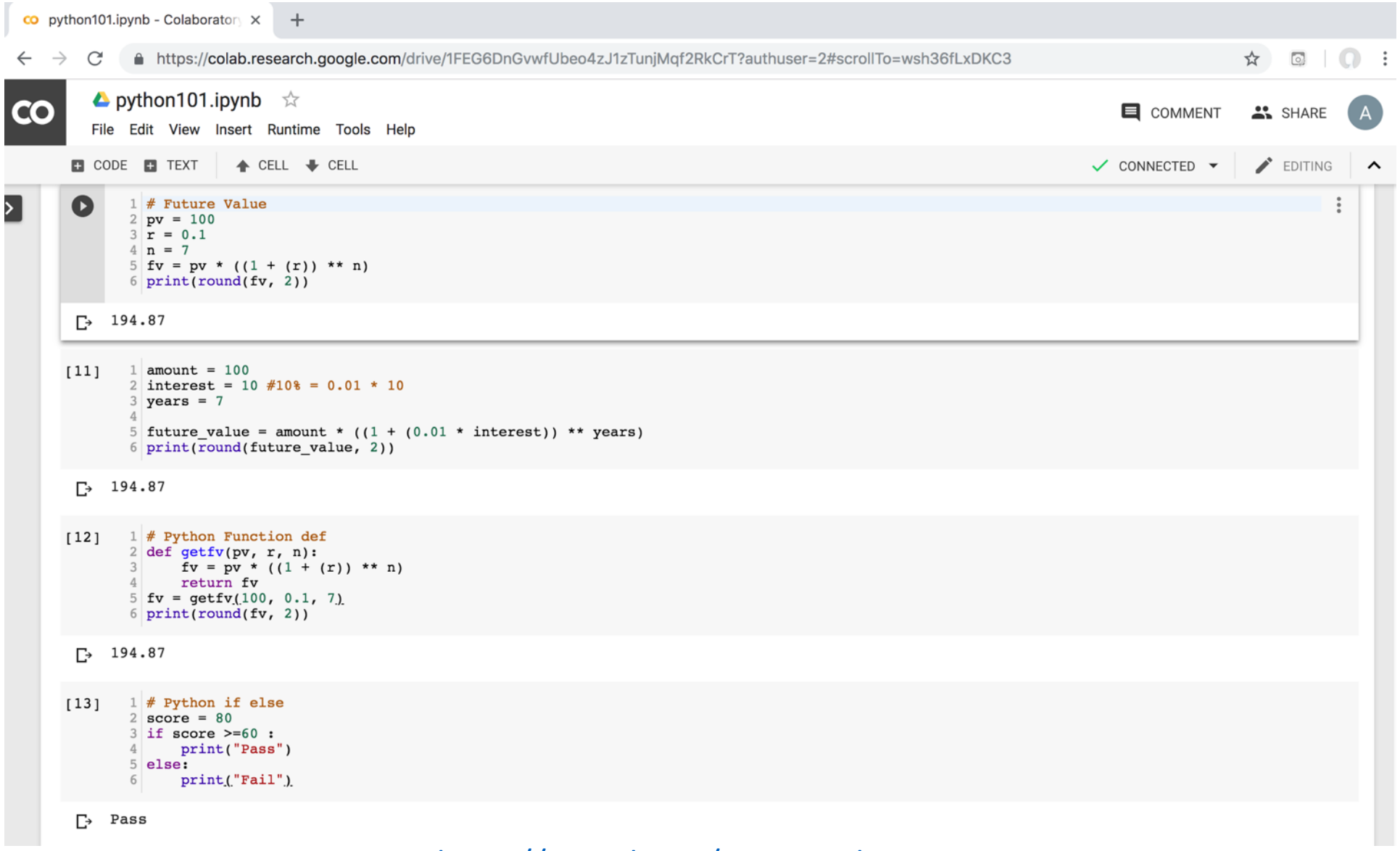
Run Jupyter Notebook
Python3 GPU
Google Colab



Google Colab Python Hello World
print('Hello World')

Python in Google Colab (Python101)

https://colab.research.google.com/drive/1FEG6DnGvwfUbeo4zJ1zTunjMqf2RkCrT

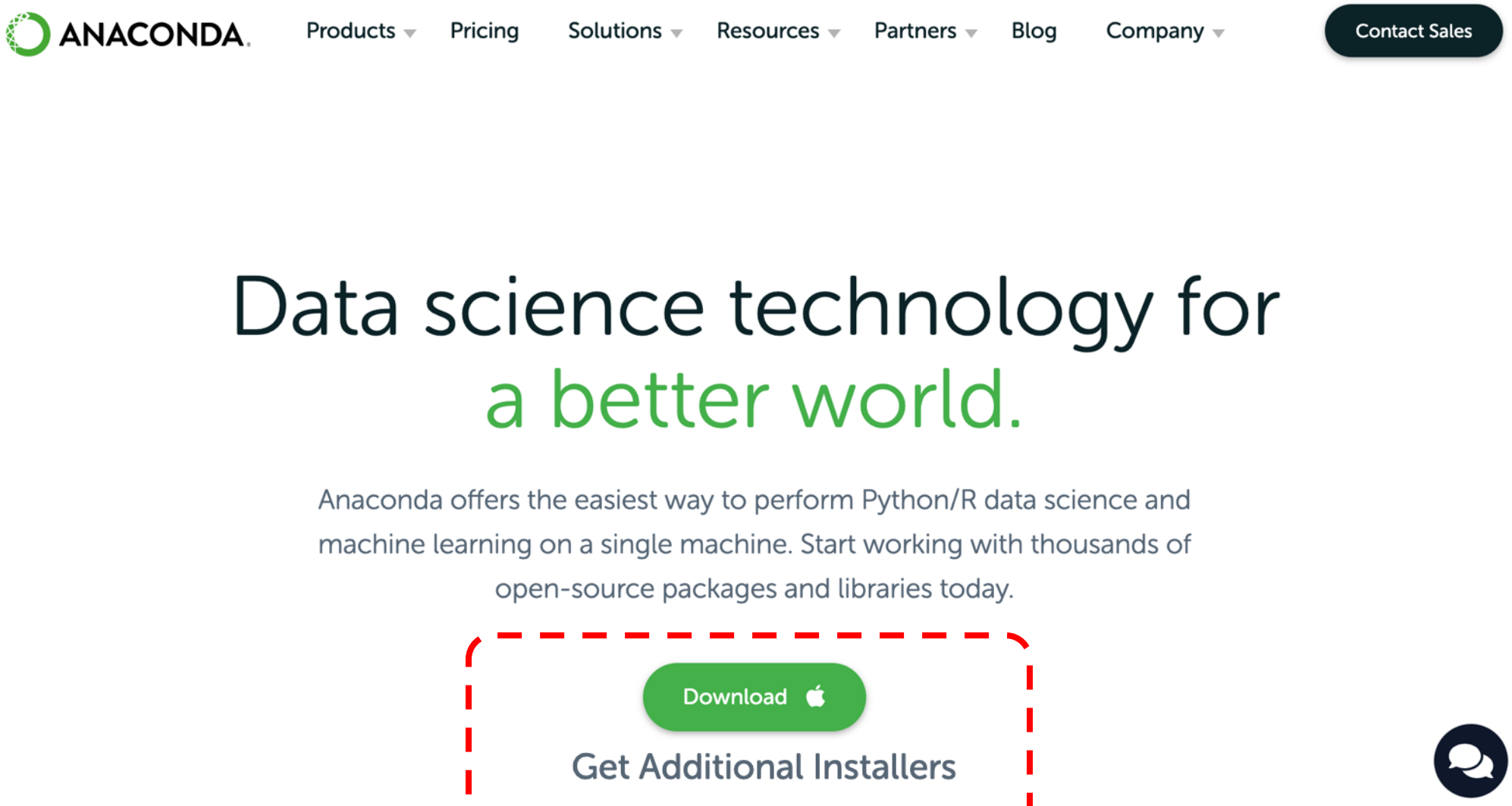


https://tinyurl.com/aintpupython101

Anaconda
The Most Popular
Python
Data Science Platform

Source: https://www.anaconda.com/

Download Anaconda

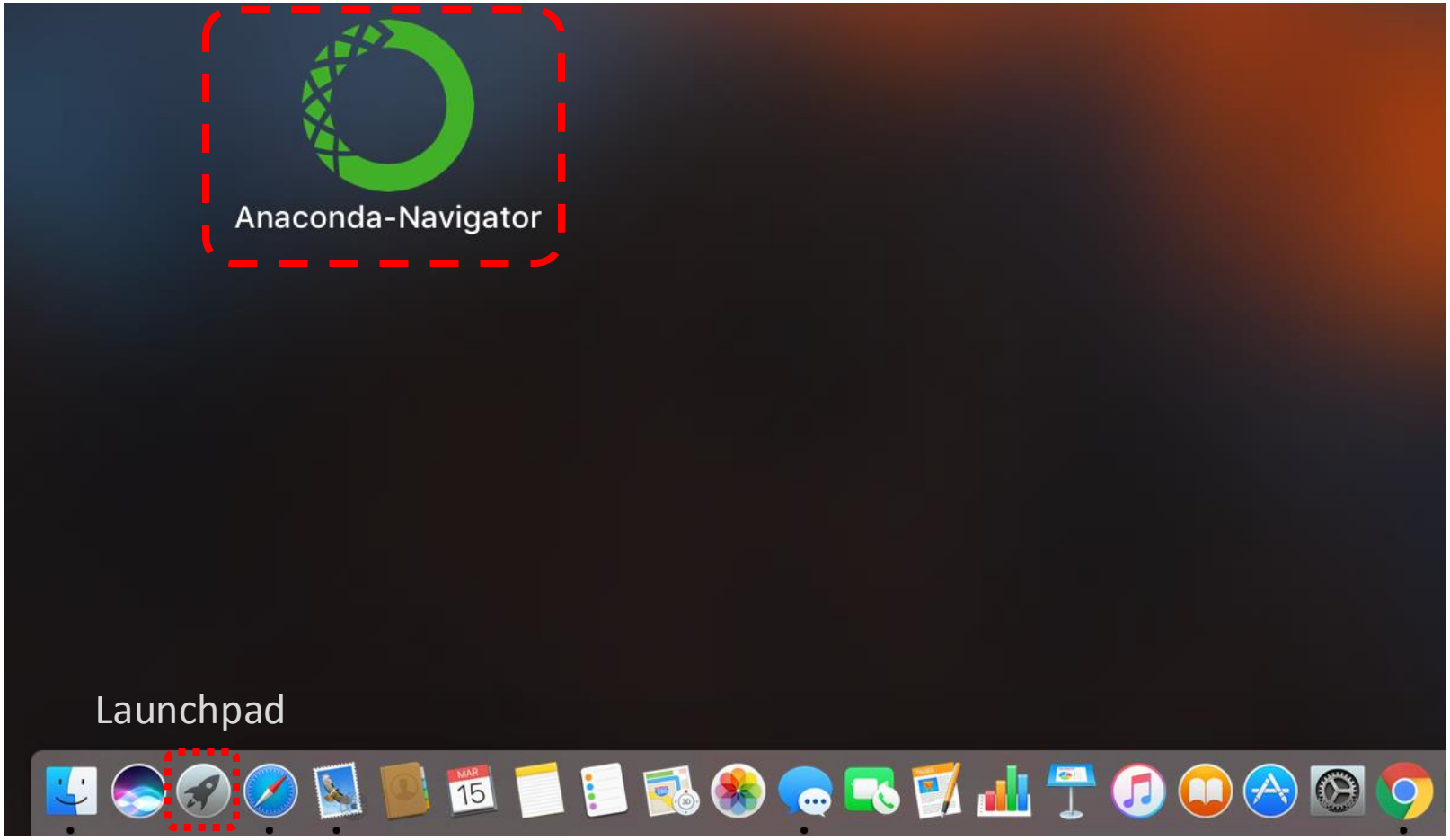


https://www.anaconda.com/download

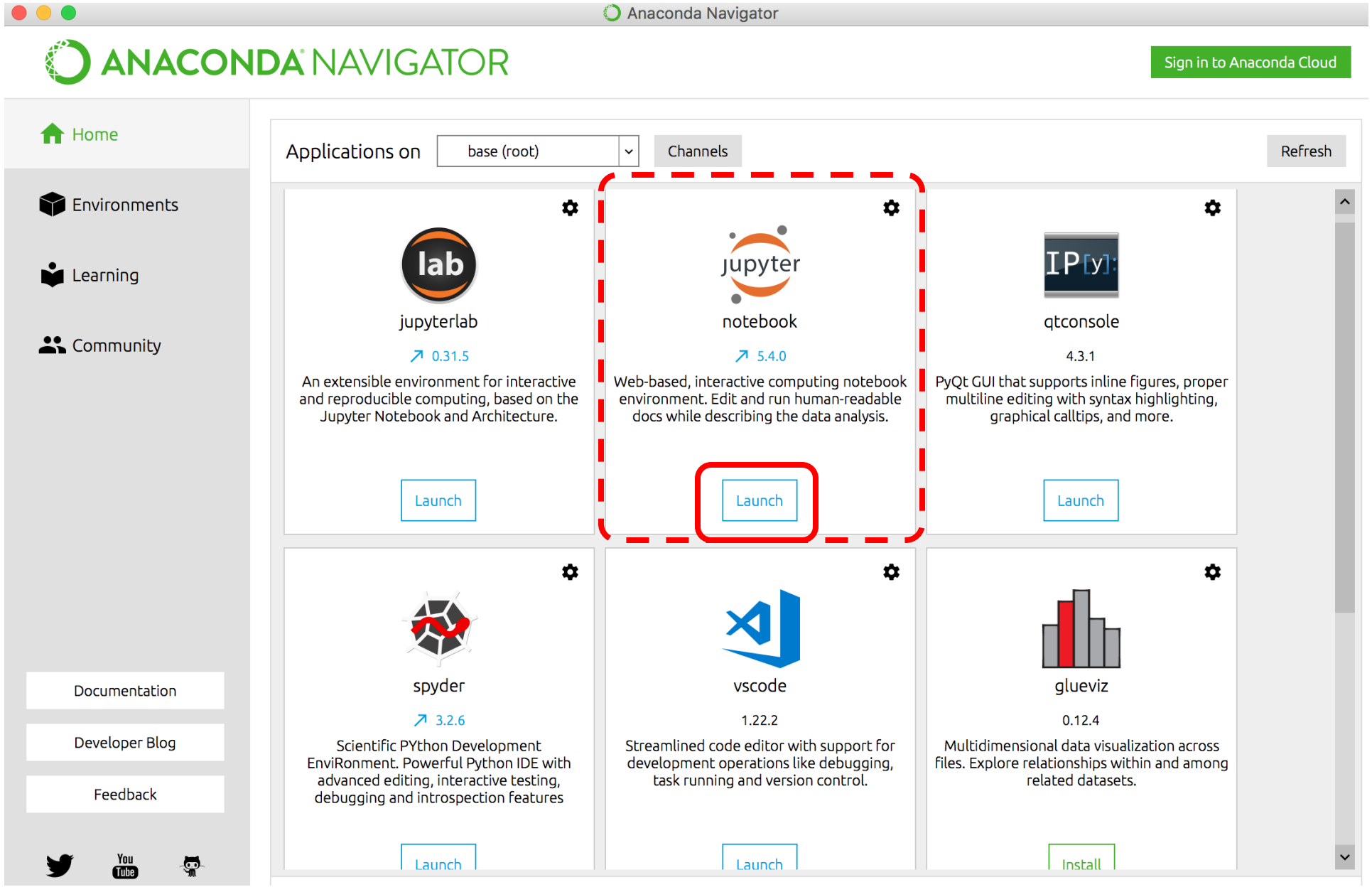
Python

HelloWorld

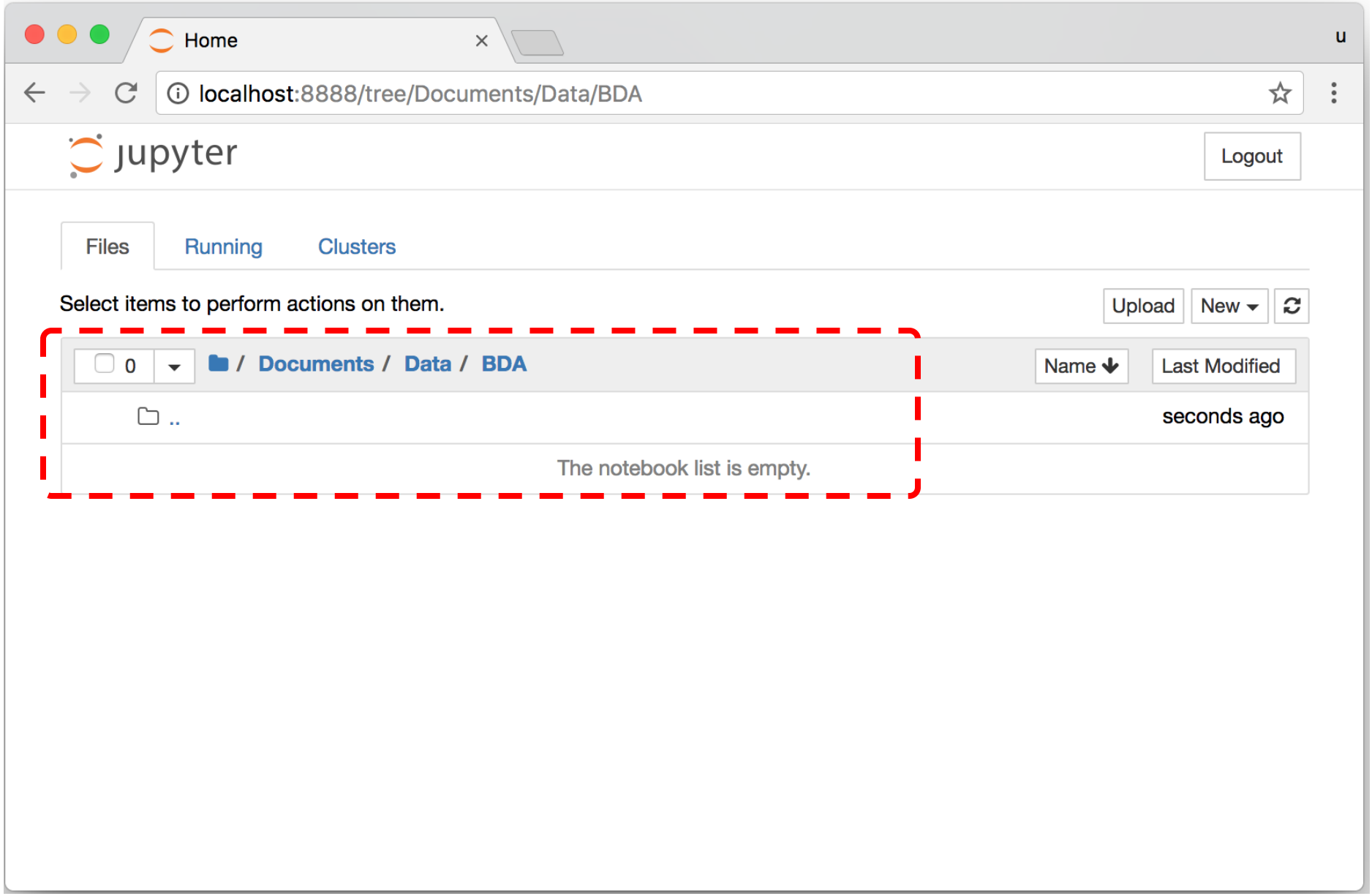
Anaconda-Navigator



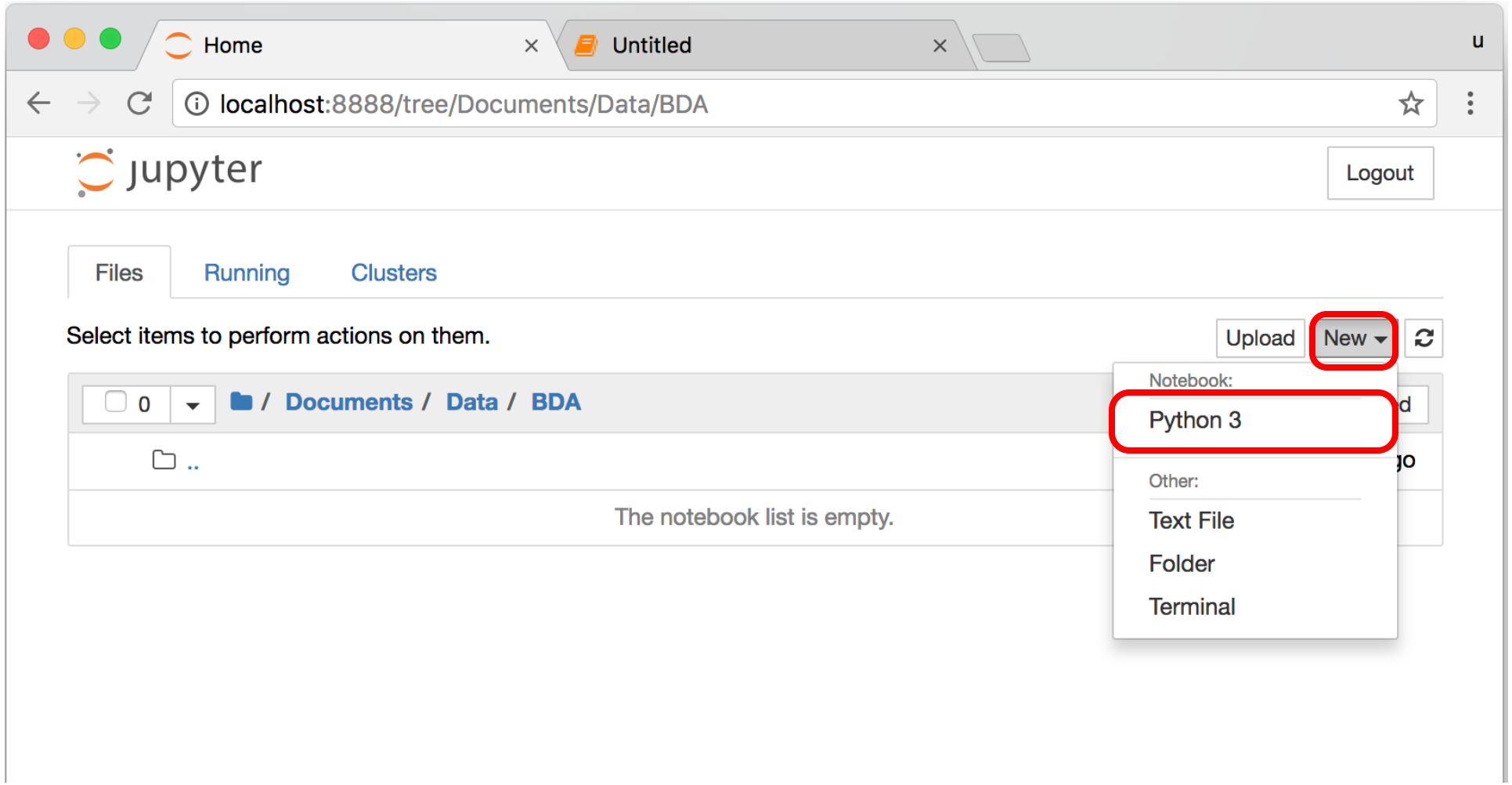
Anaconda Navigator



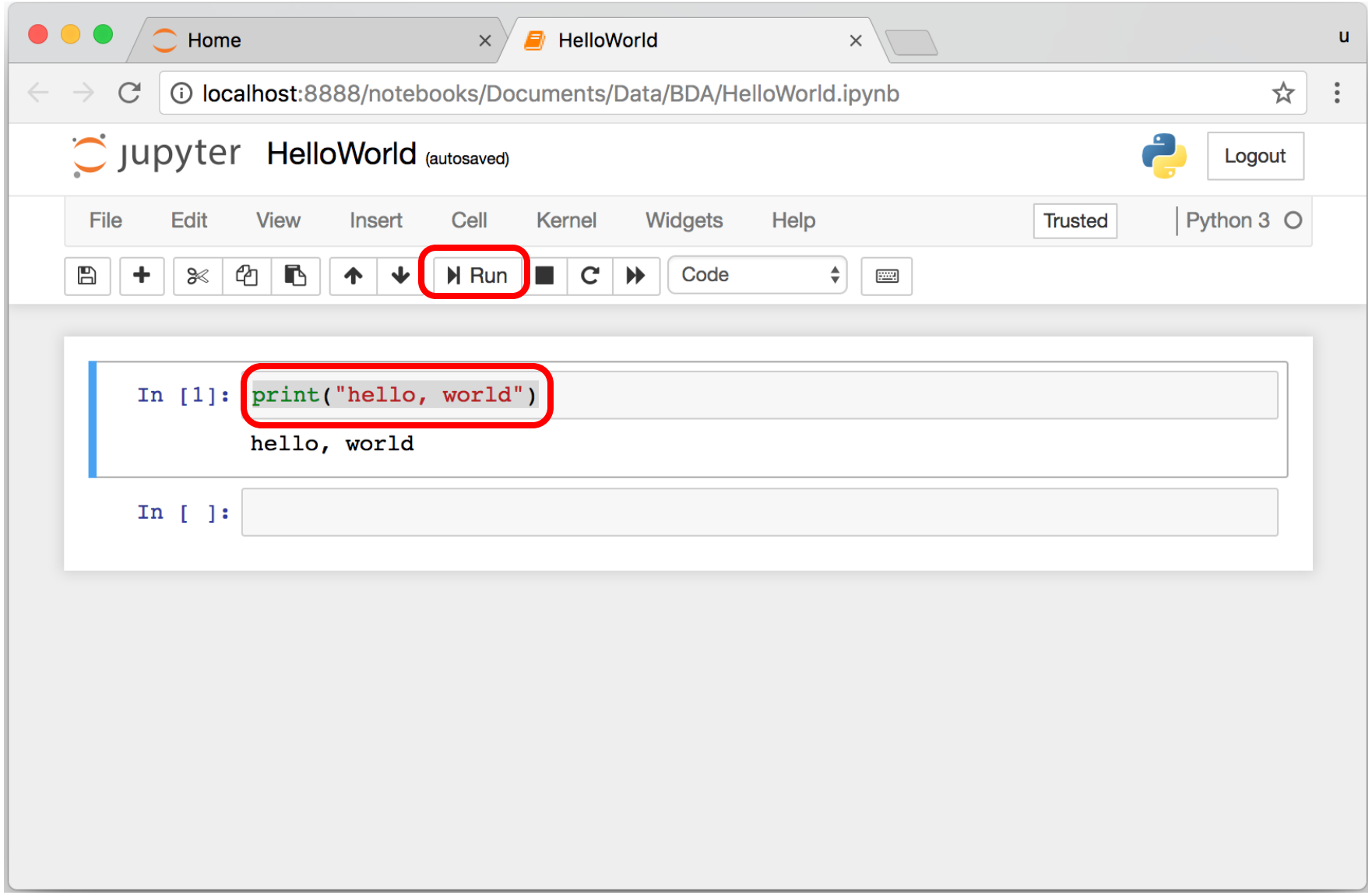
Jupyter Notebook



Jupyter Notebook
New Python 3



print("hello, world")



Python

Programming

Foundations of Python Programming

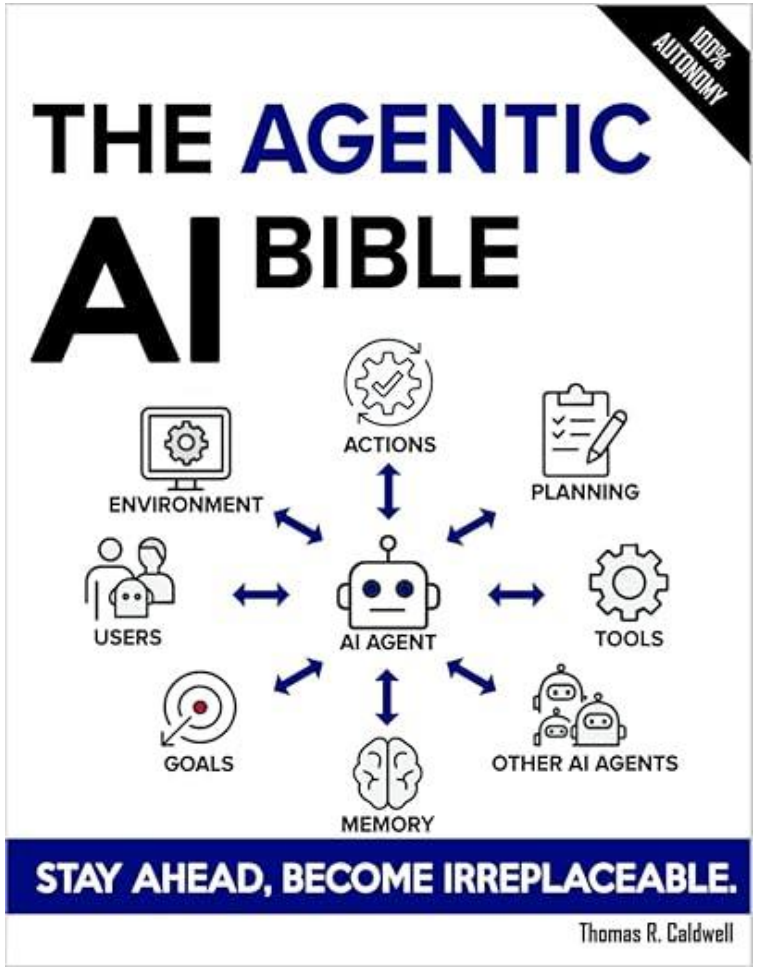
- Python Syntax
  - Python Comments
- Python Variables
- Python Data Types
  - Python Numbers
  - Python Casting
  - Python Strings
- Python Operators
- Python Booleans

Thomas R. Caldwell (2025),

The Agentic AI Bible:

The Complete and Up-to-Date Guide to Design, Build, and Scale Goal-Driven, LLM-Powered Agents that Think, Execute and Evolve,

Independently published

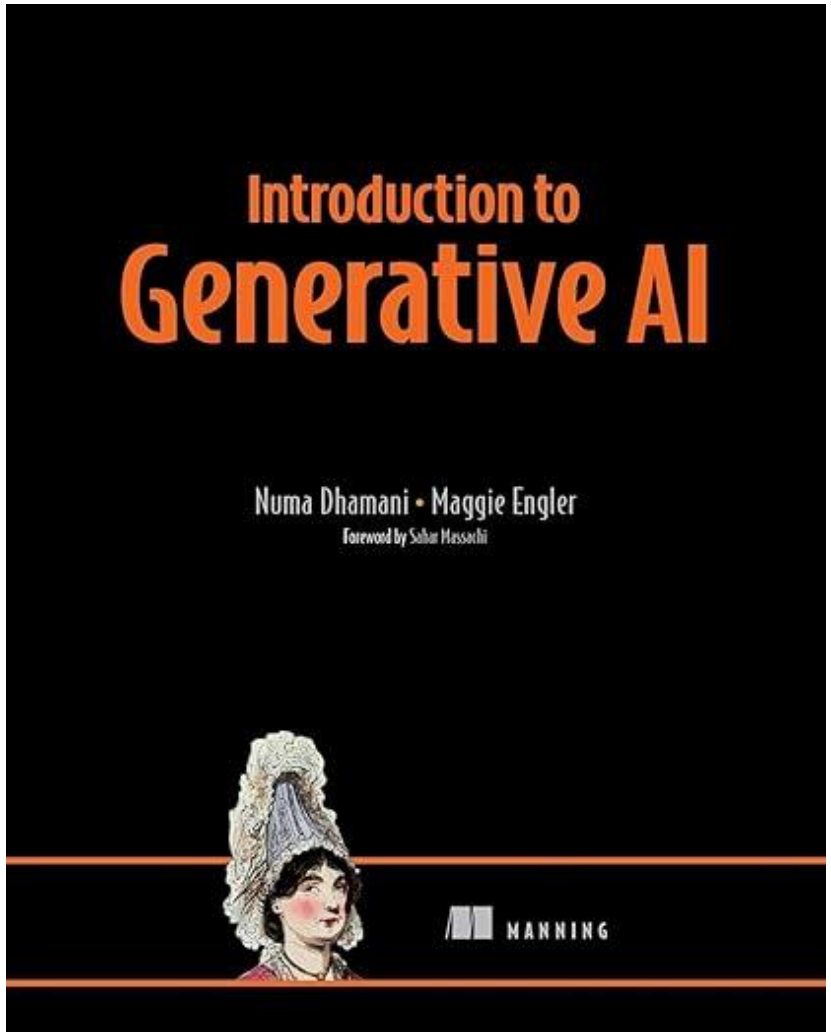


Source: https://www.amazon.com/Agentic-Bible-Up-Date-Goal-Driven/dp/B0FL21R86Q

Numa Dhamani and Maggie Engler (2024),

Introduction to Generative AI,

Manning

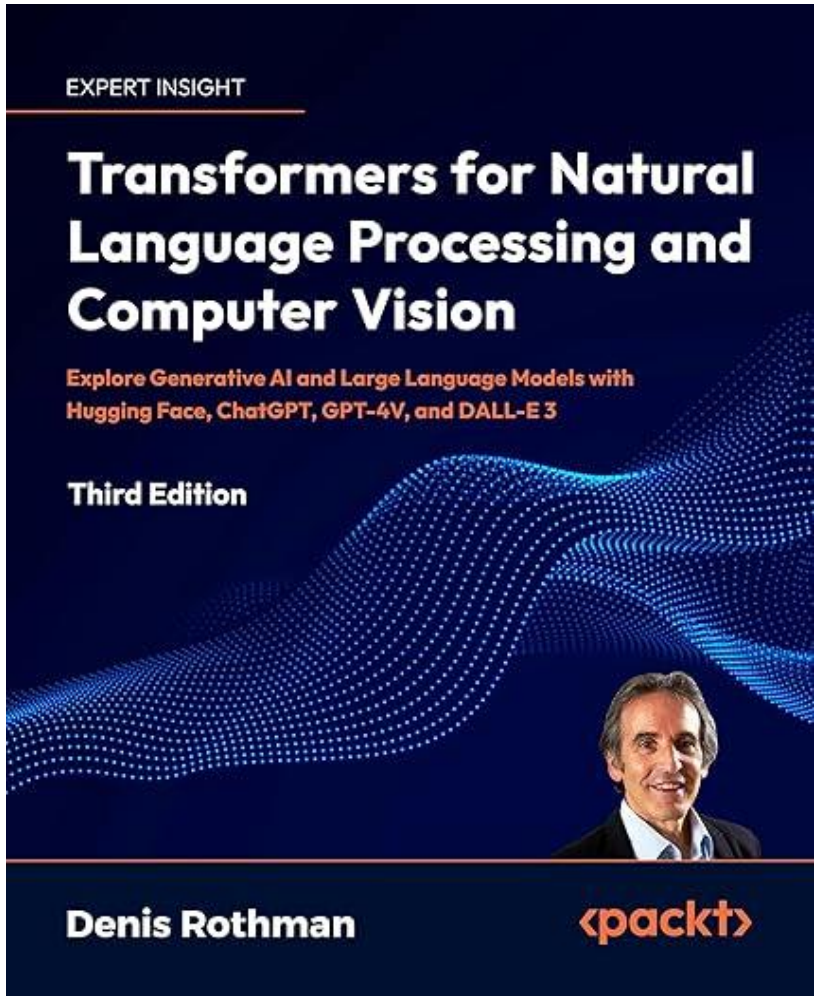


Source: Numa Dhamani and Maggie Engler (2024), Introduction to Generative AI, Manning
https://www.amazon.com/Introduction-Generative-AI-Numa-Dhamani/dp/1633437191/

Denis Rothman (2024),

Transformers for Natural Language Processing and Computer Vision:

Explore Generative AI and Large Language Models with Hugging Face, ChatGPT, GPT-4V, and DALL-E 3, 3rd Edition, Packt Publishing



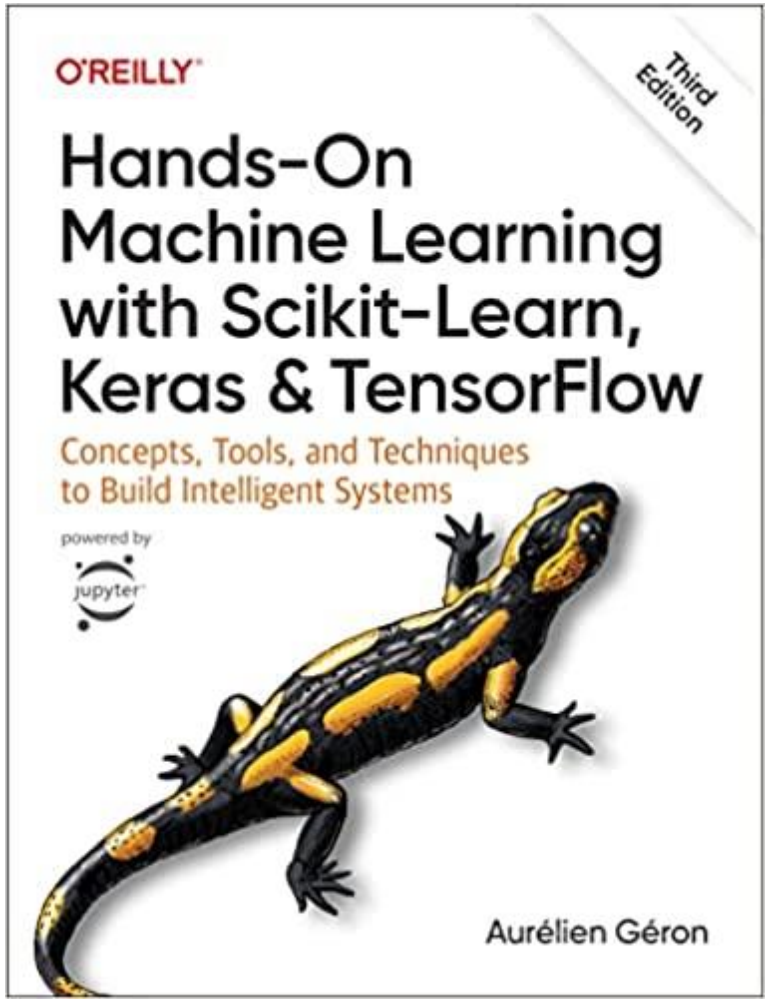
Source: https://www.amazon.com/Transformers-Natural-Language-Processing-Computer/dp/1805128728

Aurélien Géron (2022),

Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow:

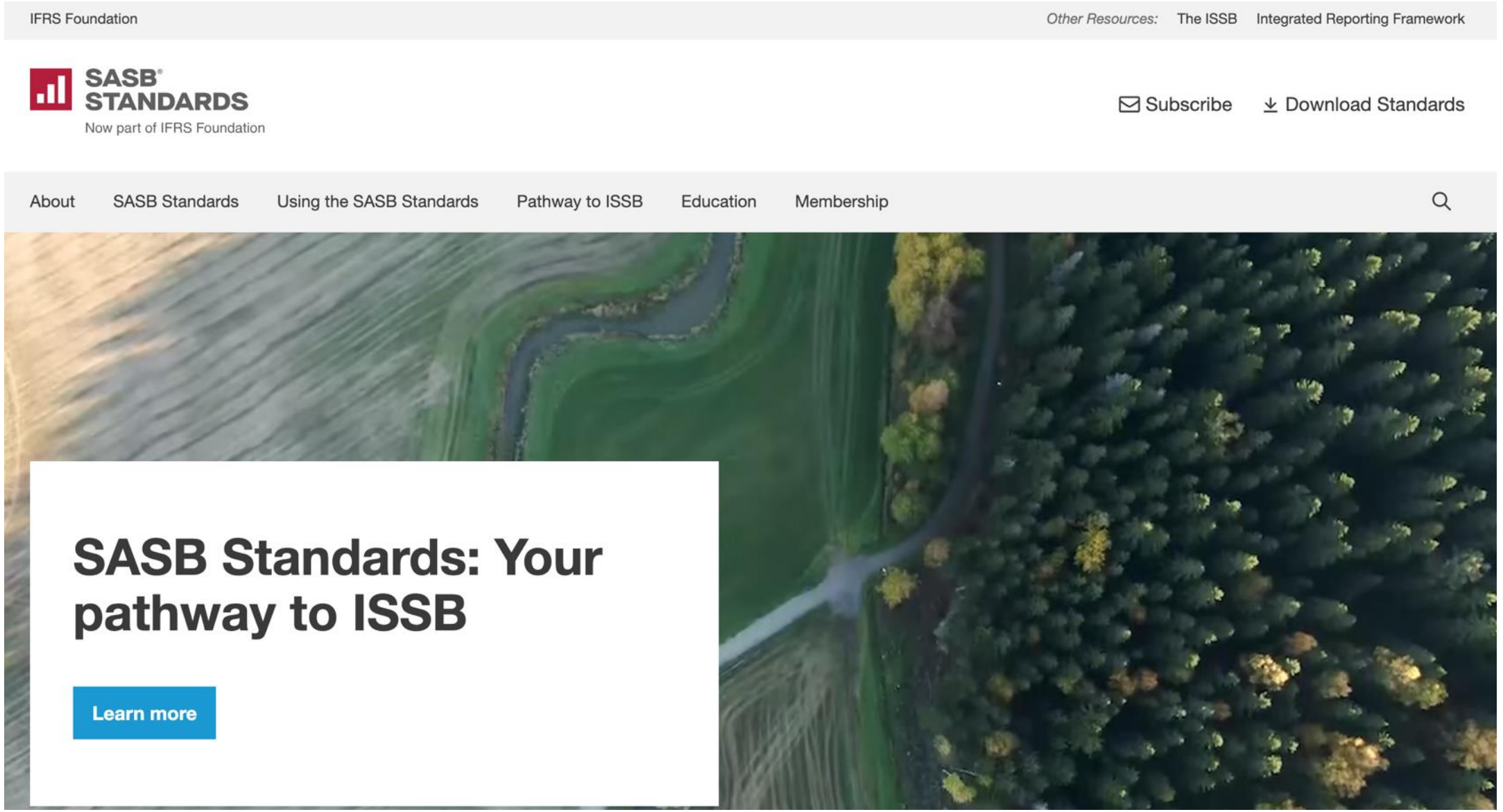
Concepts, Tools, and Techniques to Build Intelligent Systems,

3rd Edition, O'Reilly Media.



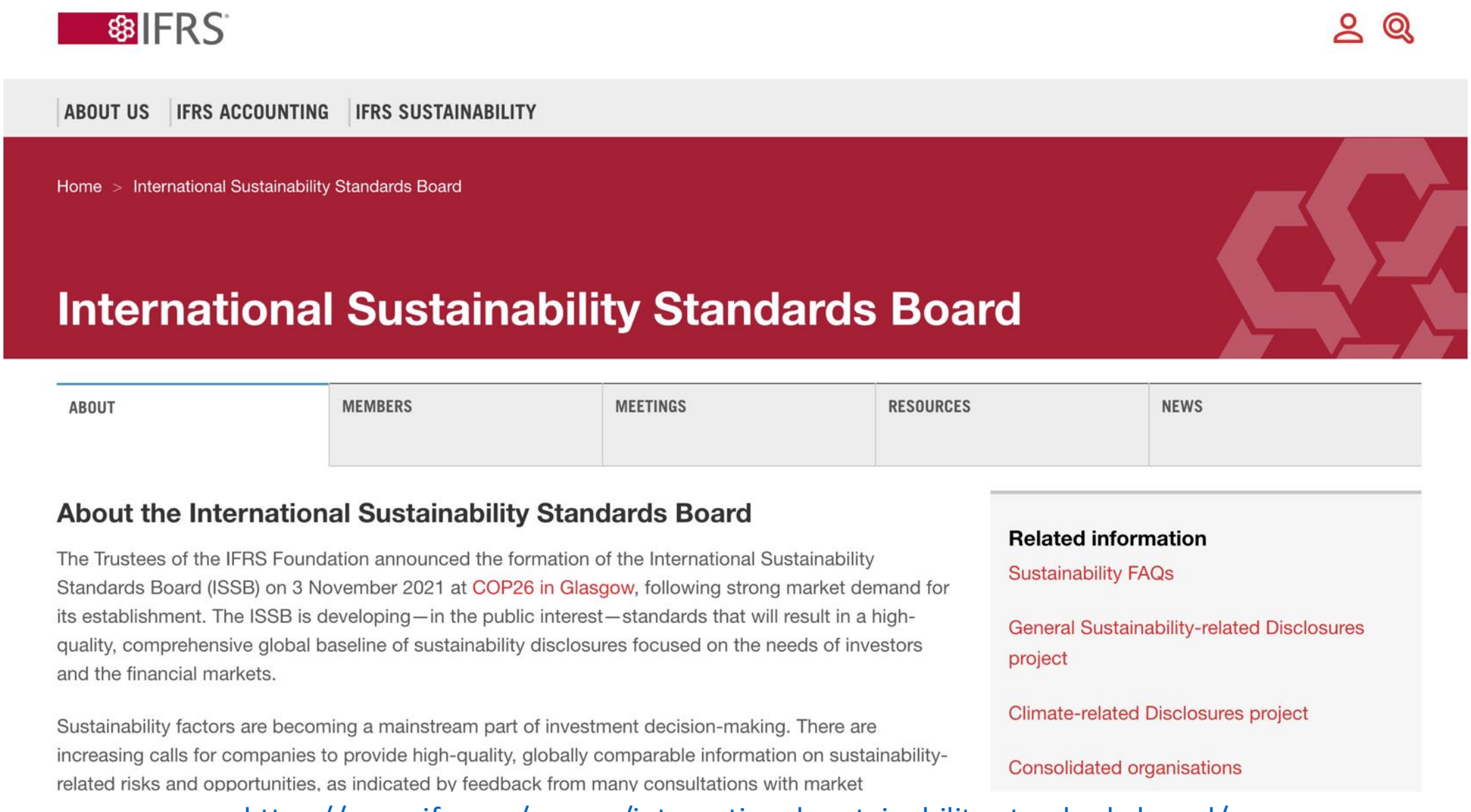
Source: https://www.amazon.com/Hands-Machine-Learning-Scikit-Learn-TensorFlow/dp/1098125975

SASB (Sustainability Accounting Standards Board)



https://sasb.org/

ISSB (International Sustainability Standards Board)



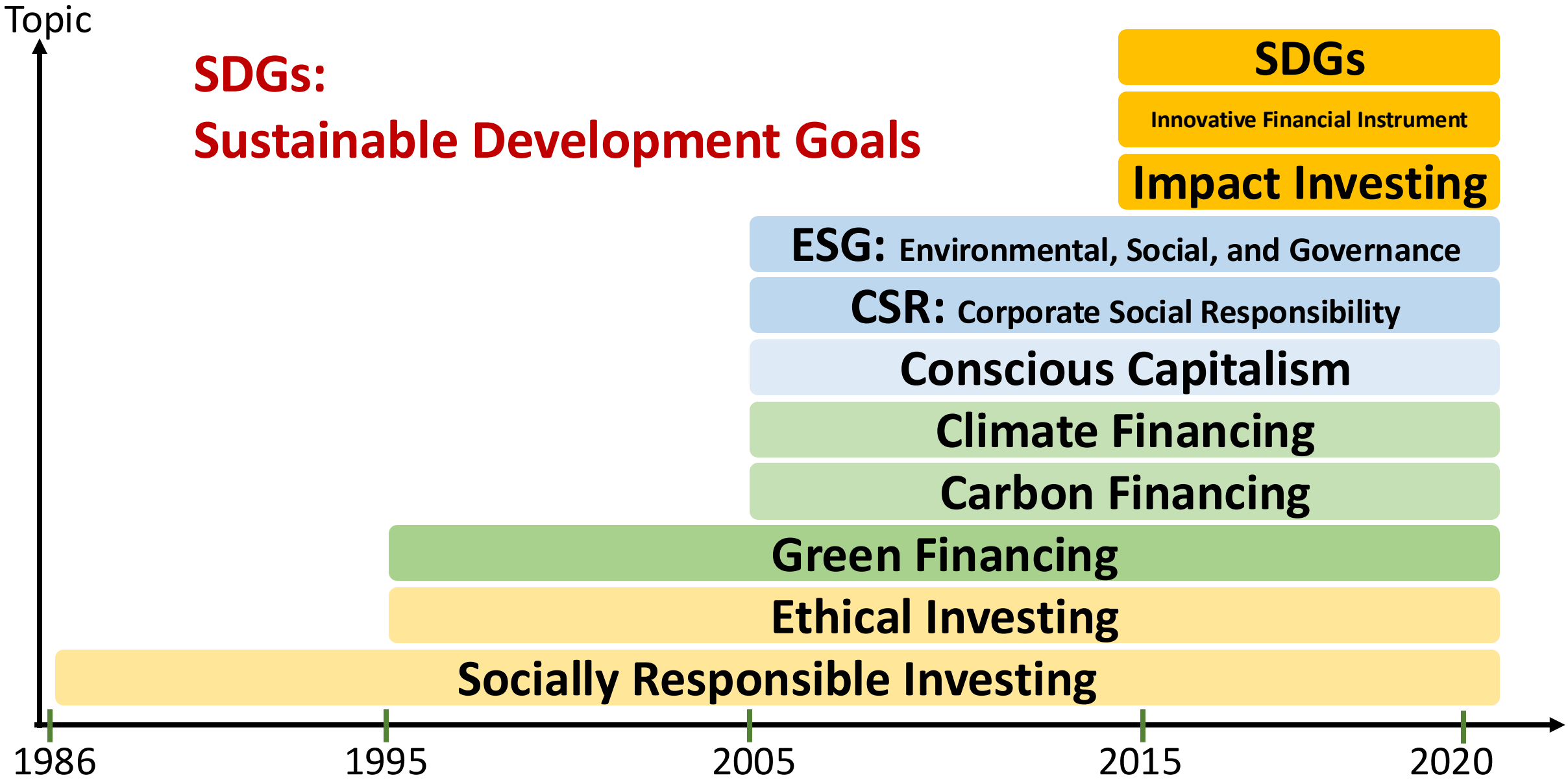
https://www.ifrs.org/groups/international-sustainability-standards-board/

Sustainability and ESG Data Analytics

Sustainable Development Goals (SDGs)

Source: https://sdgs.un.org/goals

Evolution of Sustainable Finance Research



Source: Kumar, S., Sharma, D., Rao, S., Lim, W. M., & Mangla, S. K. (2022). Past, present, and future of sustainable finance: Insights from big data analytics through machine learning of scholarly research. Annals of Operations Research, 1-44.

Green Finance
and
Sustainable Finance

AI for Environmental, Social, and Governance (AI4ESG)

Source: Nenad Tomašev, Julien Cornebise, Frank Hutter, Shakir Mohamed, Angela Picciariello, Bec Connelly, Danielle Belgrave et al. (2020) "AI for social good: unlocking the opportunity for positive impact." Nature Communications 11, no. 1: 1-6.

AI for Social Good (AI4SG)

Source: Nenad Tomašev, Julien Cornebise, Frank Hutter, Shakir Mohamed, Angela Picciariello, Bec Connelly, Danielle Belgrave et al. (2020) "AI for social good: unlocking the opportunity for positive impact." Nature Communications 11, no. 1: 1-6.

Sustainability

SDGs

CSR

ESG

Sustainable Development Goals (SDGs) and 5P

Partnership

Peace

Prosperity

People

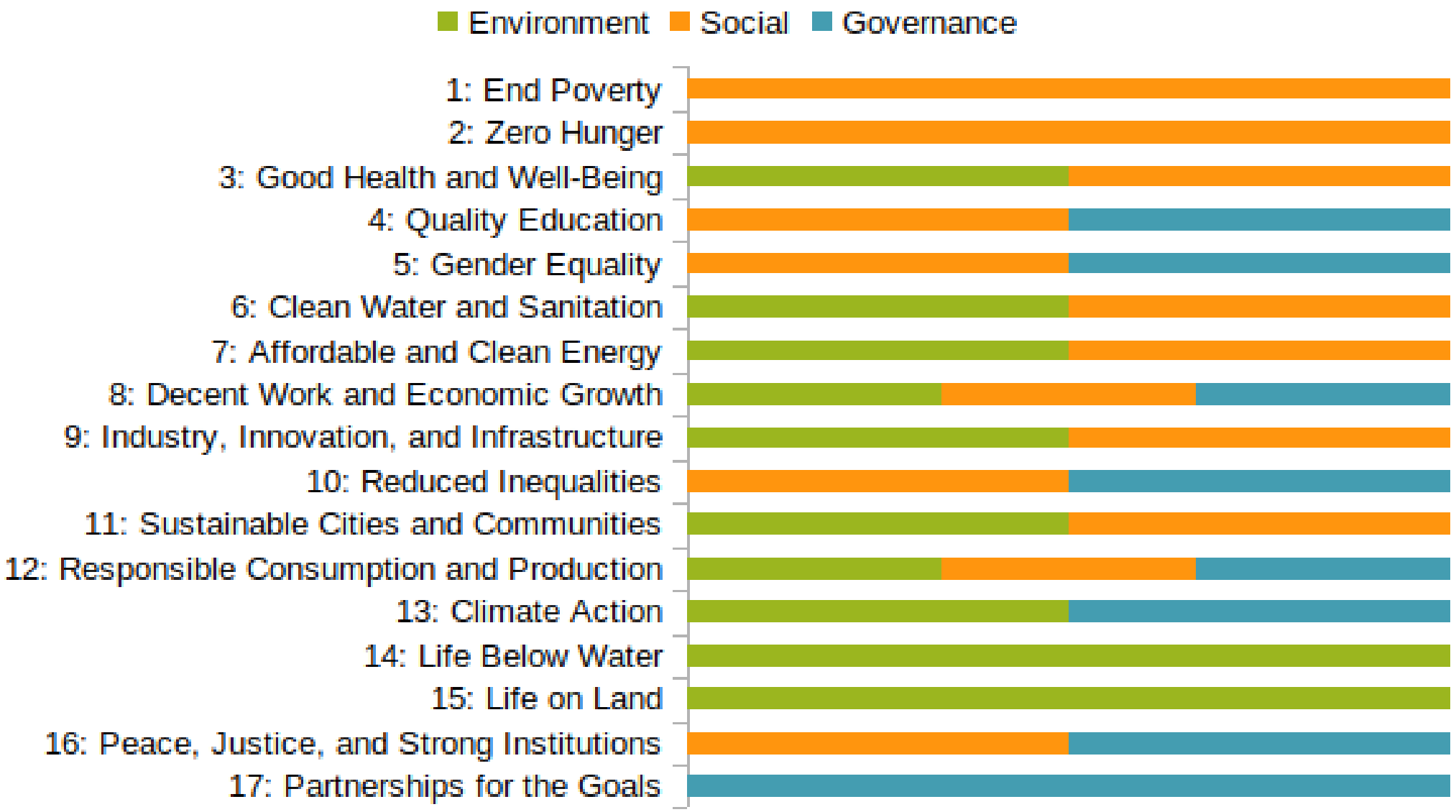
Planet

Source: Folke, Carl, Reinette Biggs, Albert V. Norström, Belinda Reyers, and Johan Rockström. "Social-ecological resilience and biosphere-based sustainability science."Ecology and Society 21, no. 3 (2016).

ESG to 17 SDGs

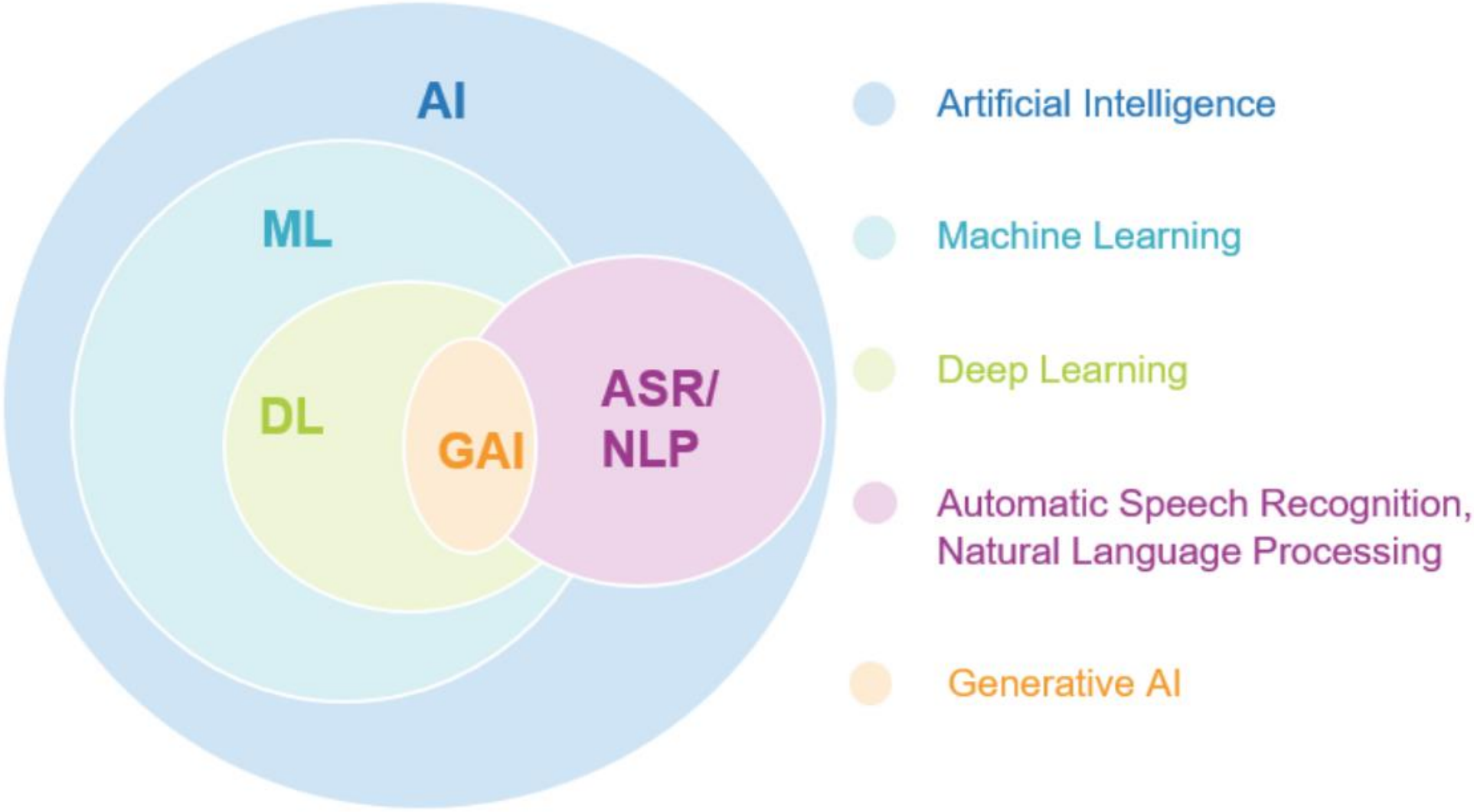
Source: Henrik Skaug Sætra (2021) "A Framework for Evaluating and Disclosing the ESG Related Impacts of AI with the SDGs." Sustainability 13, no. 15 (2021): 8503.

ESG to 17 SDGs



Source: https://sustainometric.com/esg-to-sdgs-connected-paths-to-a-sustainable-future/

AI, ML, DL, Generative AI



Source: Jeong, Cheonsu. "A Study on the Implementation of Generative AI Services Using an Enterprise Data-Based LLM Application Architecture." arXiv preprint arXiv:2309.01105 (2023).

Generative AI, Agentic AI, Physical AI

2012 AlexNet
Deep learning breakthrough

Perception AI
Speech recognition
Deep recommender systems
Medical imaging

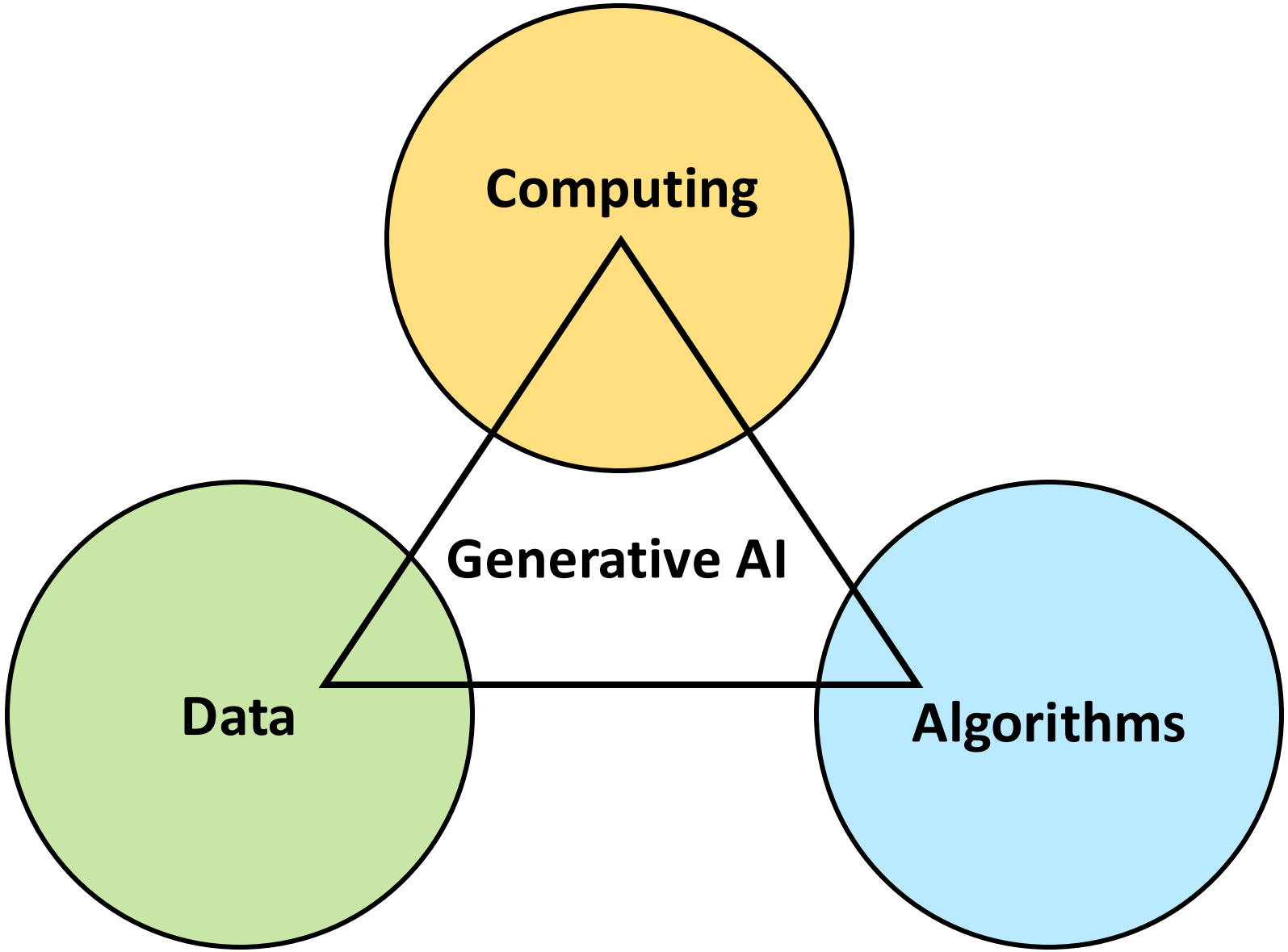
Generative AI
Digital marketing
Content creation

Agentic AI
Coding assistants
Customer service
Patient care

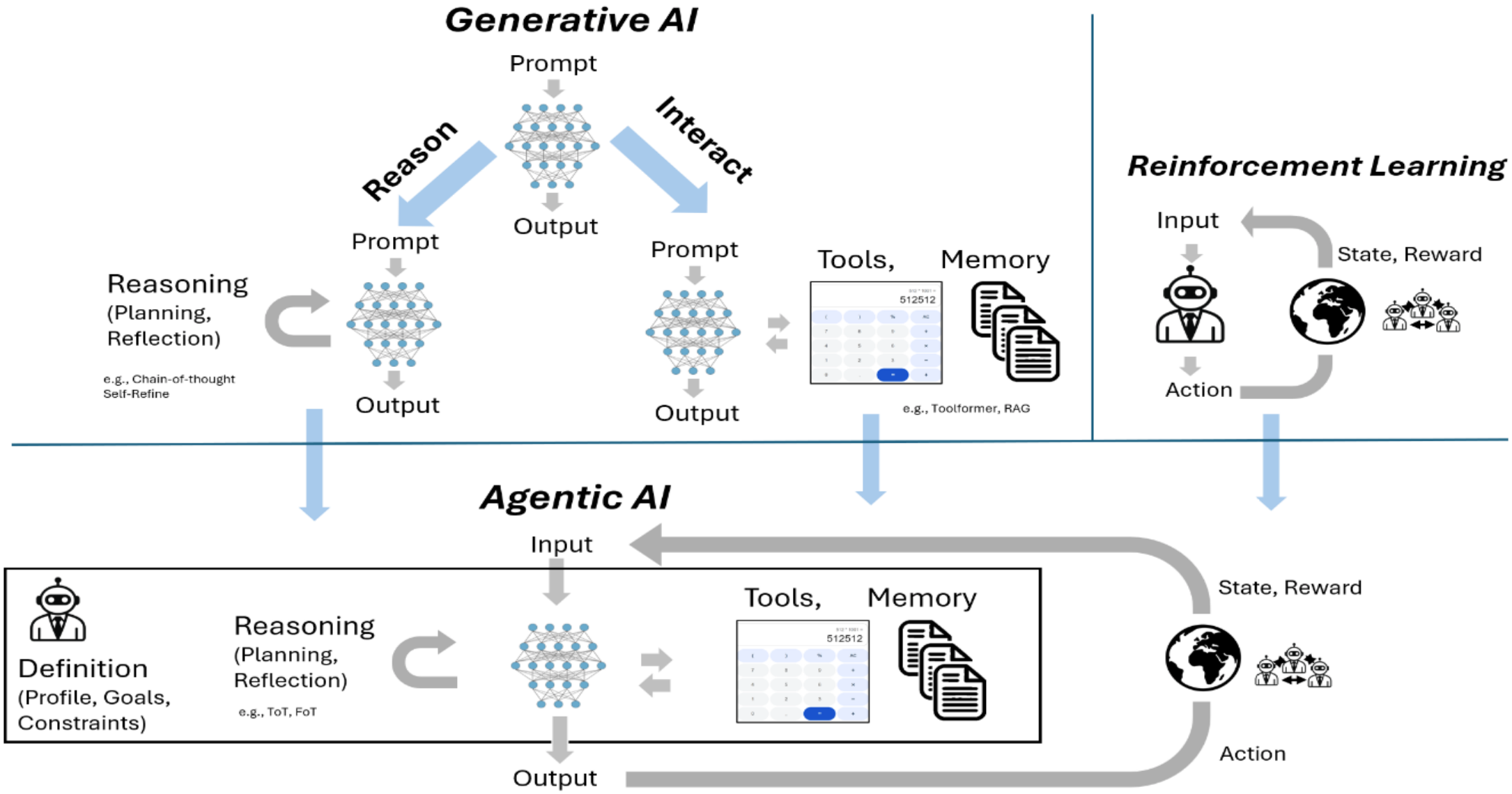
Physical AI
Self-driving cars
General robotics

Source: NVIDIA (2025), GTC March 2025 Keynote with NVIDIA CEO Jensen Huang, https://www.youtube.com/watch?v=_waPvOwL9Z8

Generative AI

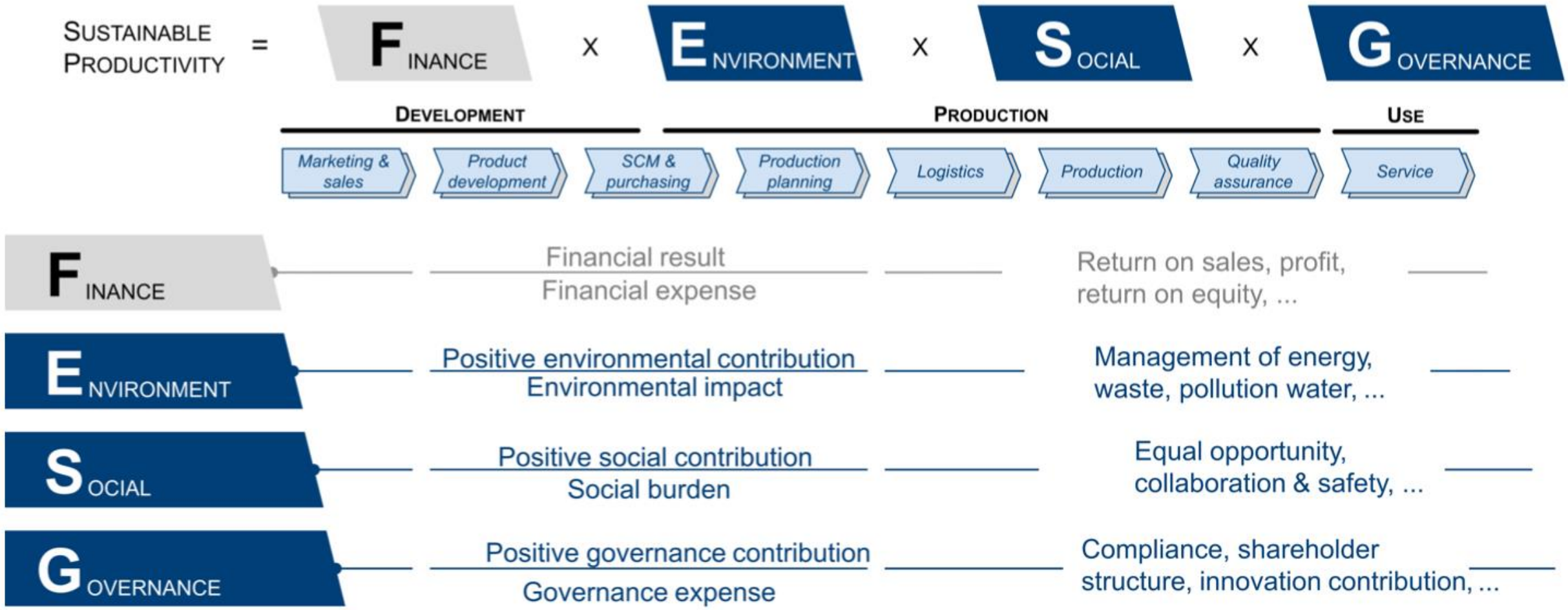


From Generative AI to Agentic AI



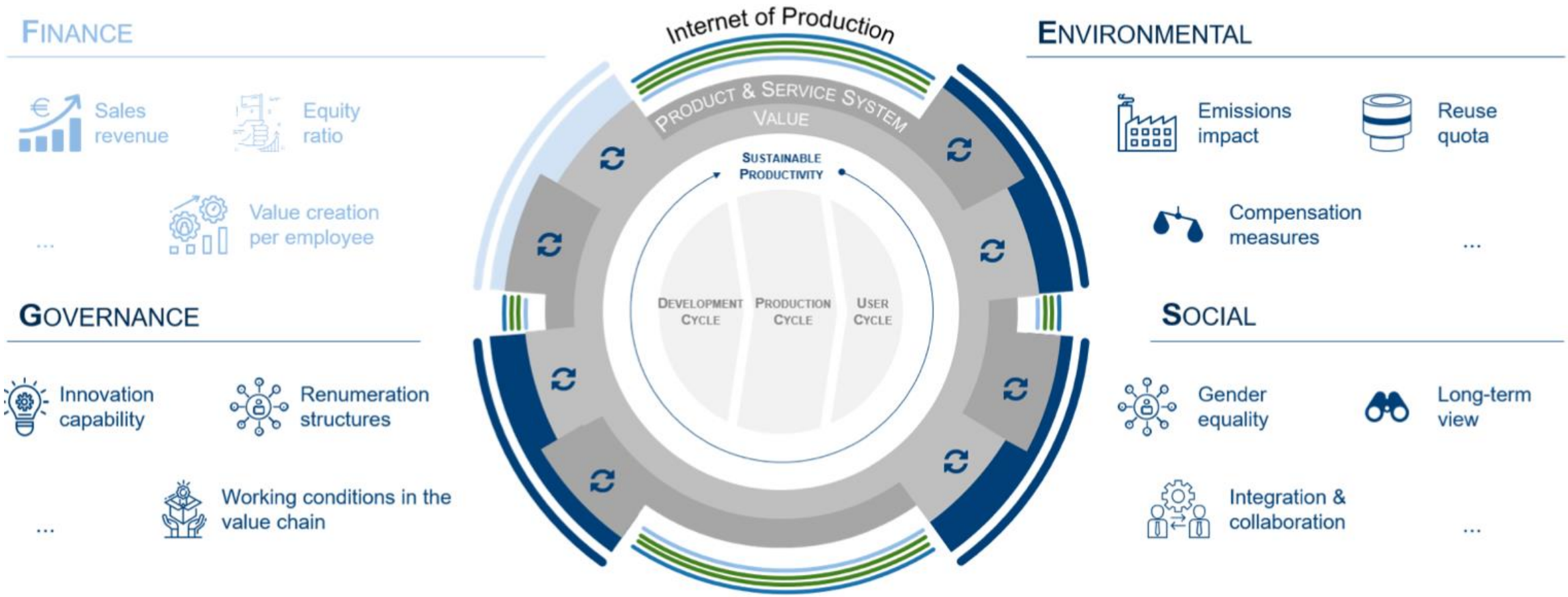
Source: Schneider, Johannes. "Generative to Agentic AI: Survey, Conceptualization, and Challenges." arXiv preprint arXiv:2504.18875 (2025).

Sustainable Productivity: Finance ESG



Source: Huang, Ziqi, Yang Shen, Jiayi Li, Marcel Fey, and Christian Brecher (2021). "A survey on AI-driven digital twins in Industry 4.0: Smart manufacturing and advanced robotics." Sensors 21, no. 19: 6340.

Sustainable Resilient Manufacturing
ESG

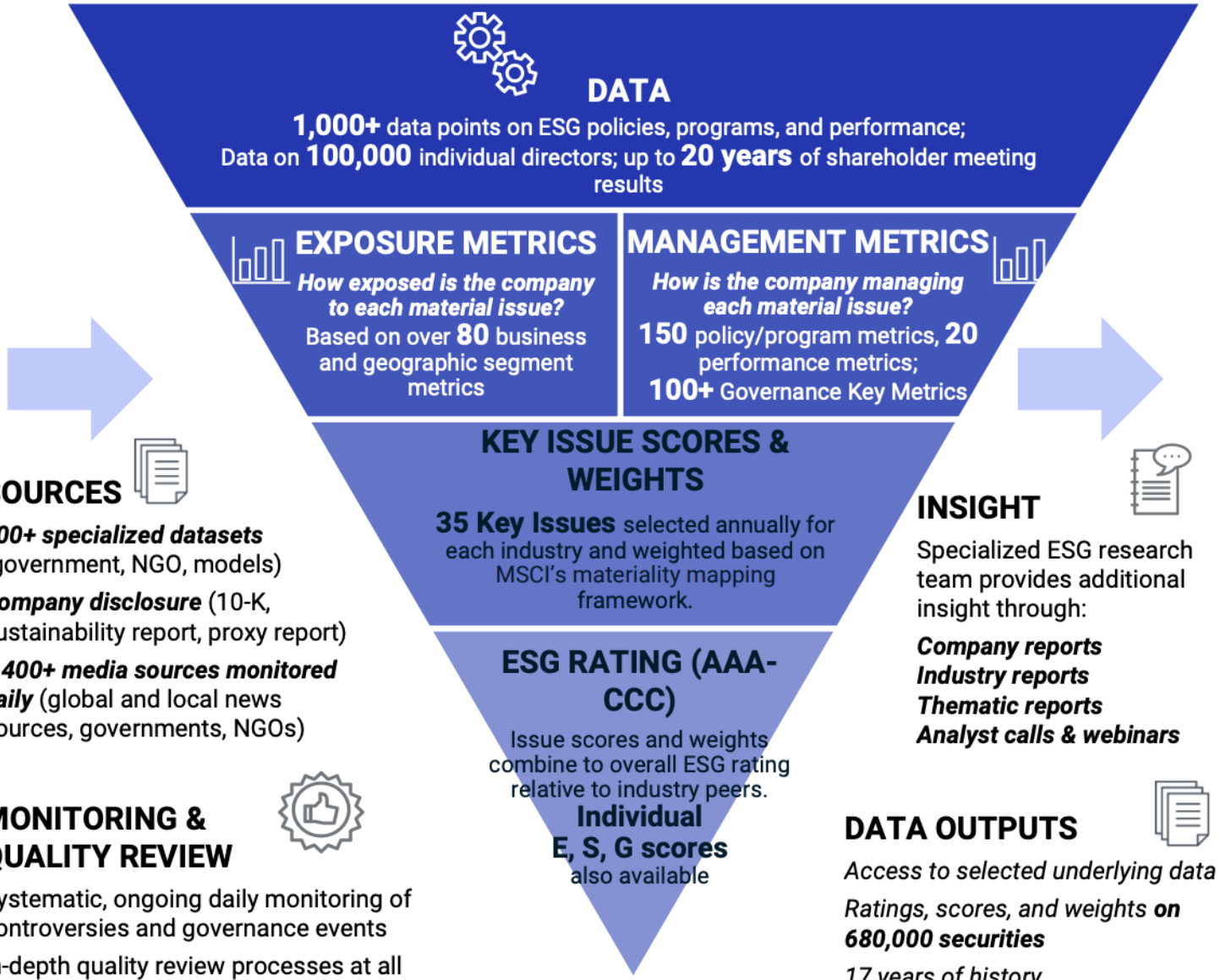


Source: Huang, Ziqi, Yang Shen, Jiayi Li, Marcel Fey, and Christian Brecher (2021). "A survey on AI-driven digital twins in Industry 4.0: Smart manufacturing and advanced robotics." Sensors 21, no. 19: 6340.

ESG Indexes

- MSCI ESG Index
- Dow Jones Sustainability Indices (DJSI)
- FTSE ESG Index

MSCI ESG Rating Framework



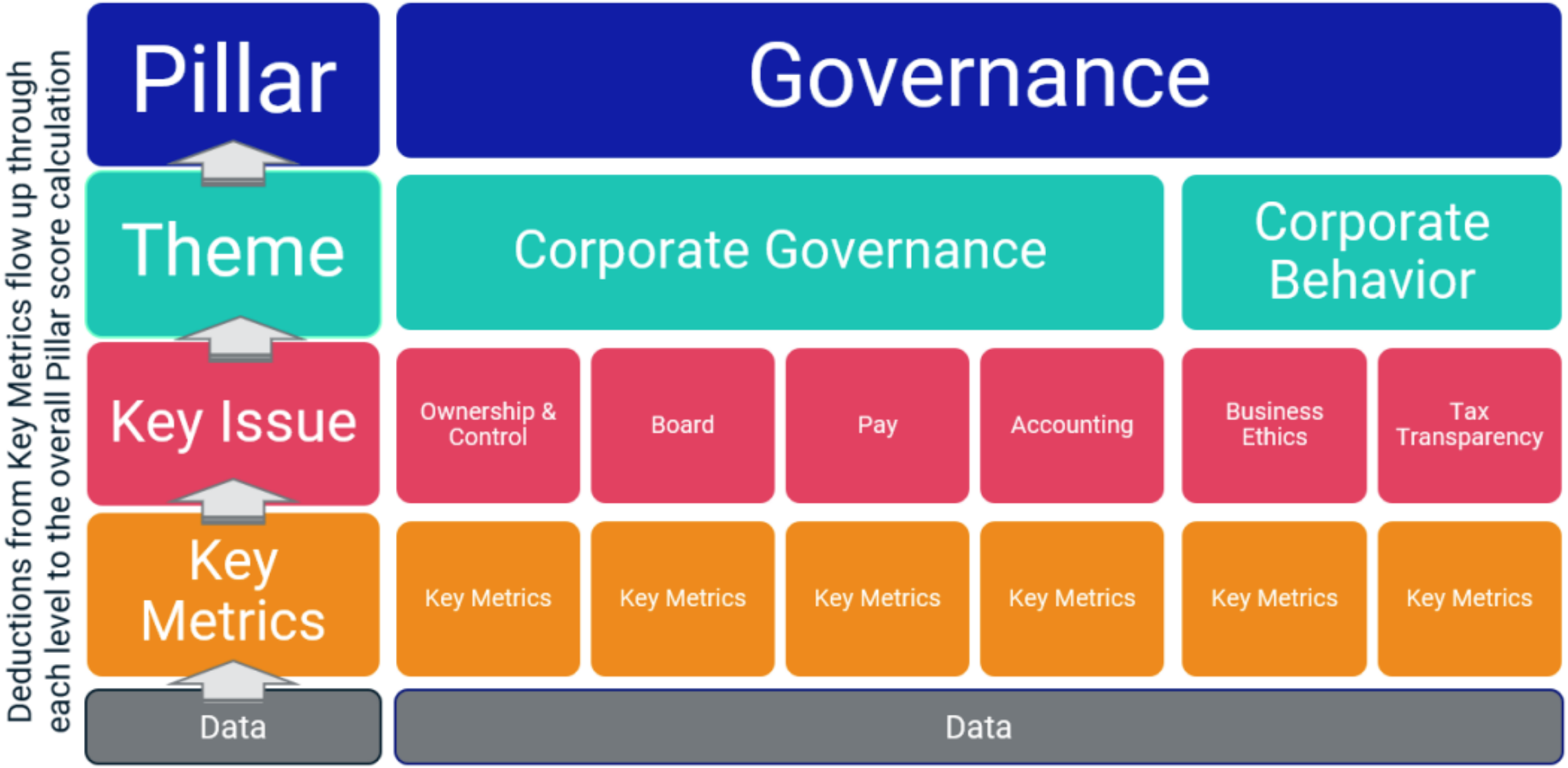
Source: https://www.msci.com/documents/1296102/21901542/ESG-Ratings-Methodology-Exec-Summary.pdf

MSCI ESG Key Issue Hierarchy

3 Pillars	10 Themes	35 ESG Key Issues	
Environment	**Climate Change**	Carbon Emissions	Financing Environmental Impact
		Product Carbon Footprint	Climate Change Vulnerability
	Natural Capital	Water Stress	Raw Material Sourcing
		Biodiversity & Land Use	
	Pollution & Waste	Toxic Emissions & Waste	Electronic Waste
		Packaging Material & Waste	
	Environmental Opportunities	Opportunities in Clean Tech	Opportunities in Renewable Energy
		Opportunities in Green Building	
Social	**Human Capital**	Labor Management	Human Capital Development
		Health & Safety	Supply Chain Labor Standards
	Product Liability	Product Safety & Quality	Privacy & Data Security
		Chemical Safety	Responsible Investment
		Consumer Financial Protection	Health & Demographic Risk
	Stakeholder Opposition	Controversial Sourcing	
		Community Relations	
	Social Opportunities	Access to Communications	Access to Health Care
		Access to Finance	Opportunities in Nutrition & Health
Governance	**Corporate Governance**	Ownership & Control	Pay
		Board	Accounting
	Corporate Behavior	Business Ethics	
		Tax Transparency	

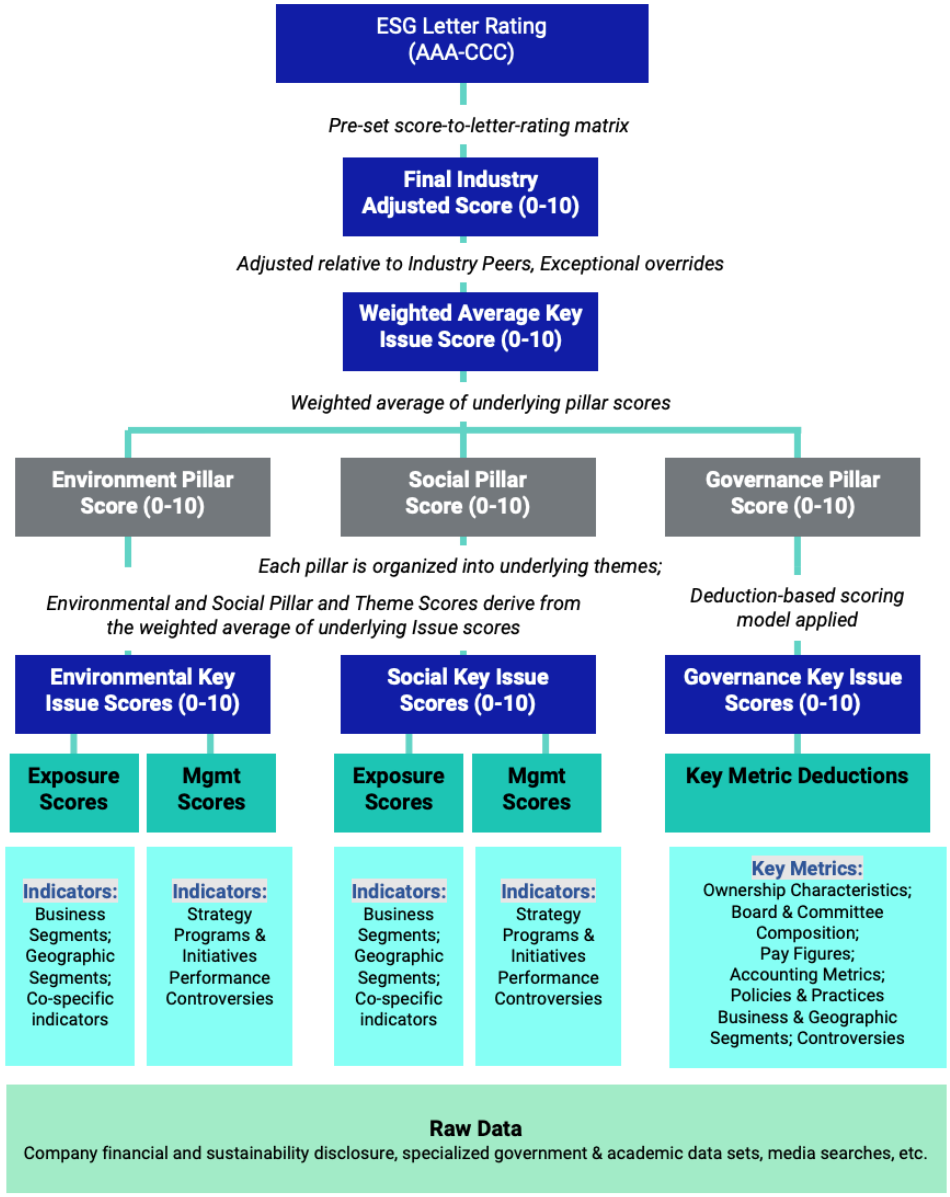
Source: https://www.msci.com/documents/1296102/21901542/ESG-Ratings-Methodology-Exec-Summary.pdf

MSCI Governance Model Structure



Source: https://www.msci.com/documents/1296102/21901542/ESG-Ratings-Methodology-Exec-Summary.pdf

MSCI Hierarchy of ESG Scores



Source: https://www.msci.com/documents/1296102/21901542/ESG-Ratings-Methodology-Exec-Summary.pdf

DJSI S&P Global ESG Score

8,000
Companies

90%
Global market capitalization

340,000+
Current Research Universe and Active Securities

Approx.
1,000
Datapoints

Assessed values, text, checkboxes, documents
Sources: Web-based questionnaire and company documents

130+
Questions

Weighted data point scores
Up to 50% industry-specific

Ave.
30+
Criteria scores

Weighted question scores
61 industry specific approaches, with tailored questions, criteria and related weightings

3
Dimension scores

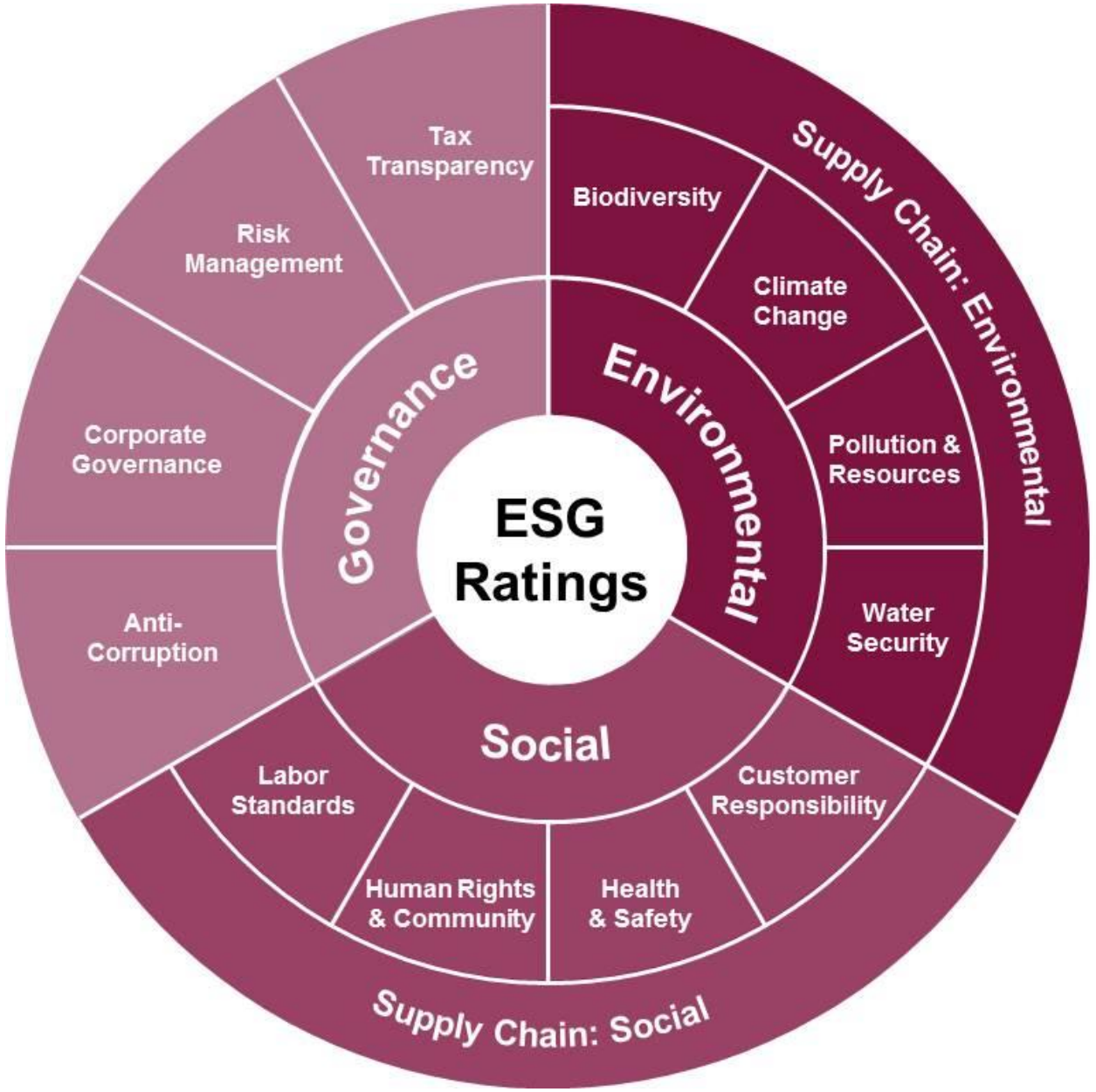
Weighted criteria scores
Adjusted for corporate ESG controversies where applicable

1
S&P Global ESG Score

Sum of weighted dimension scores

Source: DJSI, S&P Global Corporate Sustainability Assessment (CSA), https://www.spglobal.com/esg/solutions/data-intelligence-esg-scores

FTSE Russell ESG Ratings



Source: https://www.ftserussell.com/data/sustainability-and-esg-data/esg-ratings

SUSTAINALYTICS
a Morningstar company

Sustainalytics ESG Risk Ratings

Analyst-based approach

Sustainalytics' ESG Risk Ratings measure a company's exposure to industry-specific material ESG risks and how well a company is managing those risks.

Negligible	Low	Medium	High	Severe
0 - 10	10 - 20	20 - 30	30 - 40	40+

Source: https://www.sustainalytics.com/esg-data

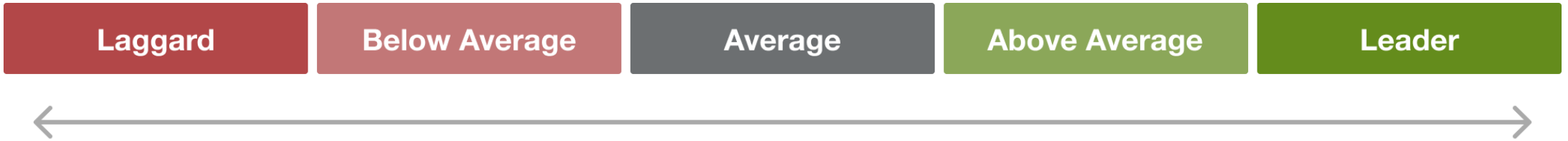
TruValue Labs

FACTSET

Truvalue ESG Ranks

Machine-based approach

- **Truvalue Labs applies AI to analyze over 100,000 sources and uncover ESG risks and opportunities hidden in unstructured text.**
- **The ESG Ranks data service produces an overall company rank based on industry percentile leveraging the 26 ESG categories defined by the Sustainability Accounting Standards Board (SASB).**
- **The data feed covers 20,000+ companies with more than 13 years of history.**



Source: :https://developer.truvaluelabs.com/data/esg-ranks

Analyst-driven vs. AI-driven ESG

Analyst-driven ESG research

Derives ratings in a structured data model

Sustainalytics

Analyst role at the end of the process allows subjectivity to color results

AI-driven ESG research

Derives signals from unstructured data

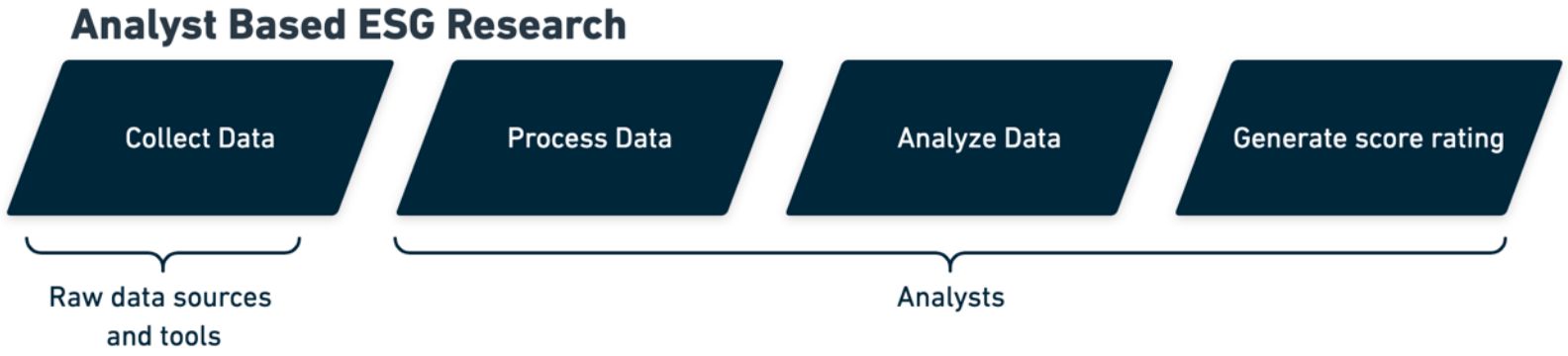
Truvalue Labs

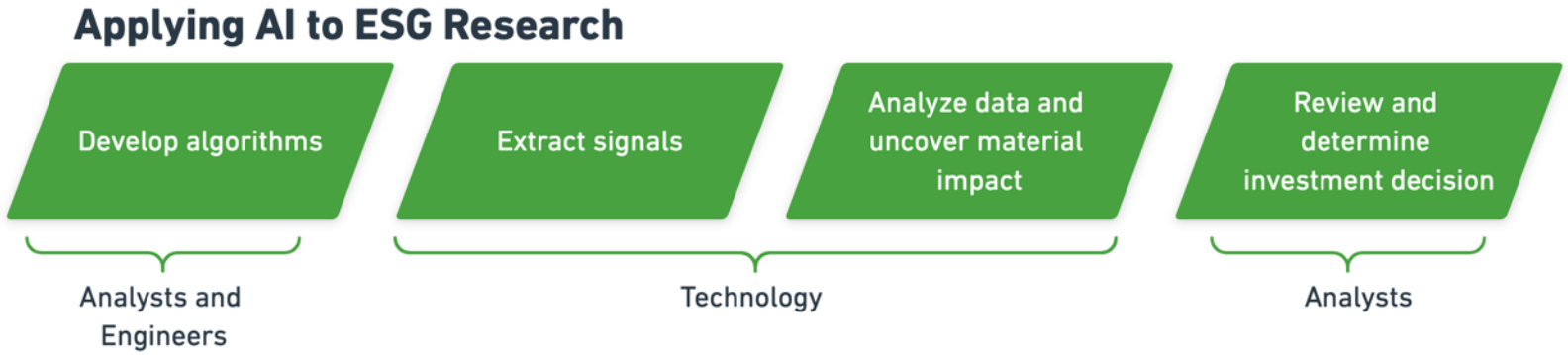
Analyst expertise at the beginning of the process produces consistent results

Source: Mark Tulay (2020), Man vs. machine: A tale of two sustainability ratings systems, GreenBiz, https://www.greenbiz.com/article/man-vs-machine-tale-two-sustainability-ratings-systems

Analyst based ESG Research

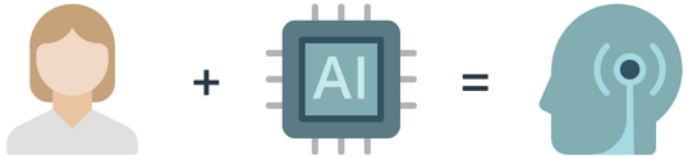
AI based ESG Research





It would take an analyst over 5 years to do what our AI can in 1 week

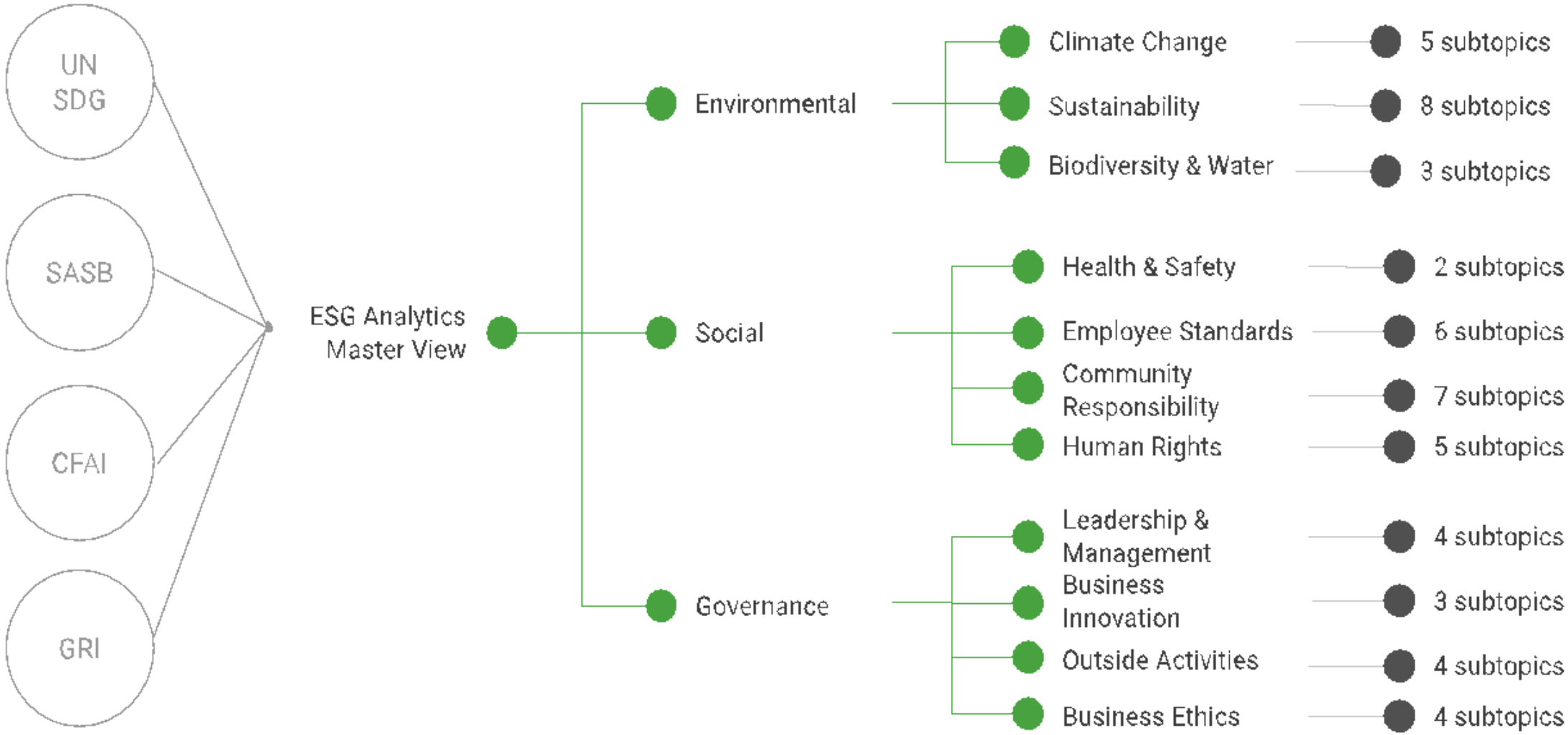
Combining analysts with AI creates gives you the full picture



ESG ANALYTICS
Invest where it matters.

Source: https://www.esganalytics.io/insights/how-data-is-accelerating-esg

ESG Analytics: NLP Taxonomy

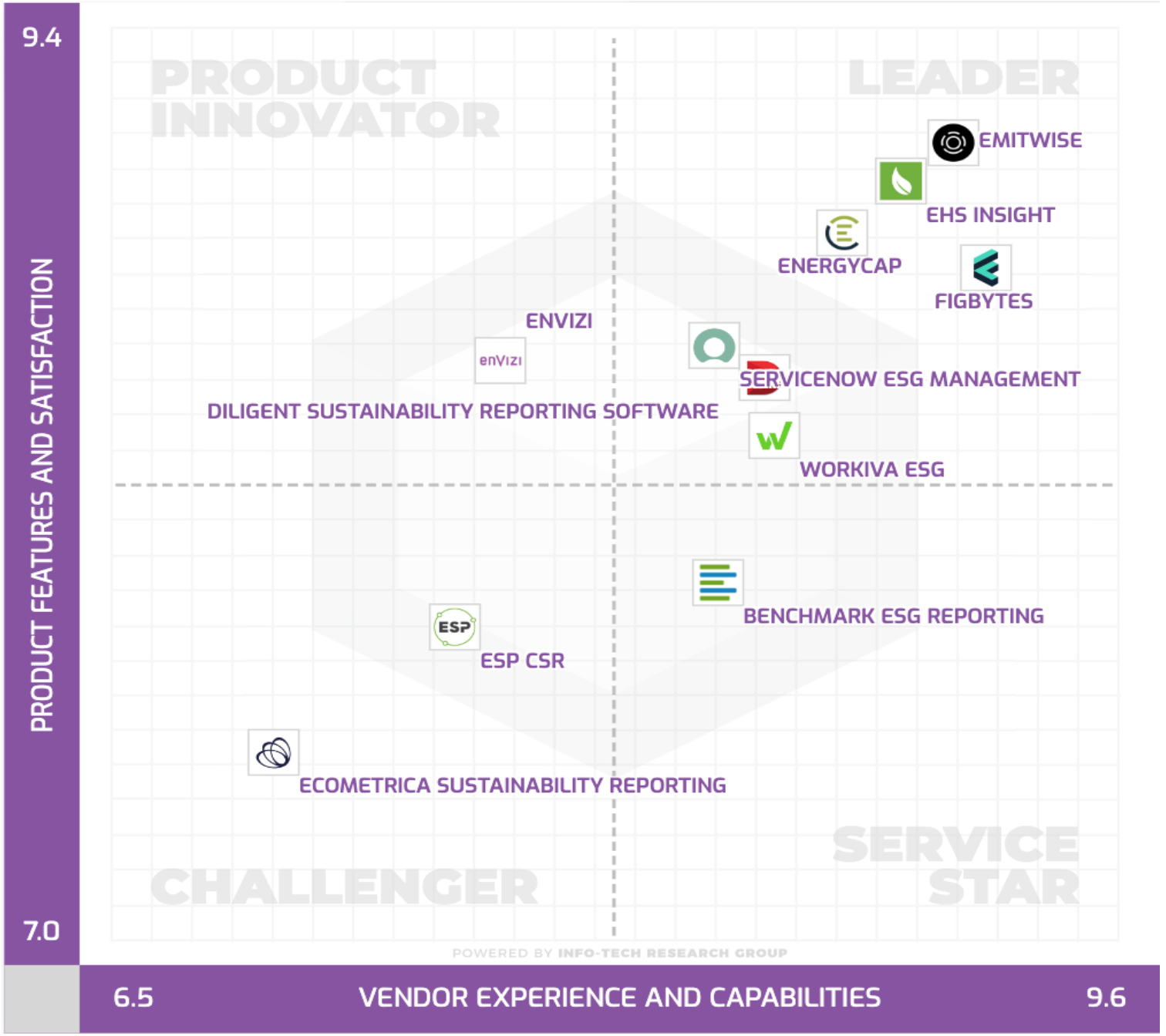


ESG ANALYTICS

Source: https://www.esganalytics.io/insights/how-data-is-accelerating-esg

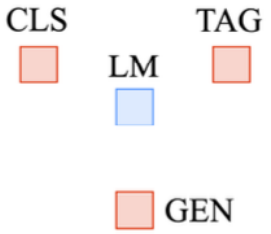
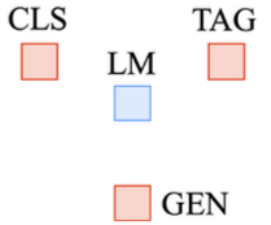
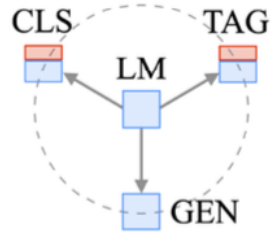
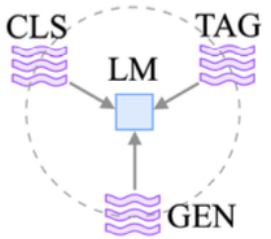
Top ESG Reporting Software

Environmental, Social and Governance (ESG) Reporting software or **Sustainability software** helps organizations manage their operational data, evaluate their impact on the environment and provide reporting to perform audits.



Source: https://www.softwarereviews.com/categories/environmental-social-and-governance-reporting

Four Paradigms in NLP (LM)

Paradigm	Engineering	Task Relation
a. Fully Supervised Learning (Non-Neural Network)	Feature (e.g. word identity, part-of-speech, sentence length)	
b. Fully Supervised Learning (Neural Network)	Architecture (e.g. convolutional, recurrent, self-attentional)	
Transfer Learning: Pre-training, Fine-Tuning (FT) c. Pre-train, Fine-tune	Objective (e.g. masked language modeling, next sentence prediction)	
GAI: Pre-train, Prompt, and Predict (Prompting) d. Pre-train, Prompt, Predict	Prompt (e.g. cloze, prefix)	

Source: Pengfei Liu, Weizhe Yuan, Jinlan Fu, Zhengbao Jiang, Hiroaki Hayashi, and Graham Neubig. (2023) "Pre-train, prompt, and predict: A systematic survey of prompting methods in natural language processing." ACM Computing Surveys 55, no. 9 (2023): 1-35.

LMArena Leaderboard

Rank (UB) ↑	Model ⇅	Score ⇅	95% CI (±) ⇅	Votes ⇅	Organization ⇅	License ⇅
1	gemini-2.5-pro	1455	±5	41,731	Google	Proprietary
1	claude-opus-4-1-20250805-thinking-16k	1451	±6	11,750	Anthropic	Proprietary
2	o3-2025-04-16	1444	±4	43,898	OpenAI	Proprietary
2	gpt-5-high	1442	±6	15,076	OpenAI	Proprietary
2	chatgpt-4o-latest-20250326	1441	±4	36,426	OpenAI	Proprietary
3	gpt-4.5-preview-2025-02-27	1439	±6	15,271	OpenAI	Proprietary
3	claude-opus-4-1-20250805	1438	±6	18,341	Anthropic	Proprietary
5	gpt-5-chat	1430	±6	11,808	OpenAI	Proprietary
6	qwen3-max-preview	1428	±7	8,781	Alibaba	Proprietary
8	grok-4-0709	1422	±5	21,446	xAI	Proprietary

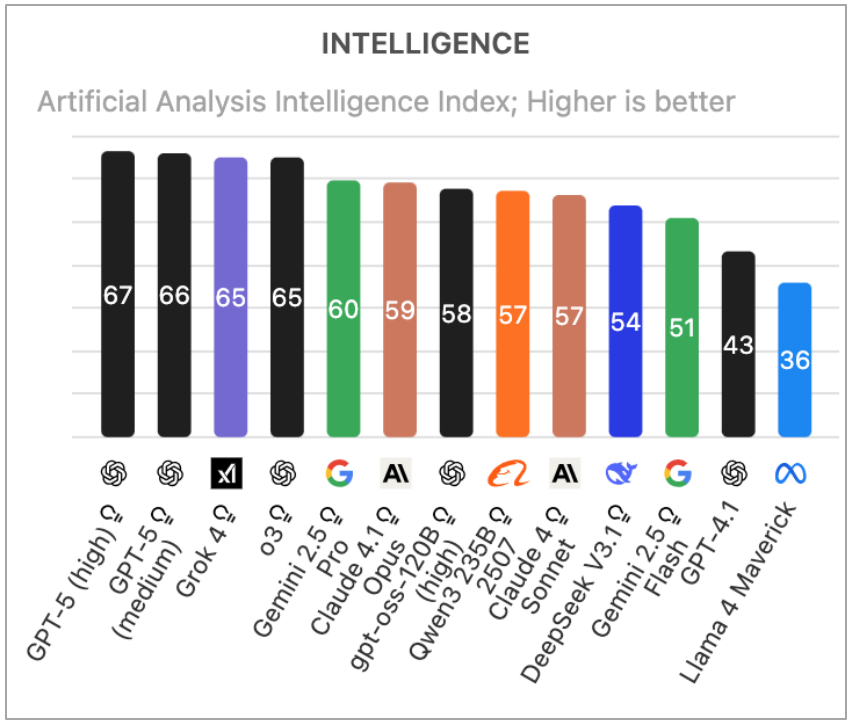
https://lmarena.ai/

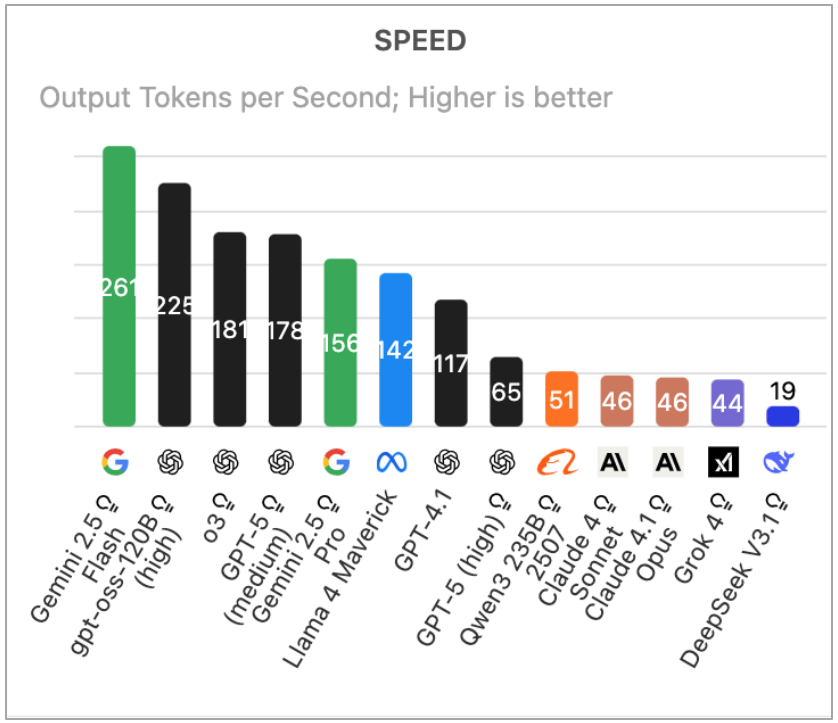
LMArena Leaderboard

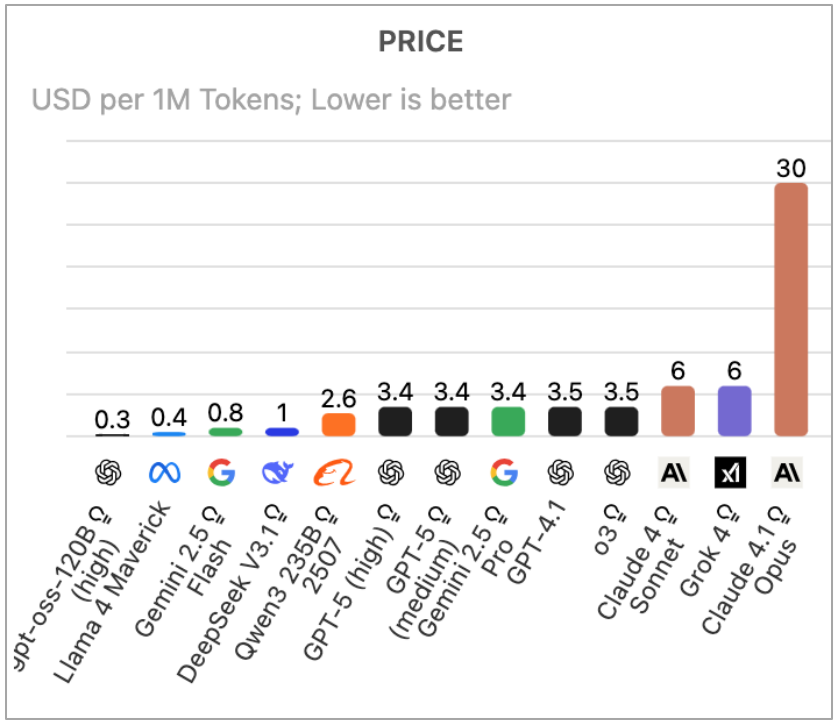
Model 239 / 239	Overall	Hard Prompts	Coding	Math	Creative Writing	Instruction Following	Longer Query	Multi-Turn
claude-opus-4-1-…	1	1	1	1	1	1	1	1
gemini-2.5-pro	1	2	3	1	1	1	1	1
chatgpt-4o-lates…	2	4	3	13	2	5	4	1
gpt-5-high	2	2	3	1	7	5	11	6
o3-2025-04-16	2	4	3	1	8	6	13	7
claude-opus-4-1-…	3	2	1	1	1	1	1	1
gpt-4.5-preview-…	3	5	4	8	1	4	3	1
gpt-5-chat	5	3	3	8	3	5	3	1
qwen3-max-preview	6	4	2	1	7	4	4	3
claude-opus-4-20…	8	4	3	6	2	2	2	7
deepseek-r1-0528	8	8	4	10	8	15	13	14
deepseek-v3.1	8	6	4	1	7	6	5	9
deepseek-v3.1-th…	8	4	3	1	2	4	1	7
grok-4-0709	8	10	12	1	4	6	8	7
kimi-k2-0711-pre…	8	10	7	13	16	24	22	7
kimi-k2-0905-pre…	8	5	3	-	6	16	12	7
qwen3-235b-a22b-…	8	4	3	2	9	6	4	7
glm-4.5	10	7	4	7	14	7	8	10

https://huggingface.co/spaces/lmarena-ai/lmarena-leaderboard

Artificial Analysis Intelligence Index
Intelligence, Speed, Price

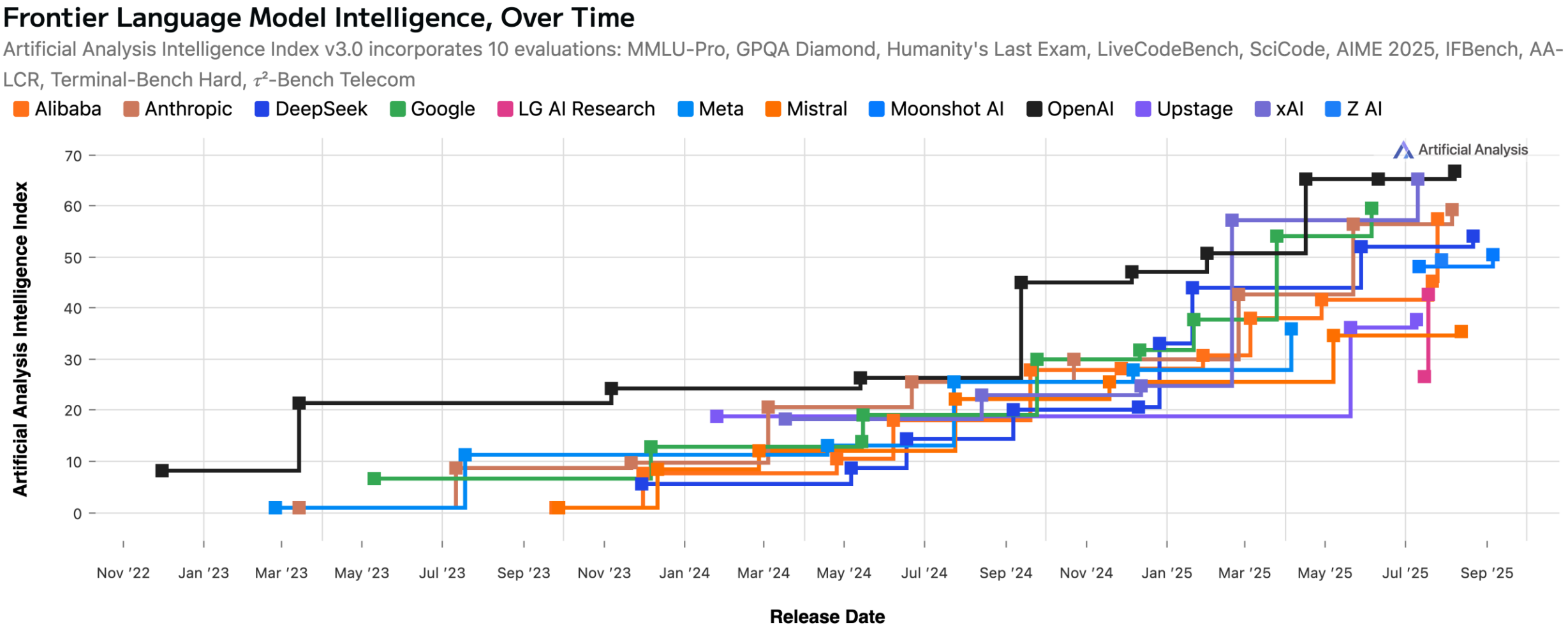






Source: https://artificialanalysis.ai/

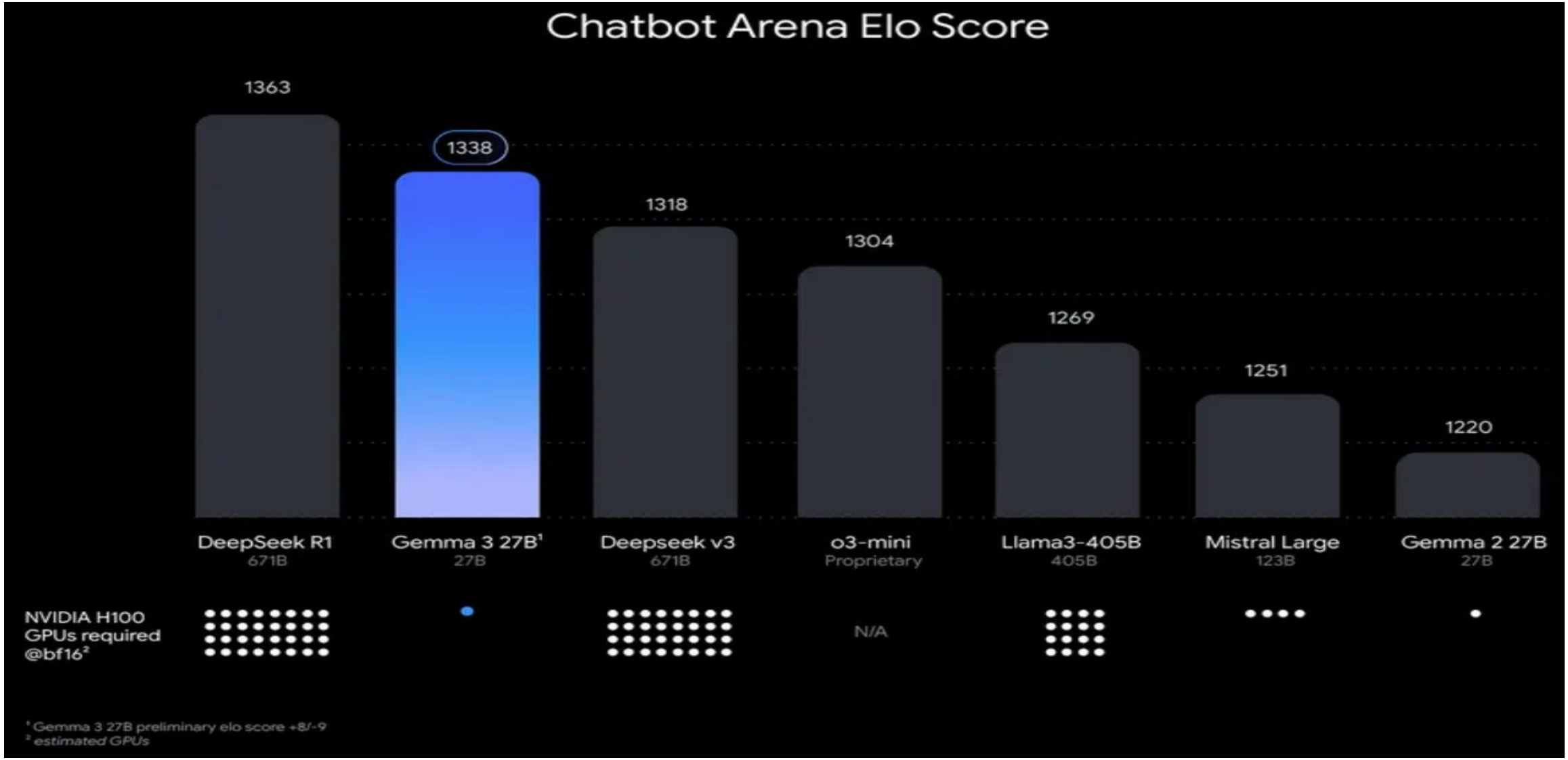
Artificial Analysis Intelligence Index 2022-2025



Source: https://artificialanalysis.ai/

Google Gemma 3 27B

The most capable model you can run on a single GPU or TPU



Source: https://blog.google/technology/developers/gemma-3/

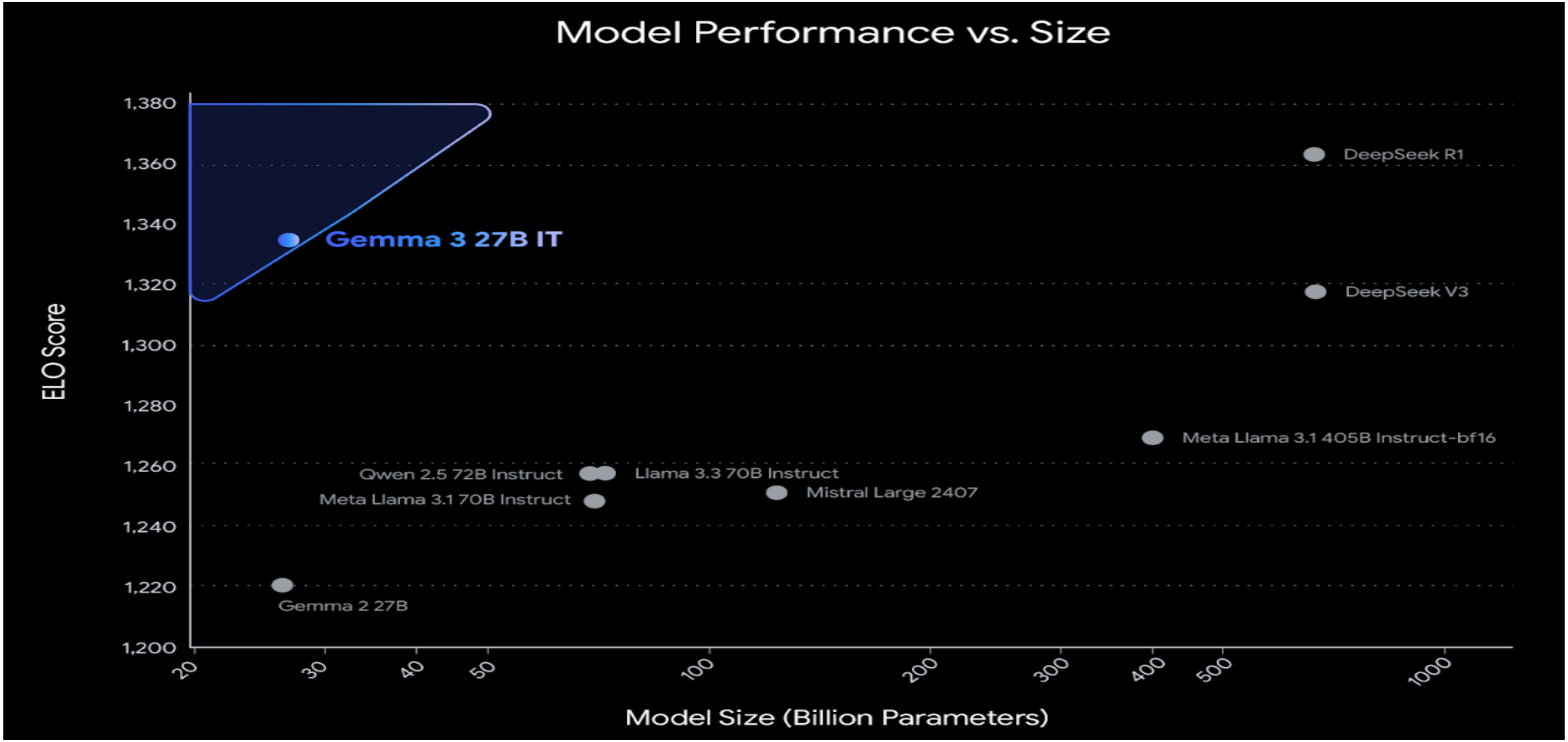
Google Gemma 3 Multimodality (vision-language input and text outputs)

MODEL	SIZE (in billion parameter)	CONTEXT LENGTH	LANGUAGES	INPUT MODALITIES
Gemma 3 1B (IT)	1B	32k	English	Input: Text Output: Text
Gemma 3 4B (IT)	4B	128k	+140 Languages	Input: Text, Image Output: Text
Gemma 3 12B (IT)	12B	128k	+140 Languages	Input: Text, Image Output: Text
Gemma 3 27B (IT)	27B	128k	+140 Languages	Input: Text, Image Output: Text
Shield Gemma 2	4B	8k	+140 Languages	Input: Text, Image Output: Text

Source: https://developers.googleblog.com/en/introducing-gemma3/

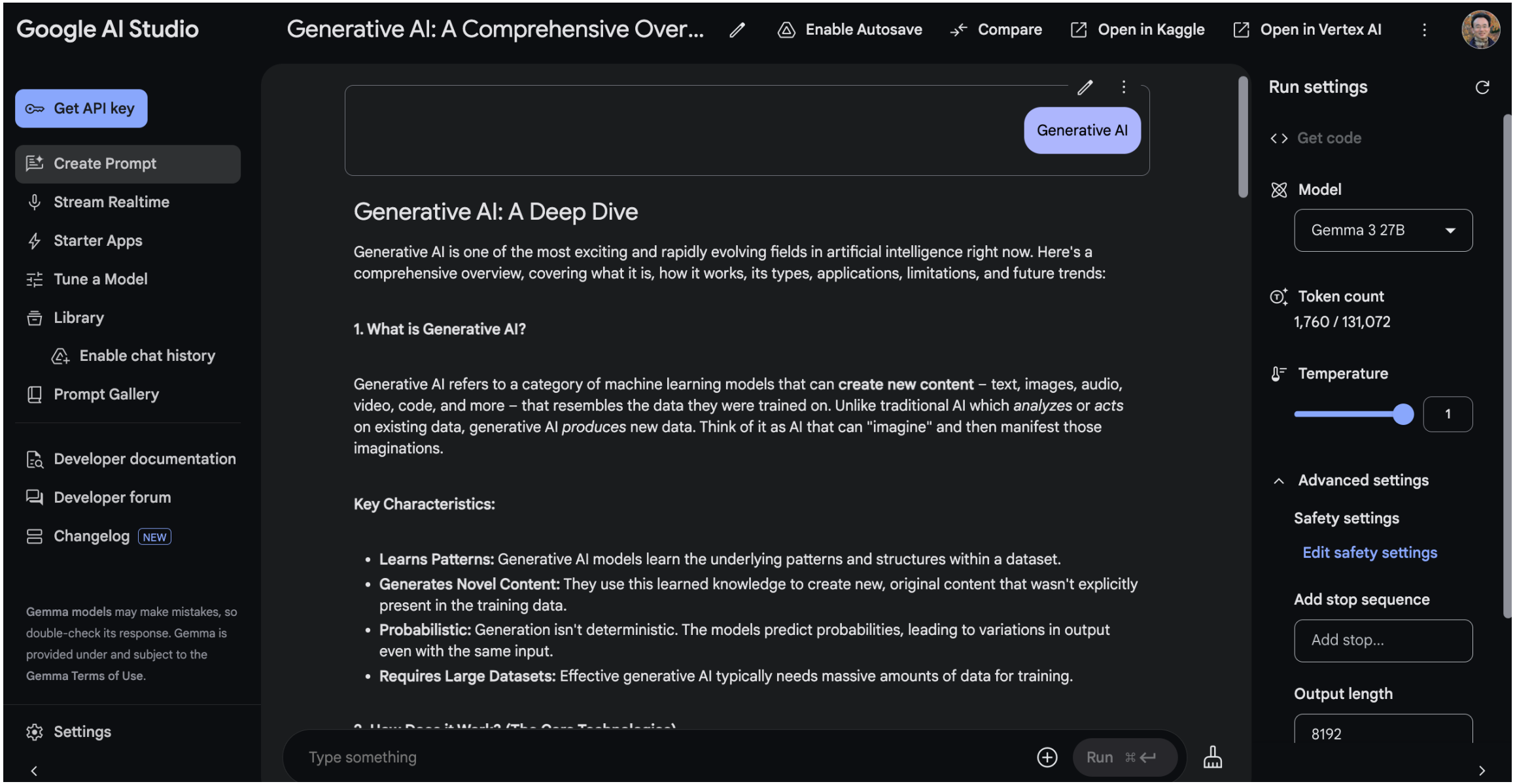
Google Gemma 3: Pre-training and Post-training

(distillation, reinforcement learning, and model merging)



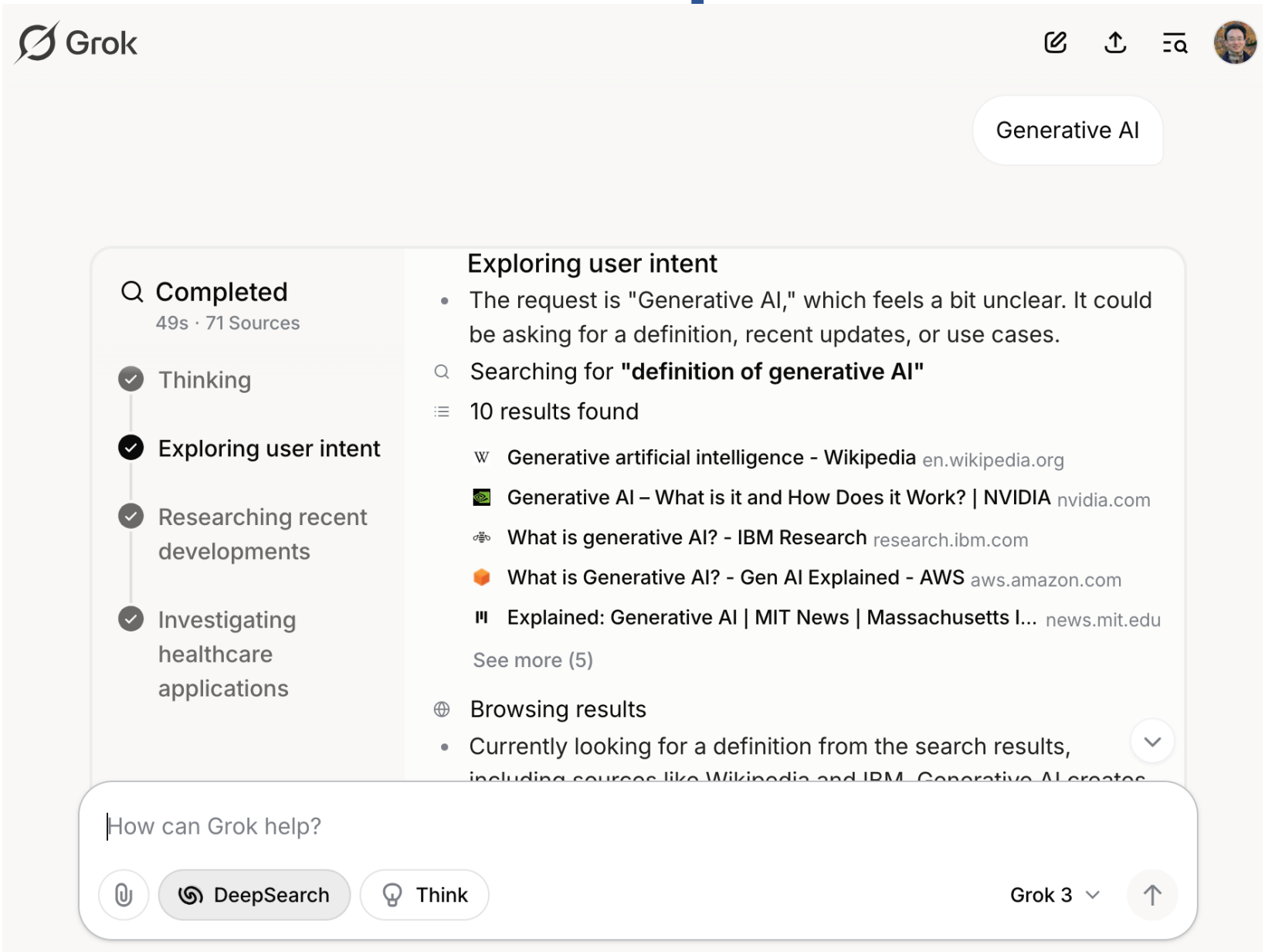
Source: https://developers.googleblog.com/en/introducing-gemma3/

Google AI Studio (Gemma 3 27B)



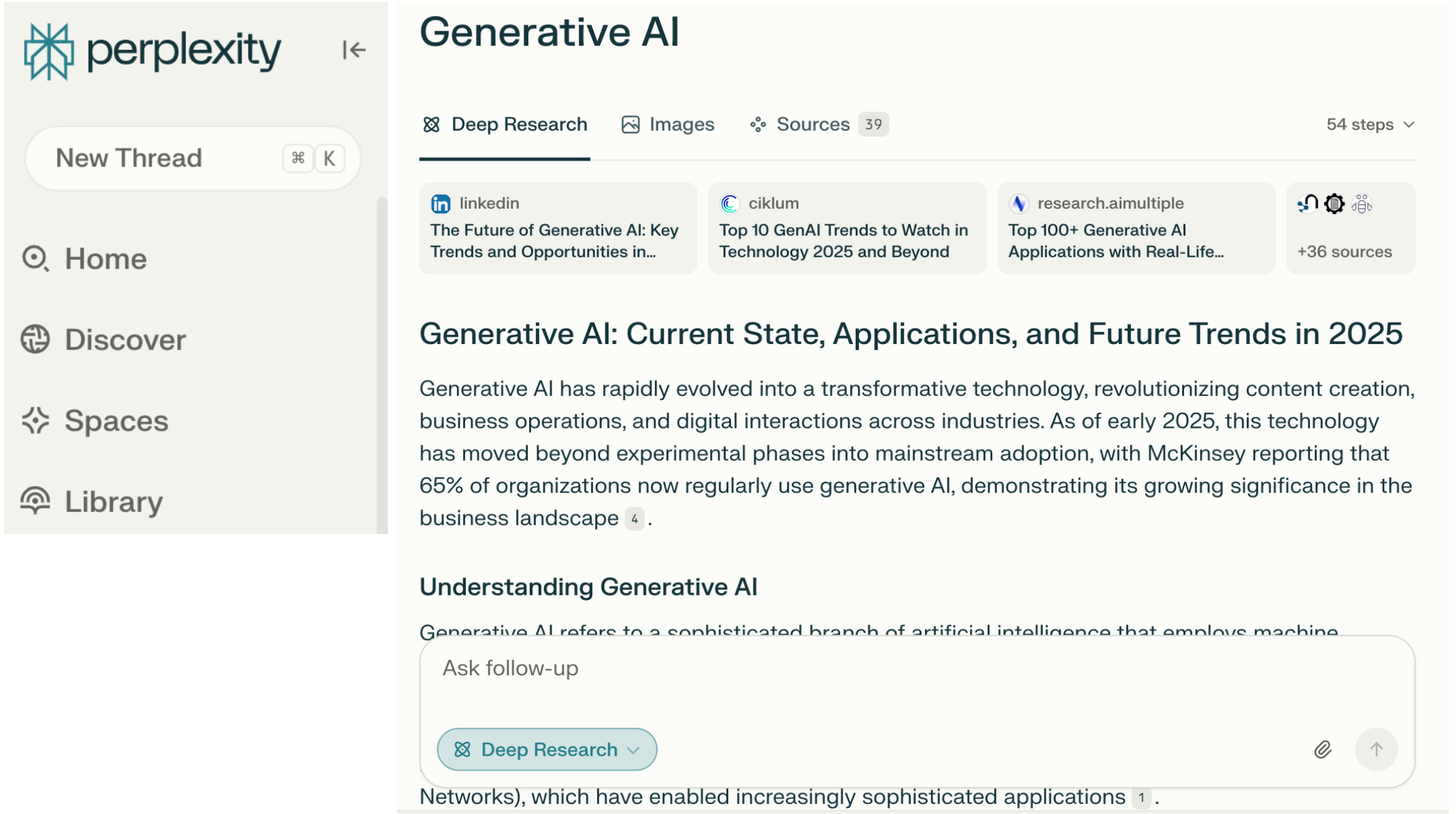
Source: https://aistudio.google.com/

Grok 3 Deep Search



Source: https://grok.com/chat

Perplexity.ai Deep Research

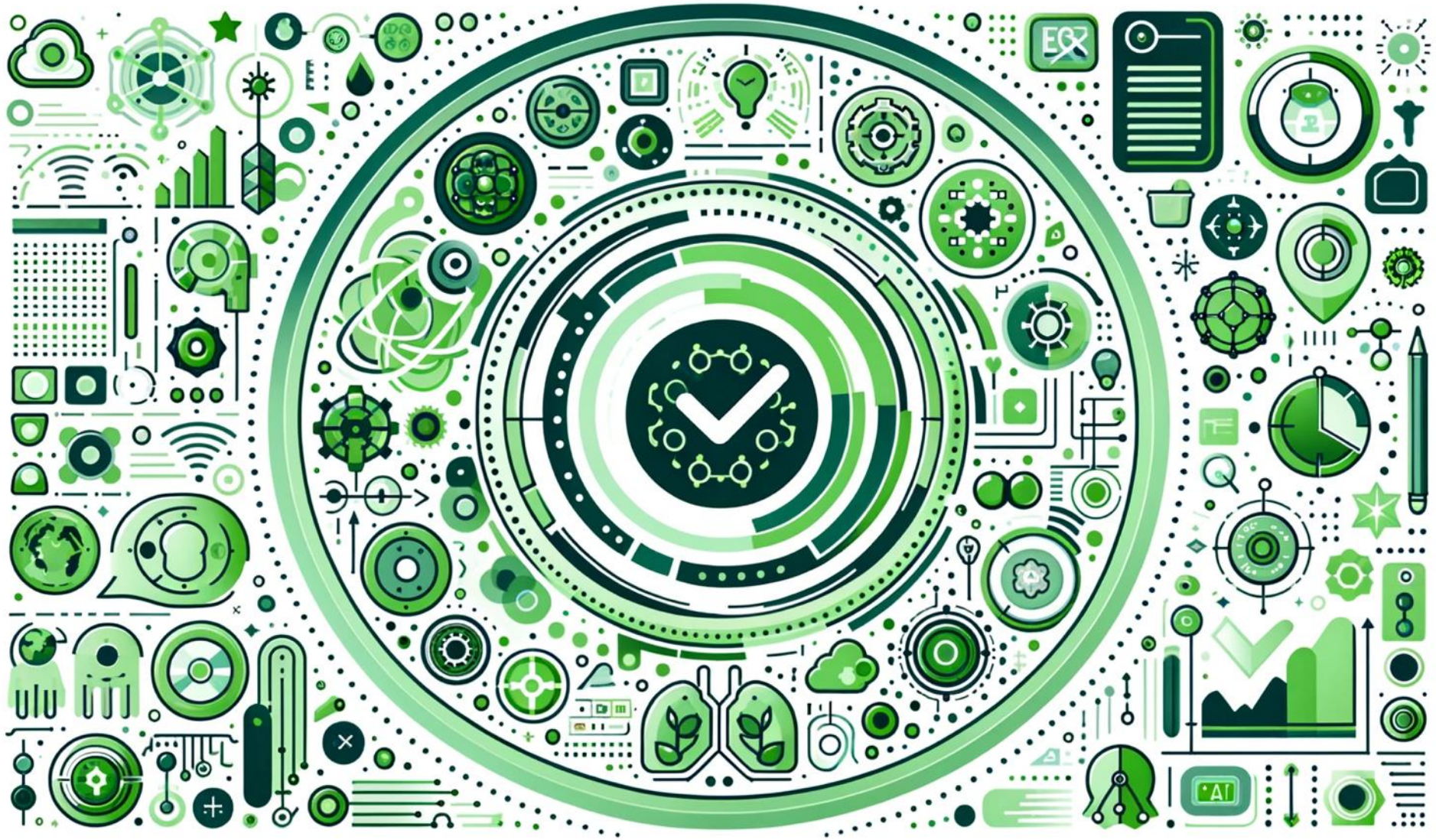


Source: https://www.perplexity.ai/

Generative AI and LLMs for Sustainability and ESG Data Analytics

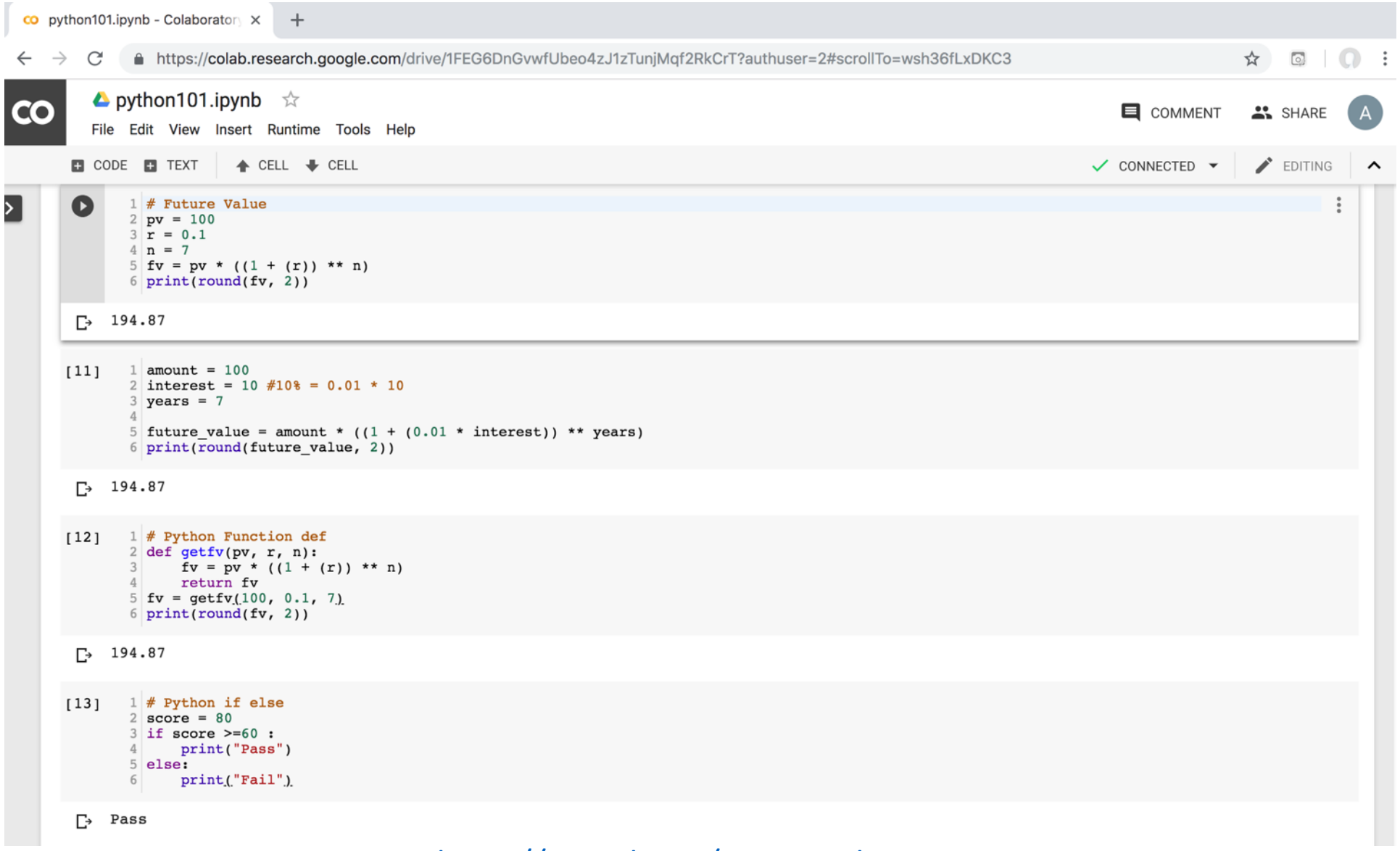
Sustainability and ESG Data Analytics

Generative AI for ESG Rating and Reporting Generation



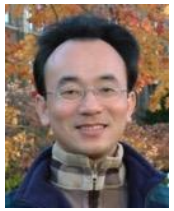
Python in Google Colab (Python101)

https://colab.research.google.com/drive/1FEG6DnGvwfUbeo4zJ1zTunjMqf2RkCrT



https://tinyurl.com/aintpupython101

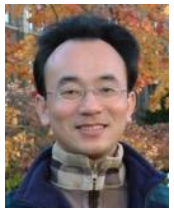
Teaching



- **Artificial Intelligence**
  - Spring 2021, Fall 2022, Fall 2024, Fall 2025
- **Sustainability and ESG Data Analytics**
  - Spring 2024, Fall 2024, Fall 2025
- **Software Engineering**
  - Fall 2020, Fall, 2021, Spring 2022, Spring 2023, Spring 2024, Spring 2025
- **Generative AI Innovative Applications**
  - Spring 2025
- **Artificial Intelligence in Finance and Quantitative**
  - Fall 2021, Fall 2022, Fall 2023, Spring 2025
- **Big Data Analytics**
  - Fall 2020, Spring 2023, Spring 2024
- **Artificial Intelligence for Text Analytics**
  - Spring 2022, Fall 2023
- **Python for Accounting Applications**
  - Fall 2023, Fall 2024, ,Fall 2025
- **Foundation of Business Cloud Computing**
  - Spring 2021, Spring 2022, Spring 2023, Spring 2024

https://web.ntpu.edu.tw/~myday/teaching.htm

Research Projects

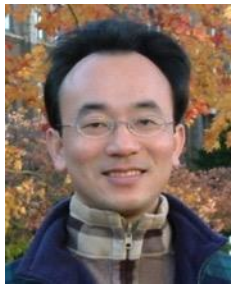


1. **Generative AI Multi-Agent Systems with LLM-Based RAG for ESG Reporting Automation**
   - NSTC (E4104), NSTC 114-2221-E-305-002-, 2025/08/01~2026/07/31
2. **Innovative Agentic AI Technology for Autonomous ESG Report Generation**
   - Industrial Technology Research Institute (ITRI), Fintech and Green Finance Center (FGFC, NTPU), NTPU-114A513E01, 2025/03/01~2025/12/31
3. **Digital Support, Unimpeded Communication: The Development, Support and Promotion of AI-assisted Communication Assistive Devices for Speech Impairment(3/3), Sub-project 3: Multimodal Cross-lingual Task-Oriented Dialogue System for Inclusive Communication Support,**
   - NSTC (HZZ22), NSTC 114-2425-H-305-003-, 3 Years (2023/05/01-2026/04/30) Year 3: 2025/05/01~2026/04/30
4. **Research on speech processing, synthesis, recognition, and sentence construction of people with language disabilities, Sub-project 3: Multimodal Cross-lingual Task-Oriented Dialogue System**
   - NTPU, 114-NTPU_ORDA-F-004, 3 Years (2023/01/01-2025/12/31) Year 3: 2025/01/01~2025/12/31
5. **Development of a Deep Learning for Dental Implant Detection in Panoramic Radiographs,**
   - University System of Taipei Joint Research Program (NTPU, TMU), USTP-NTPU-TMU-114-02, 2025/01/01~2025/12/31

https://web.ntpu.edu.tw/~myday/cindex.htm#projects

Summary

- This course introduces the fundamental concepts and hands-on practices of Python for Accounting Applications.
- Topics include
  1. Introduction to Python for Accounting Applications,
  2. Python Programming and Data Science,
  3. Foundations of Python Programming,
  4. Data Structures,
  5. Control Logic and Loops,
  6. Functions and Modules,
  7. Files and Exception Handling,
  8. Data Analytics and Visualization with Python,
  9. Obtaining Data From the Web with Python,
  10. Statistical Analysis with Python,
  11. Machine Learning with Python,
  12. Text Analytics with Generative AI and Python,
  13. Applications of Accounting Data Analytics with Python, and
  14. Applications of ESG Data Analytics with Python.



NVIDIA University Ambassador Certified Instructor

aws educate Cloud Ambassador 2020 Cohort

aws academy Accredited Educator

aws certified Solutions Architect Associate

aws certified Cloud Practitioner

Python for Accounting Applications

NTPU 國立臺北大學 National Taipei University

AACSB ACCREDITED

Contact Information

Min-Yuh Day, Ph.D.

Professor and Director

Institute of Information Management, National Taipei University

Tel: 02-86741111 ext. 66873

Office: B8F12

Address: 151, University Rd., San Shia District, New Taipei City, 23741 Taiwan

Email: myday@gm.ntpu.edu.tw

Web: http://web.ntpu.edu.tw/~myday/