

Leveraging AI in teaching coding

Generative AI in Finance Education

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Overview

- Importance of coding skills in finance.
- The role of AI in modern education.
- Evolution of Large Language Models (LLMs).

The Importance of Coding Skills in Finance

- Data-driven decision making
 - Finance rely heavily on data analysis
 - Coding enables **efficient data processing and analysis**
- Automation and algorithmic trading
 - Automating repetitive tasks
 - **e.g., developing trading strategies and backtesting trading algorithms**
- Quantitative finance
 - Financial modeling, quantitative strategies, and risk management
 - **e.g., perform simulations, make predictions, solve PDEs**
- Fintech and digital transformation
 - Emerging technologies disrupting the finance industry (**AI/ML/NLP/NLU/NLG**)
 - Developing innovative fintech solutions requires coding (**e.g., integrating these techs into financial applications/services**)
- Enhancing productivity and efficiency
 - Automating manual processes (**e.g., data extraction and integration**) and reporting
 - Building custom tools and applications (**portfolio management, robo-advisors, data visualization...**)
- Compliance and regulatory requirements
 - Coding to meet data reporting and compliance standards (**e.g., RegTech**)
 - Implementing risk monitoring and control systems

Why are these skills important to our students?

- Gain a **competitive edge** in the job market
 - Finance employers increasingly seek candidates with coding abilities
 - Coding skills differentiate job applicants, make them more attractive
- Open up **career opportunities** beyond traditional finance roles
 - quantitative analyst, financial engineer, or fintech developer
 - data scientist/data analyst
 - risk analytics/compliance analyst/RegTech professional
- Enhance **analytical and problem-solving** abilities
 - logical thinking, problem decomposition, breaking down complex problems into smaller, manageable parts
 - debugging code enhances problem-solving abilities
 - all these skills are transferable to financial analysis and decision-making
- Understand and leverage **emerging tech**
 - beyond implementations, actually understand underlying principles and architectures
- Contribute to **innovative financial solutions**
 - Consequently, the above encourages active participation in the development, integration, and customisation tailored to specific financial needs.

Challenges in Learning to Code for (Finance) Students

- Abstract and complex **concepts**
 - Understanding **programming logic**, **data structures**, **algorithms**
 - Mapping finance concepts to code **implementation**
- **Syntax** and language rules
 - Remembering and applying **syntax rules** correctly
 - Dealing with **multiple programming languages** (=confusion)
- Problem-solving and **debugging**
 - Breaking down complex problems into coding solutions
 - Identifying and fixing **errors in code**
- Lack of **engagement and motivation**
 - Traditional teaching methods can be dry and theoretical
 - Difficulty in seeing practical applications in finance
- Time and resource **constraints**
 - Balancing coding with other coursework
 - Limited access to coding **resources/support**
- Transition from **theory to practice**
 - Applying **theoretical knowledge** to real-world coding problems
 - Developing **practical coding skills** and experience

Interview with NVIDIA's CEO

[▶ YouTube clip](#)

World Governments Summit 2024, 12-14 February



- *I'm going to say something, and it's going to sound completely opposite of what people feel. You probably recall, over the course of the last 10-15 years almost everybody who sits on a stage like this would tell you it is vital that your children learn computer science. Everybody should learn how to program. And in fact, it almost exactly the opposite.*
- *It is our job to create computing technology such that nobody has to program. And that the programming language is human.*
- *Everybody in the world is now a programmer. This is the miracle. This the miracle of artificial intelligence. For the very first time, we have closed the gap. The technology divide has been completely closed. And this is reason why so many people can engage artificial intelligence.*

Examples of Generative AI Tools

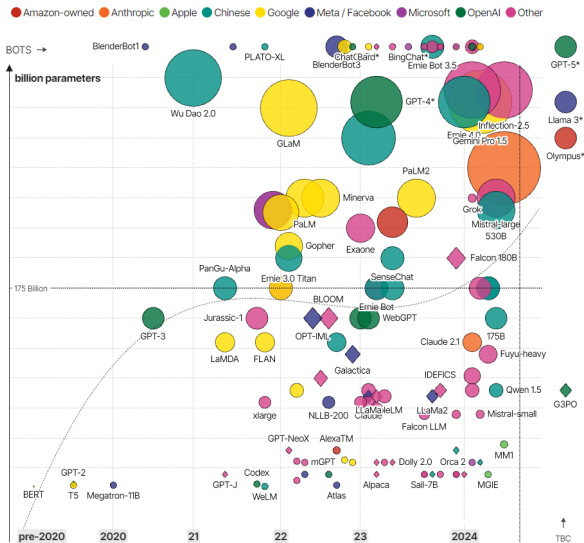
- ChatGPT (OpenAI)
 - <https://chat.openai.com/>
- Claude (Anthropic)
 - <https://claude.ai/chats>
- Gemini (Google)
 - <https://gemini.google.com/app>
- Perplexity
 - <https://www.perplexity.ai/>

There are, of course, many many more... but some may not be ideal for beginners. Comprehensive reviews:

- Best AI Chatbots for Coding in 2024:
<https://www.geeksforgeeks.org/ai-chatbots-for-coding/>
- A few other variants: <https://www.locusive.com/resources/best-generative-ai-tools-and-chatbots-for-coding>

Evolution of Large Language Models (LLMs)

► Explore Interactively



Features to Consider in LLM Code Generators

- **Intelligent Code Completion**
- **Syntax Error Detection**
- **Language Support**
- **Integration**
 - with popular programming environments and IDEs like Visual Studio Code or GitHub
- **Learning and Adaptation**
 - Gradually learn and adapt to a user's unique coding preferences over time, providing more personalised suggestions
- **Code Refactoring**
 - Models that offer code refactoring suggestions can help improve the overall quality of code = more effective learning

ChatGPT and AI guides

The better title:
“AI Conversations:
Yesterday’s News
Today”

Some of the top
sellers:



Dymocks on Collins st

Writing Effective Prompts

- Be specific about the task and desired outcome.
- Use clear and concise language.
- Iterate and refine prompts to improve responses.

Example: include in your session an icebreaker for students.

Prompt Engineering Resources

- Anthropic Prompt Library
 - <https://docs.anthropic.com/en/prompt-library/library>
- AI Workbook by Bron Eager (UTAS)
 - <https://broneager.com/workbook>

AI-aided prompt solution:

- Prompt Wizard [▶ My example](#)
 - <https://chatgpt.com/g/g-D5BXGtreN-prompt-wizard>

Benefits of Using LLMs in Teaching Coding

- Personalized learning experience.
- Immediate feedback and assistance.
- Bridging the gap between theory and practice.

Integrating LLMs into the Curriculum

- Incorporating LLM tools in coding assignments.
- Designing exercises that leverage LLM capabilities.
- Examples of AI-assisted projects.
 - Building a stock trading bot or algorithmic trading system.
 - Developing a financial data interactive visualization dashboard.
 - Creating a risk management application for implementing risk models, simulations, and scenario analysis.
 - Building a robo-advisor or personal finance management tool.
- Instructors can act as **facilitators**, guiding students on how to
 - effectively utilise LLMs,
 - providing context and domain-specific knowledge, and
 - addressing higher-level conceptual understanding.

Addressing Challenges and Limitations

- Dependence on AI and ensuring foundational knowledge.
- Lack of understanding of the generated code.
- Potential biases in AI-generated code.
- Ensuring academic integrity.
- Promoting responsible AI practices in education.

Additional Tools

futuretools - collects and organizes AI tools.

- <https://http://futuretools.io/>

Convert Anything - Converts files into different formats.

- <https://chatgpt.com/g/g-kMKw5tFmB-convert-anything>

Video Tutor - Tutors you based on chosen YouTube videos in any language. Generates educational summaries, articles, quizzes, diagrams and answers questions. Paste the link to any YouTube video, and this GPT outputs a useful, concise summary of it. The best part is that you can also drill down into certain aspects and parts of the video if you need more detail.

- <https://chatgpt.com/g/g-GvcYCKPIH-video-tutor>

beautiful ai - presentations in minutes.

- <https://www.beautiful.ai/>

Q&A

Questions?
Suggestions?
Your experience?
Discussion?



No-Code AI and ML solutions



Altair RapidMiner Data Analytics and AI Platform makes Machine Learning processes very easy and efficient to use with its vast number of plugins and data analysis techniques. You can do everything from providing multiple data sets to model deployment through this platform.

Web: <https://altair.com/altair-rapidminer>

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No-Code AI and ML solutions



Ikigai is a no-code tool used to build Data Science workflows and visualizations through modular functional blocks. It helps you drag and drop to build workflows involving different data sources. This tool allows humans to make decisions and then view the results in an AI-charged dashboard/spreadsheet.

Web: <https://www.ikigailabs.io/>

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No-Code AI and ML solutions

The logo for Teachable Machine, featuring the words "Teachable" and "Machine" in a blue, sans-serif font, stacked vertically.

Teachable Machine enables professionals to employ cutting-edge technologies like Computer Vision and Deep Learning without having to write a single line of code. Make smart predictions with your customer data and design winning solutions. It also offers good integration with Google Drive and Google's TensorFlow Deep Learning library.

Web: <https://teachablemachine.withgoogle.com/>

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No-Code AI and ML solutions



Dataiku is a No Code Data Science platform that enables teams to build data products without coding. It automates the entire Data Science workflow, from preparation to deployment, using a visual interface and pre-built connectors to data storage systems and cloud platforms.

Web: <https://www.ikigailabs.io/>

Applications:

<https://www.dataiku.com/solutions/banking/>

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No-Code AI and ML solutions



KNIME is a No Code platform for data analytics that enables visual pipeline building. It features pre-built nodes for processing, analysis, and visualization, and allows drag-and-drop pipeline construction. KNIME also has a marketplace for community-contributed extensions and integrations.

Web: <https://www.knime.com/>

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