CPF: A New Era

Become a Super Quant with Reproducible, Production-Grade Skills

Dr. Yves J. Hilpisch

The Python Quants GmbH

CPF Program

The World Our Programs Prepare You For

On the one hand

- Darkening outlook for many white-collar roles as automation pressure rises.
- Entry-level and junior opportunities shrinking in traditional analyst and developer tracks.
- Rapid advances in GenAI, agents, and automation compressing mid-skill tasks into software.

On the other hand

- Companies investing billions in AI infrastructure, data platforms, and crypto rails.
- Experienced professionals with production-grade skills see outsized productivity and compensation.
- As capital spending on technology grows, true experts capture a disproportionate share of the value.

What this means for you

The gap between generic credentials and real capabilities is widening: recent "safe bets" such as CS or finance degrees no longer guarantee durable opportunities when AI innovation cycles outpace academic cycles. The practical way to stay on the right side of this shift is focused upskilling and mastery of key technologies like Python, AI, and crypto — the core dimensions our programs are built around.

How This Session Works

- You will learn about the specifics and common features of the CPF, TAE, and TCE programs.
- The focus is on what you get, who benefits most, and how to choose the right program (or bundle).
- The session highlights the fully revamped Core Track of the CPF and what our programs share in terms of approach and learning experience.

Our Programs Are for You ...

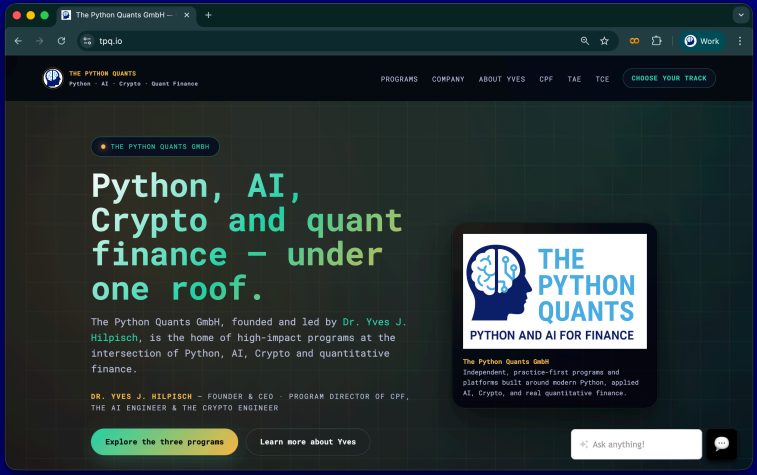
... if you are excited about quantitative finance and algorithmic trading, enthusiastic about the potential of AI, and curious about crypto technologies — and want a coherent path that links CPF, TAE, and TCE.

Agenda

1. The Python Quants (TPQ)
2. Three Programs in Comparison
3. Certificate in Python for Finance (CPF)
4. The AI Engineer (TAE)
5. The Crypto Engineer (TCE)
6. Common Features (Across Programs)

The Python Quants (TPQ)

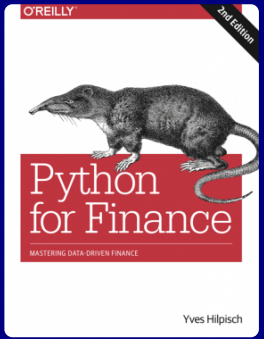
The Python Quants

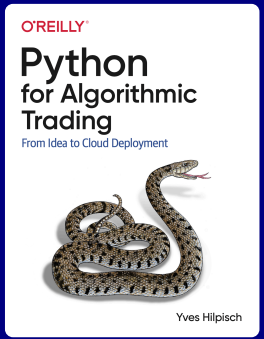


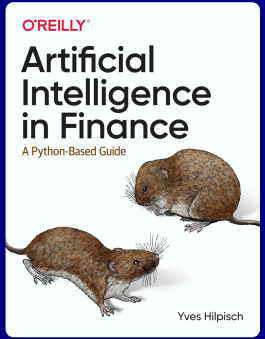
The Python Quants in 60 Seconds

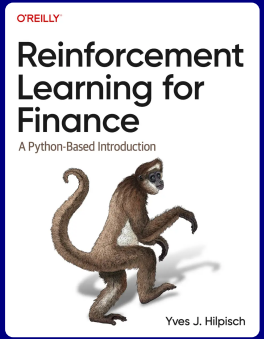
- Independent, practice-first education company led by Dr. Yves J. Hilpisch.
- Three coherent programs: CPF, TAE, TCE (plus bundle option).
- A single learning philosophy: books as the basis, guided practice, real code, real workflows.
- 7 Python & AI for Finance books published (5x O'Reilly, 2x Wiley).
- 1,000s of academics & professionals trained live and online.
- Corporate training for leading institutions (Citadel, Two Sigma, PDT Partners, and more).
- 20 years of Python & AI for quantitative finance.

Python & AI for Finance Books (I)

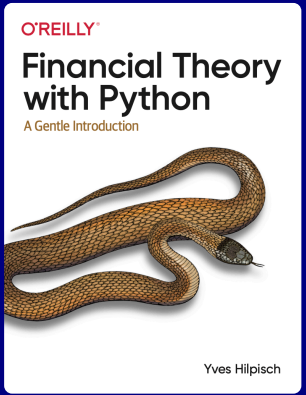


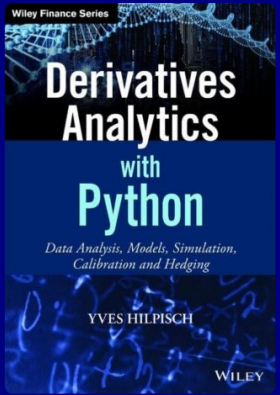


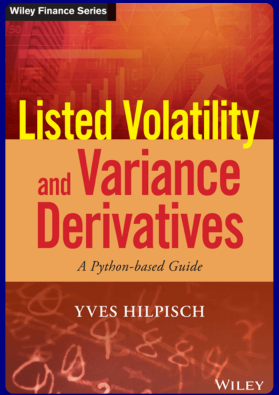




Python & AI for Finance Books (II)

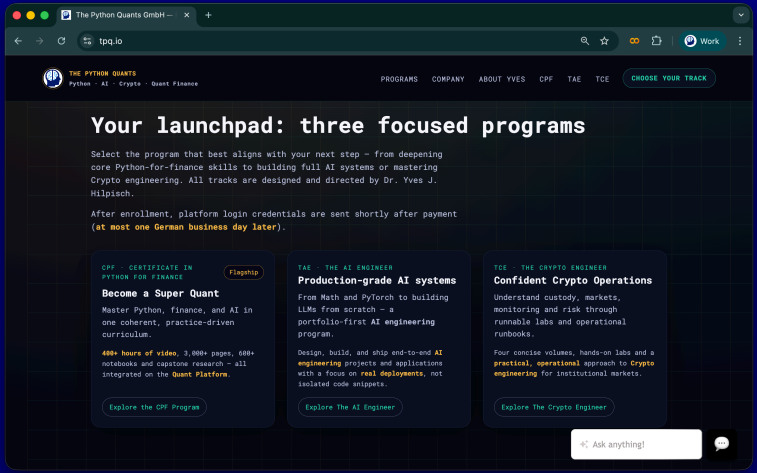






Three Programs in Comparison

Three Programs in Comparison



https://tpq.io

CPF vs TAE vs TCE (High-Level Comparison)

"Professional Processes and Best Practices at Every Step."

	CPF	TAE	TCE
Outcome	Become a Super Quant (Python + finance + AI)	Build production-grade AI systems (LLMs, agents)	Engineer crypto systems with confidence (custody, markets, ops)
Best for	Quants, finance professionals, analysts, career changers	Engineers/ML practitioners building real AI apps	Builders, risk/ops leads, quants touching crypto rails
Core coverage	Quant research + data + pricing + investing + trading + applied AI	PyTorch, LLMs, agents, deployment patterns	Primitives, Bitcoin, market plumbing, monitoring, runbooks

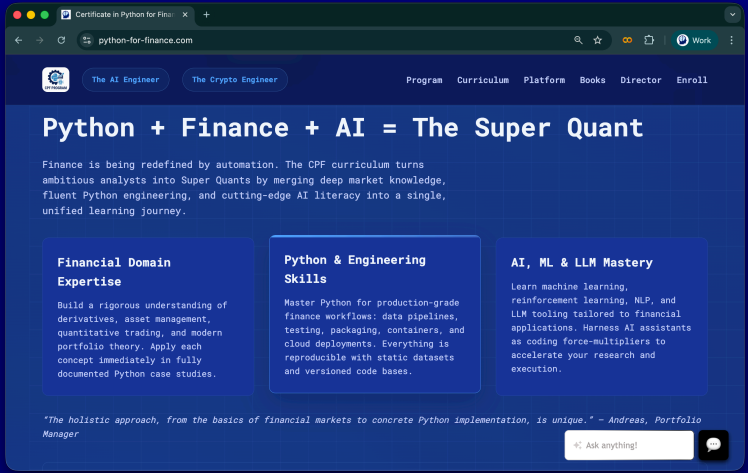
CPF vs TAE vs TCE: Hard Facts

	CPF	TAE	TCE
Books/key PDFs (count)	7 published + 2 unpublished books	8+ custom textbooks and docs	4 books + 17 notes PDFs
Docs/books pages (approx.)	3,000+ pages across books and program PDFs	1,250+ pages of engineering docs and textbooks	341+ book & 100+ notes pages
Jupyter notebooks	600+ notebooks integrated with the CPF curriculum	100+ Colab-ready notebooks for AI engineering	51 notebooks tightly linked to the TCE books
Code/scripts	Full research and trading code embedded in 600+ notebooks	300+ Python scripts for models, agents, and tooling	30 scripts plus runnable labs for custody, markets, and monitoring

CPF core track (fully revamped): 61 PDFs, 2,903 pages.
Text: 29 files, 1,968 pages; Slides: 32 files, 935 pages.

Certificate in Python for Finance (CPF)

Certificate in Python for Finance (CPF)



https://python-for-finance.com

CPF: Content, Target Groups, Benefits

This is the flagship program for quantitative finance with Python — designed to turn motivated learners into confident practitioners with reproducible, production-grade workflows.

What it covers

- Python for finance workflows, data engineering, reproducible research, applied AI in finance.
- Focus on Financial Theory, Asset Management, Algorithmic Trading, and Computational Finance.

Who benefits most

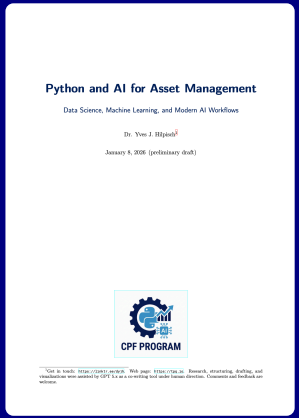
- Finance professionals, quants, analysts, researchers, lecturers, career changers, students.

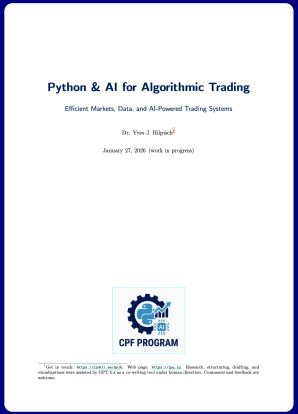
Why it matters now

- Quantitative finance is increasingly based on Python, driven by AI, and influenced by crypto — CPF delivers on all three dimensions.
- The GenAI era rewards teams that can combine domain depth with reproducible, production-grade execution.

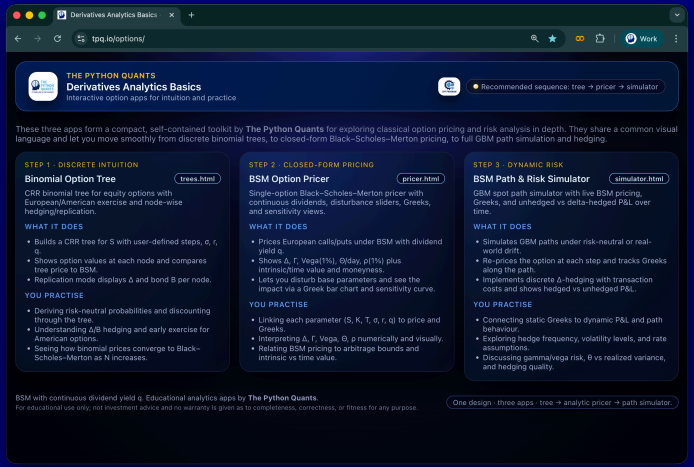
CPF: New Books (200+ Pages Each)

Brand-new resources for the GenAI era in quantitative finance.

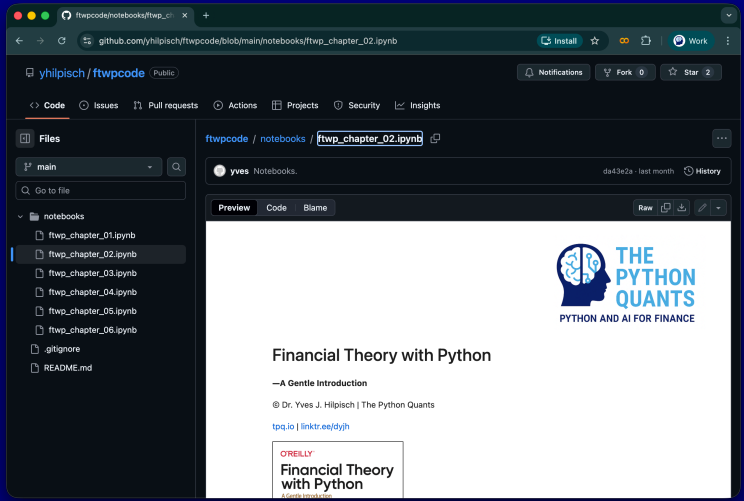




CPF: New Options Simulator Apps



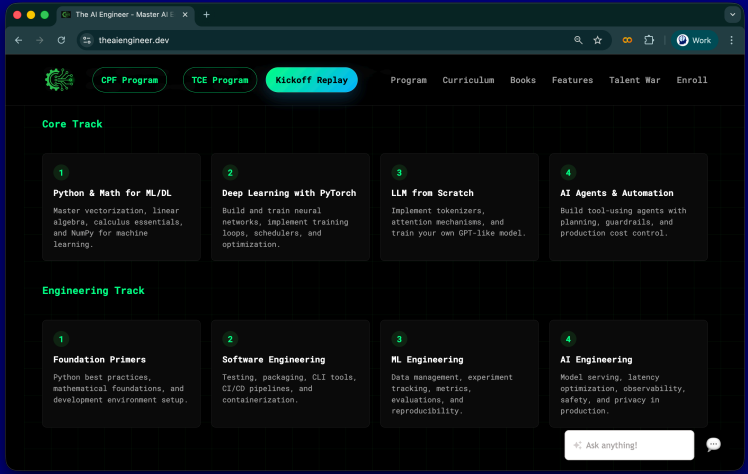
CPF: Sample GitHub Repository



https://github.com/yhilpisch/ftwpcode

The AI Engineer (TAE)

The AI Engineer (TAE)



https://theaiengineer.dev

TAE: Content, Target Groups, Benefits

This program is the fastest path from foundations to shipping: you build real AI systems (LLMs, agents, tooling) with an engineering-first, portfolio-driven approach.

What it covers

- Math + PyTorch foundations, LLMs, agents, and production-grade AI engineering patterns.
- Focus on Deep Learning, LLM Engineering, AI Agents, and Production AI Systems.

Who benefits most

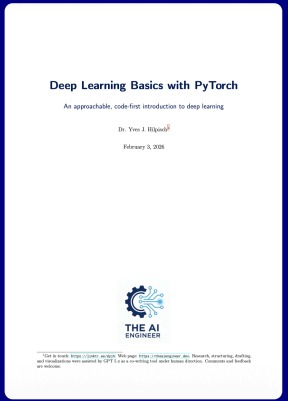
- Engineers and practitioners building real AI systems (including finance/quant contexts).

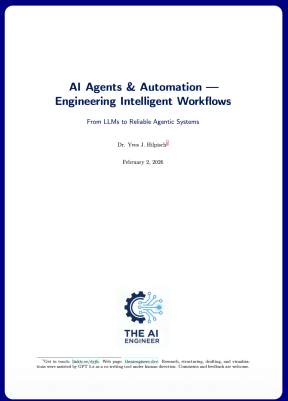
Why it matters now

- AI engineering is among the highest-paid skills in 2026 — and demand is still accelerating.
- Shipping AI reliably is an engineering problem; TAE focuses on end-to-end systems and portfolios.

Books about DL, LLMs, and AI Agents

Three focused books that support deep learning, LLM, and AI agent work across the TAE program (7 books total).





The Crypto Engineer (TCE)

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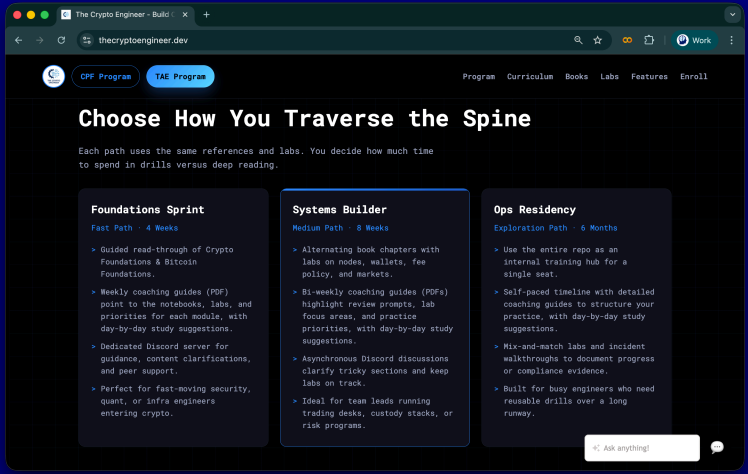


https://thecryptoengineer.dev

TCE: Content, Target Groups, Benefits

This program bridges crypto theory to operational confidence: the goal is to help you reason about custody, markets, and live systems under real constraints.

What it covers

- Crypto primitives, Bitcoin foundations, markets/data plumbing, and production operations (monitoring/runbooks).
- Focus on Custody & Wallet Ops, Bitcoin Infrastructure, Market Data Pipelines, and Monitoring/Runbooks.

Who benefits most

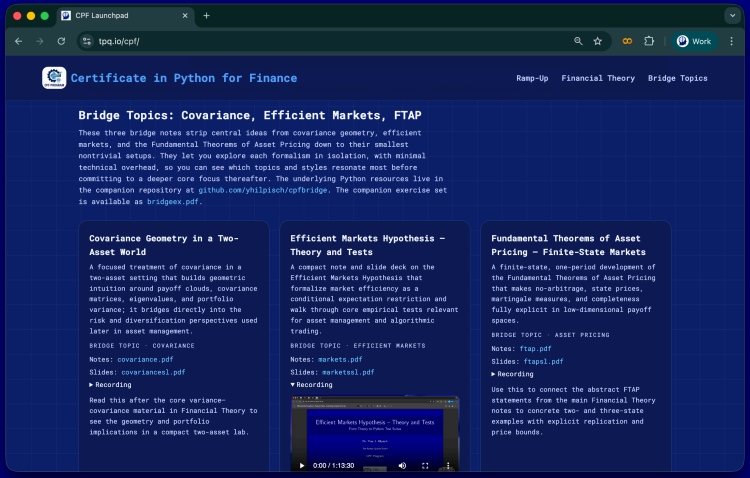
- Builders, quants, and teams operating crypto rails (custody, markets, risk, compliance interfaces).

Why it matters now

- Beyond hype, speculation, and scandals, crypto requires production-focused skills for custody, markets, and operations.
- Institutions need operational confidence; TCE bridges theory to incident-ready practice.

Common Features (Across Programs)

Common Features



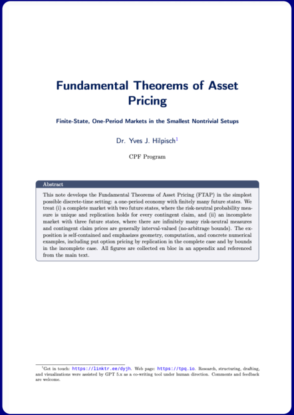
Common Features (Learning Assets & Guidance)

These features are shared across CPF, TAE, and TCE — they keep learning coherent, fast, and oriented around real outcomes.

- Launchpads (fast onboarding + a single place for resources)
- Books as the basis (coherent reference layer)
- GitHub repositories with Colab-ready notebooks and code
- Recorded sessions (CPF, TAE)
- Slide decks for sessions and high-level summaries
- Weekly/bi-weekly coaching guides (with day-by-day study suggestions)
- Exercises and capstones per class (portfolio + real competence signal)
- Community and support (Discord + clarifications + accountability)

Detailed Theoretical Notes & Books

For every core class, you get detailed theoretical notes/books that cover the key financial and mathematical concepts beyond the Python and AI coding work.



Fundamental Theorems of Asset Pricing

Finite-State, One-Period Markets in the Smallest Nontrivial Setups

Dr. Yves J. Hilpisch[1]

CPF Program

Abstract

This note develops the Fundamental Theorems of Asset Pricing (FTAP) in the simplest possible discrete-time setting: a one-period economy with finitely many future states. We treat (i) a complete market with two future states, where the risk-neutral probability measure is unique and replication holds for every contingent claim, and (ii) an incomplete market with three future states, where there are infinitely many risk-neutral measures and contingent claim prices are generally interval-valued (no-arbitrage bounds). The exposition is self-contained and emphasizes geometry, computation, and concrete numerical examples, including put option pricing by replication in the complete case and by bounds in the incomplete case. All figures are collected en bloc in an appendix and referenced from the main text.

[1]Get in touch: https://linktr.ee/dyjh. Web page: https://tpq.io. Research, structuring, drafting, and visualizations were assisted by GPT 5.x as a co-writing tool under human direction. Comments and feedback are welcome.

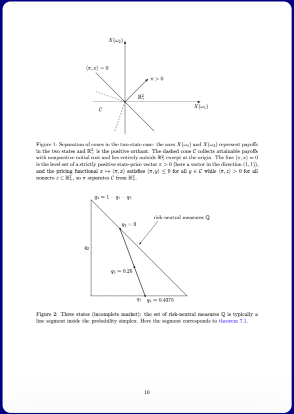


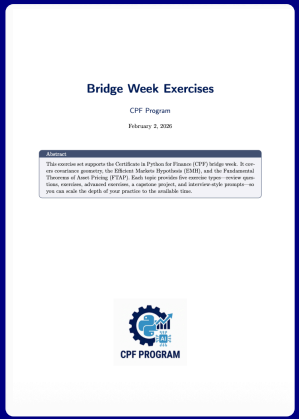
Figure 1: Separation of cones in the two-state case: the axes $X(\omega_1)$ and $X(\omega_2)$ represent payoffs in the two states and $\mathbb{R}^2_+$ is the positive orthant. The dashed cone $\mathcal{C}$ collects attainable payoffs with nonpositive initial cost and lies entirely outside $\mathbb{R}^2_+$ except at the origin. The line $\langle \pi, x \rangle = 0$ is the level set of a strictly positive state-price vector $\pi > 0$ (here a vector in the direction $(1,1)$), and the pricing functional $x \mapsto \langle \pi, x \rangle$ satisfies $\langle \pi, y \rangle \leq 0$ for all $y \in \mathcal{C}$ while $\langle \pi, z \rangle > 0$ for all nonzero $z \in \mathbb{R}^2_+$, so π separates $\mathcal{C}$ from $\mathbb{R}^2_+$.

Figure 2: Three states (incomplete market): the set of risk-neutral measures $\mathbb{Q}$ is typically a line segment inside the probability simplex. Here the segment corresponds to theorem 7.1.

10

Comprehensive Exercise Sets

Every core class comes with comprehensive exercise sets for nearly every chapter/topic: review questions, standard exercises, advanced exercises, capstone tasks, and interview-style questions.



Bridge Week Exercises

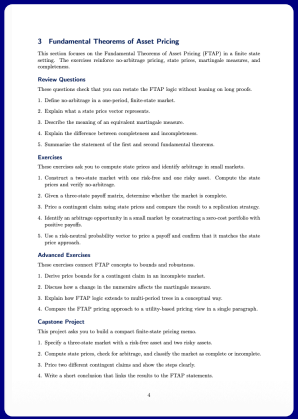
CPF Program

February 2, 2026

Abstract

This exercise set supports the Certificate in Python for Finance (CPF) bridge week. It covers covariance geometry, the Efficient Markets Hypothesis (EMH), and the Fundamental Theorems of Asset Pricing (FTAP). Each topic provides five exercise types—review questions, exercises, advanced exercises, a capstone project, and interview-style prompts—so you can scale the depth of your practice to the available time.

CPF PROGRAM



3 Fundamental Theorems of Asset Pricing

This section focuses on the Fundamental Theorems of Asset Pricing (FTAP) in a finite state setting. The exercises reinforce no-arbitrage pricing, state prices, martingale measures, and completeness.

Review Questions

These questions check that you can restate the FTAP logic without leaning on long proofs.

1. Define no-arbitrage in a one-period, finite-state market.
2. Explain what a state price vector represents.
3. Describe the meaning of an equivalent martingale measure.
4. Explain the difference between completeness and incompleteness.
5. Summarise the statement of the first and second fundamental theorems.

Exercises

These exercises ask you to compute state prices and identify arbitrage in small markets.

1. Construct a two-state market with one risk-free and one risky asset. Compute the state prices and verify no-arbitrage.
2. Given a three-state payoff matrix, determine whether the market is complete.
3. Price a contingent claim using state prices and compare the result to a replication strategy.
4. Identify an arbitrage opportunity in a small market by constructing a zero-cost portfolio with positive payoffs.
5. Use a risk-neutral probability vector to price a payoff and confirm that it matches the state price approach.

Advanced Exercises

These exercises connect FTAP concepts to bounds and robustness.

1. Derive price bounds for a contingent claim in an incomplete market.
2. Discuss how a change in the numeraire affects the martingale measure.
3. Explain how FTAP logic extends to multi-period trees in a conceptual way.
4. Compare the FTAP pricing approach to a utility-based pricing view in a single paragraph.

Capstone Project

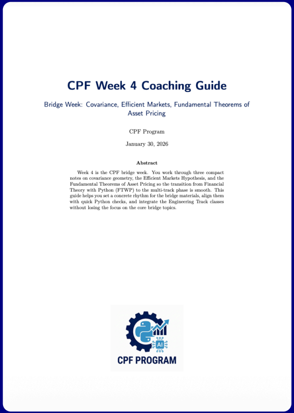
This project asks you to build a compact finite-state pricing memo.

1. Specify a three-state market with a risk-free asset and two risky assets.
2. Compute state prices, check for arbitrage, and classify the market as complete or incomplete.
3. Price two different contingent claims and show the steps clearly.
4. Write a short conclusion that links the results to the FTAP statements.

4

Coaching Guides Across Programs

All programs (CPF, TAE, TCE) include weekly and bi-weekly coaching guides with clear, day-by-day study plans; below are CPF and TAE examples.



CPF Week 4 Coaching Guide

Bridge Week: Covariance, Efficient Markets, Fundamental Theorems of Asset Pricing

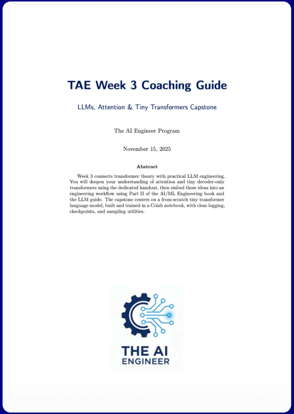
CPF Program

January 30, 2026

Abstract

Week 4 is the CPF bridge week. You work through three compact notes on covariance geometry, the Efficient Markets Hypothesis, and the Fundamental Theorems of Asset Pricing so the transition from Financial Theory with Python (FTWP) to the multi-track phase is smooth. This guide helps you set a concrete rhythm for the bridge materials, align them with quick Python checks, and integrate the Engineering Track classes without losing the focus on the core bridge topics.

CPF PROGRAM



TAE Week 3 Coaching Guide

LLMs, Attention & Tiny Transformers Capstone

The AI Engineer Program

November 15, 2025

Abstract

Week 3 connects transformer theory with practical LLM engineering. You will deepen your understanding of attention and tiny decoder-only transformers using the dedicated handout, then embed these ideas into an engineering workflow using Part II of the AI/ML Engineering book and the LLM guide. The capstone centers on a from-scratch tiny transformer language model, built and trained in a Colab notebook, with clear logging, checkpoints, and sampling utilities.

THE AI ENGINEER

Contact and Links

Dr. Yves J. Hilpisch

The Python Quants GmbH

Email:	team@tpq.io
CPF Program:	python-for-finance.com
TAE Program:	theaiengineer.dev
TCE Program:	thecryptoengineer.dev
Linktree:	linktr.ee/dyjh