

DeepSeek AI from Beginner to Paid Professional



Part 1

Master DeepSeek with Hands-On Practice,
Real-World Applications and Scalable AI Solutions

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Table of Contents

1. Introduction to DeepSeek AI.....	4
1.1. DeepSeek’s Meteoric Rise: The AI Disruptor No One Saw Coming.....	4
1.1.1. What Sets DeepSeek Apart?	4

1. Introduction to DeepSeek AI

Welcome to Part 1 of *DeepSeek AI from Beginner to Paid Professional*! In this installment, we dive into DeepSeek, a cutting-edge platform that is revolutionizing the way we build, deploy, and scale AI solutions. Whether you're a beginner taking your first steps into generative AI or an intermediate learner looking to deepen your expertise, this part of the series will equip you with the hands-on skills and practical knowledge to master DeepSeek and create deployable AI applications.

Before we dive in, I highly recommend checking out my previous book, *DeepSeek AI: Technofeudalism, Capitalism, and the New Cold War*. It's available online at major retailers like Amazon, IngramSpark, Barnes & Noble, Apple Books, and Google Play Books. The book provides a thought-provoking exploration of the broader implications of AI technologies like DeepSeek, examining their impact on global economies, political systems, and the future of work.

It's an essential read for anyone who wants to understand not just *how* to use AI, but *why* it matters in the context of today's rapidly evolving world. By understanding the societal and ethical dimensions of AI, you'll be better equipped to create solutions that are not only innovative but also responsible and impactful.

Now, let's embark on this exciting journey to master DeepSeek, where you'll learn through step-by-step projects, real-world applications, and scalable AI solutions. Whether you're building your first AI model or deploying advanced systems in production, this part of the series will empower you to turn your ideas into reality. Let's get started!

1.1. DeepSeek's Meteoric Rise: The AI Disruptor No One Saw Coming

Step aside, OpenAI! There's a new AI powerhouse shaking up the tech world. DeepSeek has gone from an underdog to a market-shifting phenomenon, making headlines and sending shockwaves through Silicon Valley. In a jaw-dropping twist, its latest AI breakthroughs have even wiped close to \$1 trillion off major tech stocks. If that's not a statement, what is?

But how did this relatively unknown AI company from China suddenly become *the* name on everyone's lips? Let's rewind and unravel the thrilling journey of DeepSeek—because this story could give a sci-fi blockbuster a run for its money.

1.1.1. What Sets DeepSeek Apart?

Cost Efficiency: DeepSeek is rewriting the AI rulebook by training its models at just 1/30th of the usual cost, thanks to smarter hardware optimization and a laser focus on essentials.

Open-Source Advantage: Unlike its competitors, DeepSeek is betting on openness. Developers worldwide can tweak and improve its models, fueling rapid innovation.

Viral Success: The DeepSeek app isn't just competing—it's dominating. It has even outpaced ChatGPT in app store rankings, proving that users are taking notice.

Performance Powerhouse: Benchmarks show that DeepSeek's models are outpacing industry giants like OpenAI's GPT-4o and Anthropic's Claude Sonnet 3.5 in several key areas.

Next-Level AI Techniques: DeepSeek isn't just following trends—it's setting them. Cutting-edge methods like *Auxiliary-Loss-Free Load Balancing* and *Low-Rank Key-Value Joint Compression* boost efficiency while keeping costs low. The two terms are explained below.

1. Auxiliary-Loss-Free Load Balancing

This technique optimizes how computational tasks are distributed across AI model components without relying on additional loss functions. Traditional load balancing often introduces auxiliary loss terms to guide resource allocation, which can slow down training and inference. By eliminating the need for these extra loss terms, DeepSeek ensures that resources are efficiently utilized while maintaining high performance and stability.

2. Low-Rank Key-Value Joint Compression

This method reduces the memory and computational load in transformer-based AI models by compressing key-value (KV) pairs using low-rank approximations. Transformers rely on storing large amounts of KV data for attention mechanisms, which can be resource-intensive. By applying low-rank matrix techniques, DeepSeek significantly reduces storage and computational overhead while preserving model accuracy, making AI processing more efficient.

Reinforcement Learning for the Win: By integrating reinforcement learning, DeepSeek continuously refines its models, improving accuracy without guzzling resources.

Multimodal Mastery: Whether it's text, vision, or code, DeepSeek is proving its versatility, tackling multiple AI domains with impressive ease.

Shaping the Future: The AI industry is watching closely. DeepSeek's efficiency-driven approach might just be the blueprint for the next wave of AI innovation.

But DeepSeek didn't get here overnight. Let's take a deep dive into its evolution and see how it became a global AI game-changer.

Table 1.1: Evolution of DeepSeek from 2023 to 2025

Year	Model Name	Key Features & Improvements
2023	DeepSeek Coder	Specialized in code generation, focused on programming tasks.
2023	DeepSeek LLM	First general-purpose language model, expanded beyond coding.
2024	DeepSeek V2	Improved NLP and reasoning capabilities, enhanced efficiency
2024	DeepSeek Coder V2	DeepSeek Coder V2 with 236B parameters, a significant advancement over the initial DeepSeek Coder model, leverages base models such as Qwen2.5-Math-7B and Llama-3.1-8B.
2024	DeepSeek V3	Introduced mixture of experts (MoE) and long-context support.
2025	DeepSeek R1-Zero	Used reinforcement learning (RL) only, minimizing fine-tuning costs. 671Billion total parameters, 37Billion activated parameters.
2025	DeepSeek R1	Fully optimized reasoning-focused model with distilled variants for flexibility. Matched OpenAI's models in performance