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Pydantic AI Training

2 days (14 hours)

Overview

Pydantic AI is a Python framework for designing reliable, strongly typed, production-ready generative AI agents. With its tools, structured outputs, validated dependencies, and observability, it enables you to build robust and maintainable business assistants.

Our Pydantic AI training will take you beyond the basics to master the practical challenges of agent design, model integration, and output control.

You'll learn how to structure an agent using Python and Pydantic, manage dependencies, orchestrate tool calls, and secure data exchanges with explicit data schemas.

By the end of the course, you'll be able to build more reliable agent-based workflows, validate responses, reduce runtime errors, and prepare a codebase ready for use in a professional environment.

This course also covers best practices for testing, traceability, evaluation, and industrialization to ensure the long-term reliability of your generative AI projects.

Like all our training courses, this one will introduce you to **the latest stable version** of the technology and its new features.

Objectives

- Understand the architecture and use cases of Pydantic AI.
- Create an agent using Python, Pydantic, and structured outputs.
- Set up tools and typed dependencies to manage interactions.
- Manage validations, errors, retries, and business safeguards.

- Ensure more robust operation through testing, observability, and production best practices.

Target Audience

- Python Developer
- AI Engineer
- Data Engineer
- Software Architect
- Tech Lead

Requirements

- Proficiency in the fundamentals of Python and object-oriented programming.
- Knowledge of Pydantic principles or data validation.
- Basic understanding of APIs and JSON exchanges.
- Previous experience with generative AI services or large language models (LLMs).
- Ability to read code and work in a Python development environment.

Technical Requirements

- A recent computer with sufficient resources to run Python 3.10+ projects.
- Installed development environment, such as VS Code or an equivalent IDE.
- A functional package manager, such as uv or pip, depending on the work context.
- Stable Wi-Fi or Ethernet connection for online exercises and model calls.
- For remote training, a working microphone and headset for collaborative workshops.

Pydantic AI Training Program

[Day 1 - Morning]

Foundations of Pydantic AI

- Positioning of the framework within the generative and agent-based AI ecosystem.
- Design principles for a reliable, typed, and production-ready agent.
- Pydantic's role in validation, serialization, and the security of data exchanges.
- Overview of essential building blocks, models, tools, dependencies, and structured outputs.
- First hands-on experience with a Python project structured around an agent.
- Hands-on workshop: Create a minimal agent and execute a simple interaction with output validation.

[Day 1 - Afternoon]

Models, Dependencies, and Tools

- Selecting and configuring a model based on the use case and technical constraints.
- Using dependencies to inject context, configuration, and external services.
- Declaring tools to connect the agent to business functions.
- Managing inputs and outputs with typed schemas and structured responses.
- Strategies for handling errors, retries, and non-compliant cases.
- Hands-on workshop: Connecting an agent to multiple business tools and securing responses with typed models.

[Day 2 - Morning]

Orchestration and

Robustness

- Building more advanced agent-based workflows with chained steps.
- Managing the conversation context and states necessary for reasoning.
- Best practices for minimizing hallucinations and keeping responses on track.
- Advanced validation of results, normalization, and handling of failure cases.
- Introduction to testing and evaluation mechanisms to ensure reliable behavior.
- Hands-on workshop: Designing a multi-step agent workflow with validation checks and error handling.

[Day 2 - Afternoon] Scaling and

Observability

- Structuring a project ready for maintenance and evolution.
- Introduction to observability and execution monitoring.
- Call traceability, behavior analysis, and anomaly detection.
- Organizing tests, datasets, and acceptance criteria.
- Best practices for preparing a more robust deployment in a production environment.
- Hands-on workshop: finalizing a mini-agent ready for production deployment, including instrumentation, testing, and final validation.

Target Audience

This training is intended for both individuals and companies—large or small—that wish to train their teams in a new advanced IT technology or to acquire specific domain knowledge or modern methods.

Prerequisites for the training

The assessment process at the start of the training program complies with Qualiopi quality standards. Upon final enrollment, the learner receives a self-assessment questionnaire that allows us to evaluate their estimated proficiency with various types of technology, as well as their expectations and personal goals for the upcoming training, within the limits imposed by the selected format. This questionnaire also enables us to anticipate certain connection or internal security issues within the company (intra-company or virtual classroom) that could

impede the monitoring and smooth running of the training session.

Teaching Methods

Hands-On Course: 60% Hands-On, 40% Theory. Training materials distributed in digital format to all participants.

Organization

The course alternates between theoretical input from the instructor—supported by examples and reflection sessions—and group work.

Assessment

At the end of the session, a multiple-choice quiz is administered to verify that participants have successfully acquired the skills.

Certification

A certificate will be issued to each trainee who has completed the entire training program.