



Gen-AI TESTING

Module 1: Core Python (Foundation for AI & Testing)

- ↳ Objective: Build strong Python fundamentals for working with AI frameworks and testing pipelines.

Python Data Structures

- ↳ Lists, tuples, dictionaries, sets
- ↳ creation, operations, comprehensions
- ↳ When to use which data structure
- ↳ Hands-on: Build a simple data store for AI responses

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Control Flow

- ↳ Loops (for, while), conditional statements (if-elif-else)
- ↳ Iterators, generators
- ↳ Hands-on: Generate and process AI outputs in loops

Functions & Modules

- ↳ Defining and calling functions
- ↳ Arguments (*args, **kwargs) and return values
- ↳ Organizing code with modules and imports
- ↳ Hands-on: Utility functions for prompt testing

Files & Exceptions

- ↳ Reading/writing text, JSON, CSV files
- ↳ Exception handling (try-except-finally)
- ↳ Hands-on: Log AI responses to a file with error handling

Object-Oriented Programming

- ↳ Classes, objects, methods, inheritance, polymorphism
- ↳ Hands-on: Class for managing AI prompt templates

Data Analysis with Pandas

- ↳ Series, DataFrames, indexing, filtering, grouping
- ↳ Import/export data
- ↳ Hands-on: Analyze AI-generated test case datasets

Module 2: Prompt Engineering

- ↳ Objective: Learn to craft effective prompts for generative AI tasks and integrate them into testing.

Single-Shot Prompts

- ↳ Basics of instruction prompts
- ↳ Hands-on: Write a single prompt to generate test cases for a simple API

Few-Shot Prompts

- ↳ Example-based prompting
- ↳ Hands-on: Feed AI multiple input-output examples for consistent test results

Chain-of-Thought Prompts

- ↳ Step-by-step reasoning in AI responses
- ↳ Hands-on: Get AI to generate multi-step test execution plans

Document QA Prompts

- ↳ Creating prompts for answering questions from documents
- ↳ Hands-on: Test extraction from requirement documents

Document QA using LlamaIndex

- ↳ Introduction to LlamaIndex architecture
- ↳ Ingest documents, query with prompts
- ↳ Hands-on: Build a doc-based test question-answering tool

Module 3: Generative AI Automation

- ↳ Objective: Automate prompt execution and testing workflows using AI frameworks

Automating Prompts with LangChain

- ↳ LangChain basics: chains, memory, tools
- ↳ Automating repetitive prompt tests
- ↳ Hands-on: Create a LangChain script for API endpoint testing

Agentic AI using Phidata

- ↳ Introduction to Phidata agents
- ↳ Task execution with AI agents
- ↳ Hands-on: Agent to generate, execute, and validate test cases



Multi-Agent Systems with CrewAI

- ↳ Multi-agent orchestration concepts
- ↳ Role-based agents (Test Planner, Test Executor, Test Reviewer)
- ↳ Hands-on: Build a crew of agents to test a mock application



Module 4: Testing in Generative AI Context

- ↳ Objective: Apply testing principles to AI outputs, prompts, and pipelines.

Testing AI Outputs

- ↳ Accuracy, consistency, and reliability checks
- ↳ Automated vs. manual validation

Prompt Testing Frameworks

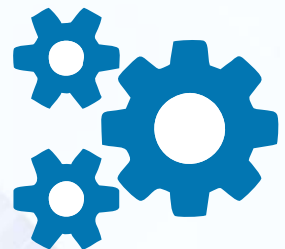
- ↳ Evaluation metrics: BLEU, ROUGE, semantic similarity
- ↳ Unit testing AI pipelines with Pytest

Regression Testing for AI Models

- ↳ Catching changes in AI output after updates
- ↳ Version control for prompts

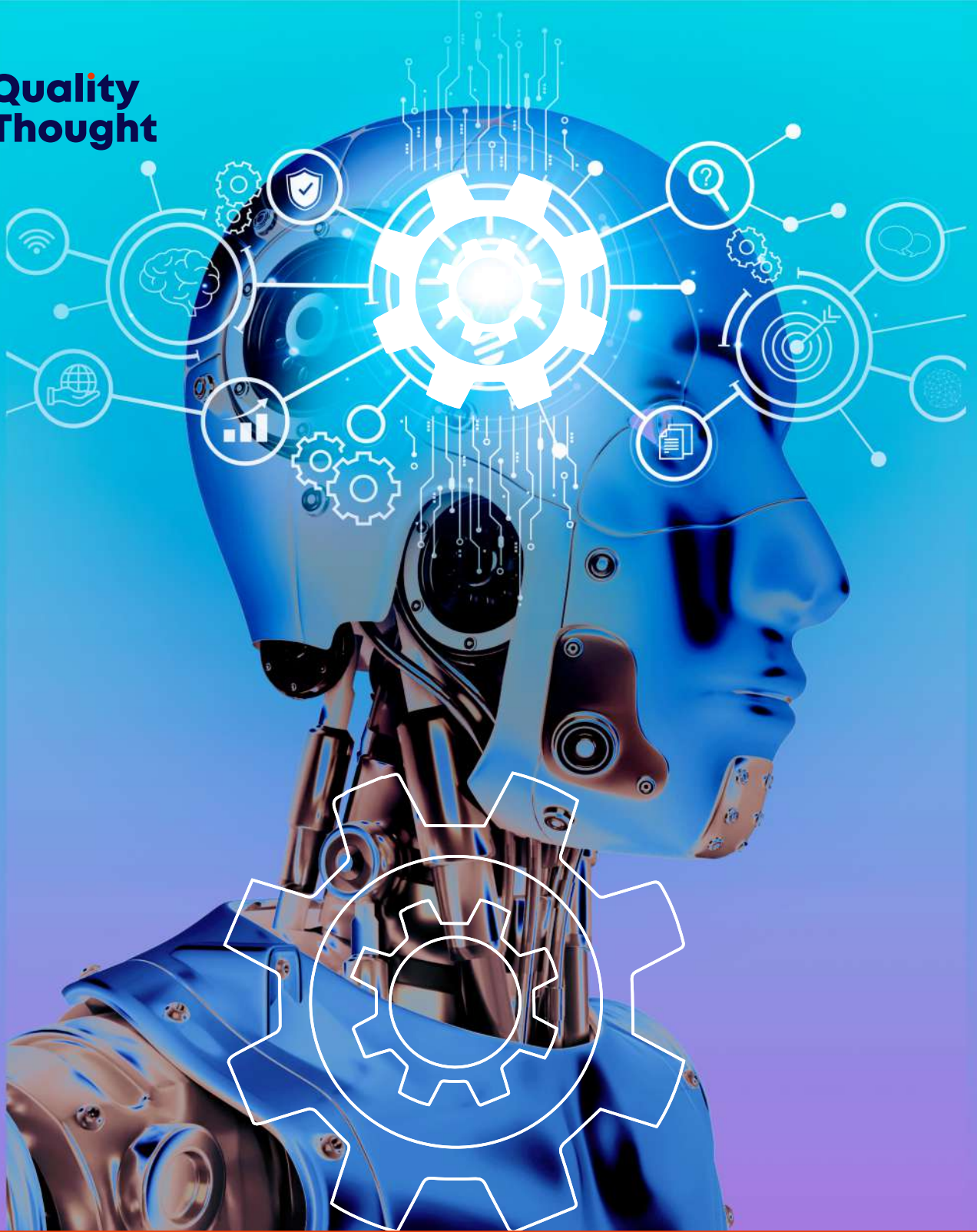
Ethics and Bias Testing

- ↳ Detecting hallucinations
- ↳ Identifying prompt bias



Module 5: Capstone Project

- ↳ Objective: Implement an end-to-end Generative AI testing solution.



**Our Students
Are Placed In**
