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Python & Generative AI Bootcamp

Tagline: From Syntax to Systems in 3 days

FA-0375 · 3 days

Agentic & Generative AI · Software Development

Introduction

In an era where automation, data-driven decision-making, and AI integration are paramount, Python stands out as the lingua franca of modern programming. Its versatility powers everything from simple scripts to complex machine learning models. This intensive 3-day bootcamp is meticulously designed to transition participants from foundational Python concepts to advanced applications, including Generative AI using LangChain and DeepSeek APIs, as well as web scraping with Selenium. Led by an instructor with over 30 years of industry experience, the course emphasizes real-world applications over academic theory, ensuring participants acquire skills directly applicable to today's tech landscape.

Learning outcomes

By the end of this bootcamp, participants will be able to:

- Write clean, efficient, and Pythonic code using best practices.
- Develop advanced Python applications incorporating object-oriented programming and asynchronous processing.
- Implement web scraping solutions using Selenium to extract and process data from dynamic websites.

- Integrate and utilize Generative AI models via LangChain, OpenAI, and DeepSeek APIs to build intelligent applications.
- Design and deploy AI-powered solutions that can interact with users, process natural language, and make informed decisions.(Maginative, arXiv)

Prerequisites

Strictly Required:

- Deep understanding of programming concepts (and OOP).
- Familiarity with any programming language (e.g., JavaScript, Java, C++).
- Comfortable using command-line interfaces and basic file operations.
- Access to a laptop with administrative privileges to install necessary software.
- Stable internet connection for accessing APIs and online resources.

Optional but Beneficial:

- Prior exposure to Python syntax and basic scripting.
- Understanding of HTML and CSS for web scraping tasks.
- Experience with RESTful APIs and JSON data formats.

Training outline

1. 1. Python Fundamentals

1.1 Introduction to Python

- Setting up the development environment (Colab, VS Code etc).
- Understanding Python syntax and semantics.
- Data types: strings, numbers, lists, tuples, dictionaries, sets.
- Control structures: conditionals, loops.

1.2 Functions and Modules

- Defining and invoking functions.
- Scope and lifetime of variables.

- Creating and importing modules.

1.3 Error Handling and File Operations

- Exception handling with try-except blocks.
- Reading from and writing to files.
- Working with JSON and CSV data.

2. 2. Advanced Python Concepts

2.1 Object-Oriented Programming (OOP)

- Classes and objects.
- Inheritance, encapsulation, and polymorphism.
- Magic methods and operator overloading.

2.2 Functional Programming

- Lambda functions, map, filter, and reduce.
- List comprehensions and generator expressions.

2.3 Asynchronous Programming

- Understanding async and await.
- Implementing asynchronous tasks with asyncio.

3. Web Scraping with Selenium

3.1 Introduction to Web Scraping

- Understanding the ethics and legality of web scraping.
- Setting up Selenium WebDriver.
- Navigating web pages and interacting with elements.

3.2 Advanced Scraping Techniques

- Handling dynamic content and AJAX calls.
- Managing cookies and sessions.
- Implementing waits and handling timeouts

3.3 Data Extraction and Storage

- Parsing HTML with BeautifulSoup.
- Storing scraped data in databases (SQLite, MongoDB).
- Exporting data to CSV and JSON formats.

3. 4. Generative AI with LangChain, OpenAI, and DeepSeek

4.1 Introduction to Generative AI

- Understanding Large Language Models (LLMs).
- Overview of OpenAI's GPT models and DeepSeek's offerings.
- Use cases and applications of Generative AI.

4.2 Working with LangChain

- Setting up LangChain in Python.
- Building chains for question-answering systems.
- Integrating memory and context into applications.

4.3 Integrating OpenAI and DeepSeek APIs

- Authenticating and making requests to OpenAI's API.
- Utilizing DeepSeek's API for code generation and reasoning tasks.
- Comparative analysis of model outputs and performance.

4.4 Building AI-Powered Applications

- Developing chatbots and virtual assistants.
- Creating tools for automated content generation.
- Implementing AI-driven data analysis and visualization.

4. 5. Project Development and Deployment

5.1 Designing Real-World Projects

- Identifying problems suitable for automation and AI solutions.
- Planning and structuring Python applications.
- Incorporating web scraping and AI components.

5.2 Deployment Strategies

- Packaging Python applications for distribution.
- Deploying applications on cloud platforms.
- Setting up continuous integration and deployment pipelines.

5.3 Best Practices and Future Learning

- Writing maintainable and scalable code.
- Staying updated with the latest Python and AI developments.
- Resources for continued learning and community engagement.

This bootcamp is tailored for professionals and enthusiasts eager to harness the power of Python and Generative AI in practical, impactful ways. With hands-on projects and expert guidance, participants will leave equipped to build sophisticated applications that meet the demands of today's technology landscape.

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