Faysal Aziz

Python (OJT) Part II

Advanced Implementation and Issue Resolution

FA-0376

Software Development

Introduction

Welcome to the Advanced Python On-the-Job Training (OJT) course! This advanced training is designed to address deeper issues and ensure that the knowledge and skills gained from the initial Python courses are being effectively implemented in your daily work. We will focus on refining your Python capabilities, troubleshooting complex problems, and optimizing your workflows for maximum efficiency. This course will provide hands-on guidance, practical solutions, and advanced techniques to elevate your Python proficiency to the next level.

Learning outcomes

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

- Identify and resolve advanced issues in Python scripts and workflows.
- Implement best practices for code optimization and performance enhancement.
- Develop advanced data manipulation and analysis techniques.
- Integrate Python with other tools and technologies used in their job.
- Apply advanced Python features and libraries to complex tasks.
- Ensure the robust and efficient implementation of Python solutions in their work.

Prerequisites

To get the most out of this course, participants should have:

- Completion of the initial Python refresher and OJT courses.
- Proficiency in basic and intermediate Python programming.

- Experience with using Python in their job-specific tasks.
- Willingness to engage in advanced problem-solving and optimization exercises.

Training outline

1. Review of Previous Learning and Implementation

1. Recap of key concepts from initial courses
2. Discussion on implementation experiences and challenges
3. Assessing current proficiency and areas for improvement

2. Advanced Python Techniques

1. Advanced data structures (sets, frozensets, tuples)
2. List comprehensions and generator expressions
3. Decorators and context managers
4. Advanced functions and lambda expressions

3. Optimizing Python Code

1. Profiling and benchmarking code performance
2. Identifying and resolving performance bottlenecks
3. Techniques for optimizing data processing and manipulation
4. Utilizing efficient data structures and algorithms

4. Advanced Data Manipulation and Analysis

1. Complex data transformations with pandas
2. Advanced merging, joining, and concatenating techniques
3. Handling large datasets and memory optimization
4. Advanced data visualization techniques with matplotlib and seaborn

5. Troubleshooting and Debugging

1. Common advanced errors and exceptions
2. Debugging complex scripts and workflows
3. Using advanced debugging tools and techniques

4. Writing and running unit tests to ensure code reliability

6. Integration with Other Tools and Technologies

1. Connecting Python with databases and SQL
2. Integrating Python with web services and APIs
3. Automating tasks with Python and shell scripting
4. Using Python with other data analysis tools (Excel, BI tools)

7. Advanced Data Wrangling for Real-World Applications

1. Case studies and real-world scenarios
2. Practical exercises tailored to job-specific tasks
3. Hands-on projects to apply advanced techniques

8. Ensuring Robustness and Efficiency

1. Writing clean, maintainable, and scalable code
2. Implementing best practices for code documentation
3. Using version control (Git) for code management
4. Ensuring data integrity and quality

9. Collaborative Problem Solving and Peer Learning

1. Group discussions on advanced problems and solutions
2. Peer reviews and feedback sessions
3. Sharing insights and best practices among participants

10. Custom Projects and Advanced Assignments

1. Working on complex, job-specific projects
2. Continuous guidance and support from the trainer
3. Presentations and feedback on project implementations

11. Continuous Learning and Improvement

1. Identifying resources for ongoing learning
2. Setting goals for future skill development

3. Strategies for staying updated with the latest Python advancements

12. Wrap-Up and Next Steps

1. Summary of advanced concepts and techniques learned
2. Q&A and open discussion
3. Planning for future training and skill enhancement

This advanced Python OJT course is designed to help you tackle deeper issues and ensure that the skills acquired from the previous courses are effectively implemented in your work. By focusing on advanced techniques and real-world applications, we aim to refine your Python proficiency and empower you to handle complex tasks with confidence and efficiency. Let's dive deeper into Python and take your skills to the next level!

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