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AWS Machine Learning Specialty Certification Training

4 days (28 hours)

Overview

The AWS Machine Learning Specialty certification is designed for professionals who want to demonstrate their ability to design, train, deploy, and monitor machine learning models on AWS. It validates advanced skills in data preparation, algorithm selection, ML industrialization, and production deployment.

Our AWS Machine Learning Specialty Certification training will enable you to master the full lifecycle of a Machine Learning project on AWS, from data collection and preparation through to deployment, monitoring, and optimization of models in production.

You will learn to use the main AWS services dedicated to Machine Learning, including Amazon SageMaker, Amazon S3, AWS Glue, SageMaker Pipelines, and SageMaker Model Monitor. The training will also enable you to structure robust, secure, and reproducible MLOps workflows.

Upon completion of this course, you will be able to prepare data, select the right algorithms, train high-performing models, deploy them on AWS, and monitor their behavior over time. You will also be prepared for the main types of questions on the AWS Machine Learning Specialty certification exam.

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

Objectives

- Understand the fundamentals of Machine Learning applied to the AWS cloud

- Prepare, clean, and transform data for model training
- Use Amazon SageMaker to train, optimize, and deploy ML models
- Set up reproducible and automated MLOps pipelines
- Secure, monitor, and optimize machine learning workloads on AWS
- Effectively prepare for the AWS Machine Learning Specialty certification

Target Audience

- Data Scientists
- Data Engineers
- ML Engineers
- Python Developers
- Cloud Architects

Prerequisites

- Basic knowledge of machine learning and applied statistics
- Experience with Python for data manipulation or ML development
- Familiarity with AWS services, including S3, IAM, and cloud environments
- Some experience in data science, data engineering, or cloud development is recommended

AWS Machine Learning Specialty Certification Training Program

[Day 1 - Morning]

Understanding Machine Learning on AWS

- Identify the objectives of the AWS Machine Learning Specialty certification
- Understand the fundamentals of Machine Learning, Deep Learning, and AI
- Distinguish between supervised, unsupervised, and semi-supervised approaches
- Discover the main AWS services dedicated to data and Machine Learning
- Understand the complete lifecycle of an ML project in a cloud environment
- Hands-on workshop: Analyze a business use case and define a Machine Learning strategy on AWS.

[Day 1 - Afternoon]

Collect, store, and prepare data

- Organizing data in Amazon S3 for machine learning projects
- Understanding suitable data formats: CSV, JSON, Parquet, and unstructured data

- Use AWS Glue to catalog, clean, and transform data
- Identify quality issues: missing values, duplicates, bias, and inconsistencies
- Implement a reliable preparation strategy before training
- Hands-on workshop: Preparing a usable dataset for a machine learning model.

Performing feature engineering

- Understand the role of feature engineering in model performance
- Create, transform, and select relevant variables
- Apply normalization, standardization, and encoding techniques
- Handling categorical, numerical, temporal, and textual variables
- Using SageMaker Processing to automate transformations
- Hands-on workshop: Building a feature pipeline for a classification use case.

[Day 2 - Morning]

Select algorithms and train models

- Compare classification, regression, clustering, and recommendation algorithms
- Identify criteria for selecting a model based on the business problem
- Using Amazon SageMaker’s built-in algorithms
- Launch and monitor training jobs in SageMaker
- Understand the concepts of training, validation, and test data
- Hands-on workshop: Train your first model with Amazon SageMaker.

[Day 2 - Afternoon]

Evaluate and optimize machine learning models

- Choosing the right metrics: accuracy, precision, recall, F1-score, RMSE, and AUC
- Identifying overfitting, underfitting, and model bias
- Optimize hyperparameters with SageMaker Automatic Model Tuning
- Compare multiple models based on technical and business criteria
- Interpret the results to select the most relevant model
- Hands-on workshop: Optimize a model and compare its performance before and after tuning.

Leveraging SageMaker to scale ML

- Understand the key components of Amazon SageMaker
- Use notebooks, training jobs, the model registry, and endpoints
- Organize experiments and monitor models
- Manage artifacts, versions, and training configurations
- Structure a reproducible and maintainable ML workflow
- Hands-on workshop: Organize a complete ML project using SageMaker components.

[Day 3 - Morning]

Deploy models to production

- Deploy a model with SageMaker Endpoints
- Compare deployment modes: real-time, batch, serverless, and asynchronous
- Configure endpoint scalability, availability, and latency
- Implement versioning, rollback, and production testing strategies
- Secure access to models exposed via API
- Hands-on workshop: Deploy an ML model and test its inference endpoint.

[Day 3 - Afternoon]

Set up MLOps pipelines

- Understand MLOps principles as applied to AWS
- Automate the preparation, training, validation, and deployment stages
- Use SageMaker Pipelines to orchestrate the ML lifecycle
- Integrate ML workflows with CI/CD practices
- Manage validations, approvals, and controlled deployments
- Hands-on workshop: Create a simple MLOps pipeline with automated training and deployment.

Secure ML data, models, and environments

- Apply IAM best practices to machine learning projects
- Securing data in S3, notebooks, and SageMaker jobs
- Understand encryption at rest and in transit with KMS
- Restrict access to resources with VPC, roles, and security policies
- Implement audit and compliance controls
- Hands-on workshop: Hardening the security of a SageMaker environment.

[Day 4 - Morning]

Monitoring models and detecting drift

- Understanding the challenges of monitoring models in production
- Monitor performance, availability, and prediction quality
- Identifying data drift and model drift
- Use SageMaker Model Monitor to track deployed models
- Set up alerts and retraining processes
- Hands-on workshop: Configuring monitoring for a deployed model.

[Day 4 - Afternoon]

Optimize ML costs, performance, and architectures

- Identify the main cost drivers of a Machine Learning project on AWS
- Selecting the right instances for training and inference
- Optimize batch processing, endpoints, and compute resources
- Evaluate trade-offs between performance, latency, cost, and complexity
- Apply FinOps best practices to ML workloads
- Hands-on workshop: Analyze and optimize the cost of an AWS ML architecture.

Preparation for the AWS Machine Learning Specialty Certification

- Understand the structure of the AWS Machine Learning Specialty exam
- Review key areas: data engineering, modeling, evaluation, deployment, and operations
- Analyze scenario-based questions and identify the most appropriate answers
- Recognizing common pitfalls related to AWS Machine Learning services
- Create a personalized review plan after the training
- Hands-on workshop: Taking the practice exam + review.

Target Audience

This training is intended for both individuals and companies, large or small, seeking to train their teams in new advanced IT technologies or to acquire specific industry knowledge or modern methodologies.

Entry-level assessment

The pre-training assessment complies with Qualiopi quality standards. Upon final registration, the learner receives a self-assessment questionnaire that allows us to evaluate their estimated proficiency in various types of technologies, as well as their expectations and personal goals for the upcoming training, within the limits imposed by the selected format. This questionnaire also allows us to anticipate certain connection or internal security issues within the company (intra-company or virtual classroom) that could pose challenges for monitoring and ensuring the smooth running of the training session.

Teaching Methods

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

Organization

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

Assessment

At the end of the session, a multiple-choice questionnaire is used to verify that the skills have been properly acquired.

Certification

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