Training: Google Cloud
Preparing for Professional Machine Learning Engineer

Google Cloud

TRAINING GOALS:

This course helps learners create a study plan for the PMLE (Professional Machine Learning Engineer) certification exam. Learners explore the breadth and scope of the domains covered in the exam. Learners assess their exam readiness and create their individual study plan.

What you'll learn

- List the domains covered on the Professional Machine Learning Engineer (PMLE) certification exam.
- Identify gaps in your knowledge and skills for each domain.
- Identify resources and learning assets available to develop your knowledge and skills.
- Create a study plan to prepare for the PMLE certification exam.

Audience

This course is intended for aspiring ML engineers, data scientists, and cloud professionals preparing for the Google Cloud Professional Machine Learning Engineer certification exam.

Products

- Vertex AI
- AutoML
- BigQuery
- Cloud Storage
- Cloud SQL
- Cloud Spanner
- Dataflow
- Dataproc
- Cloud Composer
- Cloud Build

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- Identity and Access Management

CONSPECT:

- Introduction
  - Topics
    - Course agenda
    - Module agenda
      - The value of Google PMLE certification
      - The role of an PMLE
      - About the Cymbal Retail (fictional company used in the course)
      - Resources to support your certification journey
      - Creating a study plan
    - Objectives
      - Explain the value of the Google PMLE certification
      - Describe the role of a Professional Machine Learning Engineer
      - Explain what Cymbal Retail is, and how the company will be used throughout the course
      - Identify resources to support your certification journey
- Architecting low-code AI solutions
  - Topics
    - Ira needs to understand customer segments using BigQuery and a clustering model.
    - Sasha needs to predict customer value using AutoML Cymbal Retail’s customer dataset
    - Taylor needs to build a conversational AI assistant for customers using Vertex AI Agent Builder and retrieval-augmented generation (RAG)
    - Diagnostic questions
    - Review and study planning
  - Objectives
    - Identify your level of knowledge in developing and implementing BigQuery ML and AutoML machine learning solutions
    - Determine the skills needed to select appropriate ML APIs, prepare data effectively, and build custom models using AutoML
  - Activities
    - Lecture
    - Diagnostic questions
    - Quiz

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- Collaborating within and across teams to manage data and models
  - Topics
    - Use Google Cloud's products and Cymbal Retail's rich data to design a model to predict which high-value customers are likely to stop purchasing (also known as customer churn)
    - Answer diagnostic questions
    - Review the information and plan your study
  - Objectives
    - Identify your level of knowledge in exploring, preprocessing, and managing organization-wide data
    - Identify your level of knowledge in addressing privacy implications and leveraging tools like Vertex AI Feature Store
    - Determine the skills needed to prototype models using Jupyter notebooks on Google Cloud
    - Determine the skills needed to select appropriate backends, implement security best practices, and integrate with code repositories
  - Activities
    - Lecture
    - Diagnostic questions
    - Quiz
- Scaling prototypes into ML models
  - Topics
    - Use Google Cloud's products and Cymbal Retail's rich data to build and scale customer churn prototype into a production-ready model
    - Answer diagnostic questions
    - Review the information and plan your study
  - Objectives
    - Identify your level of knowledge in scaling ML prototypes into production-ready models
    - Identify your level of knowledge in selecting appropriate ML frameworks, model architectures, and modeling techniques based on interpretability requirements.
    - Determine the skills needed to train models effectively, including organizing and ingesting training data on Google Cloud
    - Determine the skill needed to utilize distributed training techniques, perform hyperparameter tuning, and troubleshoot training failures
  - Activities
    - Lecture
    - Diagnostic questions
    - Quiz

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- Serving ML models
  - Topics
    - Use Google Cloud's products and Cymbal Retail's rich data to deploy a customer churn model and use it in production for inference
    - Answer diagnostic questions
    - Review the information and plan your study
  - Objectives
    - Identify the level of knowledge needed to effectively serve models in production
    - Identify the level of knowledge needed to select between batch and online inference, utilize various serving frameworks, organize a model registry, and conduct A/B testing for model optimization
    - Determine the skills needed to scale online model serving, including leveraging Vertex AI Feature Store
    - Determine the skills needed to manage public and private endpoints, choose appropriate hardware, optimize serving backends for throughput, and fine-tune models for optimal performance in production
  - Activities
    - Lecture
    - Diagnostic questions
    - Quiz
- Automating and orchestrating ML pipelines
  - Topics
    - Use Google Cloud’s products to orchestrate the entire machine learning pipeline for seamless execution and continuous improvement with customer churn
    - Answer diagnostic questions
    - Review the information and plan your study
  - Objectives
    - Identify the level of knowledge needed to develop and maintain end-to-end ML pipelines.
    - Identify the level of knowledge needed to validate data and model, consistent preprocessing, hosting options, component identification, parameterization, triggering mechanisms, compute needs, orchestration strategies
    - Determine the skills needed to automate model retraining, including establishing retraining policies
    - Determine the skills needed to implement CI/CD model deployment, and track and audit metadata (model artifacts, versions, data lineage)
  - Activities
    - Lecture
    - Diagnostic questions

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        - Quiz
- Monitoring ML Solutions
    - Topics
        - Use Google Cloud's products to ensure the customer churn model remains robust, reliable, and aligned with Google's Responsible AI principles
        - Answer diagnostic questions
        - Review the information and plan your study
    - Objectives
        - Identify the level of knowledge needed to assess and mitigate risks in ML solutions
        - Identify the level of knowledge needed to build secure ML systems, align with responsible AI practices, evaluate solution readiness, and utilize model explainability on Vertex AI
        - Determine the skills needed to monitor, test, and troubleshoot ML solutions
        - Determine the skills needed to establish continuous evaluation metrics, monitor for training-serving skew and feature drift, compare model performance against baselines, and investigate common training and serving errors
    - Activities
        - Lecture
        - Diagnostic questions
        - Quiz
- Your next steps
    - Topics
        - A sample study plan for the exam
        - How to register for the exam
    - Objectives
        - Review a sample study plan for the exam
        - Learn how to register for the exam
    - Activities
        - Create your study plan for the exam
        - Identify a date to take the exam based upon your plan
        - Register for the exam

REQUIREMENTS:

Experience in programming or data engineering, familiarity with Python and SQL, and practical knowledge of working with data and machine learning, ideally at least one year with ML solutions on Google Cloud within three years of industry experience.

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Difficulty level



CERTIFICATE:

The participants will obtain certificates signed by Google Cloud (course completion).

This course is intended to help you prepare for the Professional Machine Learning Engineer certification exam. Google Cloud certification exams are offered at Kryterion test centers worldwide. More information about Professional Machine Learning Engineer exam https://cloud.google.com/learn/certification/machine-learning-engineer

TRAINER:

Authorized Google Cloud Trainer

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