ACL Oral Exam - Questions and Answers

Experiment 1: ML and Analytic Services

Q: What are the main ML services offered by AWS, Azure, and Google Cloud?

A: AWS: SageMaker; Azure: ML Studio; GCP: Vertex AI. All support data preprocessing, training, deployment.

Q: How do these platforms differ?

A: AWS offers flexibility, Azure is GUI-friendly, and GCP integrates tightly with AI tools like TensorFlow.

Experiment 2: Build ML Model on Cloud with Frontend

Q: How can you integrate an ML model with a frontend?

A: Use API Gateway to connect frontend apps with deployed ML models via HTTP requests.

Q: What tech stack would you choose for frontend and why?

A: HTML/CSS/JavaScript or React for frontend, and AWS Lambda for backend integration via APIs.

Experiment 3: Data Preprocessing and Analysis

Q: What are common data preprocessing techniques?

A: Cleaning, encoding, normalization, feature extraction.

Q: What is the importance of Exploratory Data Analysis (EDA)?

A: EDA helps discover patterns, outliers, and variable relationships before modeling.

Experiment 4: Real-Time Streaming and Forecast with AWS

Q: What AWS service helps in real-time data streaming?

A: Amazon Kinesis.

Q: How is SageMaker used in this context?

A: It deploys models that predict outcomes from real-time streamed data.

Experiment 5: Image Classification for Facial Recognition

Q: What model architecture is used for image classification?

A: Convolutional Neural Networks (CNNs).

Q: What preprocessing steps are required for image data?

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A: Resize, normalize, and augment images for better training.

Experiment 6: Serverless AI API with AWS Lambda

Q: What is AWS Lambda and how is it used in ML?

A: It's a serverless compute service that can host lightweight AI functions triggered via API.

Q: What's the benefit of using serverless architecture?

A: No server management, auto-scaling, and cost-effective usage.

Experiment 7: NLP and Text Analytics with Amazon Comprehend

Q: What can Amazon Comprehend do?

A: Sentiment analysis, entity recognition, key phrase extraction.

Q: Give a use-case where this is beneficial.

A: Analyzing customer reviews or social media feedback.

Experiment 8: Build a Chatbot Using Amazon Lex

Q: What are intents and slots in Amazon Lex?

A: Intents define user goals; slots collect necessary information.

Q: How does Lex use AWS Lambda?

A: To perform backend logic like booking or data retrieval after interpreting user input.

Experiment 9: Linear Regression with Amazon Q Developer

Q: What does linear regression model?

A: Linear relationship between input and output: $y = mx + b$.

Q: What are common evaluation metrics?

A: MSE, RMSE, and R^2 score.

Experiment 10: Foundation Models and Prompt Engineering

Q: What are foundation models?

A: Large pre-trained models like GPT-3, trained on vast data for many NLP tasks.

Q: What is prompt engineering?

A: Designing effective input prompts to guide model output.