

## Assignment 4

1. Explain the architecture of AWS Rekognition.
2. List Rekognition's key features.
3. How does Rekognition integrate with S3 and Lambda?
4. Explain Rekognition Custom Labels.
5. Discuss its advantages and limitations.

### Case Study–Based Assignment: AWS Rekognition

This assignment focuses on applying AWS Rekognition's real-world capabilities in different industry scenarios. Each case study explores a unique use case where Rekognition's features—such as object detection, facial recognition, and text extraction—can automate, analyze, and enhance operational efficiency.

#### Case Study 1: Smart Campus Security System

A university wants to upgrade its security system using AI-powered facial recognition to monitor entry points, detect unauthorized visitors, and ensure student safety.

1. Describe how AWS Rekognition can be used to design this smart security system.
2. Explain the role of S3, Lambda, and DynamoDB in automating the image processing workflow.
3. What Rekognition APIs would you use for face detection and comparison?
4. Discuss how you would ensure data privacy and regulatory compliance (e.g., GDPR, student consent).
5. Suggest one improvement using Custom Labels to detect suspicious objects (like bags or helmets).

#### Case Study 2: Retail Analytics & Customer Emotion Tracking

A retail chain wants to understand customer behavior inside stores. Cameras capture real-time footage, and the company wants to analyze customer count, gender distribution, and emotions at checkout counters.

1. How can AWS Rekognition's facial analysis and emotion detection capabilities help in this scenario?
2. Design a data flow using S3 (video storage), Lambda (trigger), and CloudWatch (monitoring).
3. Which APIs will you use to detect emotions and track customers in video streams?
4. How can the data be visualized in a business intelligence dashboard?
5. What ethical considerations should be addressed when analyzing customer faces?

### Case Study 3: Healthcare Patient Monitoring System

A hospital wants to implement a system that automatically detects patient activity in hospital rooms (e.g., patient lying, sitting, or falling) and alerts nurses in emergencies.

11. 1. Explain how object and activity detection in AWS Rekognition Video can automate this process.
12. 2. Outline how SNS and Lambda can trigger real-time alerts to medical staff.
13. 3. Which Rekognition features (e.g., Custom Labels) can help recognize domain-specific actions like “patient fall”?
14. 4. How can you maintain HIPAA compliance when handling video footage?
15. 5. Suggest how the hospital could analyze data trends to improve patient care.

### Case Study 4: Media and Entertainment – Automated Video Tagging

A media production company wants to automatically tag scenes in videos for faster searching and editing — e.g., identifying “beach scenes,” “sports activities,” and “specific celebrities.”

16. 1. Which Rekognition APIs and features would you use for automatic tagging and celebrity identification?
17. 2. Create a workflow combining S3 (storage), Rekognition Video (analysis), and DynamoDB (metadata storage).
18. 3. How can Custom Labels improve tagging for specific genres (e.g., sports, nature)?
19. 4. Discuss how JSON output from Rekognition can be integrated into an editing tool or media database.
20. 5. What challenges might arise when processing large video datasets, and how can AWS handle scalability?

### Case Study 5: Financial Services – KYC (Know Your Customer) Verification

A bank needs to verify customer identity during remote onboarding by comparing the uploaded photo with the ID card image provided by the user.

21. 1. Explain how AWS Rekognition’s `compare_faces()` API can be used for KYC automation.
22. 2. Describe how Lambda functions and DynamoDB can store and verify identity results securely.
23. 3. How can `detect_text()` be used to extract ID details (like name, DOB, and ID number)?
24. 4. Discuss how Rekognition ensures data security through encryption and IAM policies.
25. 5. Identify potential limitations of using Rekognition for KYC verification (e.g., image quality, lighting, privacy).