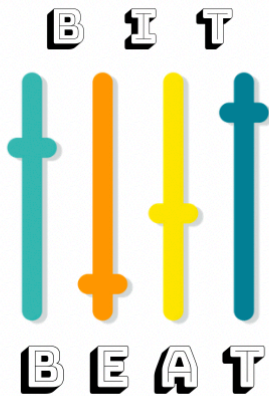# Lab2: Image Analysis Using Rekognition and Lambda Function

Version: 1.0

READ ME

World Domination One Beat At A Time

BitBeat is a new startup that is planning to take the record industry and the world by storm with its new product **BitBanger**, a web-based music mixer app. As a new member of the **BitBeat** infrastructure team, you will need a variety of skills to assist in the growth of the startup. As the startup grows, they will be creating a larger web presence.

As a team member you have to analyze some images to identify different people, music instruments and text as well as to detect any inappropriate content since the main purpose of AWS Rekognition to provide highly accurate facial analysis. Along with this, company also wants to run this code as a serverless compute service (Lambda) and manage automatically the underlying compute resources.

That's where you come in. **BitBeat** has hired you to setup their infrastructure, you've already gathered their requirements and are ready to get started.

BEFORE GETTING STARTED

Here's some important information to know before starting this hands-on activity.

Activity time: 90 min

Requirements: You must have an AWS Educate account. If you have not registered for an AWS Educate account, follow the instructions provided on [this page](#).

Getting help: If you experience any issues as you complete this activity, please ask your instructor

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DID YOU KNOW

AWS Lambda is serverless compute service that runs your code in response to events and automatically manages the underlying compute resources for you. AWS Lambda is used because it automatically run code in response to multiple events, such as HTTP requests via Amazon API Gateway, modifications to objects in Amazon S3 buckets, table updates in Amazon DynamoDB.

Task overview:

To analyze any image as well as to detect any inappropriate content, you will use AWS Rekognition software with lambda function.

Task objectives:

- Creating IAM role
- Creating a bucket and uploading image
- Creating Lambda Function
- Writing Function code
- Testing the Lambda function to analyze

Learning outcomes

Creating IAM role for Rekognition and Lambda Execution, writing a function code for lambda to analyze the image.

Let's Get Started!

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DID YOU KNOW

With serverless computing, infrastructure management tasks like capacity provisioning and patching are handled by AWS, so you can focus on only writing code that serves your customers. Serverless services like AWS Lambda come with automatic scaling, built-in high availability, and a pay-for-value billing model.

Tasks

1. **Creating IAM role**
   a. Select the **IAM** from AWS services. Choose **role** from navigation then click on **create role**.
   b. Select the type **AWS service** and choose **Lambda as a use case** then click on **Next: Permission**.
   c. Now select the **policies** as below.
      - AWSLambdaExecute
      - AmazonRekognitionFullAccess
   d. Click on **Next**. Provide the name, click on **create role**.

2. **Creating bucket**
   a. Choose **S3** service. Now click on **create bucket**, provide bucket name as **bitimage** and click on **create.**
   b. Select this created bucket, click on **upload** then choose on **Add files** and select an image from your laptop/computer, click on **upload**.
   c. Select this created bucket, click on **Permission**, choose **Edit** to provide public permission for this bucket.
   d. **Uncheck** the **block all public access** and save changes. Type **confirm** in the dialogue box of Edit block Public Access then click on **confirm**.
   e. Select the object (uploaded image) and choose **Make Public** from **Actions** then click on **Make public**.

3. **Creating Lambda function**
   a. Select **Lambda** from AWS services, click on **create function** now choose **Author from Scratch**.

> **Important info**
>
> Write the correct bucket name and object (image name) in the lambda function code.
> If you created different bucket name, use that in the function code.

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b. Provide **function name** as **lambda_rekognition**, **Python 3.6** in **Runtime** then click on **change default execution role**.

c. Now select **Use an existing role** then choose lambda_rekognition from drop down list and click on **Create Function**.

4. Writing Function code

a. Select the created lambda function **lambda_rekognition.**

b. Write the below code in **Function code,** and then click on **deploy**.

    a. This is the python code

```python
import json
import boto3

def lambda_handler(event, context):

    client = boto3.client("rekognition")

    response = client.detect_labels(Image= {"S3Object" : {"Bucket":
"bitimage", "Name": "baby_toys.png"}}, MaxLabels=8,
MinConfidence=90)

    print(response)

    # TODO implement
    return {
        'statusCode': 200,
        'body': json.dumps('Hello from Lambda!')
    }
```

5. Testing the Lambda function to analyze

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a. Click on **Test** and configure test event.
b. Select **create new test event**, provide the **event name** as a **test**.
c. Now click on **Test** to test the lambda function code.

Wait for your Lambda function until it executes.

Test

a. Once the function run successfully. It shows **Execution result: succeeded.** Now click on **Details** which shows summary and log out**.**
b. We can see the details of analysis in log out as shown in below figure.
c. The log output shows the name of recognized items and its confidence, billed duration, used max memory.

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Summary

Code SHA-256

GdcljUNIfaIMHNBzPWWer/iiZ1dbcv7JguLSpzpnjeI=

Request ID

4a7f979a-76c1-43dd-9243-722f6acef4c0

Duration

1779.81 ms

Billed duration

1780 ms

Resources configured

128 MB

Max memory used

69 MB Init Duration: 207.52 ms

Log output

The section below shows the logging calls in your code. These correspond to a single row within the CloudWatch log group corresponding to this Lambda function. Click here to view the CloudWatch log group.

```
START RequestId: 4a7f979a-76c1-43dd-9243-722f6acef4c0 Version: $LATEST
{'Labels': [{'Name': 'Person', 'Confidence': 98.43507385253906, 'Instances': [{'BoundingBox': {'Width': 0.7929859161376953, 'Height':
0.903458833694458, 'Left': 0.151997372508049, 'Top': 0.04129832983016968}, 'Confidence': 84.44326782226562}], 'Parents': []}, {'Name':
'Human', 'Confidence': 98.43507385253906, 'Instances': [], 'Parents': []}, {'Name': 'Diaper', 'Confidence': 95.06562805175781,
'Instances': [{'BoundingBox': {'Width': 0.4185282289981842, 'Height': 0.21849492192268372, 'Left': 0.33153578639030457, 'Top':
0.6661263704299927}, 'Confidence': 95.06562805175781}], 'Parents': []}, {'Name': 'Baby', 'Confidence': 95.00797271728516, 'Instances': [],
'Parents': [{'Name': 'Person'}]}], 'LabelModelVersion': '2.0', 'ResponseMetadata': {'RequestId': '039f45f7-d1f0-4065-8d14-f27b31598768',
'HTTPStatusCode': 200, 'HTTPHeaders': {'content-type': 'application/x-amz-json-1.1', 'date': 'Thu, 17 Dec 2020 04:49:42 GMT', 'x-amzn-
requestid': '039f45f7-d1f0-4065-8d14-f27b31598768', 'content-length': '669', 'connection': 'keep-alive'}, 'RetryAttempts': 0}}
END RequestId: 4a7f979a-76c1-43dd-9243-722f6acef4c0
```

⭐ **GREAT JOB!** ⭐

You have successfully created and configured **BitBeat**'s virtual infrastructure

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Let's review

You have completed the activity and have successfully analyzed the image by lambda function and AWS Rekognition software.

In this activity you:

- Created IAM role with Lambda and Rekognition policies
- Created a S3 bucket to upload images
- Created Lambda Function
- Wrote Function code in python to analyze image

Test your knowledge

1. Which policies did you use for this IAM role in this activity?
   _____

2. What is main purpose of Rekognition service?
   _____

3. Will all objects of a bucket be public when you make a bucket public?
   _____

4. How can you change the number of detected images in function code?
   _____

5. Why do you use Lambda function?
   _____

DID YOU KNOW

AWS Identity and Access Management (IAM) enables you to manage access to AWS services and resources securely. Using IAM, you can create and manage AWS users and groups, and use permissions to allow and deny their access to AWS resources. IAM is a feature of your AWS account offered at no additional charge.

aws educate

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Bonus activity –

Clean up this infrastructure

1. Choose **S3** in navigate pane and select the bucket **bitimage**, select the **object** (image) then click on **delete** and type **permanently delete** in dialogue box, click on **Delete objects**.
2. Now select bucket **bitimage** and click on Delete, type the name of bucket and click on **Delete bucket**.
3. Choose **Lambda** service, select **lambda_rekognition** function and choose **Delete** from **Actions** and confirm delete.