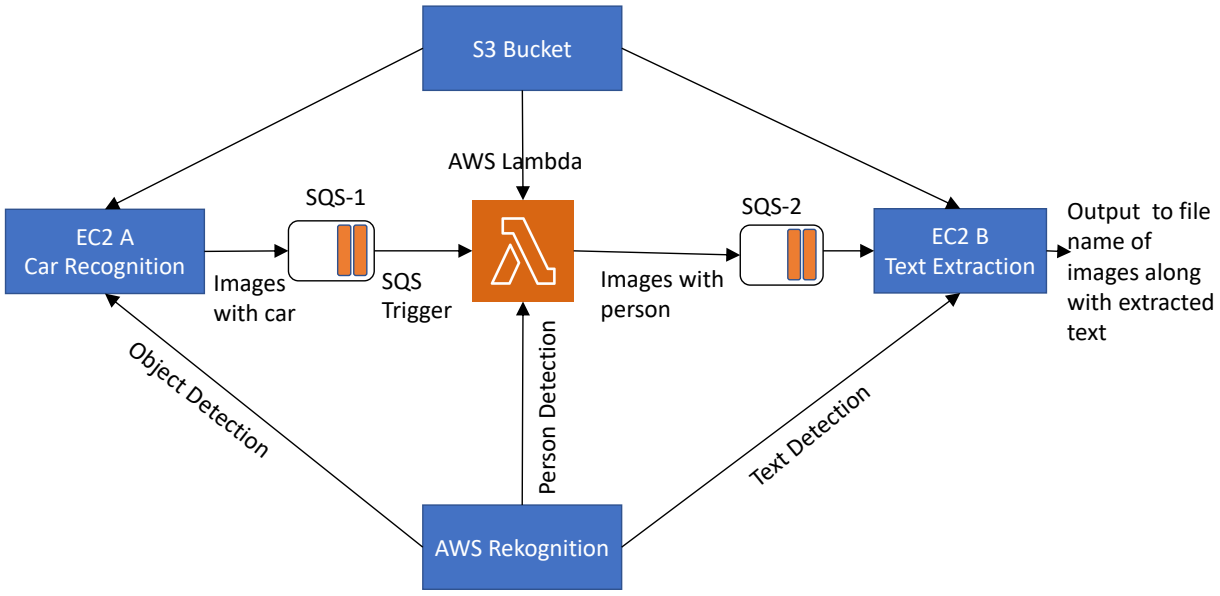
# Programming Assignment 2

## CS 442/642- Cloud Computing

### Due 4/25, 11:59PM

**Goal:** The purpose of this assignment is to learn about the usage of the Function as a Service offering of cloud computing.

**Description:** You will extend the image recognition pipeline you developed in Project 1 by adding AWS Lambda in between the two instances you created. AWS. Here is what the pipeline will look like:




You will create 2 EC2 instances (EC2 A and EC2 B in the figure) that will work in parallel similar to PA1. Then you will create an FaaS function (called Lambda in AWS) that will sit between the two instances. Instance A will read the images from an S3 bucket that we created (cs442-unr) and perform object detection in the images. When a car is detected using Rekognition, with confidence higher than 90%, the index of that image (e.g., 2.jpg) will be pushed to the first Simple Queue Service (SQS-1). The Lambda function you will create will be triggered by

SQS-1, meaning that it will automatically execute when an item is pushed to SQS-1 The Lambda function will execute object detection for the images found in SQS-1 and will push the images that contain a ”Person” object with “90%” confidence to the SQS-2 . Instance B reads indexes of images from SQS-2 as soon as these indexes become available in the queue and performs text recognition on these. When instance B finishes, it prints to a file, in its associated local disk, the indexes of the images along with all text found in the image, similar to PA1.

**Additional Information:**

If you face permission issues when trying to access the S3 bucket, Rekognition, or SQS in your function, you can add permission through the following steps:

1. Open console for Lambda
2. Go to tab configuration
3. Select Permissions from the left menu
4. In Execution Role, open the link to your role
5. In the opened window, scroll down to Permission Policies, then click “Add Permissions” and choose “Attach Policies”
6. In the search box on the opened window, type “S3”, “Rekognition”, or “SQS” to find relevant permissions
7. Choose the appropriate permission from the search results, then click “Add Permission”

**Submission:** Submit the following to the Programming Assignment 2 on Web Campus:

- The code for car recognition, Lambda function, and text recognition (including all the communication codes with the other services).
- 3-4 minute demo of the project (either video file or link to the video file).

**Grading:**

- Create AWS Lambda Function and add SQS as a Trigger – 20 points
- Implement Person Detection Code in the Lambda function – 20 points
- Add the name of images with Person (w/ 90% confidence) to SQS-2 – 10 points
- Implement full execution pipeline with two EC-2 images and Lambda function in between– 40 points
- Submit clean commented code along with a 3-5 min video description – 10 points