Your have to create 2 EC2 instances (EC2 A and B in the figure), with Amazon Linux AMI, that will work in parallel. Each instance will run a Java application. Instance A will read 10 images from an S3 bucket that we created (https://njit-cs-643.s3.us-east-1.amazonaws.com) 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) is stored in SQS. Instance B reads indexes of images from SQS as soon as these indexes become available in the queue, and performs text recognition on these images (i.e., downloads them from S3 one by one and uses Rekognition for text recognition). Note that the two instances work in parallel: for example, instance A is processing image 3, while instance B is processing image 1 that was recognized as a car by instance A. When instance A terminates its image processing, it adds index -1 to the queue to signal to instance B that no more indexes will come. When instance B finishes, it prints to a file, in its associated EBS, the indexes of the images that have both cars and text, and also prints the actual text in each image next to its index.

Additional Information:

EC2 Management

You should use the same .pem key for both instances.

You must configure the Security Group well to prevent any attacks. In the Security Group

tab, there is a column called “Source” which tells from which IP address this instance can be accessed: you should select “MYIP” from the drop box. You should open just three ports: SSH, HTTP, HTTPS.

For this assignment, the free tier instances are more than enough (this will incur no cost).

If you don’t use free-tier instances, be sure to terminate your instances after finishing your

jobs. Otherwise, you will be charged for every hour of running your instances.

Programmer’s keys

To code with AWS SDKs, you need a pair of keys (access-id, secret-key) which is provided by AWS and will be created uniquely for your account. For Standard Account and Educate Account, you will have two different sets of keys.

Standard Account (for which you will be charged): https://docs.aws.amazon.com/rekognition/latest/dg/setup-awscli-sdk.html

Educate account: Login to your Educate account and go to “Vocareum”, using the same procedure for entering to your Educate AWS account. In the Vocareum page, click on Account details to open a pop up. Then click “access your credentials”: access-key, secret-key and session-token. You need to copy/paste all of them into your credential file on the system your app is running (EC2 instances). The information about the credential file can be found in link above. When you want to create a client in your programs to access different AWS services (e.g., SQS, Rekognition), you need to retrieve your credentials from the file. The Educate session expires every 3 hours, and a new session starts when you refresh your Vocareum web page. Therefore, you will need to re-copy the credentials in your EC2 instances in such a case.

These credentials work for all AWS programming services which you intend to connect through AWS SDKs. Therefore, the same credentials can be used for Rekognition, SQS, and S3.

**Preparation Steps:**

1. **AWS Account and Credentials Setup**:
   * Ensure that you have an AWS account. If this is a part of an educational program, you might have been provided with AWS Educate credits.
   * Create a pair of AWS keys (access-id, secret-key) following the instructions provided. Remember, these keys should be kept secure and never shared.
2. **Setting up S3**:
   * If not already created, set up an S3 bucket and upload the images you want to process.

**EC2 Instance A Setup and Configuration:**

1. **Launch EC2 Instance A**: (i-04cd9add28948ce30)
   * Launch an EC2 instance with Amazon Linux AMI from the EC2 dashboard.
   * Choose a free tier instance type (e.g., t2.micro).
   * Configure the security group to allow SSH, HTTP, and HTTPS traffic from your IP (MYIP).
   * Use or create a new key pair (.pem file) for SSH access.
2. **Java Application on Instance A**:
   * SSH into Instance A.
   * Install Java and any other necessary software.:
     1. sudo rpm --import https://yum.corretto.aws/corretto.key
     2. sudo curl -L -o /etc/yum.repos.d/corretto.repo https://yum.corretto.aws/corretto.repo
     3. sudo yum install -y java-11-amazon-corretto-devel
     4. java -version
   * Create your Java application that will read images from the specified S3 bucket, use AWS Rekognition for object detection, and if a car is detected with >90% confidence, send the image index to an SQS queue.

**EC2 Instance B Setup and Configuration:**

1. **Launch EC2 Instance B**: (i-04e870b22918a1834)
   * Repeat the process as with Instance A, using the same key pair and security group configuration.
2. **Java Application on Instance B**:
   * SSH into Instance B.
   * Install Java and any other required software.
   * Create your Java application to read image indexes from the SQS queue, download the corresponding images from S3, use AWS Rekognition for text recognition, and save the results to an EBS volume.

**Execution and Monitoring:**

1. **Running the Applications**:
   * Start the Java application on Instance A to begin processing images.
   * Simultaneously, start the Java application on Instance B to begin processing the indexes from the SQS queue and performing text recognition.
2. **Monitoring**:
   * Monitor the logs or outputs of your applications to ensure they are processing the images as expected.
   * Debug and troubleshoot any issues that arise.
3. **Completion and Cleanup**:
   * Once Instance A has processed all images, ensure it sends an index of -1 to the SQS queue to signal to Instance B that processing is complete.
   * After Instance B has processed all the indexes, ensure it saves the required output to the EBS volume.
   * Finally, remember to terminate both EC2 instances to avoid any additional charges, especially if you are not using free-tier instances.
4. **Review and Submission**:
   * Review the requirements of your assignment and ensure all steps have been completed as expected.
   * Submit your work as per the instructions provided by your educator or AWS academy.

This should provide a comprehensive step-by-step approach to fulfill the requirements of your project while using AWS services efficiently and securely.

Queue: https://sqs.us-east-1.amazonaws.com/261847612621/CMCImageQueue

[default]

aws\_access\_key\_id=ASIATZ52VPTGU2IYHQUH

aws\_secret\_access\_key=O0srBDKmX76WW8i5OJC2ra9vc57a5ej6fnzlHWfK

aws\_session\_token=FwoGZXIvYXdzEMf//////////wEaDL3B9DOtG1shCCiQeCK/AWEmfvJtM9bIu7nBCrmnJ75Rl4F8YlmVCw4DsjUDr/aCDf2FDUlw0ZBlbC+iH+GUgqRrjIbmeE3CREoZFgSykZGlDIRksJgIAkKvcJcacoqsbAWBfZgfVLptKZl/kZNQku3NNbNyUm9d1yPxR+fGHT5my09fI9sXOvxeQDj8/EuwQOv0/oAhIYCBLPqfe7wxE6KHkuhY9FysEEQcD+IBN/3zh/10FWuAa9j9gCMxXZdnaHHl7Ev/YQzIq/8NHeLVKOLv16gGMi3xAFivpVUlnAvwTJ7FRVceFfM3ZugXV/CtxSazT+A7CzvMFpM7yEJ6WzgVUdA=