Cloud Computing - Programming Assignment 1

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Steps to setup the EC2 instance in AWS Management console:

- Click on the "Launch instance" button to initiate the instance creation process.
- Name your EC2 instances according to your preference.
- Select the instance type as "t2.micro." T2 instances are cost-effective and offer a baseline level of CPU performance with the ability to burst above the baseline when necessary.
- Use the pre-populated "vockey" as the Key-Pair value.
- Under Network Settings, create a security group with the following rules:
    a. Allow SSH traffic from your IP address only.
    b. Allow incoming HTTPs traffic from the internet.
    c. Allow incoming HTTP traffic from the internet.
- It's recommended not to make changes to the settings under "Configure storage" and "Advanced details" unless you are well-versed in these configurations.
- Repeat the above steps a second time to create a second EC2 instance. You can name these instances as "EC2-A" and "EC2-B." Your instances will appear as shown in the example image.
- Hit "Launch Instances"
- Hit "View Instances"

To add IAM roles to the created instances, follow these steps:

1. After creating your instances, go to the EC2 instances dashboard to view your instances. If your instances are not in a running state, select an instance, click on the "Instance state" dropdown, and choose "Start instance."

2. Once your instances are running, select each instance one by one.

3. Navigate to "Actions" > "Security" > "Modify IAM role."

4. From the dropdown menu, select the pre-populated "LabInstanceProfile" role. Please be aware that this role might not have the necessary permissions for accessing resources such as S3, SQS, or Rekognition, which are required for your project.

5. Update the IAM role for the selected instance.

These steps will associate the specified IAM role with your EC2 instances.

REGARDING JAVA:

When working with the Java programs, it's important to note that we have two distinct programs: one for object recognition and the other for text recognition. The need for these two programs is explained in the project description.

The object detection program will be executed on the first instance, while the text detection program will run on the second instance.

Ensure that you have the executable JAR files for each of these programs ready. JAR files are essentially compressed archives containing .class files, as well as other assets such as audio or image files, and even directories.

Once you have the JAR files prepared, you can upload them to the respective EC2 instances using either Cyberduck (for Mac users). For this project, we will be using Cyberduck, particularly if you're operating on a Mac system.

If you require guidance on how to upload files to an EC2 instance using Cyberduck, you can refer to the following link: "SFTP into your EC2-instance with Cyberduck."

Please note that when you use Cyberduck to FTP into your EC2 instance, the username to be used is 'ec2-user'.

SSH Access from MAC:
To establish SSH access from a Mac to both of our EC2 instances, follow these steps. Please note that these instructions are intended for Mac and Linux users:

1. Begin by selecting the "AWS Details" link provided above these instructions.
2. Click on the "Download PEM" button to save the "labsuser.pem" file. Typically, your browser will save this file in the Downloads directory.
3. Open a terminal window and navigate to the directory where the .pem file was downloaded. For example, if it was saved in your Downloads directory, you can use the command: `cd ~/Downloads`

4. Set the permissions on the key file to be read-only by executing this command: `chmod 400 labsuser.pem`

5. Return to the AWS Management Console, and within the EC2 service, go to "Instances." Select the checkbox next to the instance you wish to connect to.

6. In the "Description" tab, copy the IPv4 Public IP value.

7. Go back to the terminal window and run this command, replacing `<filename>` with the actual filename of your .pem key file and `<public-ip>` with the copied Public IP address:

`ssh -i labsuser.pem ec2-user@52.207.251.75`
`ssh -i labsuser.pem ec2-user@18.212.239.250`

8. When prompted to allow the first connection to this remote SSH server, type 'yes'. Since you are using a key pair for authentication, you won't be asked for a password.

Run the programs on respective EC2 instance:

To run the programs on their respective EC2 instances, follow these steps:

1. First, ensure that you've updated your access_key, secret_key, and default_region in your AWS terminal. You can do this by running the command `aws configure` in your AWS terminal. Make sure that the default region is set to "us-east-1."

2. After configuring your AWS settings, you can execute the programs using the following commands:
   - For the first program (object recognition), use: `java -jar CarRecognize.jar`
   - For the second program (text recognition) with the desire to output the result in a text file, use: `java -jar CarText.jar > output.txt`

By running the second program with the output redirection (`> output.txt`), you will create an "output.txt" file. This file will capture the output of the second program, which is running on the second instance. It will contain essential data about the indexes of images that feature both cars and text, along with the actual text associated with each image index.