# Laboratory 5: Amazon Web Services Tutorial

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**Due Oct 5 at 11:59 PM (Report), Oct 7 at 11:59 PM (Video)**

While this is a team assignment, you are encouraged to individually go through the tutorials (for those of you who do not have the account yet, please resort to using your team member who has an account – otherwise, you are encouraged to get your own through AWS directly until the request accounts gets their approval).

For this lab, only submit the slide deck for the report. You do not have to submit a video demo. On the other hand, make sure to do due diligence to capture screenshots to show that you have accomplished the tasks using your own account.

1) **EC2**

Learn about AWS container service and run an Amazon ECS sample container code. You need to take some screenshots and prove that you have done it correctly. Also provide detailed explanation of the experiment.

(Step 1.) Learn about Amazon EC2 container service and create the IAM (Identity and Access Management) user and group.

(Step 2.) Launch a Linux virtual machine instance of type 'micro' (Hardware selection) with 1 GB memory and 1vCPU. You can use the default network configuration.

(Step 3.) To connect to the system with SSH generate a key pair, set up the execution environment. Now get started with the ECS container by running a sample container application.

(Step 4.) Shutdown the container and its host EC2 instance to avoid additional charges.

Throughout the process you can refer the developer guide. Useful information can be found at
https://docs.aws.amazon.com/AmazonECS/latest/developerguide/Welcome.html
https://docs.aws.amazon.com/AmazonECS/latest/developerguide/ECS_GetStarted.html

2) **S3 and SNS –** Photo uploads to Amazon S3

Amazon Simple storage service (S3) is a scalable web-based cloud storage service that AWS provides. Explore some SDK tools on the AWS for using either iOS or any Android phone to store photos on Simple Storage Service (S3) cloud and notify AWS users using the Simple Notification Service (SNS). You can download the Amazon AWS SDK for Android or iOS
https://aws.amazon.com/mobile/resources/

Perform the following operations and report results. Explain the step-by-step procedure in detail.

1. Upload the selected image to the AWS S3 bucket, using the Access key and security key credentials provided for the user.
2. Show in Browser button and display the image in the browser.
3. Create a URL for the image in the bucket, so that it can be shared and viewed by other people.
4. Comment on extended applications beyond this experiment.

3) **Amazon RDS**

Amazon Relational database service (RDS) is used to operate and scale a relational database in the cloud. It provides us an option to choose some of the familiar database engines like MySQL, Oracle, PostgreSQL etc.

To get familiar with RDS you're required to go through the AWS tutorial on creating and connecting a MySQL database with RDS (https://aws.amazon.com/getting-started/tutorials/create-mysql-db/?trk=gs_card). Present your implementation of the tutorial through slides, screen shots and a demonstration.

4) **Amazon Lambda**

Given two lists, *predicted* = [1,0,1,1,0,1,1,0,1,1] and *actual* = [1,1,1,0,0,1,1,0,0,1], write a function using Amazon Lambda service without managing servers, to find the true positive rate, true negative rate, precision, accuracy (https://en.wikipedia.org/wiki/Confusion_matrix) where 1 is referred as positive class and 0 as negative class.

Look into the programming languages supported by Lambda and code this simple functionality in a language of your choice.

Step 1. Enter the lambda console. Create a custom function to implement the given the operation.

Step 2. Provide the configuration information which includes the compute resources (for example, memory), execution timeout, and an IAM role that AWS Lambda can assume to execute your Lambda function on your behalf.

Step 3. Invoke the function written and verify the results. After execution present the screen shots of the execution results, summary and log output.

Step 4. Delete the lambda function.