ECE1779: Introduction to Cloud Computing

Fall 2020

Assignment 3

Serverless Computing

Due Dates

Final Report: 24+ hours before final demo and code walkthrough

Final demo and code walkthrough: Between **December 9th-11th** (A signup sheet will be posted on Piazza)

Objective

This assignment will expose you to the following Amazon technologies: Lambda, API Gateway, and DynamoDB.

Description

Use your creativity to develop a complete and cool web application.

Requirements

Your application implementation should comply with the following requirements:

1. All persisted data should be stored on **DynamoDB and S3**. Use them appropriately.
2. **You should use Lambda to deploy your application.**
3. In addition to the main web functionality, your application should also include a separate process that runs in the background and does something useful for your application (for example, doing some analytics on collected data, garbage collection or something else).
4. You can use Zappa or similar tools to deploy your application, but you **must not** use Zappa to deploy the background process, rather you **should** work directly with Lambda functions.
5. You should create a model for the total AWS costs incurred by deploying your application on AWS. Take all the AWS services you use (Lambda, API Gateway, S3,

Network bandwidth, …) into account and predict the long-term deployment cost of your application based on these parameters:

a. Average number of users in a month that will be using your application

In your model, assume typical and reasonable user behaviour.

For this project you can use as many AWS services as you want. AWS has many services (such as image recognition, speech detection, geographical services, etc) that your application could benefit from. Feel free to use them. The purpose here is to show modern applications can be built quickly by connecting already available services.

Final demo and code walkthrough

You will demo the final version of your application and conduct a code walkthrough with one of the TAs. Details for setting up a demo/walkthrough appointment will be provided closer to the submission deadline.

At least 24 hours before your scheduled demo/walkthrough you will need to provide to the TA a final report with the following contents:

1. A short description of your application (something you would say if you wanted to advertise your application to the public)
2. Description on how to use your application
3. The architecture of your application, specially the functions you have defined and their interactions in addition to the background process
4. The cost model for AWS costs. Also, predict these costs after six months for 10, 1000 and 1000,000 users using your model. Discuss your assumptions about the user behaviour, such as requests per day, etc.

Marking Scheme

- **Originality/Creativity (includes ideas on implementation) (20%)**
- **Ease of use and user experience (25%)**
- **The background process (10%)**
- **Technical complexity (25%)**
- **Final report (20%)**

Note that 20% of your grade is allocated to original ideas and creativity on both the project subject and especially ideas on implementation. You should be able to identify and explain your original ideas.