**Northeastern University – Silicon Valley**

CS 6620 Cloud Computing

**Homework Set #8** [100 points]

***INSTRUCTIONS: Please provide clear explanations in your own sentences, directly answering the question, demonstrating your understanding of the question and its solution, in depth, with sufficient detail. Submit your solutions [PDF preferred]. Include your full name. Do not email the solutions.***

**PART I: Concepts and Theory, Algorithms [60 points]**

1. Watch this tutorial and make notes:

Then, explain the 12 to 15 specific STEPS you learned from this tutorial which are useful for you to build the complete eCommerce SaaS web app you desiegned earlier. Follw the exact steps detailed in this particular tutorial and expalin how you’d use them to you build your eCommerce App SaaS.

[React App on AWS S3 with Static Hosting + Cloudfront | Practical AWS Projects #1](https://www.youtube.com/watch?v=mls8tiiI3uc&list=PL9nWRykSBSFgWDlD9t6Q8umECQPFOXP9b&index=1)

1. Study the book chapter on **Scalability of Web Apps**

Scalable and High-Performance Web Applications.pdf

Then, provide a basic design showing scalability calculations for your 3 tier eCommerce Web app SaaS. What are the key metrics of scalability for this SaaS and how can you achive scalability. Provide a detailed 1-2 page design with calcs and a diagram.

1. What is **DevOps**? Why do you need it for the scalability growth of your eCommerce Web app SaaS?

Explain a CI/CD with DevOps design you would follow within AWS to enable this for your eCom app.

List any 4 Devops tools we discussed in class (see references). How can you enable CI/CD nd devOps for your App using these instaed of AWS? Provide a basic design. <https://www.eginnovations.com/blog/top-devops-tools/>

**PART II: LAB [40 points]**

1. Following the examples in Chapter 10 (page 554) section on **AWS Elasticsearch** service. Then, setup a basic Elasticsearch on AWS and show serach and results. It is now called Amazon OpenSearch Service (successor to Amazon Elasticsearch Service). See the tutorials and Book’s exmple to complete this. Clusters etc is not necessary, a basic install and Search use case is sufficient.

**References**

Scalability book chapter in Q#. 2 is link <https://www.informit.com/articles/article.aspx?p=26942&seqNum=18>

<https://queue-it.com/blog/autoscaling-is-hard-infographic/> scalability basics – why?

<https://queue-it.com/blog/autoscaling-is-hard-infographic/>

<https://d1.awsstatic.com/whitepapers/AWS_DevOps.pdf>

<http://athena.ecs.csus.edu/~buckley/CSc233/DevOps_for_Dummies.PDF>

<https://www.eginnovations.com/blog/top-devops-tools/>

Web App (SaaS) capacity estimation and design CCU

<https://cloudkul.com/blog/what-is-concurrent-users/>

<https://servebolt.com/articles/calculate-how-many-simultaneous-website-visitors/>

Scaling saS App on AWS from 10 CCU to 1 million users

https://www.simform.com/blog/building-scalable-application-aws-platform/

Elastic search

<https://docs.aws.amazon.com/opensearch-service/latest/developerguide/what-is.html>

<https://www.youtube.com/watch?v=mWRo_JVgP_0>

<https://sematext.com/guides/elasticsearch/>