**Northeastern University – Silicon Valley**

CS 6620 Cloud Computing

**Homework Set #6** [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]**

Please provide accurate, concise (maximum 10 sentence) answers.

1. Consider equation (12.1, pg 643) from the textbook for the response time of an app. [15 points]
   1. What is the typical response time of a web application (resaerch using the web). What is an acceptable range for it, and what problems occur if it exceeds that range.
   2. Consider 3 different types of workloads [from this overview](https://www.scaleyourapp.com/a-super-helpful-guide-to-understanding-workload-its-types-in-cloud/):

CPU Intensive, Memory Intensive and Stoarge Intensive. Provide real world examples of each of these. Comment on how the diferent Parameters on the right hand side of the equation (12.1) will be different for each of these workload type and why. Please explain.

1. Write a 1-2 page Design Note on how you would design a Performance Testing project for your eCommerce SaaS on AWS Cloud. Please refer to the paper Mukherjee et al. Performance Testing Web Applications on the Cloud, and provide similar approach, with diagrams. [15 points]
2. For this question, you need to study these articles: [30 points]

GraphDatabases.pdf and PostGreSQL.pdf

Then, consider the Database Schema for the Products, Transactions and junction table ProductsTransactions here:

<https://medium.com/@kimtnguyen/relational-database-schema-design-overview-70e447ff66f9>

1. Make 2 or 3 basic tables (only few example ros) for your eCommerce App (SaaS) following these schema. What are the advantages of using postgreSQL for this data?
2. How do you map (translate) this schema to a Graph Db schema? Answer this question using the reference resources.

**PART II: LAB [30 points]**

**Coding needed:** Following the examples in Chpater 12, section 12.7 of textbook, repeat the same Load Testing and Bottleneck Detection case study and show and explain your results. [40 points]

**References**

How to Map Relational Data to a Graph DataBase in Four Steps

<https://www.tibco.com/resources/solution-brief/how-map-relational-data-graph-database-four-steps>

<https://www.tibco.com/sites/tibco/files/resources/sb-graph-database-final.pdf>