

# ENSF 608 – Fall 2021

Lab 5 – Friday, December 09

Student Name: Bhavyai Gupta

Submission date: December 09, 2021

## Question 1

1. Each tuple in a relation should represent one entity or relationship instance. Attributes of different entities should not be mixed in the same relation.
2. Design a schema that does not suffer from the insertion, deletion, and update anomalies. If there are anomalies, the applications should take them into account.
3. Relations should be designed such that their tuples will have as few NULL values as possible.
4. The relations should be designed to satisfy the lossless join condition. No spurious tuples should be generated by doing a natural join of any relations.

## Question 2

SQL refers to relational databases, in which data is stored in the form of tables. In these databases, the schemas must be defined before information can be added. These databases tend to have rigid schemas with only vertical scaling.

NoSQL refers to non-only SQL databases, in which data can be stored in any structured or unstructured manner – Key value pairs, JSON documents, wide columns, or graph nodes and edges. These databases aim to have flexible schemas with focus on horizontal scaling.

## References

L. Schaefer. “NoSQL vs SQL Databases” MongoDB.com.  
<https://www.mongodb.com/nosql-explained/nosql-vs-sql> (accessed Dec. 1, 2021)

B. Anderson and B. Nicholson. “SQL vs. NoSQL Databases: What's the Difference?” IBM.com.  
<https://www.ibm.com/cloud/blog/sql-vs-nosql> (accessed Dec. 1, 2021)

## Question 3

The Extensible Markup Language (XML) is a simple text-based format for representing structured information: documents, data, configuration, books, transactions, invoices, and much more. It was derived from an older standard format called SGML (ISO 8879), in order to be more suitable for Web use. XML is a widely used format for sharing structured information today: between programs, between people, between computers and people, both locally and across networks.

XML Query Language (XQuery) is a query and programming language for processing XML documents and data. XML data and other databases that store data in a format analogous to HTML can be processed with XQuery. The main objective of XQuery is to provide query mechanisms for data extraction from real and virtual Web based documents. It aims to link Web and database technologies with the help of XML.

## References

L. Quin. "XML ESSENTIALS" w3.org  
<https://www.w3.org/standards/xml/core> (accessed Dec. 1, 2021)

Techopedia "XML Query Language (XQuery)" Techopedia.com  
<https://www.techopedia.com/definition/2671/xml-query-language-xquery> (accessed Dec. 1, 2021)

## Question 4

The software development field is constantly changing and evolving. Aspiring developers should have the ability to learn new technologies. Developers should find ways to adapt to the new technology and leverage its benefits. Since no technology can be possibly perfect, aspiring developers should learn to work around any weakness of the technology they are using in order to position themselves in a very good place to continue working forward.

## Question 5

I had worked with some SQL before, but never got a chance or motivation to learn ER, EER, and relation model diagrams. So, the key takeaway for me is the understanding of these diagrams. I think this understanding of DB diagrams is very important during the design phase of any software project that uses relational database. This could be useful to me if I must refer design documents of an already established software system, or when I am creating such a system myself.