**Title:** INFO 330 – Module 2: Assignment02 (Questions and Answers)

**Desc:** This file has the answers to the questions in Assignment2

**Name:** Thomas Luk

**Date:** 01/18/2020

**Introduction**

In Module02, we discussed how to enhance a database. This involves learning about how databases are designed and which how additional features can be added. Some design aspects include constraints and abstraction layers and the benefits of implementing them.

1. Explain the purpose of database constraints.

The purpose of database constraints is to ensure that the data that is being entered into the database is well-formed and valid. Constraints allow the data to be consistent, meaning that it maintains entity integrity, domain integrity and referential integrity. This increases the usability and trustworthiness of the database. For example, the “PRIMARY KEY” constraint allows a database manager to uniquely identify every database entry.

1. Explain the benefits of an abstraction layer.

The benefit of adding an abstraction layer is to reduce the amount of disruption caused by a change in the structure of a database. As the underlying structure of databases is often constantly updated, learning about the structure may be cumbersome. Abstraction creates a new layer of software objects that allow users to interact with the database without needing to fully understand the underlying software. Furthermore, there may be security benefits in creating an abstraction layer. The abstraction layer prevents a user from either accidentally or purposely altering or viewing the internal structure of the database.

1. Discuss the purpose and ERD and Meta-Data worksheet.

ERDs allow database managers to understand the structure of a database. An ERD will indicate how each table relates to each other, and which entities uniquely identifies each database entry. The meta-data spreadsheet describes the constraints that are set on every field. This allows database managers to understand where they should input certain types of information and what kind of information they should be inputting. For example, a database may only accept unique identifiers in a domain, and the meta-data spreadsheet would indicate that.

1. Explain the steps involved with designing a simple database.

Database design begins by having a good understanding of what data you’re trying to sort. This is where constraints on data and candidate keys should be considered. A suitable primary-key should be created to uniquely identify each entry. Next, create an ERD using a tool like draw.io to visualize how the database should be structured. Be sure to apply all the rules of normalization to prevent redundancy in the data. This can be done by considering questions such as whether there are repeating values, multi-part values and multi-value fields. Names of domains and entities must be created to have clear and non-ambiguous naming schemes. After the ERD is created, the database can now be created using a tool like Azure Data Studio. This is when the constraints are all put into place. Finally, the meta-data spreadsheet should be reviewed to ensure that the database is well structured.

**Summary**

Implementing proper database design is crucial for creating a well-formed database. Database constraints create consistency in the data, while abstraction layers allow for upgradability security. ERDs and Meta-Data spreadsheets helps understand how the database is designed.