CSCI 327 – Homework 1

Question 1

Part A

1. Scalability: Databases can handle large amounts of data and can be easily scaled to accommodate more data.
2. Data Integrity: Databases can enforce data integrity constraints to ensure that data is accurate and consistent.
3. Security: Databases can provide access control mechanisms to restrict access to sensitive data.

Part B

1. Small Data: For small amounts of data, the overhead of using a database may not be justified.
2. Performance: Databases can introduce complexity that may impact performance for certain types of applications.
3. Cost: Databases can be expensive to set up and maintain, especially for small organizations.

Question 2

Part A

Data abstraction simplifies working with data by hiding the technical details of storage and management, so users interact only with what they need while the system handles the complexity behind the scenes.

Part B

The database schema is like the blueprint or design—it defines the structure of the database, such as the tables and relationships. It’s fixed (or changes rarely if we are changing the whole design) and doesn’t depend on the actual data in the database.

The database instance on the other hand is the actual data stored in the database at some time. It’s like a snapshot of the database contents, and it keeps changing as new data is added, deleted, etc.

Question 3

Part A:

You should start the MariaDB database server first because the Apache web server depends on the database server to serve dynamic content. Although I think the web server could be started first, it just won't respond properly for some requests.

Part B

A_I stands for Auto Increment. It’s used to automatically generate a unique value for that column every time a new row is added. Typically, it’s used for primary key columns so that each row gets a unique identifier

without manually doing it.

Question 4

```
CREATE TABLE `college`.`student` (`ID` INT(10) NOT NULL , `first_name`
VARCHAR(30) NOT NULL , `last_name` VARCHAR(30) NOT NULL , `GPA` DECIMAL(5)
NOT NULL , `email` VARCHAR(75) NOT NULL , `phone_number` VARCHAR(10) NULL
, PRIMARY KEY (`ID`), UNIQUE (`email`)) ENGINE = InnoDB;
```