# Purdue University
# Computer Science Department
# CS44800 Homework 1 (Feedback)
# Fall 2019

As usual, provide enough detail to support your answers. Make sure to answer all the questions. Also, if you are planning to submit your assignment handwritten, please write legibly. We encourage you to itemize your answers.

Most common errors were:

## Question 1.

### (a) Capabilities
- Most students included basic capabilities such as defining data, constructing data, manipulating data, but do not mention important capabilities like backup and recovery, controlled redundancy and security – *which are very important*.
- You may got points deducted if your answers did not included any relevant insight, examples, and was just a mere listing of DBMS capabilities.

### (b) Comparison
- Even though that some benefits of using DBMS apply to file systems and in-memory storage), we were expecting a comparison of databases against both scenarios.

## Question 2.

- **Unique Constraints:** Most students gave proper examples of unique constraints that could be applied to the database. However, it was occasionally seen that some of you had confused the unique constraints with domain constraints.
- **Referential Integrity:** Most common error was the confusing of the referential integrity constraint with a domain constraint: requiring that a course have a not null value for the department attribute does not constitute a referential integrity constraint. A referential integrity constraint requires that a record's foreign key references an existing primary key in another table.

## Question 3.

- **Schema vs. State:** Most of you have got this correct. However, some of you wrote that an empty database/table is an example of a schema – which is technically wrong. A blank table is also a "state" of the relation.

**Question 4.**

- **Logical and Physical Independence:** Almost everyone got this correct and the examples were mostly accurate.
- **Which one is harder to achieve:** While everyone was correct, the language *" ... - a stricter requirement"* appears in more than half of the class. We did not take off any point for this but in the future, we appreciate answers in your own words rather than verbatim from the book.

**Question 5.**

- Some of you included a classification of components from this [blog](blog). However, that list refers to **components within a database and its environment**. Using the list provided in this blog as DBMS components is inaccurate. We are referring to internal components of a DBMS – *components that work together to provide all the needed capabilities offered by a DBMS*.
- Software, hardware, procedures, data, database access language (e.g. SQL) are not DBMS components.
- Please refer to section 2.4.1 from a comprehensive list of DBMS components.

**Question 6**

- You need to explain each property in ACID (Atomicity, Consistency, Isolation and Durability). If you did not elaborate on ACID properties, you got points deducted.
- Many students appeared to miss the consistency and durability properties.

**Question 7.**

- Accessing disk block is expensive because of Seek time (s), rotational delay (rd), and block transfer time (btt). You need to expand on each of the issue.

Kindly remember to expand answer in detail for homework 2. We encourage you to answer the questions using your own words and not just copy text from the Textbook.