**44-560 Advanced Topics in Database Systems**

**Assignment-02: Normalization**

Answer the following questions (Answers should be short and precise, preferably one line. Place the answer below the question and highlight your answer in yellow like This is the Answer):

1. **Provide three reasons why we do normalization?**

**i) Flexible database design**

**ii) Discard repeating groups**

**iii) Minimize the redundancy**

1. **Condition(s) for a relation to be in First Normal Form?**

**A relation is 1NF if it has no repeating groups.**

1. **Condition(s) for a relation to be in Second Normal Form?**

**A relation is in 2NF if it is in 1NF, and it has no partial dependencies.**

1. **What is Partial Dependency?**

**A partial dependency occurs when a non-key attribute is determined by only part of the primary key.**

1. **What is Transitive Dependency?**

**When a non-key attribute uniquely determines the value of another attribute.**

1. **Condition(s) for a relation to be in Third Normal Form?**

**A relation is in 3NF if no repeating groups, it is in 2NF, and it has no transitive dependencies.**

Consider a clinic that gives health services on different health-related issues. New patients are enrolled. Every doctor and patient is provided with ID number. The hospital has maintained a single spreadsheet to store all details so far. As the result, it has become very difficult for the hospital to keep track of the information being accumulated.

**Normalization:**

Here, the data is not atomic, and it consists of partial dependencies and transitive dependencies. As per database developer perspective, it is required to normalize the data into 3NF. Apply the necessary normalizations on the given data and transform the data into the third normal form.

The excel sheet has a list of data, consisting of doctor details, Patient details, Clinic code, Room Number, Room Type and Bed Type and Registration details.

Download the excel sheet from assignment page.

**To submit your assignment, you are responsible for the following.**

* Rename this given file with your Lastname\_Assignment02.
* Include 3NF normalized excel sheet. Consider one tab in the excel sheet as a table. Highlight the primary key attribute cell in yellow color \_\_\_\_ and foreign keys in \_\_\_\_.
* Design and draw the ER diagram with all normalized entities and relationships and submit it via Screenshot from Lucid chart, ERD plus, or other diagramming tools. Clearly show key attributes, including primary keys and foreign keys, and the relationships between the entities.

Note:

* Do not introduce new surrogate keys as primary keys in the entities in your solution.
* Do not include any composite keys in your solution.

Attach the excel sheet and diagram screenshot separately in your submission. For the diagram, make sure to add enough of your desktop to show the screen is running in your laptop (for example, a command prompt window with your SID in command line).