BRAC UNIVERSITY
Inspiring Excellence

Department of Computer Science and Engineering

Course Code:CSE370	Credits: 1.5
Course Name: Database Systems	

Lab 08
Introduction to Database Design and Normalization
(Project Milestone 1)

I. Topic Overview:

This lab aims to help students identify and implement the process of designing a complete database system. It also aims to assist the students in getting started with their final project, collaborate in group and make design decisions.

Entity-Relationship (ER) and Enhanced Entity Relationship (EER) diagrams are used to describe the organization and relationship of data stored in a database for efficient storage and redundancy control. In this lab, students will work in groups to design an ER/EER diagram for their final Database project. Afterwards, the students will map their diagrams to a database schema; identify primary keys and foreign keys. They will also be introduced to Normalization for superior schema design. Finally they will use PHPMyAdmin to create a database for their project

II. Lesson Fit:

Students should have an understanding of the following:

1. Entities and Relationships
2. Schema Mapping

III. Learning Outcome:

After this lecture, the students will be able to:

a. Design a complete database system using ER/EER diagrams
b. Map ER/EER diagrams to database schema
c. Apply Normalization upto 3rd Normal Form.
d. Create a database using standard MySQL GUI such as PHPmyAdmin.
e. Team Work

IV. Anticipated Challenges and Possible Solutions

Students might face problems in identifying the Normal forms and applying Normalization.

Solutions: Teachers will explain the concept of Functional Dependencies (FD). Once students identify all FDs, they will be able to apply Normalization.

V. Acceptance and Evaluation

Students will show their progress as they complete each problem. They are expected to complete until Task 3 in class. They will be marked according to their class performance.

Activity Detail

a. **Hour: 1**
   Teachers give an overview of designing a Database System using ER/EER diagrams. Students will list all features for their project and design ER/EER diagram in group
   Problem Task:
      i. Task 1 and 2

b. **Hour: 2**
   Discussion:
   Check Task 2 and make appropriate corrections and suggestions. Teachers will give an overview of the schema mapping algorithm and Normalization.
   Problem Task:
      i. Task 3 and Task 4

c. **Hour: 3**
   Discussion:
   Check students have correctly mapped ER/EER diagram to database schema and applied Normalization where possible. Suggest corrections.

VI. Home tasks

a. Task 5

Lab 8 Activity List

Task 1

1. List the main features of your database project.
2. List all entities and describe the relationships between entities

Task 2

Design an ER/EER diagram for your database system project.

Task 3

Map your ER/EER diagram to a database schema using standard mapping rules. (Check Chapter 7 from Theory Lecture)

Task 4

1. Is your Schema in 1NF, 2NF or 3NF? Explain
2. Apply Normalization until 3NF where necessary.

Task 5

1. Open XAMPP controller. MySQL and Apache should be running
2. Go to PHPMyAdmin [localhost/phpmyadmin] from your browser
3. Do the following:
    a. Create a database for your project
    b. Create all tables from the mapped schema, with appropriate attributes and data types
    c. Set primary keys and foreign keys
    d. Import the database for later use.