Computer Science Department

University of Computer & Emerging Sciences (FAST-NU)

ASSIGNMENT COVER SHEET

COURSE TITLE	DATABASE SYSTEMS	COURSE CODE	CS2005	
INSTRUCTOR	Teaching Team.	TYPE	☐ Indiv.	☑ Group (Please tick)
ASSIGNMENT NO	1			
ASSIGNMENT	Entity Relationship Diagram- Case studies			
HAND OUT DATE	20-Feb-2023	DUE DATE	06-Mar-2023 (10:00 AM)	

ASSESSMENT CRITERIA (or attached)	% Mark
Submission: Hard and **Scanned** copies are required. Submit **Hard Copies** to Mr. Amir or Mr. Fahad in the Academic Office (till the due date and time). The submissions that will be slided beneath Instructor's office doors or submitted elsewhere will not be graded. Also, Submit **Scanned Copies** of the assignment on Google Classroom. **Group of max 2 students is allowed, individual work is acceptable in extreme situations and with prior written (by email) permission of theory course teacher. Such permission should be sought at least 5 days before the deadline of the assignment.** **Any type of plagiarism will lead to 0% marks of both/all parties.** **Late submission (even 1 min) will result in zero marks.** **There will be no credit if the given requirements are changed.**	

TO BE COMPLETED BY STUDENT (TEAM LEAD)

NAME _____

ID NO _____

Time Taken

DECLARATION: I/We declare that this Coursework is my/our group's own work

SIGNATURES (All members)

GROUP MEMBERS ID

ID _____

ID _____

GRADE/ MARK AWARDED ☐

COMMENTS _____

INSTRUCTOR'S SIGNATURE _____ DATE _____

Case Study 1: [25 marks]

National Solutions Convention (NaSCon)

The biggest flagship event of FAST National University, Islamabad campus, the National Solutions Convention (NaSCon) is just around the corner. The university has assigned you the duty of efficiently managing all the records of this event. You have to design the ERD for NaSCon Management System. NaSCon is managed by a president, vice president, and management team. The management team is divided into departments such as sponsorship, marketing, operations, security, logistics, etc. Each department will have its own executive body. The executive body consists of a secretary and a team. There will be a separate event head for each event. All members have a unique id (roll number), first name, last name, age, email, and role. NaSCon organizes a number of events of different categories such as EE (Robo Wars, Speed Wiring), CS (Game Jam, Bug Hunt), Business (Marketing Plan, Finance Guru), and Sports, etc. Each event will have a time, date, registration price, participants, and information about prizes. Each participant can participate in more than one event. The participants can either be from FAST University or any other university. The students of FAST will have a special discount on all ticket prices so you will have to maintain the difference between both kinds of participants. All participants will have a unique id, first name, last name, age, and contact. The participants of FAST will also have their roll numbers saved. Non-FASTians will have a university name. Some events will also have teams of participants rather than a solo participant. You must manage this as well. Many different organizations sponsor NaSCon. You will also have to save their record. Each sponsoring organization will have the name of the company, the name of the representative, CNIC, and the name of the category/event for which they are willing to sponsor. Each sponsor can sponsor multiple events. Similarly, an event can be sponsored by multiple sponsors.

Case Study 2: [25 marks]

Pakistan Super League (PSL)

Season 8 of the Pakistan Super League began on February 13, 2023. The PSL is a Pakistani cricket league. In this, multiple teams have matches against each other. At the end of the tournament, the winning team gets the trophy and cash prize. A schedule is made to maintain the records of all the matches. Each match has a match ID, date and time, team A, team B, result, etc. A team can play multiple matches in a season, but a match can only involve two teams. Each match takes place in a specific stadium. Each stadium has a stadium ID, location, seating capacity, stadium rating, etc. A stadium can host multiple matches, but a match can only be played in a specific stadium. A match can have a maximum of two innings, but each inning belongs to a specific match. An inning may have an inning ID, match ID, batting team ID, runs scored, wickets taken, overs bowled, etc. Each team has its own team ID, name, represented city, number of players, coach, etc. A team has multiple local and foreign players, but a specific player can only belong to a single team (for that season). A player may have his player ID, name, role in the team, date of birth, city, country, matches played, runs scored, wickets taken, etc. A player has statistics for each match he has played. Its statistics included statistics ID, runs scored, balls faced, boundaries scored, wickets taken, catches taken, overs bowled, etc. A player’s specific statistic belongs to a specific match.

Case Study 3: [25 marks]

PUBG

A gaming company has developed a popular online survival game called PUBG. They want to implement a database management system for their game to store and manage various aspects of the game such as player information, match details, inventory management, weapons, and vehicles used in the game. You are assigned the duty to create an ERD for their database. Each player in the game has a unique player ID, name, level, rank, wins, kills, cash, and deaths. Players can add each other as friends. Players in the game can play a match as a solo, duo, or squad. Each match has a unique match ID, type, map, duration, and winner. The match is played on square maps. Each map has a fixed area and number of players. In a match, players can use different types of weapons including melee, guns, and throwables. Each weapon has a name, unique id, type, and damage. Guns also have magazine capacity and reload time. Players can also use different types of vehicles in a match. Each vehicle has a unique id, name, speed, and health. Each vehicle has a seating capacity indicating that multiple players can ride it at a time. You will need to map different interactions within the game as relations such as a player can kill other players, a player can destroy vehicles, etc. Think of some other interactions as well. Also, some vehicles and weapons are exclusive to specific maps while some are available on all maps. In addition to playing matches, players also have an inventory. The inventory contains items that the player owns. There can be different items such as clothing, weapons and vehicle skins, and crates. Each item has a unique id, name, type, price, and status(collected or not). The crates contain cash and/or clothing items. Players can also purchase items from the shop using cash.

Case Study 4: [25 marks]

LinkedIn

LinkedIn is a professional networking platform that enables users to connect with others in their industry, find job opportunities, and share professional information and experiences. On LinkedIn, users can make connections with other users. Every user has a unique ID, name, email, password, profile information (bio), skills, etc. A user can have connections with many users. A connection can be established between two users when one sends a connection request to the other and the request is accepted. Each connection has a connection ID, user ID of the sender, user ID of the recipient, date of connection, etc. There are also companies registered on LinkedIn. A company may have a company ID, name, size, description, etc. Companies post jobs on LinkedIn, and users can apply for those jobs. A job may include a job ID, company ID, job title, job description, location, salary, etc. Other than jobs, users can also make posts on LinkedIn. Other users can like and comment on the posts. A single user can make multiple posts. A user can like and comment on multiple posts and can make multiple comments on a single post but can only like a post once. Each post has its own post ID, user ID, post description, post date and time, etc.

Deliverables:

Submit your work that should include:

- ERD: Complete ER diagrams for all the given scenarios. It is necessary to specify all entities, attributes, constraints, relationships and all the concepts that you have studied in Chapter 03.
- Documentation: Paragraphs explaining details about the design regarding the following aspects

    1. Mention the diagramming software that you have used for the assignment.
    2. Any clarifications about your ERD which are not evident in the model itself.
    3. Any assumptions you had to make with respect to the requirements.
    4. Any constraints (business rules) apparent from the requirements that you are unable to model via your ERD.