

## CA1 Questions for ppt presentation

Ppt presentation must contain the following points:

1. Construct an ER diagram.
2. List your assumptions and clearly indicate the cardinality mappings as well as any role indicators in your ER diagram.
3. Map the ERD in the relational model corresponding to the described application.
4. Also make sure to have the primary keys and foreign keys clearly.

Question no. 1 to 20 for the first 20 students respectively. Similarly repeat the same questions for the next 20 students and follow the same pattern for other roll numbers also (including stream change and lateral candidates). [Check the “Question Mapping” file]. **Similar contents of the ppts will be rejected.**

Please note the following

1. Prepare a presentation on the assigned topic and upload (in .pdf format) positively by 29-01-2024 (Monday) 11.00 AM. Post this the drive link will be closed.
2. Save the file with the naming format **"Your Name\_Roll no"** only. **DO NOT DEVIATE FROM THIS.**
3. The file size should not exceed the stipulated size of 4MB.

**Date of ppt presentation:**

**29.01.2024 (1:30 pm – 2:50 pm) – First 25 Students.**

**30.01.2024 (11:30 am – 1:30 pm) – Leftover Students**

1	<p>Suppose you are given the following requirements for a simple database for the National Hockey League (NHL):</p> <ul style="list-style-type: none"> <li>• the NHL has many teams,</li> <li>• each team has a name, a city, a coach, a captain, and a set of players,</li> <li>• each player belongs to only one team,</li> <li>• each player has a name, a position (such as left wing or goalie), a skill level, and a set of injury records,</li> <li>• a team captain is also a player,</li> <li>• a game is played between two teams (referred to as host_team and guest_team) and has a date (such as May 11th, 1999) and a score (such as 4 to 2).</li> </ul>
2	<p>A university registrar's office maintains data about the following entities:</p> <ul style="list-style-type: none"> <li>• courses, including number, title, credits, syllabus, and prerequisites;</li> <li>• course offerings, including course number, year, semester, section number, instructor(s), timings, and classroom;</li> <li>• students, including student-id, name, and program;</li> <li>• instructors, including identification number, name, department, and title.</li> </ul> <p>Further, the enrollment of students in courses and grades awarded to students in each course they are enrolled for must be appropriately modeled. Construct an E-R diagram for the registrar's office. Document all assumptions that you make about the mapping constraints.</p>
3	E-R diagram for a car-insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents.
4	E-R diagram for a hospital with a set of patients and a set of medical doctors. Associate with each patient a log of the various tests and examinations conducted.
5	E-R diagram which models an online bookstore.
6	<p>Consider a university database for the scheduling of classrooms for final exams. This database could be modeled as the single entity set exam, with attributes course-name, section- number, room-number, and time. Alternatively, one or more additional entity sets could be defined, along with relationship sets to replace some of the attributes of the exam entity set, as</p> <ul style="list-style-type: none"> <li>• course with attributes name, department, and c-number</li> <li>• section with attributes s-number and enrollment, and dependent as a weak entity set on course</li> <li>• room with attributes r-number, capacity, and building</li> </ul> <p>Show an E-R diagram illustrating the use of all three additional entity sets listed.</p>
7	<p>Company organized into DEPARTMENT. Each department has unique name and a particular employee who manages the department. Start date for the manager is recorded. Department may have several locations.</p> <ul style="list-style-type: none"> <li>• A department controls a number of PROJECT. Projects have a unique name, number and a single location.</li> <li>• Company's EMPLOYEE name, ssno, address, salary, sex and birth date are recorded. An employee is assigned to one department, but may work for several projects (not necessarily controlled by her dept). Number of hours/week an employee works on each project is recorded; The immediate supervisor for the employee.</li> <li>• Employee's DEPENDENT are tracked for health insurance purposes (dependent name, birthdate, relationship to employee).</li> </ul>

8	E-R diagram for keeping track of the exploits of your favourite sportsteam. You should store the matches played, the scores in each match, the players in each match and individual player statistics for each match. Summary statistics should be modelled as derived attributes.
9	A salesperson may manage many other salespeople. A salesperson is managed by only one salespeople. A salesperson can be an agent for many customers. A customer is managed by one salespeople. A customer can place many orders. An order can be placed by one customer. An order lists many inventory items. An inventory item may be listed on many orders. An inventory item is assembled from many parts. A part may be assembled into many inventory items. Many employees assemble an inventory item from many parts. A supplier supplies many parts. A part may be supplied by many suppliers.
10	E-R diagram of the bank. It provides different kinds of bank accounts. and loans. It operates number of branches.
11	ER Diagram for the School Management System.
12	E-R diagram of Library Management System.
13	<p>Assume we have the following application that models soccer teams, the games they play, and the players in each team. In the design, we want to capture the following:</p> <ul style="list-style-type: none"> <li>• We have a set of teams, each team has an ID (unique identifier), name, main stadium, and to which city this team belongs.</li> <li>• Each team has many players, and each player belongs to one team. Each player has a number (unique identifier), name, DoB, start year, and shirt number that he uses.</li> <li>• Teams play matches, in each match there is a host team and a guest team. The match takes place in the stadium of the host team.</li> <li>• For each match we need to keep track of the following: <ul style="list-style-type: none"> <li>o The date on which the game is played</li> <li>o The final result of the match</li> <li>o The players participated in the match. For each player, how many goals he scored, whether or not he took yellow card, and whether or not he took red card.</li> <li>o During the match, one player may substitute another player. We want to capture this substitution and the time at which it took place.</li> </ul> </li> <li>• Each match has exactly three referees. For each referee we have an ID (unique identifier), name, DoB, years of experience. One referee is the main referee and the other two are assistant referee.</li> </ul>
14	<p>The Advising Center at a University would like an "Advising Website" to be created so they can better manage the student requests for advising appointments. The Advising Center would like to assign appropriate academic or industry advisors to students based on their expertise.</p> <p>Every advisor has an area (or areas) of expertise, that is, they are knowledgeable in providing career advice for particular career areas (e.g. Arts, Education, Engineering, Healthcare, Marketing, etc...)</p>

	<p>Students come to the Advising Center to get advice in a particular career area. Students who log into the system will have a profile with their basic information – first name, last name, computingID, phone number, email, and a career area which they select from a list of career areas.</p> <p>Both academic and industry advisors have their basic information – first name, last name, advisorID, office location, phone, email, and area(s) of expertise (area of expertise taken from the same list of career areas the students have).</p> <p>Let's assume each student is interested in only one career area (e.g. Engineering) whereas advisors can have more than one career area listed as their areas of expertise.</p> <p>Students can request an advising session and, based on their career area, an appropriate advisor will be assigned.</p> <p>An advising session will be scheduled between the student and an advisor at a specific date and time, in a particular location (either Rice 103, Rice 204, or Rice 304), and for a specific career area (for example, this advising session is to discuss the Engineering career area). At the end of the advising session, the student has the opportunity to rate their experience with a simple numeric rating (e.g. 1 to 10) and a free-form text box.</p> <p>At various times, the Advising Center would want to gather information about the number of advising sessions that took place per career area, the total number of unique students who requested advising sessions (students can request multiple advising sessions during an academic year), the average rating given, or the advisor who was rated the highest, etc.</p>
15	<p>Consider the following database scenario for a hospital</p> <p>Hospital staff consist of doctors and nurses.</p> <p>Each hospital staff has a staffID, name (first name, middle name, and last name), and phone numbers.</p> <p>Doctors have an office and up to 3 specializations.</p> <p>Doctors have nurses that work with/assist them.</p> <p>Each nurse has one specialization and belongs to a specific department in the hospital.</p> <p>All nurses work with doctors.</p> <p>Many nurses can work with one doctor.</p> <p>Doctors sometimes consult with a colleague (who is another doctor).</p> <p>Doctors treat patients.</p> <p>Patient information collected by the hospital consists of patientID, name, insurance, date of admission, and checked out date.</p> <p>A patient can undergo a number of tests.</p> <p>Doctors perform tests.</p> <p>Each test has a unique ID, name, a result, and a date and time the test was performed.</p>
16	<p>ER diagram for each of the following descriptions:</p> <p>a) Each company operates four departments, and each department belongs to one company.</p>

	<p>b) Each department in part (a) employs one or more employees, and each employee works for one department.</p> <p>c) Each of the employees in part (b) may or may not have one or more dependants, and each dependant belongs to one employee.</p> <p>d) Each employee in part (c) may or may not have an employment history.</p> <p>e) Represent all the ER diagrams described in (a), (b), (c), and (d) as a single ER diagram.</p>
17	<p>You are required to create a conceptual data model of the data requirements for a company that specializes in IT training. The Company has 30 instructors and can handle up to 100 trainees per training session. The Company offers five advanced technology courses, each of which is taught by a teaching team of two or more instructors. Each instructor is assigned to a maximum of two teaching teams or may be assigned to do research. Each trainee undertakes one advanced technology course per training session.</p>
18	<p>Read the following case study, which describes the data requirements for a video rental company. The video rental company has several branches throughout the USA. The data held on each branch is the branch address made up of street, city, state, and zip code, and the telephone number. Each branch is given a branch number, which is unique throughout the company. Each branch is allocated staff, which includes a Manager. The Manager is responsible for the day-to-day running of a given branch. The data held on a member of staff is his or her name, position, and salary. Each member of staff is given a staff number, which is unique throughout the company. Each branch has a stock of videos. The data held on a video is the catalog number, video number, title, category, daily rental, cost, status, and the names of the main actors, and the director. The catalog number uniquely identifies each video. However, in most cases, there are several copies of each video at a branch, and the individual copies are identified using the video number. A video is given a category such as Action, Adult, Children, Drama, Horror, or Sci-Fi. The status indicates whether a specific copy of a video is available for rent. Before hiring a video from the company, a customer must first register as a member of a local branch. The data held on a member is the first and last name, address, and the date that the member registered at a branch. Each member is given a member number, which is unique throughout all branches of the company. Once registered, a member is free to rent videos, up to maximum of ten at any one time. The data held on each video rented is the rental number, the full name and number of the member, the video number, title, and daily rental, and the dates the video is rented out and date returned. The rental number is unique throughout the company.</p>
19	<p>The Hudson Engineering Group (HEG) has contacted you to create a conceptual model whose application will meet the expected database requirements for the company's training program. The HEG administrator gives you the description (see below) of the training group's operating environment. The HEG has 12 instructors and can handle up to 30 trainees per class. HEG offers five "advanced technology" courses, each of which may generate several classes. If a class has fewer than 10 trainees, it will be cancelled. Therefore, it is possible for a course not to generate any classes. Each class is taught by one instructor. Each instructor may teach up to</p>

	two classes or may be assigned to do research only. Each trainee may take up to two classes per year.
20	<p>The music database stores details of a personal music library, and could be used to manage your MP3, CD, or vinyl collection. Because this database is for a personal collection, it's relatively simple and stores only the relationships between artists, albums, and tracks. It ignores the requirements of many music genres, making it most useful for storing popular music and less useful for storing jazz or classical music.</p> <p>We first draw up a clear list of requirements for our database:</p> <ul style="list-style-type: none"> <li>• The collection consists of albums.</li> <li>• An album is made by exactly one artist.</li> <li>• An artist makes one or more albums.</li> <li>• An album contains one or more tracks</li> <li>• Artists, albums, and tracks each have a name.</li> <li>• Each track is on exactly one album.</li> <li>• Each track has a time length, measured in seconds.</li> <li>• When a track is played, the date and time the playback began (to the nearest second) should be recorded; this is used for reporting when a track was last played, as well as the number of times music by an artist, from an album, or a track has been played.</li> </ul>