Database Management Systems II

Year 2, Semester 1

SLIIT
COMPUTING | BUSINESS | ENGINEERING

Lab Sheet 01

Question 1

Consider a company called ABC Consolidated which contains many banks under it.

- Each bank contains a code, name and a registration number. The code and name are unique.
- The bank has many branches which contain a branch number, branch name and an address. The branch number is unique for each bank.
- Each bank contains many accounts. An account contains an account number, balance, a customer and an account type.
- Each account type contains a name, a code and a description. Account code is unique each account type.
- Account type may be Savings or Current. The Savings account type contains an interestrate. The Current account type has max-cheques which pertains to maximum cheques that can be written per month.
- Each customer has a customer number, NIC number, name, address, phone and PIN. Both NIC and customer number are unique.
- There are many transactions processed in a bank. Each transaction has a transaction id, date & time of transaction, amount and responsible party or application for the transaction (i.e. bank, ATM, teller, cheque, etc.) and description (interest calculation, fund transfer, cheque number etc.)
- Each transaction has one or many accounts that it affects and the type of affect that the transaction (either a credit/debit) has on the account.

Answer the following questions and then draw the ER diagram for the scenario above.

1. How many entities are there in the scenario? What are they?.....
   .....
   .....

2. Are all the entities you identified strong? …….
    a. If not what are the weak entities you identified? …….
    b. How did you identify the weak entities?.....

3. What are the different types of relationships in the scenario? ……...
    …….
    …….
    a. Is there any superclass/subclass relationship in the scenario? If yes, what entities are involved in the superclass/subclass relationship?.....
    …….
        i. What constraints (overlapping/disjoint/covering) could exist relevant to the superclass/subclass relationship?.....
    b. Is there any aggregation relationship in the scenario If yes, what entities are involved in the aggregation relationship?.....
    ……..
4. Fill the following table with relevance to each entity you identified.

Name of the entity	Key	Attributes
1.		
2.		
3.		
4.		
5.		
6.		
7.		

Question 2

The requirements for SLIIT batch registration are as follows:

- There are many campuses at SLIIT. Each campus has a code, name and an address. Code and name are unique.

- SLIIT offers many programs of study (e.g., “Certificate in Information Technology”, “Diploma in Information Technology”, etc.). Each program has a code (unique), name, description and specialization.
- There are semesters in each program of study. Each semester contains a semester number (such as 1, 2, 3, etc.)”, a semester (either “Semester 1” or “Semester 2”) and year (“Year 1”, “Year 2”, “Year 3” or “Year 4”). Semester number is unique for the program of study and increases monotonically with the level of study.
- An academic year consists of many academic semesters. Each academic semester belongs to some semester of a program of study.
- Academic semester consists of an academic year and an academic semester number (unique). There are many batches at SLIIT. Each batch contains an id (unique), group number (“C1”, “M1”, etc.), maximum number of students a batch can contain and a section (either “Weekday” or “Weekend”).
- A batch has a campus and a program of study. There may be many batches that may follow a single academic semester (for example, Semester 1, 2004 can have both M1, and M2 batches following it). A batch may follow many academic semesters during its program of study (for example, M1 batch may follow semester 1, 2004 and semester 2, 2004).
- There are students at SLIIT. Each student has a registration number (unique), name, address and a phone
- A student registers himself/herself to a particular batch’s academic semester (For example, a student may register to M1 batch during semester 1, 2004). A date registered should be maintained.

Draw an E-ER diagram for the above-mentioned requirements

1. How many entities are there in the scenario? What are they?.....
   .....
   .....
2. Are all the entities you identified strong? …….
   a. If not what are the weak entities you identified? …….
   b. How did you identify the weak entities?.....

3. What are the different types of relationships in the given scenario?…….
   ……
   ……

   a. Is there any superclass/subclass relationship in the scenario? If yes, what entities are involved in the superclass/subclass relationship?.....
      …….
   b. Is there any aggregation relationship in the scenario? If yes, what entities are involved in the aggregation elationship?.....
      ……..
      i. What are the cardinalities of the aggregation relationship?.....
         ……

4. Fill the following table with relevance to each entity you identified.

3. What are the different types of relationships in the diagram? ……...
   ……
   ……

   a. Is there any superclass/subclass relationship in the diagram? If yes, what entities are involved in the superclass/subclass relationship?.....
      ……
      i. What constraints (overlapping/disjoint/covering) could exist relevant to the superclass/subclass relationship?.....
   b. Is there any aggregation relationship in the diagram? If yes, what entities are involved in the aggregation relationship?.....
      ……

Name of the entity	Key	Attributes
1.		
2.		
3.		
4.		
5.		
6.		

7.		
8.		
9.		
10.		