Due Date: Tuesday, 26th April 2022

University of Engineering & Technology, Peshawar
Dept. of Computer Systems Engineering

Database Management Systems – Spring 2022

Assignment No. 2

NOTE: Given Lecture 2, Lecture 2b, and Lecture 3 slides, answer the following questions. Please submit HAND WRITTEN work. PRINTED work will be awarded zero marks.

Q1: DEFINE the following terms and give REQUIRED EXAMPLES:

a) Entity [2 examples]
b) Attribute [2 examples]
c) Simple Attribute [2 examples]
d) Composite Attribute [2 examples]
e) Single-Valued Attribute [2 examples]
f) Multi-Valued Attribute [2 examples]
g) Stored Attribute [2 examples]
h) Derived Attribute [2 examples]
i) Unary Relationship [draw 1 example]
j) Binary Relationship [draw 1 example]
k) Ternary Relationship [draw 1 example]
l) Associative Entity [draw 1 example]
m) Time Stamping [draw 1 example]

Q2: DRAW AND CONVERT "Simple Multivalued Attribute" and "Composite Multivalued Attribute" in alternate forms.

Q3: Emerging Electric wishes to create a database with the following entities and attributes:

- Customer, with attributes Customer ID, Name, Address (Street, City, State, Zip Code), and Telephone
- Location, with attributes Location ID, Address (Street, City, State, Zip Code), and Type (values of Business or Residential)
- Rate, with attributes Rate Class and RatePerKWH

After interviews with the owners, you have come up with the following business rules:

- Customers can have one or more locations.

- Each location can have one or more rates, depending on the time of day.

Draw an ERD for this situation and place minimum and maximum cardinalities on the diagram. State any assumptions that you have made.

Q4: At a weekend retreat, the entity type PERSON has three subtypes: CAMPER, BIKER, and RUNNER. Draw a separate EER diagram segment for each of the following situations:

a) At a given time, a person must be exactly one of these subtypes.
b) A person may or may not be one of these subtypes. However, a person who is one of these subtypes cannot at the same time be one of the other subtypes.
c) A person may or may not be one of these subtypes. On the other hand, a person may be any two (or even three) of these subtypes at the same time.
d) At a given time, a person must be at least one of these subtypes.

Q5: Develop an EER model for the following situation using the traditional EER notation covered in Lecture 3 - Enhanced ER Model:

A nonprofit organization depends on a number of different types of persons for its successful operation. The organization is interested in the following attributes for all of these persons: SSN, Name, Address, City/State/Zip, and Telephone. Three types of persons are of greatest interest: employees, volunteers, and donors. Employees have only a Date Hired attribute, and volunteers have only a Skill attribute. Donors have only a relationship (named Donates) with an Item entity type. A donor must have donated one or more items, and an item may have no donors, or one or more donors.

There are persons other than employees, volunteers, and donors who are of interest to the organization, so that a person need not belong to any of these three groups. On the other hand, at a given time a person may belong to two or more of these groups (e.g., employee and donor).

Good Luck