ST. XAVIER’S COLLEGE

**Maitighar,Kathmandu**

**(Affiliated to Tribhuvan University)**



**Database Management System**

**Lab Assignment #5**

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1. What do you mean by Entity- Relationship Diagram? Explain.

Ans->

The Entity- Relationship Diagram(ERD) is the graphical representation of the relationships that exists among the entities.

Here ,entities refers to the unique identification of any things.

Major components of E-R diagram are:

**Rectangles**: (representing entity sets.)

**Ellipses**: (representing attributes).

**Diamonds**: (representing relationship sets)

**Lines**: (linking attributes to entity sets and entity sets to relationship sets).

**Double ellipses**: represents multivalued attributes.

**Dashed ellipses**: represents derived attributes

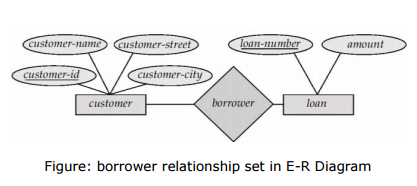
**Double lines**:=( represents total participation of entity in relationship sets)

**Double rectangles**: represents weak entity sets (discuss in later section)

**Underline**: indicates primary key attributes [1].

Example :

The relationship set borrower having two entity sets customer and loan can be express as:



1. Define entity and give an example.

Ans ->

An entity may be defined as an object in the real world that has its unique identification. Anything around us can be referred as an entity that is distinguishable from any other objects. An entity can be described by a set of properties called attributes.

For example:

Let customer be an entity. It can be described by attributes like customer\_id, customer\_name, customer\_addres .

Similarly , Particular course in university can be an entity and course\_id, course\_name are attributes for entity course.

1. Explain the different between an entity class and an entity instance.

Ans -> An entity class is a group of entities of the same type, i.e. VEHICLE. An entity instance is a particular entity, i.e. VEHICLE 12345.

1. Define attribute and its types.

Ans -> Attributes can be defined as the properties of the entity. The entities can be described in various forms as per required, such descriptive properties are referred as attribute. The attribute are represented by the ellipse in the ERD.

Example : colour,size,brand & cost may be the attribute of the entity clothes.

There are various types of attributes on different basis.

1. **Simple and Composite attribute**

Attribute which can not be divide into subparts (i.e. into other attributes) called simple attribute. For example, customer\_id in customer entity set is simple attribute, since it can not divide into sub attributes.

Attribute that can further divide into subparts called composite attribute. For example, customer\_name in customer entity set is composite attribute since it can be divided into sub attributes: customer\_fname, customer\_mname and customer\_lname.

1. **Single-valued and Multivalued attributes**

Attribute that can take only one value in every entry called singled-valued attribute. For example, attribute customer\_name in customer entity set is single-valued attribute since it cannot contain more than one customer name in any entry.

An attribute that can take more than one values in any entry called multivalued attribute. For example, in a customer entity set

attribute customer\_phonenumber is multivalued attribute since customer may have zero or one or several phone number.

1. **Stored and Derived attribute**

Attribute whose values can be derived from the values of other related attributes or entities called derived attribute. For example, in customer entity set, attribute age is derived attribute if customer entity set has attribute date\_of\_birth. We can derive age of customer from

date\_of\_birth and current\_date. Here the attribute date\_of\_birth is stored attribute and the attribute age is derived attribute. The value of derived attribute is not stored, it is computed when required.

1. What is derived attributes?

Ans-> Attribute whose values can be derived from the values of other related attributes or entities called derived attribute. In derived attribute one attribute is calculated from another attribute. The derived attribute may not be stored in the database but rather calculated using algorithm .

Example : In the entity Student, stu\_Age would be considered a derived attribute since it could be calculated using the student's date of birth with the current date to find their age[2].﻿﻿

1. Define relationship and give an example.

Ans -> A relationship can be defined as is an association among two or more entities.

Study

Students

Colleges

The connection between the entity student and the entity college is defined by the relation study. In the ERD the relations are represented by a diamond symbol.

1. Explain the difference between a relationship class and a relationship instance.

Ans -> A relationship class is an association among entity classes; a relationship instance is an association among entity instances.

8. Define degree of relationship.

Ans -> Degree of relationship refers to the number of participating entities in a relationship[3].

9. List and give an example of the three types of binary relationships. Draw an E-R diagram for each.

Ans ->

The types of binary relationships are :

a)one to one (1:1)

A Principal Teacher manages one Department

Each Department is managed by one Principal Teacher

one to one relationship

b)one to many (1:M)

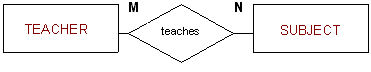
A Subject can be offered many times

Each Offering belongs to one Subject

c)many to many (M:N)

A Teacher can teach many different Subjects

Each Subject can be taught by many Teachers[5]



10. Define the terms maximum cardinality and minimum cardinality.

Ans ->

Maximum cardinality is the maximum number of instances of an entity that can participate in an instance of a relationship.

Minimum is the least number of instances of an entity that can participate in an instance of a relationship[4].

11. Explain the distinctions among the terms primary key, candidate key and super key.

12. What are the main building modules of the entity relationship model? Discuss each one.

13. What is composite attributes, when it is used?

14. Explain the difference between single-value attributes and simple attributes.

15. Discuss the difference between a composite key and a composite attribute. How would

each indicated in an E-R diagram?

16. What two courses of action are available to a designer when a multivalued attribute is

encountered ?

17. Explain the various terms of an E-R model and how are they represented in an E-R

model?

18. Explain the concept of dependent entities? Give example.

19. What is the difference total and partial participation? Explain.

20. What do you mean by mapping cardinalities ? explain various type of cardinalities.

21. What is the difference between single-value and multivalued attributes? Explain.

Ans -> Single valued attribute can take only one value at a time.For example : the name field can take only one name at a time; A person doesnot have two names in the single field.

Multivalued attribute can take more than one value at a time. For example : A person can have more than one number including zero to many.

22. Explain the concept of participation constraints.

23. Difference the binary relationship with ternary relationship

References :

[1]” <http://searchcrm.techtarget.com/definition/entity-relationship-diagram>” ,August 27 2015.

[2]”<http://databasemanagement.wikia.com/wiki/E/R_Model:_Type_of_Attributes>,”August 27 2015 .

[3]” http://www.webmaster-forums.net/web-programming-and-application-development/what-degree-relationship-database”, August 27 2015 .

[4]”https://www.google.com.np/url?sa=t&rct=j&q=&esrc=s&source=web&cd=4&cad=rja&uact=8&ved=0CDAQFjADahUKEwiyjfOO0cjHAhWWWo4KHaD7DoY&url=http%3A%2F%2Ffacweb.cs.depaul.edu%2Fbfisher%2Fcsc319%2Fch03-ans.doc&ei=9K3eVbLDMZa1uQSg97uwCA&usg=AFQjCNE9FmqXnpKCexel5yNKYoWY5do4cg”, August 27 2015

[5]<https://www.dlsweb.rmit.edu.au/toolbox/ecommerce/tbn_respak/tbn_e2/html/tbn_e2_devsol/er_model_relnshps.htm,27> August 2015.