MIS 320 Database Management Systems: Assignment 2

1. This is a **group assignment**. Your group may discuss this assignment with your classmates, but your answers should be your own. There will be a severe penalty for submitting copied answers. Make sure that you review the slides, book chapter and in-class solutions.

2. This assignment is due at 11:59 PM on **Thursday, February 15th, 2024**. Please submit your assignment on Canvas as a file upload. You can use Lucidchart or other open access tools to draw. You can also use electronic pens to draw on your computer and then convert.

3. Please indicate your **roster name** in your homework submission. **10 points will be deducted from your grade for missing your name.**

4. It is important that your answers are **clear** and **understandable**. No matter which tool(s) you use, submit your assignment in one pdf file. DO NOT use a google document. Upload a pdf and make sure that it is posted by 11:59 PM on Thursday, February 15th.

5. Follow the directions provided for assignment #1. In addition, be careful about the creation of supetype and subtype entities, and pay particular attention to completeness constraints, disjoint/overlapping constraints and subtype discriminators.

6. Stay true to the problem description even if it doesn't describe the current business reality. The goal of the assignment is to depict multiple technical situations to you so you learn the tools well.

7. Make sure to familiarize yourself with the **grading rubric** at the end of this assignment. I will be using it to grade your assignment.

I pledge on my honor that I have not given or received any unauthorized assistance on this assignment.

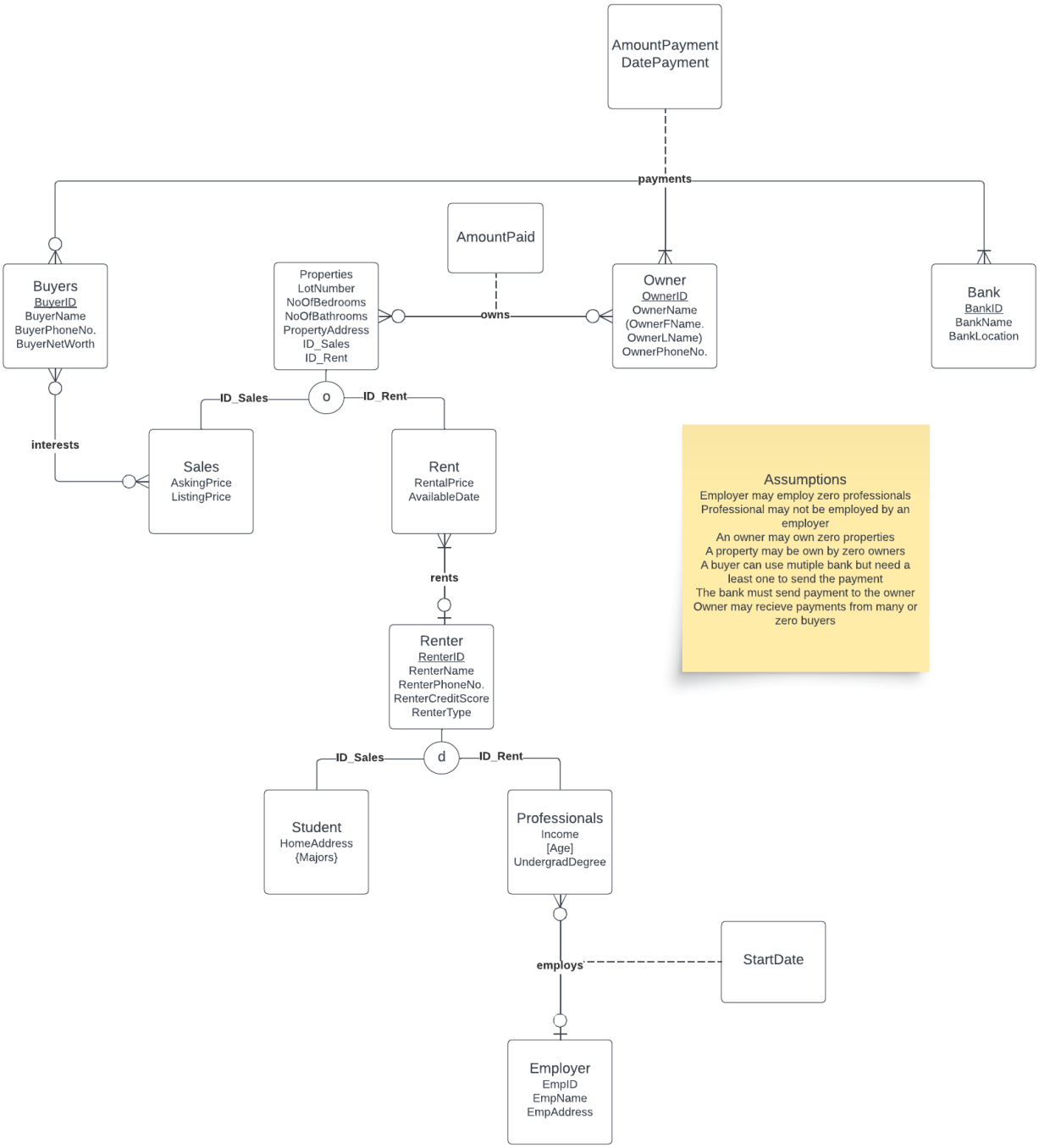
Your Roster Names:

Sign: Giselle Echeverria Date: 02/15/2024

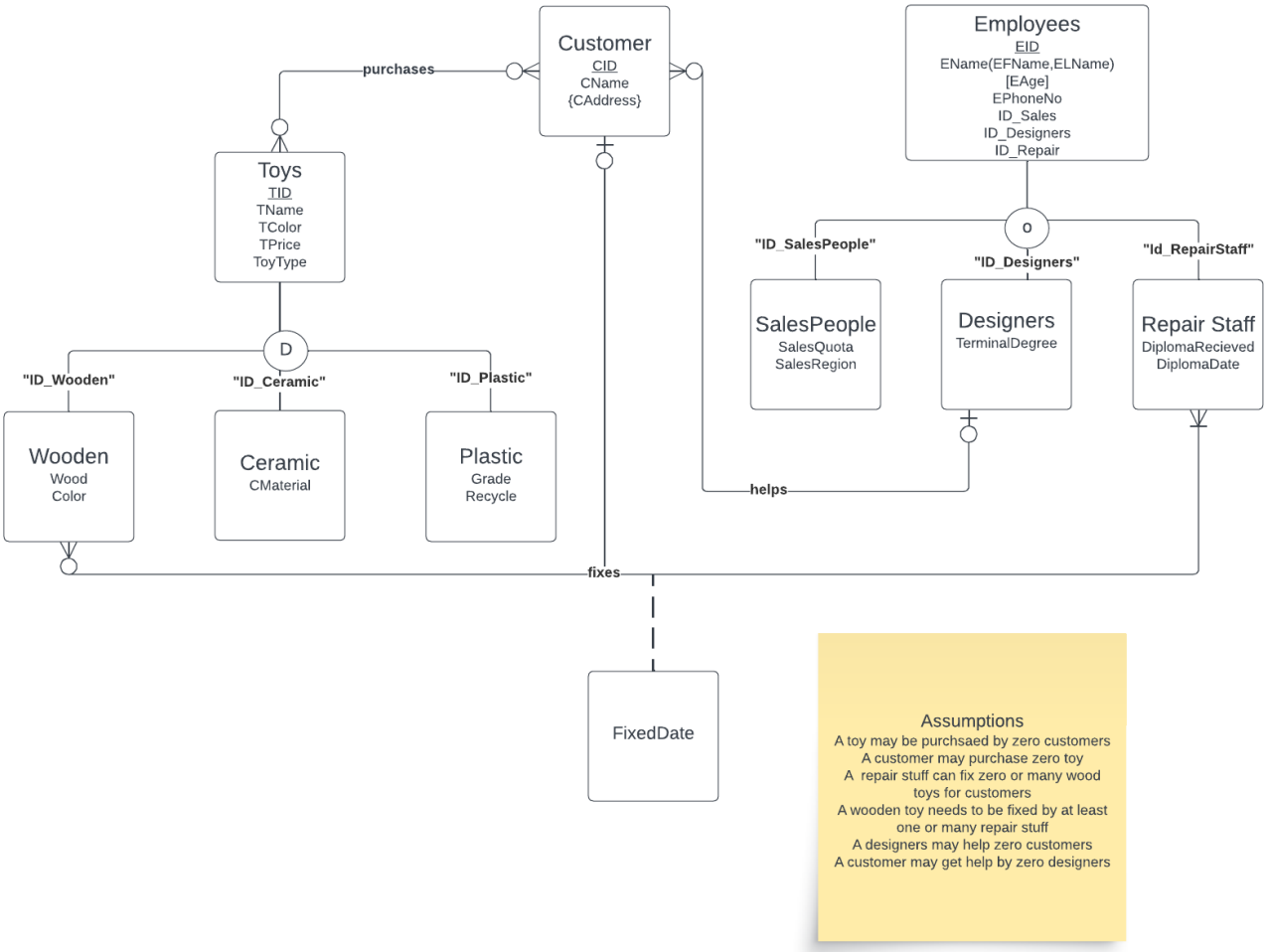
Sign: Janida Magallanes Date: 02/15/2024

Sign: Date:

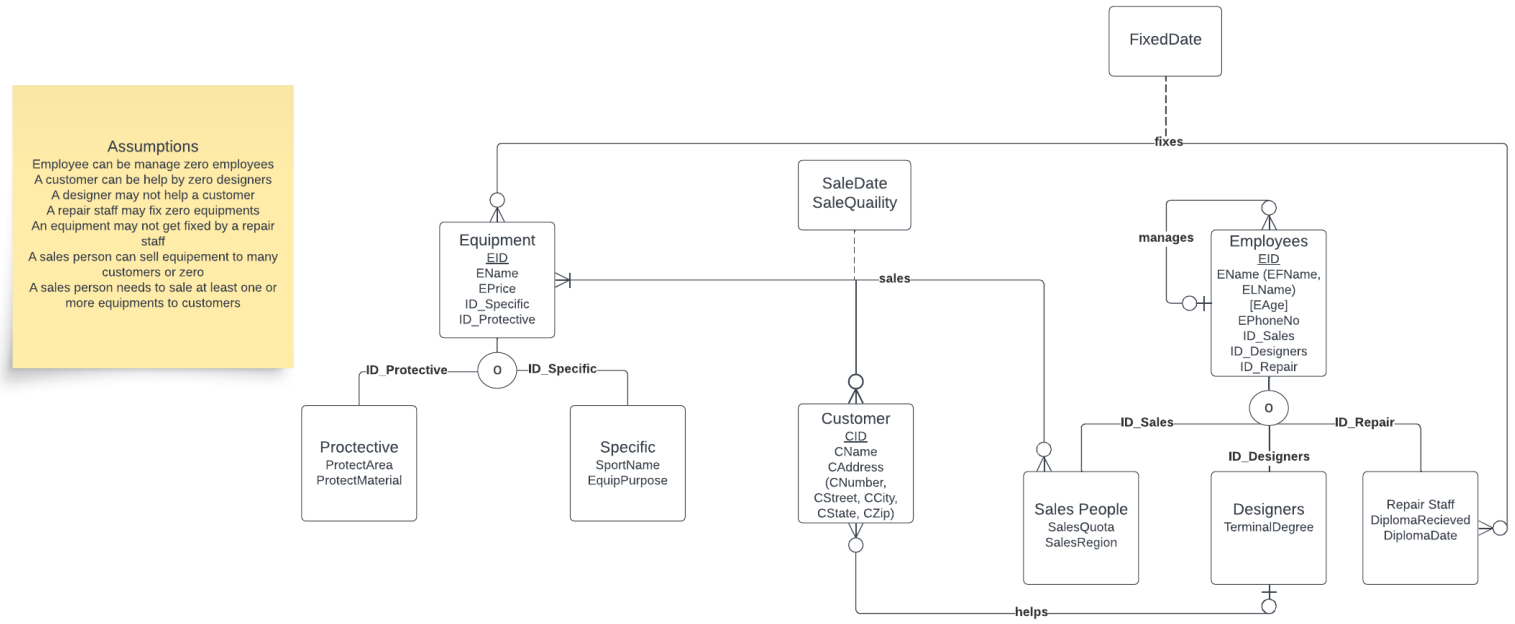
1. Draw an EER diagram for the following description. A property management company manages two types of properties – those for sale and those for rent. It is possible for a property to be for both rent and sale. All properties have the following attributes: LotNumber, NoOfBedrooms, NoOfBathooms and PropertyAddress. An owner can own multiple properties and a property can be owned by multiple owners. The amount that these owners paid for these properties is important to maintain. Owners' attributes include OwnerID, OwnerName (which is a composite attribute containing OwnerFName, OwnerLName) and OwnerPhoneNo. Properties for sale have additional attributes, including AskingPrice and ListingDate. Properties for rent also have additional attributes, including RentalPrice and AvailableDate. Buyers can be interested in zero or more properties for sale and properties for sale can receive interest from zero or more buyers. Renters can rent one or more properties and a property can be rented to zero or one renter. Buyers have the following attributes: BuyerID, BuyerName, BuyerPhoneNo and BuyerNetWorth. Renters have the following attributes: RenterID, RenterName, RenterPhoneNo and RenterCreditScore. Buyers send payments via their banks to the owners. The amount of payment is an important attribute to capture at the relationships level as is the date of payment. Banks have the following attributes: BankID, BankName, BankLocation. Renters are of two types – students and professionals. Other types of renters can also be added later. Students have additional attributes, such as HomeAddress and Majors; Majors is a multivalued attribute. Professionals have additional attributes, such as Income, Age (derived attribute) and UndergradDegree. Professionals must be employed by at least one employer and an employer may employ many professionals. Employers have the following attributes: EmpID, EmpName, EmpAddress. The date on which a professional starts working for an employer is an important attribute to maintain. Make your assumptions explicit. **[25 points]**


AmountPayment
DatePayment
payments
AmountPaid
Buyers
BuyerID
BuyerName
BuyerPhoneNo.
BuyerNetWorth
Properties
LotNumber
NoOfBedrooms
NoOfBathrooms
PropertyAddress
ID_Sales
ID_Rent
owns
Owner
OwnerID
OwnerName
(OwnerFName.
OwnerLName)
OwnerPhoneNo.
Bank
BankID
BankName
BankLocation
ID_Sales
o
ID_Rent
interests
Sales
AskingPrice
ListingPrice
Rent
RentalPrice
AvailableDate
Assumptions
Employer may employ zero professionals
Professional may not be employed by an employer
An owner may own zero properties
A property may be own by zero owners
A buyer can use mutiple bank but need a least one to send the payment
The bank must send payment to the owner
Owner may recieve payments from many or zero buyers
rents
Renter
RenterID
RenterName
RenterPhoneNo.
RenterCreditScore
RenterType
ID_Sales
d
ID_Rent
Student
HomeAddress
{Majors}
Professionals
Income
[Age]
UndergradDegree
employs
StartDate
Employer
EmpID
EmpName
EmpAddress

2. Draw an EER diagram for the following description. The CEO of a toy manufacturing company wants to build a database for his company. Toys can be of three types: wooden, ceramic and plastic. All toys have four attributes: TID, TName, TColor and TPrice. Wooden toys have two attributes: Wood and Color. Ceramic toys have one attribute: CMaterial. Plastic toys have two attributes: Grade and Recycle. It is not possible for a toy to belong to more than one category. Other types of toys may be added. Toys can be purchased by any number of customers and customers can purchase any number of toys. Customer attributes include: CID, CName and CAddress. CAddress is a multi-valued attribute. The company has three types of employees: salespeople, designers and repair staff. It is possible for an employee to belong to more than category. All employees share these attributes: EID, EName (EFname, ELname), EAge and EPhoneNo. Salespeople have two additional attributes: SalesQuota, SalesRegion. Designers have an additional attribute: TerminalDegree. It is important for the company to maintain the last diploma that a Repair staff received and the date on which they did. Repair staff fix wooden toys purchased by customers. It is important to store the date on which the toy is fixed. A designer can help any number of customers and a customer can be helped by only one designer. Make your assumptions explicit. **[25 points]**



3. Draw an EER diagram for the following description. A sport equipment manufacturing company wants to build a database for its products. Equipment are of two types: protective and specific sport. Other types of equipment can be added. All equipment have three attributes: EID, EName, and EPrice. Protective equipment have two attributes: ProtectArea, and ProtectMaterial. Specific Sport equipment have two attributes: SportName, and EquipPurpose. It is possible for an equipment to be both protective and specific sport. The company has three types of employees: salespeople, designers and repair staff. It is possible for an employee to belong to more than category. All employees share these attributes: EID, EName (EFname, ELname), EAge and EPhoneNo. EAge is a derived attribute. Salespeople have two additional attributes: SalesQuota, SalesRegion. Designers have an additional attribute: TerminalDegree. It is important for the company to maintain the last diploma that a Repair staff received and the date on which they did. Sales staff sell equipment to customers. Customer attributes include: CID, CName and CAddress. CAddress is a composite attribute, consisting of CNumber, CStreet, CCity. CState, and CZip. The date and quantity of the sale must be captured and stored. Repair staff fix any number of specific sport equipment and specific sport equipment can be fixed by any number of repair staff. It is important to store the date on which the equipment is fixed. A designer can help any number of customers and a customer can be helped by only one designer. An employee can manage zero to many other employees and an employee can be managed by only one employee. Make your assumptions explicit. **[25 points]**



Grading Rubric for Assignment 2

Errors in the E/R Diagram	
Error	**Penalty**
Entities not included in the E/R diagram	-1 for each, up to -2
Entities not correctly identified in the E/R diagram	-1 for each, up to -2
Supertype and subtype entities incorrectly conceptualized	-1 for each, up to -2
Relationships at the supertype and subtype level incorrectly conceptualized	-1 for each, up to -2
Completeness constraints, disjoint/overlapping constraints and subtype discriminators incorrectly represented	-1 for each, up to -2
Attributes not included in the E/R diagram	-1 for each, up to -2
Attributes not correctly identified in the E/R diagram	-1 for each, up to -2
Relationships not included in the E/R diagram	-1 for each, up to -2
Incorrect cardinality for relationships (i.e., one-to-one; one-to-many; many-to-many; optional/mandatory). **NOTE:** This penalty is for cases where I have told you that things are one way and you model them another way.	-1 for each, up to -2
Primary key not indicated in the E/R diagram	-1 for each, up to -2
Additional entities or attributes or relationships (**NOTE:** However, in many-to-many relationships, you may need to add attributes to the relationship)	-1 for each, up to -2
Assumptions not indicated clearly (mention why you think certain things are related in a certain manner; explain why some relationships are one-to-one or one-to-many or many-to-many or mandatory/optional)	-1 for each, up to -2
Overall Document	
Is the document clear, readable and understandable?	-5 if not