In-Class Activity #2: ER Modeling

Submission Instructions

Submit your solutions as a Word or PDF file through **Canvas>Assignments>In-Class Activities (ICAs).**

You must create your diagrams electronically, and they cannot be hand-drawn. Use ERDPlus to create your diagrams (https://erdplus.com/#/standalone). It's free, and there is a short YouTube tutorial on the course website that shows you how to create ERDs using ERDPlus and export the diagrams as a graphic which can be placed into a Word document.

How to place ERDs created in ERDPlus into Word documents?
1. After creating your ERD in ERDPlus, export an ERD as an image file (with a .png file extension) from ERDplus. To do so, click **Diagram** and the click **Export Image**.
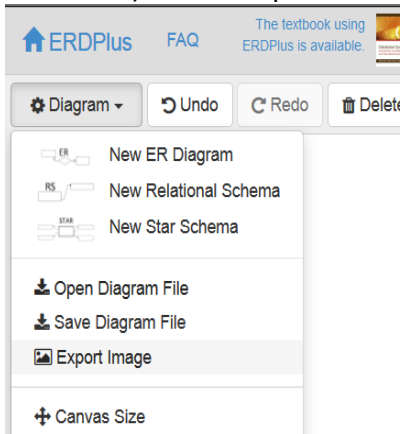
2. In Word, on the **Insert** tab, click **Pictures**.
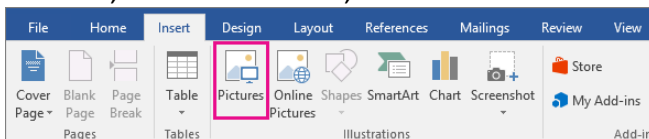
3. Browse to the picture you want to insert, select it, and then click Insert.

Instructions:

Recall the two scenarios below from the previous in-class exercise. In groups of three, create two ER diagrams, one for each of the scenarios described below. Your diagram should reflect all entities, attributes, and relationships mentioned in the descriptions. **Also, make sure you include primary keys for all entities even if not explicitly described in the problem statement.**

(Don't start from scratch! Use the list of entities and attributes in the previous exercise as a starting point.)

Scenario 1: Inventory and Parts

The purchasing department of the Monster Car Company wants to track part orders for its specialty vehicles. The company builds several awesome vehicles, such as a truck (which they call "Truckasaurus"), limousine ("Limosaurus"), a van ("Vanasaurus"), or an RV (for some reason, "Buddy").

When a new vehicle is ordered by the customer, the division that makes that vehicle will order parts from purchasing. The purchasing department **doesn't care what vehicle the part is for**, it just wants to track what parts were ordered.

Each order can contain multiple parts, and a part can be part of more than one order. An order is described by order id number, order date, the first and last name, email address, department name, and phone number of the contact person in the originating department.

A part is described by its name, the Monster Car Companies internal part number, and a description of the part. Also, the inventory level for each part is tracked so that the department knows when they need to restock in order to maintain timely order fulfillment.

A part supplier is described by its name, contact phone number, and contact email address. A part may be sourced from several suppliers, and a supplier can sell multiple parts to the Monster Car Company.

Finally, suppliers have their own part numbering schemes. This means that the manufacturer parts numbers for the same part may be different for different suppliers. The database should keep track of suppliers' part numbers and relate them back to the car company's own internal part number. For example, the Monster Car Company may refer to a "hex widget" as "101," but supplier 1 may use the part number "201" and supplier 2 may use the part number "804."

Entities	Attributes
Order	Order ID, Order Date, First name, Last name, Email, Department, Phone
Part	Internal part number, Name, Description, Inventory level
Supplier	Supplier ID, Name, Phone, Email
Other attributes	*Supplier Part ID* *(Note: Supplier part ID is not an attribute of the entity Part because one part can come from multiple suppliers, and thus have different supplier part IDs for each supplier. It is not an attribute of the entity Supplier either because one supplier can supply different parts, and thus have different supplier part IDs for each part.* *In fact, Supplier Part ID is a relationship attribute. It depends on both Part and Supplier. We will talk more about relationship attributes soon.)*
Nouns that are not entities:	purchasing department (division), Monster Car Company, vehicle, truck, limousine, van, RV, customer, part numbering scheme, database

Scenario 2: Housing Authority

The Big City public housing agency has assigned you the task of keeping track of who is living in the agency's developments over time. The agency needs a database that allows them to capture this information.

The city has several public housing developments across Big City. A development is described by its development id, its name, and the number of units. Each unit in the development is described by the unit number, the number of bedrooms, the number of bathrooms, and the square footage.

You also need to keep track of the people living in each unit. The basic unit of residence is the household, described by a household id and a description field (for notes from the agency). There is a limit of only one household per unit at a time although multiple households will occupy a unit over time. Each household can be made up of one or more residents, and a resident can only be part of one household.

A resident is described by their first and last name, their date of birth, and whether they are they are the head of the household.

Finally, keep track of when a household moved into and out of a unit. You want to be able to track households as they move from one unit to another or from one development to another. Therefore, you can describe the occupancy of a household in a housing unit by a start date and an end date. If they are currently living in the unit, the end date would be left blank.

Entities	Attributes
Development	DevelopmentID, Name, Number of units
Unit	Unit Number, Bedrooms, Bathrooms, Square footage
Household	HouseholdID, Description
Resident	First name, Last name, Birthdate, Head of household?
Other attributes	*Move in date (start date), Move out date (end date)* *(Note: Move in/out dates are not an attribute of the entity Household because one household can have different move in/out dates if it moves from one unit to another. It is not an attribute of the entity Unit either because one unit can have different households over time.* *In fact, Move in/out dates are relationship attributes. It depends on both Household and Unit. We will talk more about relationship attributes soon.)*
Nouns that are not entities:	Big City public housing agency (city, Big City, agency), task, database, information, occupancy

Insert your ERD for Scenario 1 here:

Insert your ERD for Scenario 2 here: