# Unit 07 Problem Set Submission Form

## Overview

| | |
|---|---|
| Your Name | Hendi Kushta |
| Your SU Email | hkushta@syr.edu |

## Instructions

Put your name and SU email at the top. Answer these questions all from the lab. When asked to include screenshots, please follow the screen shot guidelines from the first lab.

Remember as you complete the problem sets it is not only about getting it right / correct. We will discuss the answers in class so it's important to articulate anything you would like to contribute to the discussion in your answer:

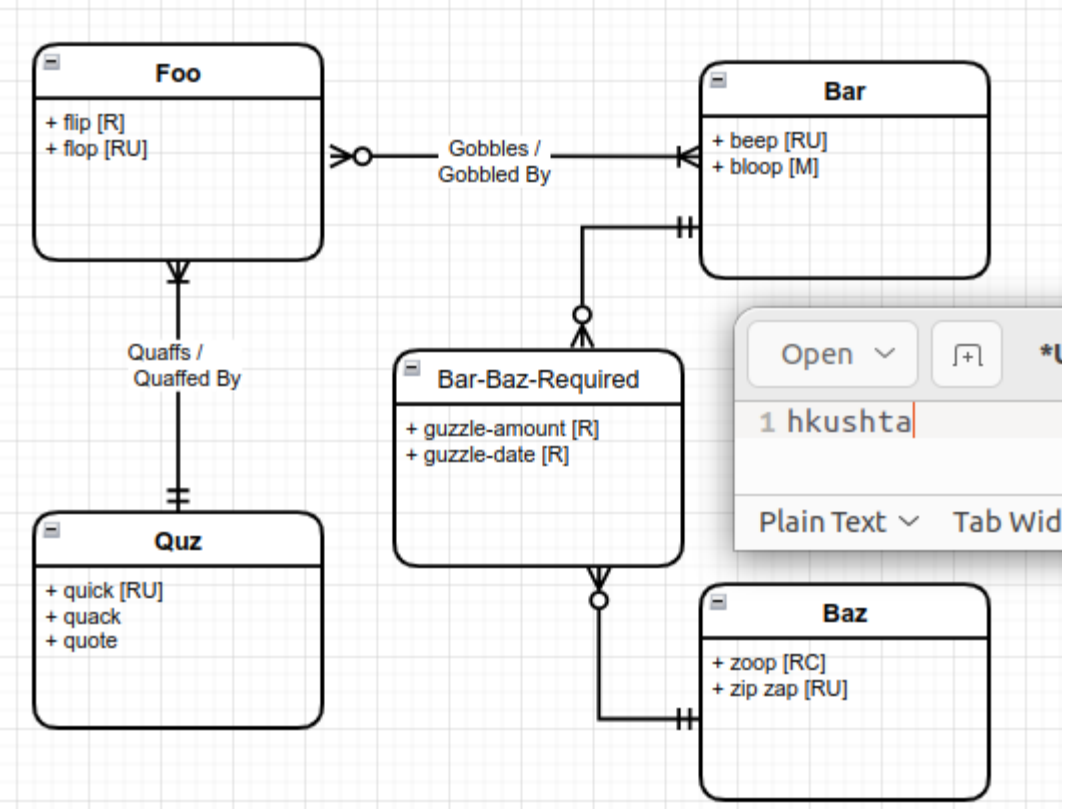
- If you feel the question is vague, include any assumptions you've made.
- If you feel the answer requires interpretation or justification provide it.
- If you do not know the answer to the question, articulate what you tried and how you are stuck.

This how you receive credit for answering questions which might not be correct.

## Questions

Answer these questions using the problem set submission template. You will need to provide a screen shot for each answer. Please follow the guidelines for submitting a screenshot.

1. Provide a screenshot of your completed E-R Diagram (ERD) from Walkthrough Part 3.



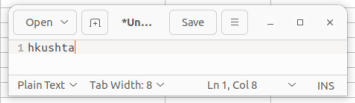

2. Provide a screenshot of your E-R data requirements from Walkthrough Part 4.

**Entities and Attributes**

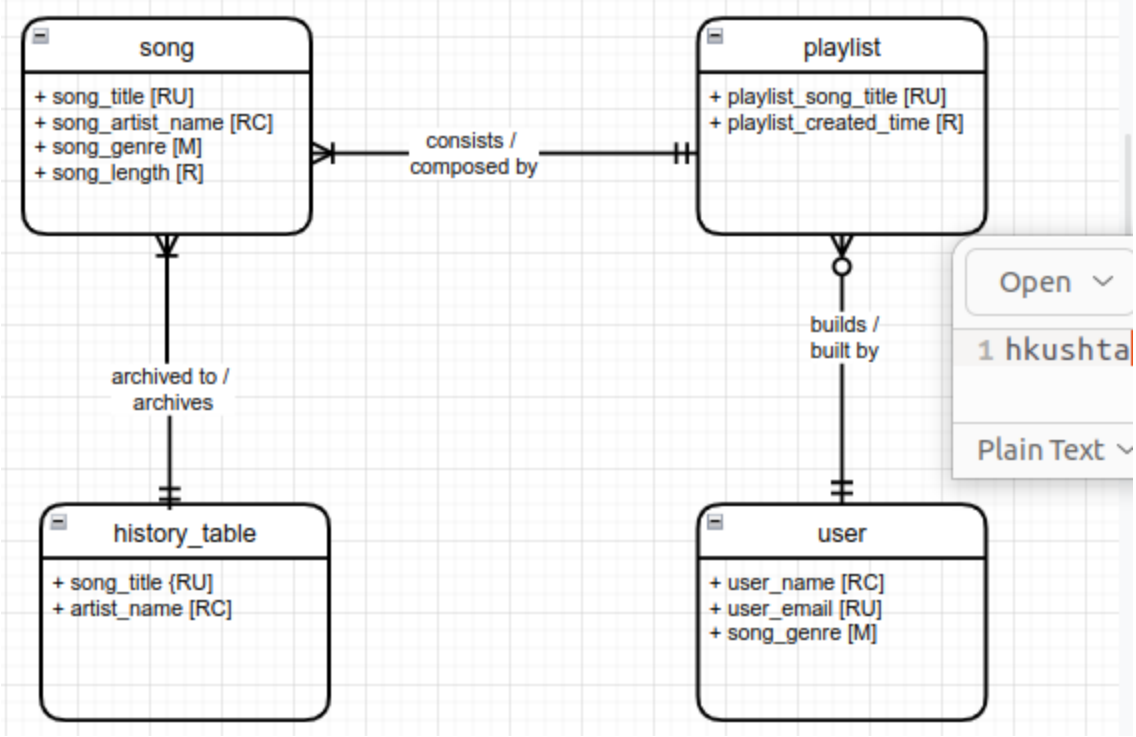
| Entity | Attribute | Props | Description |
|---|---|---|---|
| **song** | song_title | RU | title of the song |
| | song_artist_name | RC | the artist who sings the song can be first + last name |
| | song_genre | M | hip hop, classic, rock |
| | song_length | R | length of song |
| | | | |
| | | | |
| | | | |
| **user** | user_name | RC | user name when they sign in, can be composite |
| | user_email | RU | user email to validate their account |
| | music_genre | M | hip hop, classic, rock |
| | | | |
| | | | |
| | | | |
| **playlist** | playlist_song_title | RU | title of the song |
| | playlist_created_time | R | when the user has searched for a song |
| | | | |
| **history_table** | song_title | RU | title of the song |
| | artist_name | RC | the artist who sings the song can be first + last name |

**Relationships**

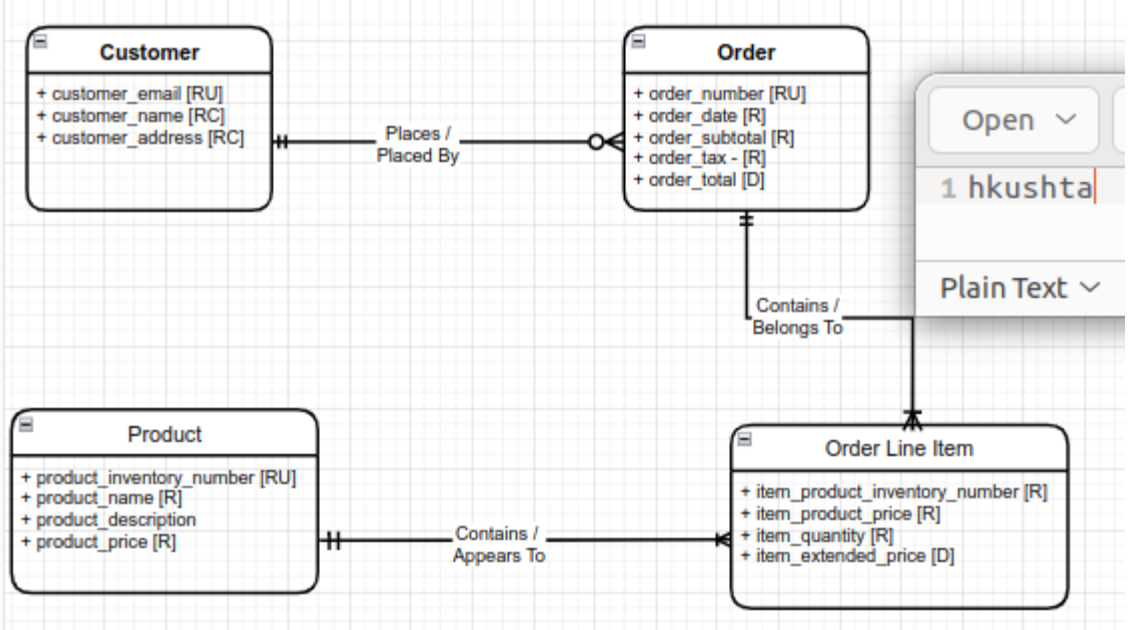
| Relationship | Entity | Rule | Min | Max | Entity |
|---|---|---|---|---|---|
| playlist – song | **playlist** | consists | 1 | M | **song** |
| | **song** | composed by | 1 | 1 | **playlist** |
| | | | | | |
| user – playlist | **user** | builds | 0 | M | **playlist** |
| | **playlist** | built by | 1 | 1 | **user** |
| | | | | | |
| song – history_table | **song** | archived to | 1 | 1 | **history_table** |
| | **history_table** | archives | 1 | M | **song** |




3. Provide a screenshot of the E-R Diagram (ERD) Walkthrough Part 4.




4. Draft an ERD from the following requirements. Try not to let your interpretation of the facts get into the way until **after you've drawn the diagram**. Once you have a diagram together, feel free to criticize and comment.
   a. Entities: customer, order, products, order line item
   b. Attributes:
      i. Customer: customer email – unique, required, customer name – composite, required, customer address – composite, required.
      ii. Order: order number – unique, required, order date – required, order subtotal – required, order tax – required, order total – derived
      iii. Products: product inventory number – required, unique, product name – required, product description, product price – required.
      iv. Order Line Item: item product inventory number – required, item product price – required, item quantity – required, item extended price – derived.
   c. Relationships:
      i. A customer places 0 or more orders. An order is placed by 1 and only 1 customer.
      ii. An order contains 1 or more line items. A line item belongs to 1 and only 1 order.
      iii. A line item contains 1 and only 1 product, a product appears on 0 or more line items
   d. Other facts:
      i. You cannot have a line item without a product and an order.




For an order line to exist, it should be a one to many relationship with both order and product entities. None of them can be empty.

5. In this next example, I give you a list of data requirements, but they are not organized into entities, relationships, and attributes. You may have to make some assumptions to complete E-R Model.
   a. A car is made by only one manufacturer, but a manufacturer makes a lot of cars.
   b. A car has a make, model, vehicle identification number (vin), msrp, and color.
   c. A manufacturer has a name (which is unique and not always the same as the make).
   d. A manufacturer has several plants where the cars are made. A plant is owned by just one manufacturer.
   e. A car is produced at just one single plant. And a plan produces several cars.
   f. A Plant has a name and address.
   g. Only cars of a certain make are produced at certain plants. For example, plant “A” might produce makes “X”, “Y”, and “Z”, while plant “B” might produce makes “W” and “Z” only.

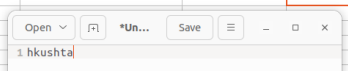
   Use a copy of the **Empty-ER-Data-Requirements** spreadsheet, provided with this lab, to enter your data requirements. Provide a screenshot of your data requirements.

**Entities and Attributes**

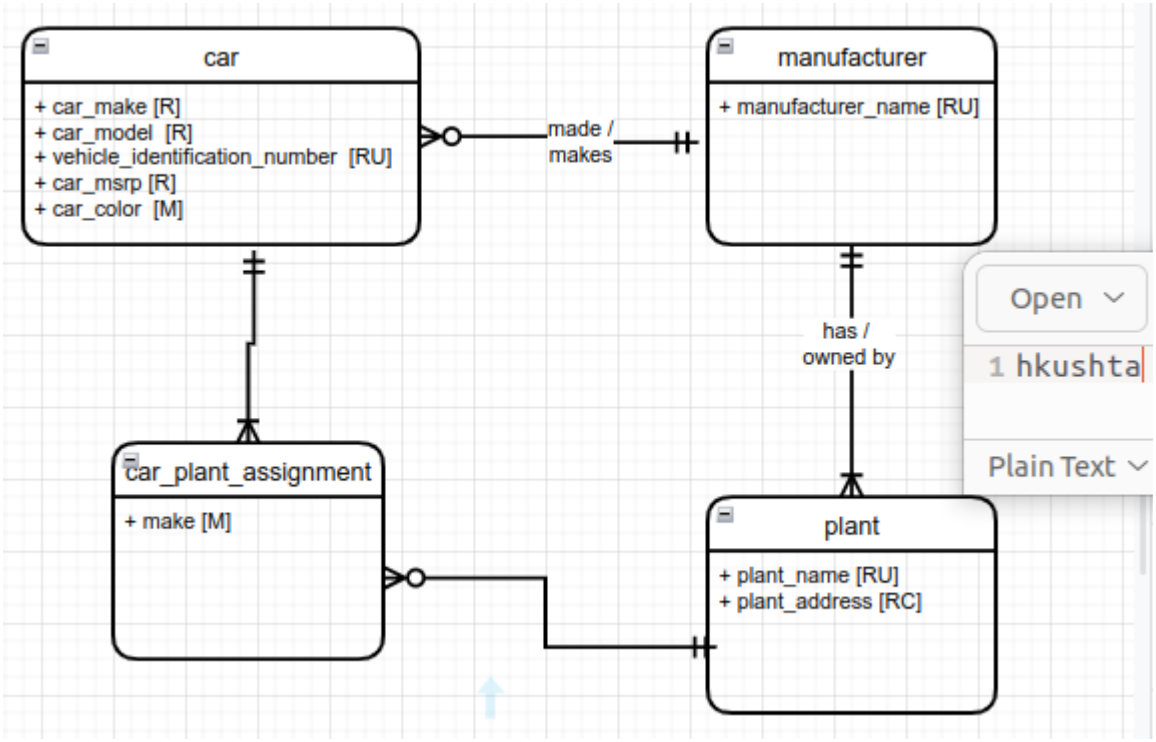
| Entity | Attribute | Props | Descripion |
|---|---|---|---|
| **car** | car_make | R | car brand, audi, kia |
| | car_model | R | car model, Q7, A8 |
| | vehicle_identification_number | RU | identifying code for a mobile |
| | car_msrp | R | manufacturer suggested retail price |
| | car_color | M | color of the car, red, blue and grey |
| | | | |
| | | | |
| **manufacturer** | manufacturer_name | RU | name of the manufacturer that makes the car |
| | | | |
| | | | |
| **plant** | plant_name | RU | name of the plant |
| | plant_address | RC | address where the plant is |

**Relationships**

| Relationship | Entity | Rule | Min | Max | Entity |
|---|---|---|---|---|---|
| car – manufacturer | **car** | made by | 1 | 1 | **manufacturer** |
| | **manufacturer** | makes | 0 | M | **car** |
| | | | | | |
| manufacturer – plant | **manufacturer** | has | 1 | M | **plant** |
| | **plant** | owned | 1 | 1 | **manufacturer** |
| | | | | | |
| car – plant – assignment | **car** | produced | 1 | 1 | **plant** |
| | **plant** | produces | 0 | M | **car** |




6. Draw an ER Diagram based on the data requirements you identified in the previous question.




Only cars of a certain make are produced at certain plants. So a car make X produced in plant A, meaning that 1 car is produced in just a plant. Plant A can produce many car makes X, Y, Z. car-plant entity is to connect car and plant entities, based on the condition above. We can add more attributes in it, but for the sake of problem, I am just going with make.

7. In this last example, read the following paragraphs, identify the data requirements. Once more use a copy of the **Empty-ER-Data-Requirements** spreadsheet, provided with this lab, to enter your data requirements.
The XYZ consulting firm handles project management for its customers.

   Customers have a name, address, phone, and one or more contacts (people who work for the company). Customers interact with XYZ through projects.

For any project there should be the name of the project the estimated cost, estimated hours, and an agreed-to billable hourly rate. There should also be an optional description for the project. There should be one customer contact assigned to the project.

Each project is broken down in to tasks. Tasks have a name, estimated time to completion, actual time to completion, and assigned employee to the task. One employee is assigned to the project as the project manager. Tasks also contain a list of required skills to complete the tasks. An example of those skills might be database, systems admin, project management, web design, or programming to name a few.

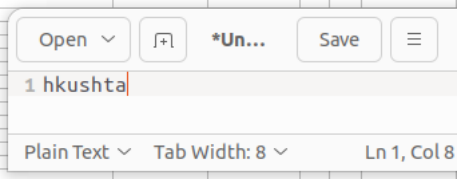
XYZ employees have a name, email, set of skills (like the ones in tasks), and billable hourly rate. The estimated and actual billable amounts are derived from the employee's hourly rate and the task's estimated and actual time to completion these values should be stored with the task. Employees can work on more than one task and can be assigned to different tasks at the same time.

**Entities and Attributes**

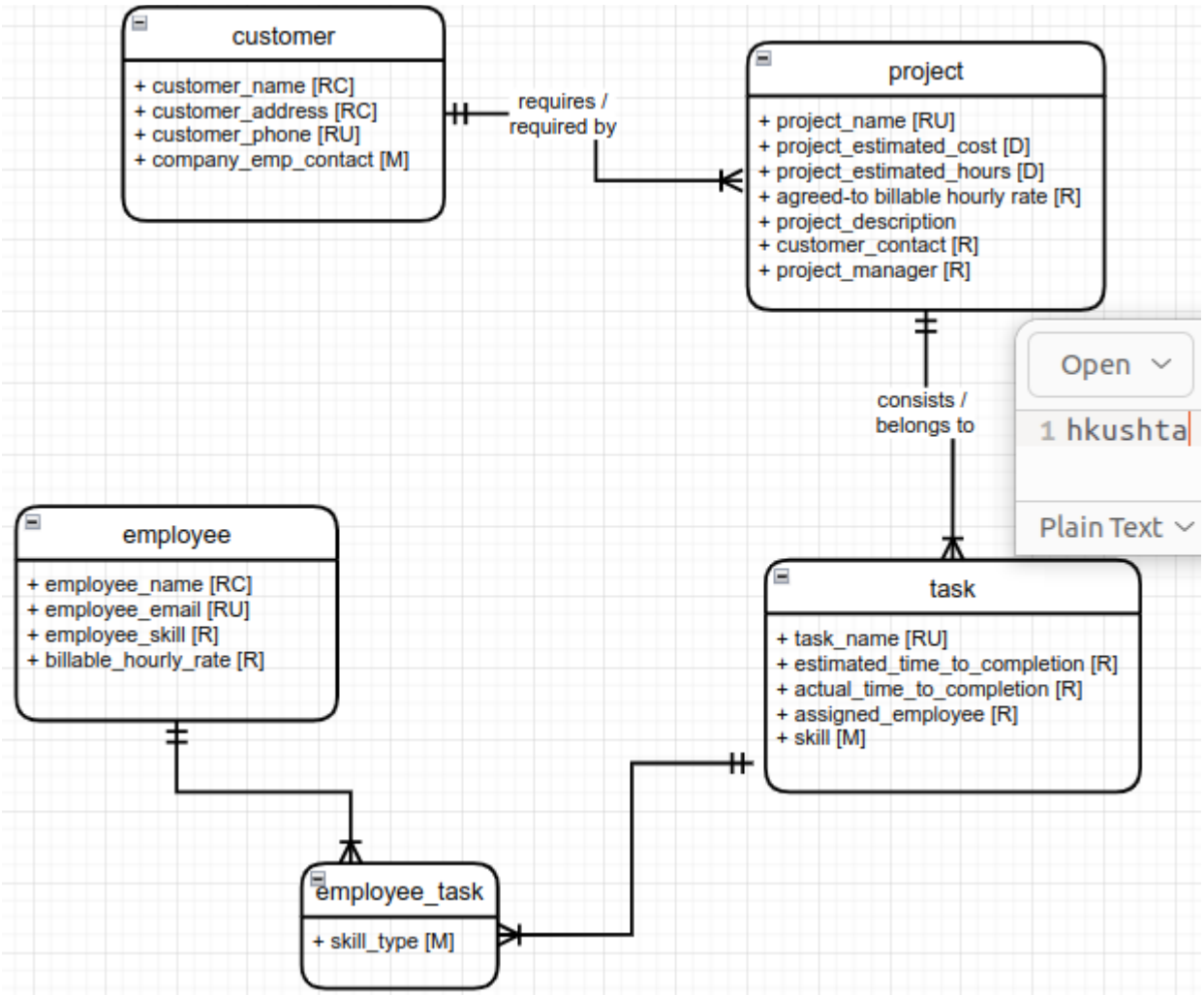
| Entity | Attribute | Props | Description |
|---|---|---|---|
| **customer** | customer_name | RC | first + last name |
| | customer_address | RC | street, city, state |
| | customer_phone | RU | customers phone number |
| | company_emp_contact | M | xyz employee contacts that customer have |
| | | | |
| **project** | project_name | RU | name of the project |
| | project_estimated_cost | D | how much is expected to be the total cost of the project |
| | project_estimated_hours | D | how many hours are expected the project to last |
| | project_aggred_to_billable_hourly_rate | R | amount of money parts agrees for an hour |
| | project_description | | description of the project, what it is about |
| | project_customer_contact | R | customer contact |
| | project_manager | R | manager that is in charge of the project |
| | | | |
| **task** | task_name | RU | name of the task |
| | task_estimated_time | R | Estimated amount of time it takes the task to be completed |
| | task_actual_time | R | amount of time it takes the task to be completed |
| | task_assigned_employee | R | to whom is the task assigned |
| | task_skill | M | what skills are needed for the task |
| | | | |
| **employee task** | task_list_of_skills | M | database, system admin, project management |
| | | | |
| **employee** | employee_name | RC | first + last name |
| | employee_email | RU | email of the employee |
| | employee_skill | M | what skills are needed for the task |
| | employee_billable_hourly_rate | R | how much customer will pay for an hour work from employee |

**Relationships**

| Relationship | Entity | Rule | Min | Max | Entity |
|---|---|---|---|---|---|
| customer - project | **customer** | requires | 1 | M | **project** |
| | **project** | required by | 1 | 1 | **customer** |
| | | | | | |
| project - task | **project** | consists | 1 | M | **task** |
| | **task** | belongs to | 1 | 1 | **project** |
| | | | | | |
| employee - task | **employee** | works | 1 | M | **task** |
| | **task** | assigned to | 1 | M | **employee** |




8. Draw an ERD based on the data requirements you identified in the previous question.




We can also connect employee entity with project entity, but then all the relationships would be a mess. So an employee is assigned to a project via tasks.

## Reflection

Use this section to reflect on your learning. To achieve the highest grade on the assignment you must be as descriptive and personal as possible with your reflection.

1. What are the key things you learned through the process of completing this assignment?

   Build conceptual models from text. Using the data requirement spreadsheet to build a conceptual model.

2. What were the challenges or roadblocks (if any) you encountered on the way to completing it?

This assignment was very time consuming for me. It took much time to think about possible relationships between tables and how to connect them with each other.

3. Were you prepared for this assignment? What can you do to be better prepared?

   Yes, I was

4. Now that you have completed the assignment rate your comfort level with this week's material. This should be an honest assessment: (choose one)

   4 ==> I understand this material and can explain it to others.
   **3 ==> I understand this material.**
   2 ==> I somewhat understand the material but sometimes need guidance from others.
   1 ==> I understand very little of this material and need extra help.