

Assignment 1

1. A database management system should interact with an application using GUI to accurately cater to the user's needs. It should contain all entities and attributes, and be easily sorted and searched for maximum efficiency. All of the data should be relevant and easily related to one another. It must be properly sized to ensure all data is accounted for, but also take into consideration the memory it takes up.
2. Data is information that is usually stored on a computer and sent and received through electronic or magnetic signals. Data can consist of numbers, statistics, facts, or descriptions of certain entities.

Program-Data Independence is when data remains in tact and accessible even if the database is modified. This prevents people from losing data when a database is being changed or updated.

A DBMS Catalog is simply data of data. That is, it is a system that holds all of the information about data in a database, for example, its constraints, indexes, definition, structure, owner, etc. It makes it easier for the developer to remember everything about each piece of data, by providing a guide for all of its qualities.

3. A weak entity is an entity that cannot be identified by its attributes alone; it relies on a parent entity that describes it more directly. For example, a car can be uniquely identified by a vehicle identification number, and a weak entity would therefore be a tire. A tire has several attributes, but none that directly relate to a car. Also, without the car, the tire would not be identifiable.
4. A client-server architecture is a model of data transportation in which multiple clients send and receive information over a network. It uses a centralized, single server to deliver and retrieve signals from many clients simultaneously.

Two-tier client server architecture is when an interface on the client's end directly communicates with a database on the server's end. The pros are that it is easy to set up and understand, but the cons are that it can only function well if there are a small number of users. This is where three-tier client server systems are used. These involve an additional layer from the client and the server, but the connection is not direct, which improves security. There is an intermediate receiving application that deals with partially processed data in which the transaction management takes place.

5. I will be using an online book store application for this example.

Customer

- Customer_name, Customer_ID, Customer_address, Customer_payment

Books

- Book_name, Book_author, Book_price, Book_ID, Book_genre, Book_condition

Account

- Account_username, Account_password, Customer_name, Customer_ID, Customer_address, Customer_payment

Order

- Book_number, Book_price, Book_name, Book_ID

Receipt

- Account_username, Customer_payment, Order_total

Customer

Customer_name	<u>Customer_ID</u>	Customer_address	Customer_payment
Jacob Stevens	3347928	543 Turtleback Dr.	7394-4839-1003-4932

Books

Book_name	Book_author	Book_price	<u>Book_ID</u>	Book_genre	Book_condition
Frankenstein	Shelley, Mary	\$8.99	774920	Gothic fiction	Used - good
Great Gatsby, The	Fitzgerald, F. Scott	\$12.00	840021	Romance	Used - good
Grapes of Wrath, The	Steinbeck, John	\$4.59	932217	Historical fiction	Used - poor
Catch-22	Heller, Joseph	\$14.99	274031	War	New
Brave New World	Huxley, Aldous	\$9.99	204168	Science fiction	Used - good

Account

Account_user name	Account_pas sword	Customer_na me	<u>Customer_ID</u>	Customer_ad dress	Customer_pa yment
jsteve12	ilovebooks	Jacob Stevens	3347928	543 Turtleback, Dr.	7394-4839-1 003-4932

Order

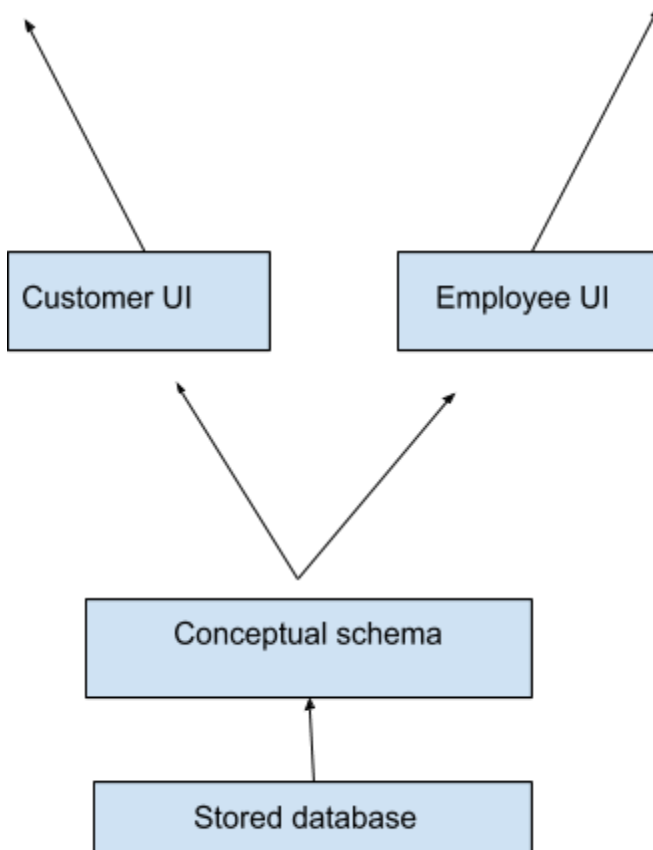
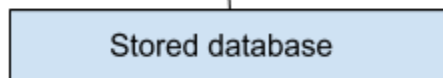
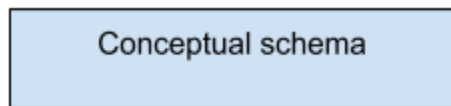
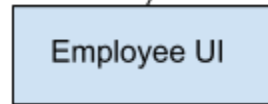
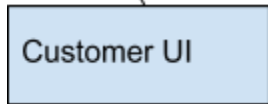
Book_number	Book_price	Book_name	<u>Book_ID</u>
1	\$8.99	Frankenstein	774920
2	\$14.99	Catch-22	274031
3	\$9.99	Brave New World	204168

Receipt

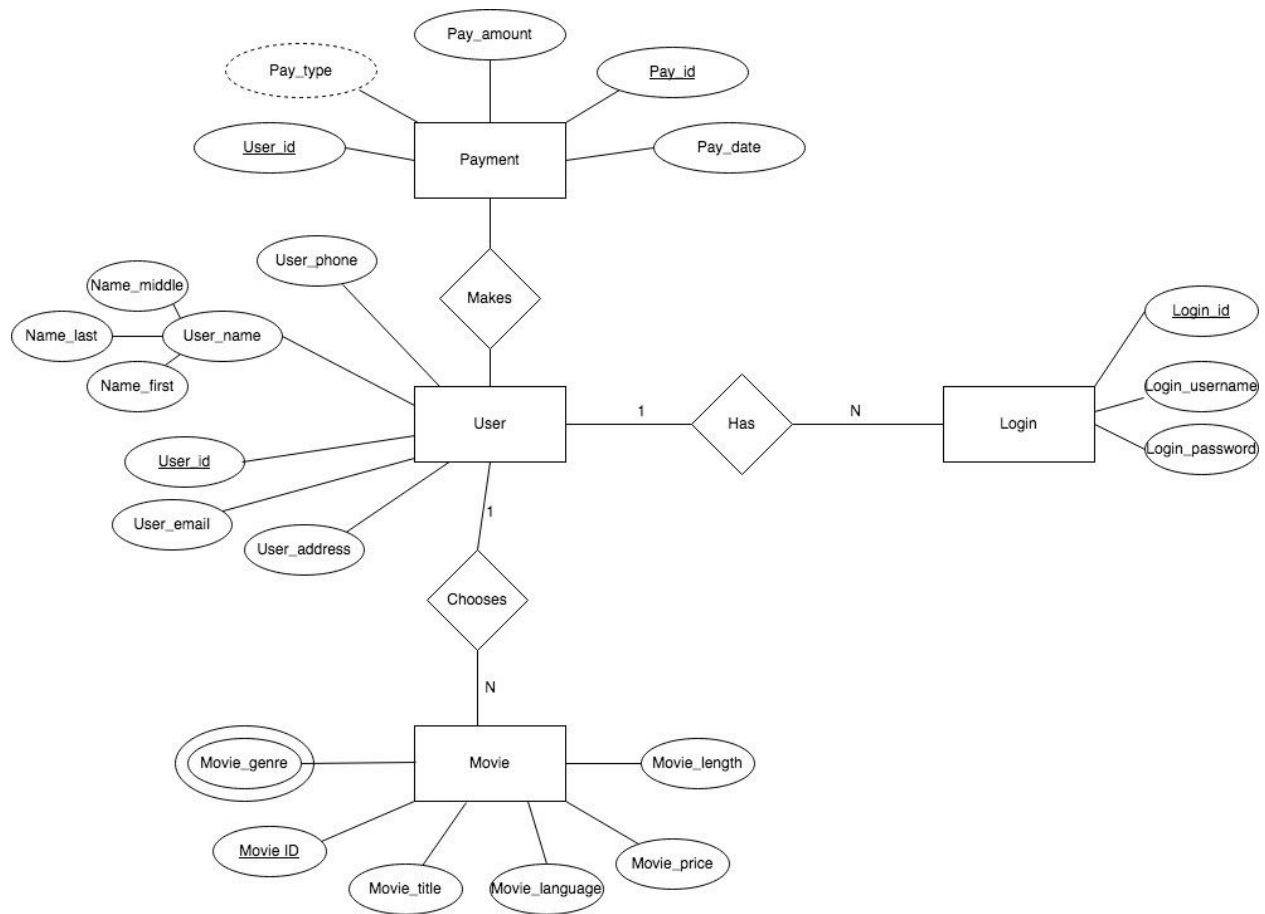
Account_username	Customer_payment	Order_total
jstevens12	XXXX-XXXX-XXXX-4932	\$34.97

End user (customer)

End user (employee)



8.



7. An entity type is a group of all the entities with shared attributes. For example if a table Student has 2 entities each with a name, ID, and major, then Student would be an entity type containing those 2 entities. Essentially it is all of the entities in a table, as long as they all have the same attributes.

An entity set is a collection of entities with the same entity type. An example would be a set of people that are all customers at the same bank. In terms of a table, an entity type would be the collection of all entities in the table whereas an entity set would be a few select rows in the table.

An entity is an individual real-world person, object, or idea that has several characteristics and can be distinctly identified. An entity type is a group of all entities with shared attributes. An

entity set is a subset of entity type, that is, it is a selection of a few entities within an entity type with shared attributes.