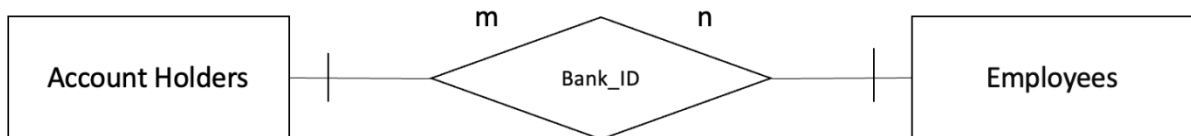Assignment 1
Database 1 (Grimes)

Company #1: Bank of America (Banking/Finance)

1. Company #1: Bank of America (Banking/Finance)
2. Company #1: Bank of America (Banking/Finance) Entity Types
   - Account Holders
   - Employees
3. Bank of America (Banking/Finance) Attributes
   - Account Holders (Bank_ID, Customer ID, Account Balance, Account Type, Transaction History, Contact Information)
   - Employees (Bank_ID, Employee ID, Position, Salary, Department, Employment Status)
4. Data Dictionary

Table Name	Column Name	Data Type	Length
AccountHolders	Bank_ID	Integer	10
AccountHolders	Customer_ID	Integer	10
AccountHolders	Account_Balance	Decimal	(10, 2)
AccountHolders	Account_Type	VARCHAR	20
AccountHolders	Transaction_History	Text or VARCHAR(MAX)	20
AccountHolders	Contact_Information	Text or VARCHAR(MAX)	20
Employees	Bank_ID	Integer	10
Employees	Employee_ID	Integer	10
Employees	Position	VARCHAR	50
Employees	Salary	Decimal	(10, 2)
Employees	Department	VARCHAR	50
Employees	Employment_Status	VARCHAR	20

5. ERD

6. Tables
   AccountHolders Table:

Bank_ID	Customer_ID	Account_Balance	Account_Type	Transaction_History	Contact_Information
1	101	5000.00	Savings	Transaction 1: $100, Transaction 2: $50	john.doe@email.com, 123-456-7890

| 1 | 102 | 12000.00 | Checking | Transaction 1: $500, Transaction 2: $200 | jane.smith@email.com |
| 2 | 201 | 800.50 | Savings | Transaction 1: $50, Transaction 2: $25 | bob.jones@email.com, 987-654-3210 |

Employees Table:

Bank_ID	Employee_ID	Position	Salary	Department	Employment_Status
1	501	Financial Analyst	80000.00	Finance	Full-time
1	502	Teller	45000.00	Operations	Part-time
2	601	Manager	100000.00	Operations	Full-time

7. Business Rules:

1. Every customer has a minimum of one account: There must be an equivalent entry in the Employees database (Employee) for every record in the Account Holders table (Customer). This suggests that for a customer to be listed in the database, they must have at least one account.

2. A customer may have several accounts: There is a many-to-many relationship between the Account Holders and Employee entities. This suggests that a client can hold numerous accounts, providing them with flexibility in handling different kinds of financial items.

3. A single customer is the owner of an account: The Account Holders and Employees entities have a many-to-many relationship. This suggests that to avoid confusion regarding account ownership, each account needs to have a distinct client owner.

4. A balance is required for every account: In the Account Holders table, the Account_Balance attribute is required and cannot be nullable. This suggests that to guarantee accurate financial records, each account in the system needs to have a corresponding balance.

Company #2 HBO (Home Box Office)

1. Company #2: HBO (Home Box Office) (Entertainment)
2. Company #2: HBO (Home Box Office) (Entertainment) Entity Types
   - Subscribers
   - Content Creators
3. HBO (Home Box Office) (Entertainment) Attributes
   - Subscribers (HBO_ID, Subscriber ID, Subscription Plan, Watch History, Billing Information, Preferences)
   - Content Creators (HBO_ID, Creator ID, Works Produced, Contract Details, Awards and Recognition)
4. Data Dictionary

Table Name	Column Name	Data Type	Length
Subscribers	HBO_ID	Integer	10
Subscribers	Subscriber_ID	Integer	10
Subscribers	Subscription_Plan	VARCHAR	20
Subscribers	Watch_History	Text or VARCHAR(MAX)	30
Subscribers	Billing_Information	Text or VARCHAR(MAX)	30
Subscribers	Preferences	Text or VARCHAR(MAX)	30
ContentCreators	HBO_ID	Integer	10
ContentCreators	Creator_ID	Integer	10
ContentCreators	Works_Produced	Text or VARCHAR(MAX)	30
ContentCreators	Contract_Details	Text or VARCHAR(MAX)	30
ContentCreators	Awards_and_Recognition	Text or VARCHAR(MAX)	30

5. ERD

6. Tables

Subscribers Table:

HBO_ID	Subscriber_ID	Subscription_Plan	Watch_History	Billing_Information	Preferences
1	101	Premium	Game of Thrones S8E1, Westworld S3E5, Friends S1E1	Credit Card ending in 1234	Fantasy, Drama
1	102	Basic	Stranger Things S2E3, The Mandalorian S1E7	PayPal: user@email.com	Sci-Fi, Adventure
2	201	Premium	The Sopranos S4E2, Chernobyl S1E1, Barry S2E4	Credit Card ending in 5678	Crime, Comedy, Drama

ContentCreators Table:

HBO_ID	Creator_ID	Works_Produced	Contract_Details	Awards_and_Recognition
1	501	Game of Thrones, Westworld, Friends	2-year agreement	Emmy for Best Drama Series (Game of Thrones)
1	502	Stranger Things, The Mandalorian	3-year agreement, Exclusive content provision	Golden Globe for Best Drama Series (Stranger Things)
2	601	The Sopranos, Chernobyl, Barry	1-year agreement, Limited series production	Emmy for Outstanding Limited Series (Chernobyl)

7. Business Rules:

1. Required Subscription Plan: The Subscribers table's Subscription_Plan property is required and cannot be nullable. This suggests that each customer needs to have a clear understanding of the amount of service they are receiving through a defined subscription plan.

2. Variable-Length Text Attributes: There are two types of text attributes: text and VARCHAR(MAX) for the Watch_History, Billing_Information, and Preferences. This suggests that users can choose how much information they wish to supply for each of these variables, giving them flexibility in retaining past information, payment information, and user preferences.

3. Required Works Produced: The ContentCreators table's Works_Produced field is required and cannot be nullable. This suggests that in order for the database to appropriately reflect content creators' efforts, they must have produced at least one piece of work.

4. Subscribers' Engagement with Content Creators: Through the "Engages_With" relationship, subscribers communicate with content creators. This suggests that the interaction between subscribers and content creators indicates that viewers express their viewing preferences and help to establish associations between content creators and subscribers.
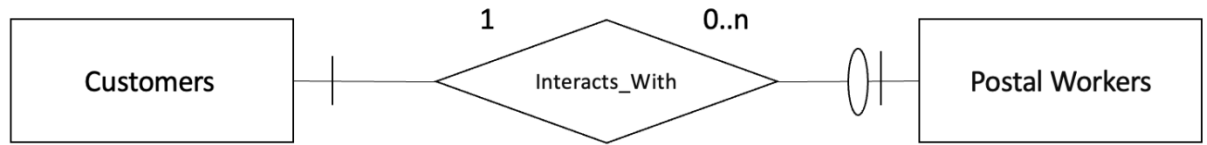

Company #3 United States Postal Service (USPS) (Service)

1. Company #3: United States Postal Service (USPS) (Service)
2. Company #3: United States Postal Service (USPS) (Service) Entity Types
   - Customers
   - Postal Workers
3. United States Postal Service (USPS) (Service) Attributes
   - Customers (USPS_ID, Customer ID, Mailing Address, Package Tracking Numbers, Service Requests, Billing Information)
   - Postal Workers (USPS_ID, Employee ID, Route Information, Work Schedule, Vehicle Information, Performance Metrics)
4. Data Dictionary

Table Name	Column Name	Data Type	Length
Customers	USPS_ID	Integer	10
Customers	Customer_ID	Integer	10
Customers	Mailing_Address	Text or VARCHAR(MAX)	50
Customers	Package_Tracking_Numbers	Text or VARCHAR(MAX)	50
Customers	Service_Requests	Text or VARCHAR(MAX)	50
Customers	Billing_Information	Text or VARCHAR(MAX)	50
PostalWorkers	USPS_ID	Integer	10
PostalWorkers	Employee_ID	Integer	10
PostalWorkers	Route_Information	Text or VARCHAR(MAX)	50
PostalWorkers	Work_Schedule	Text or VARCHAR(MAX)	50
PostalWorkers	Vehicle_Information	Text or VARCHAR(MAX)	50
PostalWorkers	Performance_Metrics	Text or VARCHAR(MAX)	50

5. ERD

6. Tables
Customers Table:

USPS_ID	Customer_ID	Mailing_Address	Package_Tracking_Numbers	Service_Requests	Billing_Information
1	101	123 Main St, Cityville, USA	USPS101PKG001, USPS101PKG002	Priority shipping for important documents	Credit Card ending in 1234
1	102	456 Oak St, Townsville, USA	USPS102PKG001, USPS102PKG002	Package rerouting due to vacation	PayPal: user@email.com
2	201	789 Pine St, Villagetown, USA	USPS201PKG001, USPS201PKG002	Change of address request	Cash on delivery

PostalWorkers Table:

USPS_ID	Employee_ID	Route_Information	Work_Schedule	Vehicle_Information	Performance_Metrics
1	501	Downtown and Residential Areas, Cityville, USA	Monday to Friday, 8 AM - 5 PM	USPS Truck #101, Mileage: 50,000	On-time delivery: 95%, Accuracy: 98%
1	502	Suburban Routes, Cityville, USA	Tuesday to Saturday, 9 AM - 6 PM	USPS Van #201, Mileage: 30,000	On-time delivery: 97%, Accuracy: 99%
2	601	Commercial Areas, Villagetown, USA	Monday to Saturday, 7 AM - 4 PM	USPS Bike #301, Mileage: 10,000	On-time delivery: 92%, Accuracy: 97%

7. Business Rules:

1. Mandatory Customer ID: The Customers table's Customer_ID field must exist and cannot be null. This suggests that to ensure correct identification within the system, each customer needs to have a unique identifier.

2. PostalWorkers Unique Employee ID: The PostalWorkers database has a unique Employee_ID field. This suggests that to avoid duplication and guarantee uniqueness, every postal worker needs to have a unique employee ID.

3. Interacts_With Relationship Cardinality - Customers to Postal Workers: The third relationship cardinality is interactions between customers and postal workers. A postal worker may deal with one client or many. Each consumer interacts with zero to many postal workers. This suggests that postal workers may serve several clients and that customers may engage with different postal workers on multiple occasions.

4. Variable-Length Text Attributes: Variable-length data is allowed for text or VARCHAR(MAX) attributes (Mailing_Address, Service_Requests, etc.). This suggests that the adaptability to various consumer requirements is ensured by accommodating diverse amounts of information through flexibility.

Assignment 1
Database 1 (Grimes)