

Data and Application

Project Phase 1

Three of a Kind

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MINIWORLD

The Miniworld for this database design is an Advertisement Agency which manages its clients (Brands), actors and creates Ads which can be displayed on partner Channels during shows. This allows brands to control their products and produce Ads of those by choosing actors and producers they see fit and by displaying them on best shows, hence giving them the opportunity to maximize their viewership. The actors are also given flexibility to work with certain brands and their products which he or she prefers and can work with the directors. This database allows the Agency to work efficiently, maximize its clientage and work in a systematic manner while also allowing other participating parties to access and manage their work ensuring full transparency to all. The users of this database are the Brands, Actors, Directors, Channels, and the Ad Agency itself.

USERS

- The Ad Agency acts as the database manager. Having access to the database, it can view and manage its association with the brands, the actors, their contracts, and the channels. It is also responsible for payments to the actors (based on contracts) and other salaried employees. It handles adding, dropping, or updating the details of the below mentioned users. Using this vast and well-organized database, the agency can manage during which shows to put the Ads of which brand to maximize its clientage and thus its revenue. It can analyze its top channels, check its average ad production costs etc.
- Through this database the Brands can view which Ads of theirs are being displayed on which channel and during which show, the contracts they have signed and can also manage their Products. They can see and filter actor profiles and thus sign contracts with whom they see fit for their products.
- The Actors have a systematic access to their current contracts i.e., the Products and Directors they have signed with, the Ads they have acted in.

They can also sign new contracts with the products of a brand he or she prefers to work on new Ad for.

- The Channels can manage their current shows i.e., their timings and days. The channel can also manage the base price it charges for an Ad to be displayed on its channel and the surcharge/Ad added during the show. It can also view the current Ads being displayed on its channel. It can also see how much revenue the shows generate through ads and thus allowing them to decide about less profitable shows etc.
- The Directors also can view and manage their current contracts i.e., the Products (of the Brands) and Actors they have signed with to create a new Ad and can also view the Ads they have directed.

Entities

Channel

A channel is a TV channel which has different shows

- Channel Name: (*key attribute*): Name of the TV Channel
 - Required
 - Unique for each channel
 - String with letters or numbers
- Base Price: Base price of the channel for any ad to show on it (in Rs.)
 - Required
 - Number ≥ 0

Show (Weak)

Weak identity dependent on a channel. Its identifying relationship is Broadcasts

- Name: Name of the show
 - Required
 - Nonempty string having letters and numbers
- Timings: (*composite partial key attribute*): Day and Start Time of the Show
 - Required
 - Unique for every Show in a Channel
 - Day: Valid day (Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday)
 - Start Time: Valid Time
- Duration: Duration of show (in mins)
 - Required
 - Number > 0
- Surcharge: Price per second for an advertisement
 - Required
 - Number >= 0
- Genre: (*multivalued attribute*): Genre of the Show
 - Required
 - String
 - Values within Comedy | Thriller | Romance | Suspense | Sci-fi | Action | Horror | Fantasy

Brand

A brand is a company with some products it wants to advertise

- Brand Name: (*key attribute*)
 - Required
 - Unique for every Brand
 - String composed of alphabet and numbers
- POC: (*composite attribute*): (Person of contact) has Name, Email and Phone
 - Required
 - Name: Nonempty string having letters
 - Email: Valid email address
 - Phone: Valid Mobile number

Ad

Advertisement of a Product. A contract results in the creation of an Ad.

- Serial No.: (*key attribute*): Serial Number of Ad
 - Required
 - Unique for every Ad
 - Number > 0
- Duration: Length of the ad (in seconds)
 - Required
 - Number > 0
- Genre: (*multivalued attribute*): Genre of the Ad
 - Required
 - String
 - Values within Comedy| Thriller| Romance| Suspense| Sci-fi| Action| Horror | Fantasy

Product (Weak)

Product of a brand (weak entity). Its identifying relationship is Has Products.

- Name: (*partial key attribute*): Name of the product
 - Required
 - Unique for every Product of a Brand
 - String: alphanumeric
- Description: Description of the product
 - String: alphanumeric
- Price: Price of the product (in Rs.)
 - Number >= 0

Person

Has 2 disjoint and total subclasses- Director and Actor

- Aadhar Card: (*key attribute*): Unique Aadhar number for a person
 - Required
 - Unique for every person
 - 12-digit number
- Phone: (*multivalued attribute*): Mobile number of the Person
 - Required
 - Valid mobile number
- Age: (*derived attribute*): Age of Person, derived from DOB
- Gender: Gender of person
 - Required
 - One of these: Male | Female | Other
- Name: Full name of the Person
 - Required
 - Nonempty string having letters
- Account No.: Bank account number to deposit money
 - Required
 - Number with number of digits between 8 and 12

Director (Subclass of Person)

Directs an ad

- Salary: Monthly Salary (in Rs.)
 - Required
 - Number ≥ 10000
- Join Date: Date when Contract Manager joined company
 - Required
 - Valid date not after current time
- DOB: Date of Birth of the Person
 - Required
 - Valid Date before current time – 18 years

Actor (Subclass of Person)

Performs in an advertisement. Has a partial subclass- Junior Actor

- Experience: Experience of actor in the industry in years
 - Number ≥ 0
- Physical Features (*composite attribute*): Height (cm) & Weight (kg) of Actor
 - Required
 - Height: Number > 0
 - Weight: Number > 0
- DOB: Date of Birth of the Person
 - Required
 - Valid Date before current time

Junior Actor (Subclass of Actor)

Minor Actor (Age < 18)

- Guardian: (*composite multivalued attribute*): Holds Guardian details- Aadhar no., Name and Phone
 - Required
 - Aadhar no.: 12-digit unique number
 - Name: Nonempty string having letters

Relationships

Broadcasts

- A Channel broadcasts Show
- 1:N relationship between Channel and Show
- Identifying relationship for week entity Show

- Both participations are total as a Channel will always have a show and a Show will always have an associated Channel

Displayed Between

- An Ad is Displayed Between a Show
- M:N relationship between Show and Ad
- It has an attribute- Times Shown: Number of times an ad is displayed in between a show
- Participation of Show is partial as Show may not have any Ad. But participation of Ad is total, as an Ad will always come in between a Show

Is Assistant Of

- Some Directors Is Assistant Of another Director
- 1:N relationship type between Director (Senior) and Director (Assistant)
- Both participants are partial, as not every director is an assistant and not every manager has an assistant
- A Director can have at most 3 Assistants

Has Products

- A Brand Has Products
- 1:N relationship type between Brand and Product
- Identifying relationship for Product
- Participation of both is total as Brand will always have a Product and a Product will always be of a Brand.

Prefers

- An Actor can prefer to work for certain Brands
- M:N relationship type between Actor and Brand

- Participation of both is partial as a Brand may not be preferred by any Actor and an Actor may not prefer any Brand

Contract

- 4-degree relationship between exactly one Product, exactly one Actor, exactly one Director and exactly one Ad
- Identifying Relationship for Ad
- It has attributes- Start Date, Duration and Contract Money (includes payment to Actor)
- An Actor signs the contract to work for a particular Product with a Director to form an Ad

Functional Requirements

- **CRUD:** Create, Read, Update and Delete functionality for Channel, Show, Brand, Product, Ad, Actor, and Director. Input for Create and Update must be valid considering constraints of all attributes for that entity type.
- **Actors with Physical features in a specific range and gender:** It returns list of actors which have a particular gender and whose physical features lie in the given range. It takes gender and the range of physical features as its input.
- **Names of a show with surcharge less than a value:** It takes a positive number as its input and returns the list of names of the shows which have a surcharge value of lesser than the given input value.
- **Maximum of Sum of the Contract Money of Brand:** It returns the maximum value of the sum of the contract money of all the contracts of a particular brand.
- **Average Ad Production Cost:** It returns the average production cost of the Ads.

- **Partial Text Search for Actor:** This takes an input string including of only letters and returns the list of Actors which have the input string in their names.
- **Partial Text Search for Show:** This takes an input string including of letters and returns the list of shows which have the input string in the show names.
- **Get Best Shows for an Ad:** For a given Ad find the Shows which will result in highest views i.e., return the shows that have at least one genre matching with the ad.
- **Get shows list sorted by amount earned from them:** Sort all the shows by the amount they earn: $\text{Surcharge} * \text{Total Duration of Ads displayed}$.
- **Get Bill for an Ad:** For a given Ad, get the bill given by: $\text{Ad Production Cost} + \sum (\text{Base Price of Channels}) + \sum (\text{No of times ad is displayed in show} * \text{Duration} * \text{Surcharge of Show})$.
- **Maximum preferred Brands:** Get the brand which is most preferred by the actors.