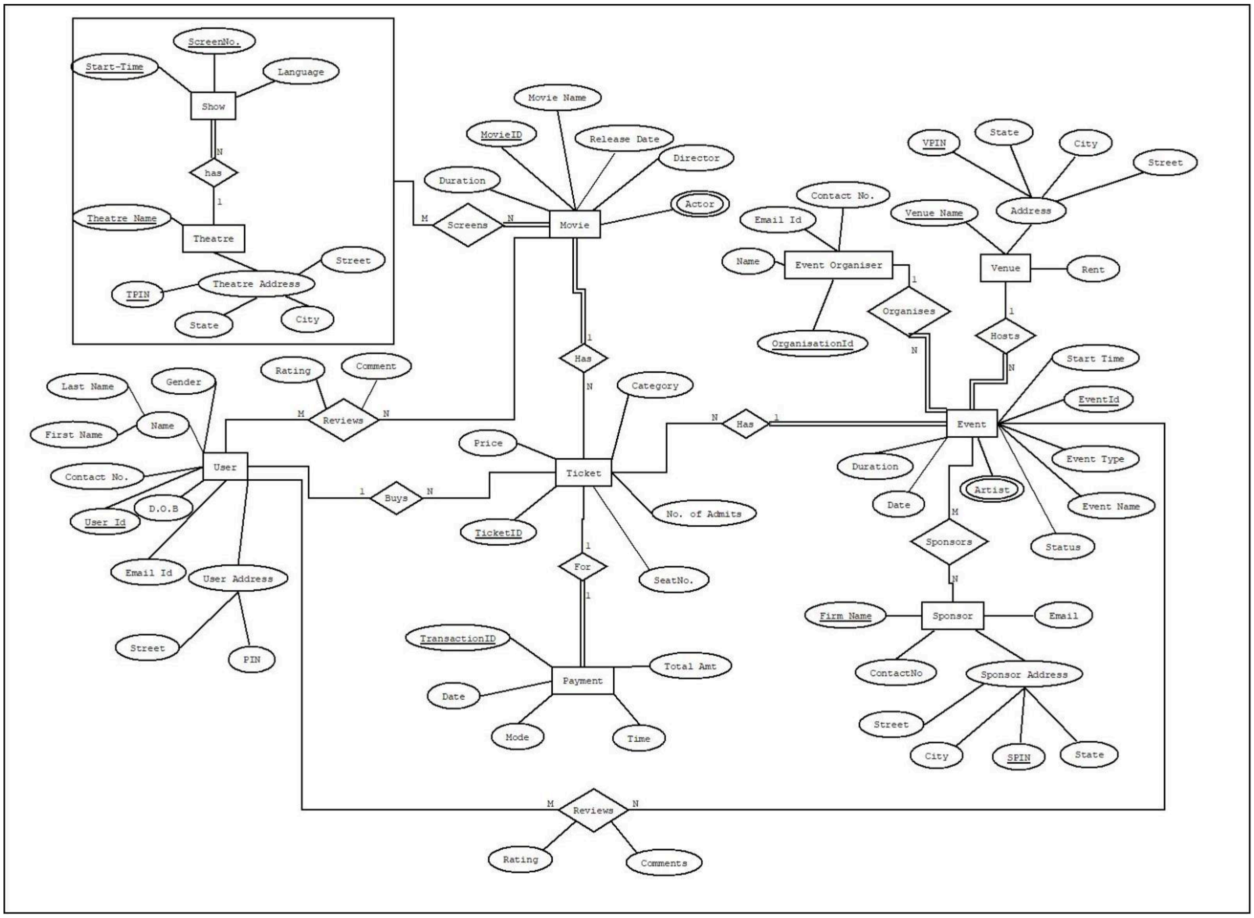
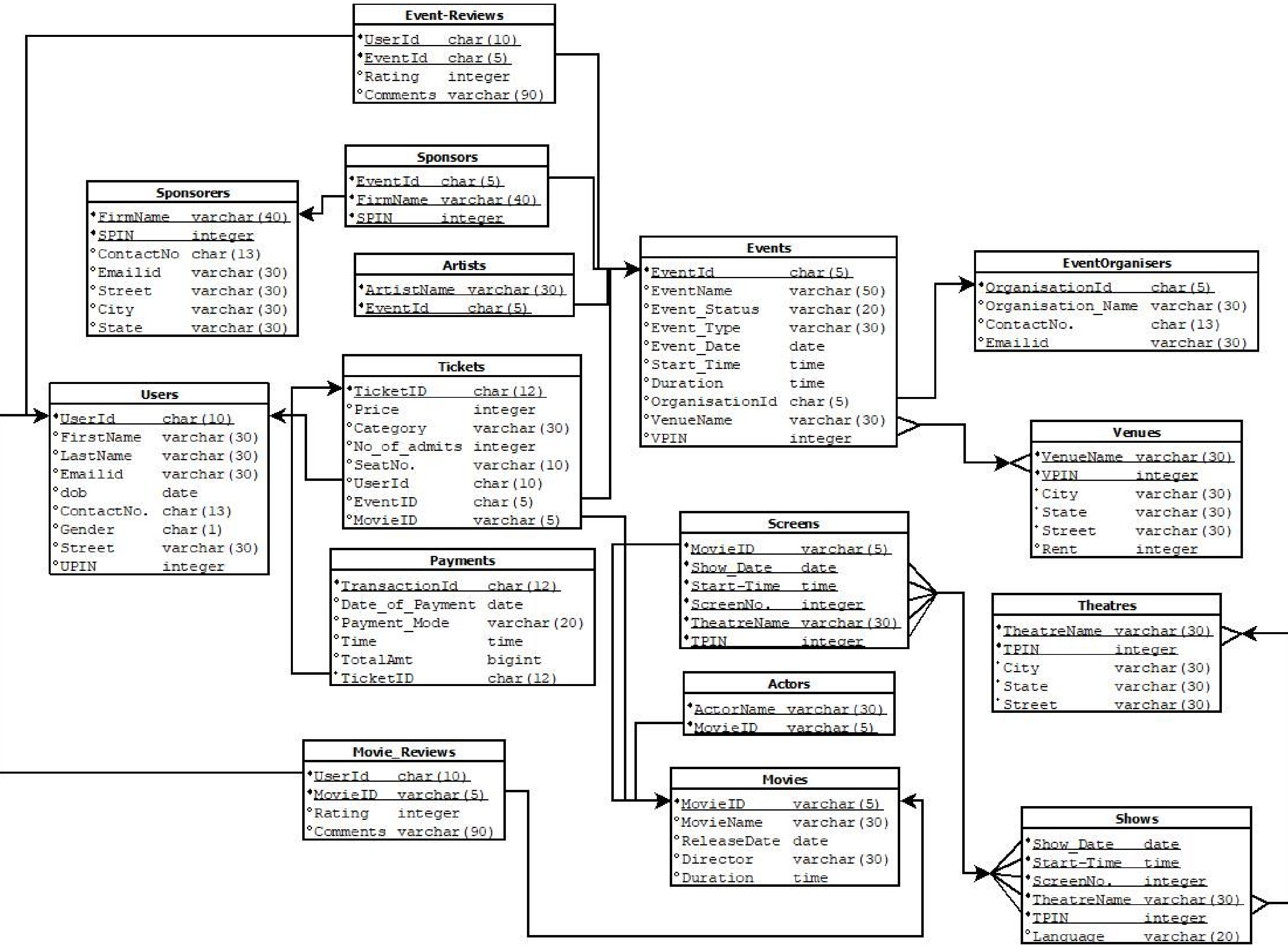
ER Diagram


ScreenNo.
Start-Time
Language
Show
N
has
1
Theatre Name
Theatre
Street
Theatre Address
TPIN
State
City
Movie Name
MovieID
Release Date
Director
Duration
Actor
M
Screens
N
Movie
Contact No.
Email Id
VPIN
State
City
Street
Venue Name
Address
Name
Event Organiser
Venue
Rent
1
Organises
1
Hosts
OrganisationId
N
N
1
Has
N
Start Time
EventId
Rating
Comment
Last Name
Gender
Category
Name
M
Reviews
N
First Name
N
Has
1
Event
Price
User
Contact No.
Ticket
Duration
Event Type
1
Buys
N
Artist
D.O.B
User Id
Date
No. of Admits
Event Name
TicketID
M
Sponsors
Status
1
For
Email Id
User Address
SeatNo.
1
N
TransactionID
Firm Name
Sponsor
Email
Total Amt
Street
PIN
Payment
ContactNo
Sponsor Address
Date
Street
Mode
Time
City
SPIN
State
M
Reviews
N
Rating
Comments

Relational Schema



Proof that relations are in Boyce-Codd Normal Form

1. ‘Users’ relation :

- Attribute :
  Users { UserId, FirstName, LastName, Emailid, dob, ContactNo., Gender, Street, UPIN }

- Functional dependencies :
  UserId->FirstName
  UserId->LastName
  UserId->Emailid
  UserId->dob
  UserId->ContactNo.
  UserId->Gender
  UserId->Street
  UserId->UPIN

Let X = UserId ,
Computing the closure,
X^+ = { UserId , FirstName , LastName , Emailid , dob , ContactNo , Gender ,Street , UPIN }
Thus, **Primary key = UserId**

The left side of all the FDs in the minimal set of FDs for the relation ‘Users’ is UserId, which is the primary key of this relation, so **“Users” is in BCNF**.

2. ‘Tickets’ relation :

- Attribute :
  Tickets { TicketID, Price, Category, No_of_admits, SeatNo., UserID, EventId, MovieID }

- Functional dependencies :

  TicketID->Price
  TicketID->Category
  TicketID->No_of_admits
  TicketID->SeatNo.
  TicketID->UserID
  TicketID->EventID
  TicketID->MovieID

Let X = TicketID ,
Computing the closure,
X^+ = { TicketID, Price, Category, No_of_admits, SeatNo., UserID, EventId, MovieID }
Thus, **Primary key = TicketID**

The left side of all the FDs in the minimal set of FDs for the relation ‘Tickets’ is TicketID, which is the primary key of this relation, so **“Tickets” is in BCNF**.

3. ‘Events’ relation :

- Attribute :

  Events { EventId, EventName, Event_Status, Event_Type, Event_Date, Start-Time, Duration, OrganisationId, VenueName, VPIN}

- Functional dependencies :

  EventId->EventName
  EventId->Event_Status
  EventId->Event_Type
  EventId>Event_Date
  EventId->Start-Time
  EventId->Duration

EventId->OrganisationId
EventId->VenueName
EventId->VPIN

Let X = EventId ,
Computing the closure,
X^+ = { EventId, EventName, Event_Status, Event_Type, Event_Date, Start-Time, Duration, OrganisationId, VenueName, VPIN }
Thus, **Primary key = EventId**

The left side of all the FDs in the minimal set of FDs for the relation 'Events' is EventId , which is the primary key of this relation, so **"Events" is in BCNF**.

4. 'Sponsorers' relation :

- Attribute :
  Sponsorers { FirmName, SPIN, ContactNo., Emailid, Street, City, State }

- Functional dependencies :
  {FirmName,SPIN}->ContactNo
  {FirmName,SPIN}->Street
  {FirmName,SPIN}->City
  {FirmName,SPIN}->State
  {FirmName,SPIN}->Emailid

Let X = {FirmName,SPIN} ,
Computing the closure,
X^+ = { FirmName, SPIN, ContactNo., Emailid, Street, City, State }
Thus, **Primary key = { FirmName,SPIN }**

The left side of all the FDs in the minimal set of FDs for the relation 'Sponsorers' is {FirmName,SPIN}, which is the primary key of this relation, so **"Sponsorers" is in BCNF**.

5. ‘Movies’ relation :

- Attribute :
  Movies { MovieID, MovieName, ReleaseDate, Director, Duration}

- Functional dependencies :
  MovieID -> MovieName
  MovieID -> ReleaseDate
  MovieID -> Director
  MovieID -> Duration

Let X = MovieID ,
Computing the closure,
X^+ = { MovieID, MovieName, ReleaseDate, Director, Duration }
Thus, **Primary key = MovieID**

The left side of all the FDs in the minimal set of FDs for the relation ‘Movies’ is MovieID, which is the primary key of this relation, so **“Movies” is in BCNF**.

6. ‘Venues’ relation :

- Attribute :
  Venues { VenueName, VPIN, City, State, Street, Rent }

- Functional dependencies :
  {VenueName,VPIN}->City
  {VenueName,VPIN}->Street
  {VenueName,VPIN}->State

{VenueName,VPIN}->Rent

Let X = {VenueName,VPIN} ,
Computing the closure,
X^+ = { VenueName, VPIN, City, State, Street, Rent }
Thus, **Primary key = { VenueName,VPIN }**

The left side of all the FDs in the minimal set of FDs for the relation 'Venues' is {VenueName,VPIN}, which is the primary key of this relation, so **"Venues" is in BCNF**.

7. 'Payments' relation :

- Attribute :
  Payments { TransactionId, Date_of_Payment, Payment_Mode, Time, TotalAmt, TicketID }

- Functional dependencies :
  TransactionID->Date_of_Payment
  TransactionID->Payment_Mode
  TransactionID->Time
  TransactionID->TotalAmt
  TransactionID->TicketID

Let X = TransactionID ,
Computing the closure,
X^+ = { TransactionId, Date_of_Payment, Payment_Mode, Time, TotalAmt, TicketID }
Thus, **Primary key = TransactionID**

The left side of all the FDs in the minimal set of FDs for the relation 'Payments' is TransactionID, which is the primary key of this relation, so **"Payments" is in BCNF**.

8. ‘Theatres’ relation :

- Attribute :
  Theatres { TheatreName, TPIN, City, State, Street }

- Functional dependencies :
  {TheatreName,TPIN}->City
  {TheatreName,TPIN}->Street
  {TheatreName,TPIN}->State

Let X = {TheatreName,TPIN} ,
Computing the closure,
X^+ = { TheatreName, TPIN, City, State, Street }
Thus, **Primary key = { TheatreName,TPIN }**

The left side of all the FDs in the minimal set of FDs for the relation ‘Theatres’ is {TheatreName,TPIN}, which is the primary key of this relation, so **“Theatres” is in BCNF**.

9. ‘EventOrganisers’ relation :

- Attribute :
  EventOrganisers { OrganisationID, Organisation_Name, ContactNo., Emailid }

- Functional dependencies :
  OrganisationID->Organisation_Name
  OrganisationID->ContactNo.
  OrganisationID->Emailid

Let X = OrganisationID,
Computing the closure,
X^+ = { OrganisationID, Organisation_Name, ContactNo., Emailid }
Thus, **Primary key = OrganisationID**

The left side of all the FDs in the minimal set of FDs for the relation 'EvenOrganisers' is OrganisationID, which is the primary key of this relation, so **"EventOrganisers" is in BCNF**.

10. 'Movie_Reviews' relation :

- Attribute :
  Movie_Reviews { UserId, MovieID, Rating, Comments }

- Functional dependencies :
  {UserId,MovieID} -> Rating
  {UserId,MovieID} -> Comments

Let X = {UserId,MovieID},
Computing the closure,
X^+ = { UserId, MovieID, Rating, Comments }
Thus, **Primary key = { UserId,MovieID }**

The left side of all the FDs in the minimal set of FDs for the relation 'Movie_Reviews' is {UserId,MovieID}, which is the primary key of this relation, so **"Movie_Reviews" is in BCNF**.

11. 'Event_Reviews' relation :

- Attribute :
  Event_Reviews { UserId, EventId, Rating, Comments }

- Functional dependencies :
  {UserId, EventId} -> Rating
  {UserId, EventId} -> Comments

Let X = { UserId, EventId },
Computing the closure,
X^+ = { UserId, EventId, Rating, Comments }
Thus, **Primary key = { UserId, EventId }**

The left side of all the FDs in the minimal set of FDs for the relation 'Event_Reviews' is {UserId, EventId}, which is the primary key of this relation, so **"Event_Reviews" is in BCNF**.

12. 'Screens' relation :

- Attribute :
  Screens { MovieID, TheatreName, TPIN, Show_Date, Start-Time, ScreenNo. }

Here, **Primary key = { MovieID, TheatreName, TPIN, Show_Date, Start-Time, ScreenNo. }**

According to the BCNF Rule, all attribute primary key relations are always BCNF. Hence, **"Screens" is in BCNF**.

13. 'Actors' relation :

- Attribute :
  Actors { ActorName, MovieID }

Here, **Primary key = { ActorName, MovieID }**

According to the BCNF Rule,all attribute primary key relations are always in BCNF. Hence **"Actors" is in BCNF**.

14. 'Artists' relation :

- Attribute :
  Artists { ArtistName, EventId }

Here, **Primary key = { ArtistName, EventId }**

According to the BCNF Rule,all attribute primary key relations are always in BCNF. Hence **“Artists” is in BCNF**.

15. ‘Sponsors’ relation :

- Attribute :
  Sponsors { EventId, FirmName, SPIN }

Here, **Primary key = { EventId, FirmName, SPIN }**

According to the BCNF Rule,all attribute primary key relations are always in BCNF. Hence **“Sponsors” is in BCNF**.

16. ‘Shows’ relation :

- Attribute :
  Shows { Show_date, Start-Time, ScreenNo.,Language, TheatreName, TPIN }

- Functional dependencies :
  {Show_date, Start-Time, ScreenNo., TheatreName, TPIN} -> Language

Let X = {Show_date, Start-Time, ScreenNo., TheatreName, TPIN},
Computing the closure,
X^+ = { Show_date, Start-Time, ScreenNo.,Language, TheatreName, TPIN }
Thus, **Primary key = {Show_date, Start-Time, ScreenNo., TheatreName, TPIN}**

The left side of all the FDs in the minimal set of FDs for the relation ‘Shows’ is {Show_date, Start-Time, ScreenNo., TheatreName, TPIN}, which is the primary key of this relation, so **“Shows” is in BCNF**.