G-13 Relational Schema

IT-214

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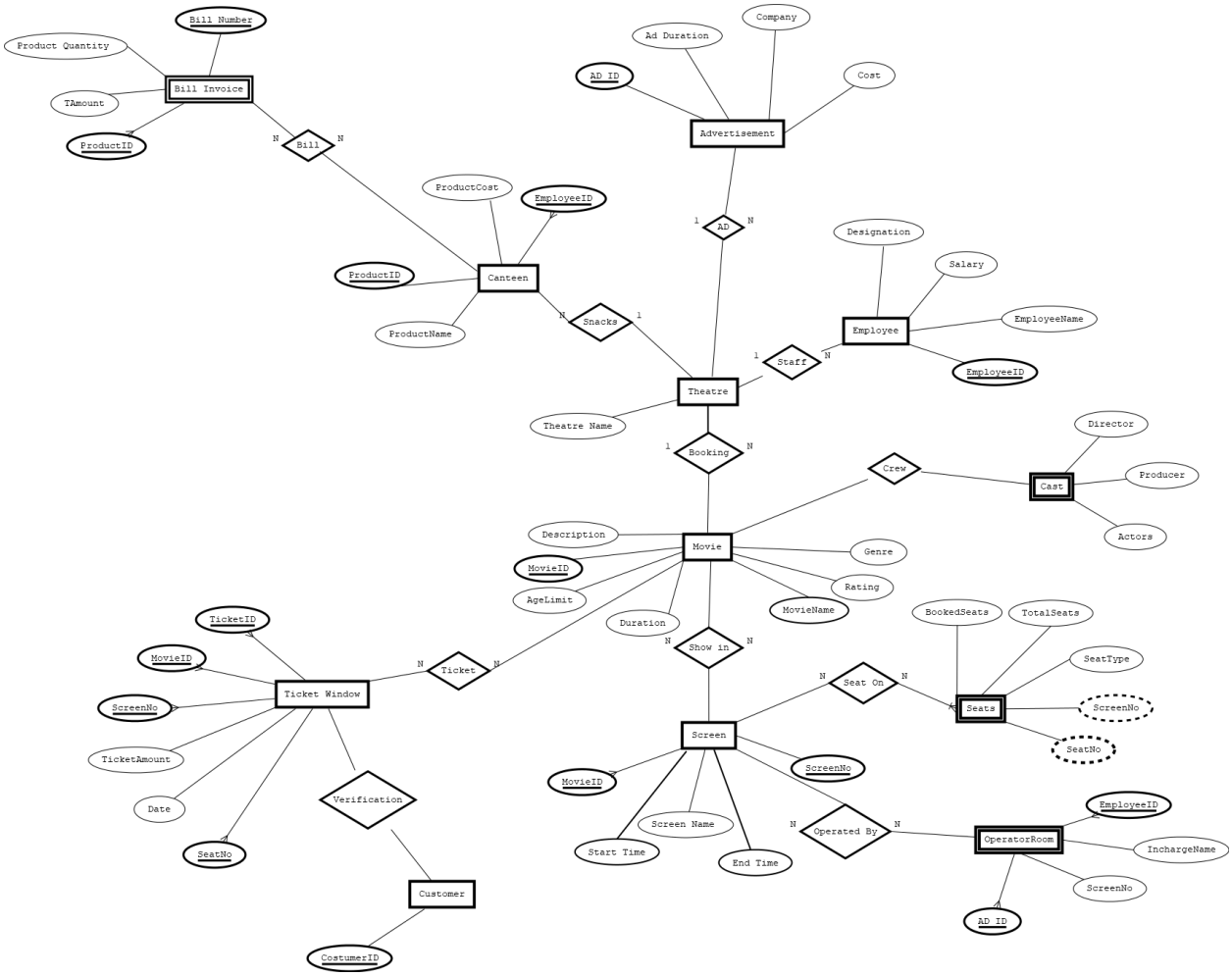
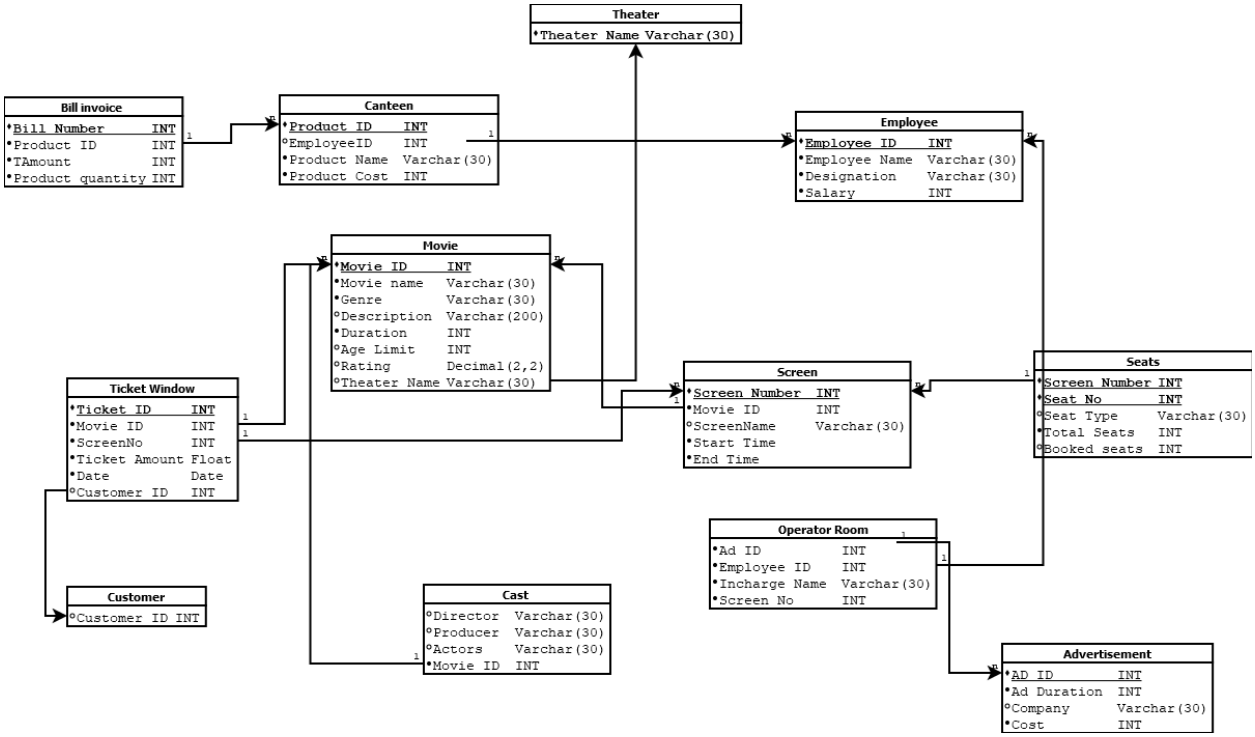
ER Diagram


Bill Number
Product Quantity
Bill Invoice
TAmount
ProductID
N
Bill
N
Ad Duration
Company
AD_ID
Cost
Advertisement
ProductCost
EmployeeID
1
AD
N
Designation
Salary
ProductID
Canteen
Snacks
N
1
ProductName
Employee
EmployeeName
1
Staff
N
EmployeeID
Theatre
Theatre Name
1
Booking
N
Director
Crew
Cast
Producer
Actors
Description
Movie
Genre
MovieID
Rating
AgeLimit
MovieName
Duration
Show in
N
BookedSeats
TotalSeats
SeatType
TicketID
MovieID
N
Ticket
N
Seat On
N
Seats
ScreenNo
Ticket Window
ScreenNo
Screen
SeatNo
TicketAmount
Date
Verification
MovieID
ScreenNo
Screen Name
Start Time
End Time
N
Operated By
N
EmployeeID
OperatorRoom
InchargeName
SeatNo
Customer
ScreenNo
CostumerID
AD_ID

Relational Schema



Minimal FD Set & Proof that relations are in BCNF

1. Theater

- **Attributes**: Theator_Name
- **FD**: Theator_Name → Theator_Name

Candidate Key: Theator_Name

The left hand side is a key which satisfies the condition for BCNF hence the relation **is in BCNF**.

2. Employee

- **Attributes**: Employee_ID, Employee_Name, Designation, Salary
- **FD**: Employee_ID → Employee_Name, Designation, Salary

Candidate Key: Employee_ID

The left hand side is a key which satisfies the condition for BCNF hence the relation **is in BCNF**.

3. Canteen

- **Attributes**: Product_ID, EmployeeID, Product_Name, Product_Cost
- **FD**: Product_ID →Product_Name, Product_Cost

  EmployeeID → EmployeeID

Candidate Key: (Product_ID, EmployeeID)

None of the FD have their left side as Key, hence it dose't support the condition of BCNF. Hence, the relation is **not in BCNF**.

For this relation to be in BCNF, we need make 2 tables one for product and one for employes and another for Employee with canteen number and EmployeeID as composite key.

Then we will inherit the employee table and product table into the canteen table.

4. Bill_Invoice

- **Attributes**: Bill_Number, Product_ID, TAmount, Product_quantity
- **FD**: Bill_Number → Product_ID, TAmount, Product_quantity

Candidate Key: Bill_Number

The left hand side is a key which satisfies the condition for BCNF hence the relation **is in BCNF**.

5. Movie

- **Attributes**: Movie_ID, Movie_name, Genre, Description, Duration, Age_Limit, Rating, Theatre_Name
- **FD**: Movie_ID → Movie_name, Genre, Description, Duration, Age_Limit, Rating, Theatre_Name

Candidate Key: Movie_ID

The left hand side is a key which satisfies the condition for BCNF hence the relation **is in BCNF**.

6. Screen

- **Attributes**: Screen_Number, Movie_ID, ScreenName
- **FD**: Screen_Number → Movie_ID, ScreenName

Candidate Key: Screen_Number

The left hand side is a key which satisfies the condition for BCNF hence the relation **is in BCNF**.

7. Seats

- **Attributes**: Screen_Number, Seat_No, Seat_Type, Total_Seats, Booked_seats
- **FDs**:

  Screen_Number → Total_Seats, Booked_seats

  Seat_No, Screen_Number → Seat_Type

  Candidate Key: Seat_No, Screen_Number

The first FD is not the key, hence the relation is **not in BCNF**.

8. Ticket Window

- **Attributes**: Ticket_ID, Movie_ID, ScreenNo, Ticket_Amount, Date, Customer_ID
- **FD**: Ticket_ID → Movie_ID, ScreenNo, Ticket_Amount, Date, Customer_ID

  Candidate Key: Ticket_ID

The left hand side is a key which satisfies the condition for BCNF hence the relation **is in BCNF**.

9. Customer

- **Attributes**: Customer_ID
- **FD**: Customer_ID → Customer_ID

  Candidate Key: Customer_ID

The left hand side is a key which satisfies the condition for BCNF hence the relation **is in BCNF**.

10. Cast

- **Attributes**: Movie_ID, Director, Producer, Actors
- **FD**: Movie_ID → Director, Producer, Actors

Candidate Key: Movie_ID

The left hand side is a key which satisfies the condition for BCNF hence the relation **is in BCNF**.

11. Operator Room

- **Attributes**: Ad_ID, Employee_ID, Incharge_Name, Screen_No
- **FD**: Employee_ID → Incharge_Name, Screen_No, Ad_ID

Candidate Key: Employee_ID

The left hand side is a key which satisfies the condition for BCNF hence the relation **is in BCNF**.

12. Advertisement

- **Attributes**: Ad_ID, Ad_Duration, Company, Cost
- **FD**: Ad_ID → Ad_Duration, Company, Cost

Candidate Key: Ad_ID

The left hand side is a key which satisfies the condition for BCNF hence the relation **is in BCNF**.

DDL Script

```
dbms project ddl
create schema Theatre;
set search_path to theatre;
create table Theatre(
theatre_name varchar(30)
);

create table Employee(
Employee_ID int primary key,
Employee_name varchar(30),
Designation varchar(30),
Salary int,
);

create table Canteen(
Product_ID int primary key,
Employee_ID int,
Product_Name varchar(30),
Product_Cost int,
foreign key (Employee_ID) references Employee(Employee_ID)
);

create table Bill_Invoice(
Bill_Number int primary key,
Product_ID int,
TAmount int,
Product_Quantity int,
foreign key (Product_ID) references Canteen(Product_ID)
);


create table Movie(
Movie_ID int primary key,
theatre_name varchar(30),
Movie_name varchar(30),
```

```
Genre varchar(30),
Description varchar(200)
Duration int,
Age_Limit int,
Rating decimal(2,2),
foreign key (theatre_name) references Theatre(theatre_name)

);

create table Screen(
Screen_No int primary key,
Movie_ID int,
Screen_Name varchar(30)
foreign key (Movie_ID) references Movie(Movie_ID)
);

create table Ticket_Window(
Ticket_ID int primary key,
Movie_ID int,
Screen_No int,
Ticket_Amount float,
Date Date,
Customer_ID int,
foreign key (Movie_ID) references Movie(Movie_ID),
foreign key (Screen_No) references Screen(Screen_No)
foreign key (Customer_ID) references customer(Customer_ID)
);

create table Seats(
Screen_No int,
Seat_No int primary key,
Seat_Type varchar(30),
Total_Seats int,
Booked_seats int,
foreign key (Screen_No) references Screen(Screen_No)
);
```

```
create table Advertisement(
Ad_ID int primary key,
Ad_Duration int,
Company varchar(30),
Cost int
);

create table Opearator_Room(
Ad_ID int,
Employee_ID int,
Incharge_Name varchar(30),
Screen_No int,
foreign key (Employee_ID) references Employee(Employee_ID),
foreign key (Ad_ID) references Advertisement(Ad_ID)
);

create table Cast(
Director varchar(30),
Producer varchar(30),
Actors varchar(30),
Movie_ID int,
foreign key (Movie_ID) references Movie(Movie_ID)
);

create table customer(
Customer_ID int UNIQUE
);
```