

Kennesaw State University  
College of Computing & Software Engineering  
CS 3410: Introduction to Database Systems  
Section W01

NCG Cinema Movie Showings

Jessica Palmer,

Cade Percival,

Katlin Scott,

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## Executive Overview

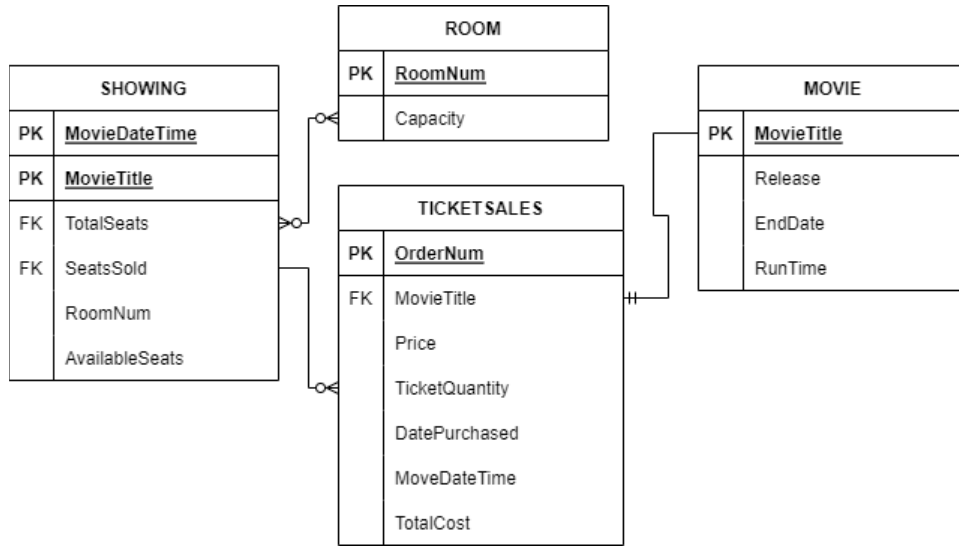
**Client:** NCG Cinema

**Primary Objective:** To create a database for NCG Cinema to store information concerning movie showings, what theatre rooms they will be shown in, and movie ticket sales.

**Overview:** NCG Cinema is a movie theatre located in Marietta, Georgia that uses current digital technology to showcase the latest movie releases. The IT department is understaffed and is struggling to keep up with the movie showing catalogs. They want to redesign and reimplement the database to assist them in keeping track of the movie showings. They have requested that the database will need to have the movie showings' information (movie title, release date, end date, and runtime) as well as the number of seats sold, and seats left available for said showing. The database also needs to list each movie and keep track of how many tickets are sold and the total cost of a ticket sale. Lastly, there also needs to be a record of how many total seats are in specific theater rooms and how many tickets can be sold for that theater room.

To solve this problem, our theater database will have entries for all movie showings. There will also be another entity keeping track of the showings with the related data (MovieDateTime, RoomNum, etc.) along with another entity keeping track of the ticket sales for each movie and showing, taking into consideration the capacity of the room the movies are being shown in. Therefore, each room will not allow overbooking for the theater.

## Entity Relationship Diagram



Legend:

- +— One and only one
- < 0 or many

## Relational Schema

MOVIE (MovieTitle, Release, EndDate, RunTime)

- Primary Key: MovieTitle

SHOWING (MovieDateTime, *MovieTitle*, *RoomNum*, TotalSeats, SeatsSold, AvailableSeats)

- Primary Key: MovieDateTime,
- Foreign Key: MovieTitle, RoomNum

ROOM (RoomNum, Capacity)

- Primary Key: RoomNum

TICKETSALES (OrderNum, *MovieTitle*, TicketQuantity, Price, PurchaseDate, *MovieDateTime*, TotalCost)

- Primary Key: OrderNum
- Foreign Key: MovieTitle, MovieDateTime

## Data Dictionary

Attribute	Table	Null?	Unique?	Foreign Key	Primary Key	Ref Table	Domain
MovieTitle	MOVIE	No		No	No	N/A	Character string length 100
Release	MOVIE	Yes	No	No	No	N/A	Date
EndDate	MOVIE	Yes	No	No	No	N/A	Date
RunTime	MOVIE	No	No	No	No	N/A	Character string length 15
MovieDateTime	SHOWING	No	Yes	No	Yes	N/A	Date/Time
MovieTitle	SHOWING	No	No	Yes	No	N/A	Character string length 100
RoomNum	SHOWING	No	No	Yes	No	N/A	2-digit integer
TotalSeats	SHOWING	No	No	No	No	N/A	3-digit integer
SeatsSold	SHOWING	No	No	No	No	N/A	3-digit integer
AvailableSeats	SHOWING	No	No	No	No	N/A	3-digit integer
RoomNum	ROOM	No	Yes	No	Yes	N/A	2-digit integer
Capacity	ROOM	No	No	No	No	N/A	3-digit integer
OrderNum	TICKETSALES	No	Yes	No	Yes	N/A	10-digit integer
MovieTitle	TICKETSALES	No	No	Yes	No	N/A	Character string length 100
TicketQuantity	TICKETSALES	No	No	No	No	N/A	3-digit integer
Price	TICKETSALES	No	No	No	No	N/A	Currency
PurchaseDate	TICKETSALES	No	No	No	No	N/A	Date
MovieDateTime	TICKETSALES	No	No	No	No	N/A	Date/Time
TotalCost	TICKETSALES	No	No	No	No	N/A	Currency

## CRUD Matrix

Tables x Forms	Movie	Showing	TicketSales	Room
Movie	CRUD	U		
Showing	R	CRUD	RU	U
TicketSales	RU		CRUD	
Room		RU		CRUD

C = Create or Insert a Record (Row)

R = Read/Query or Select a Row

U = Update or Modify

D = Delete

## Table Description

Table	Table Description
Movie	Maintains details of movie. Each row represents one movie.
Showing	Maintains showing information. Each row represents one showing.
Room	Maintains room information. Each row represents one room.
TicketSales	Keeps track of ticket sales. Allows for multiple ticket sales per order.



## Tables

### MOVIE

	MovieTitle ▾	Release ▾	EndDate ▾	RunTime ▾
+	Batman	3/4/2022	6/4/2022	193 min
+	Dog	2/18/2022	5/18/2022	133 min
+	Spider-Man: No Way Home	12/17/2021	3/17/2022	160 min
+	Trolls World Tour	3/10/2022	6/10/2022	103 min
+	Uncharted	2/18/2022	5/18/2022	127 min
*				

### SHOWING

	MovieDateTime ▾	MovieTitle ▾	RoomNum ▾	SeatsSold ▾	TotalSeats ▾	AvailableSeats ▾
	3/23/2022 11:00:00 AM	Uncharted	1	0	70	70
	3/23/2022 11:05:00 AM	Dog	2	0	70	70
	3/23/2022 11:10:00 AM	Trolls World Tour	3	0	70	70
	3/23/2022 11:30:00 AM	Batman	5	0	70	70
	3/23/2022 11:45:00 AM	Spider-Man: No Way Home	4	0	70	70
	3/23/2022 1:25:00 PM	Batman	5	0	70	70
	3/23/2022 1:35:00 PM	Trolls World Tour	3	0	70	70
	3/23/2022 1:40:00 PM	Uncharted	1	0	70	70
	3/23/2022 1:50:00 PM	Dog	2	0	70	70
	3/23/2022 3:00:00 PM	Spider-Man: No Way Home	4	0	70	70
	3/23/2022 3:20:00 PM	Batman	5	0	70	70
	3/23/2022 4:00:00 PM	Trolls World Tour	3	0	70	70
	3/23/2022 4:20:00 PM	Uncharted	1	0	70	70
	3/23/2022 4:25:00 PM	Dog	2	0	70	70
	3/23/2022 5:20:00 PM	Batman	5	0	70	70
	3/23/2022 6:15:00 PM	Spider-Man: No Way Home	4	0	70	70
	3/23/2022 6:55:00 PM	Dog	2	0	70	70
	3/23/2022 7:05:00 PM	Uncharted	1	0	70	70
	3/23/2022 7:15:00 PM	Batman	5	0	70	70
	3/23/2022 9:10:00 PM	Batman	5	0	70	70
	3/23/2022 9:25:00 PM	Dog	2	0	70	70
	3/23/2022 9:35:00 PM	Spider-Man: No Way Home	4	0	70	70
*			0	0	70	

### ROOM

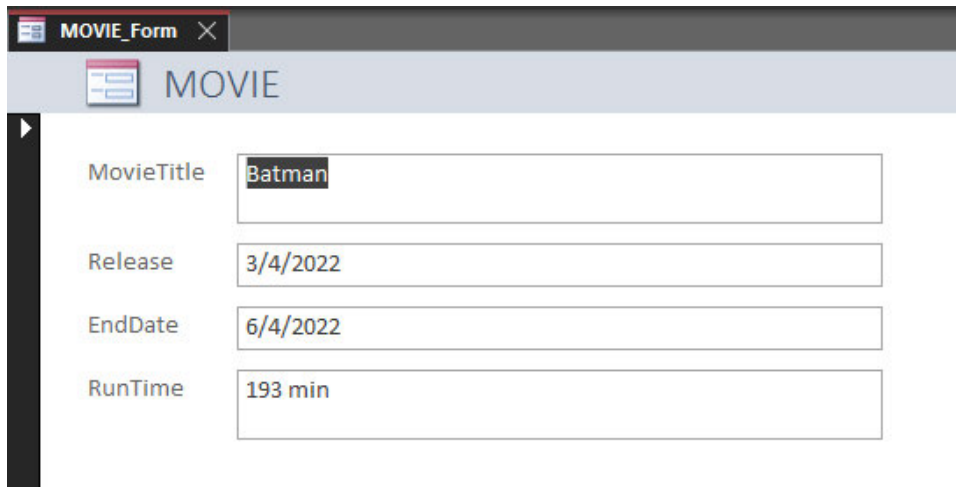
	RoomNum ▾	Capacity ▾
+	1	70
+	2	70
+	3	70
+	4	70
+	5	70
+	6	70
*	(New)	70

## TICKETSALES

OrderNum	MovieTitle	MovieDateTime	Price	TicketQuantity	DatePurchased	TotalCost
1	Batman	3/23/2022 3:20:00 PM	\$5.00	3	3/22/2022	\$15.00
2	Dog	3/23/2022 11:05:00 AM	\$5.00	5	3/23/2022	\$25.00
3	Uncharted	3/23/2022 11:00:00 AM	\$5.00	2	3/12/2022	\$10.00
4	Uncharted	3/23/2022 11:00:00 AM	\$5.00	10	3/5/2022	\$50.00
5	Dog	3/23/2022 11:05:00 AM	\$5.00	4	3/21/2022	\$20.00
6	Dog	3/23/2022 11:05:00 AM	\$5.00	2	3/22/2022	\$10.00
7	Spider-Man: No Way Home	3/23/2022 3:20:00 PM	\$5.00	2	3/22/2022	\$10.00
8	Trolls World Tour	3/23/2022 11:45:00 AM	\$5.00	3	3/23/2022	\$15.00
9	Batman	3/23/2022 3:20:00 PM	\$5.00	1	3/23/2022	\$5.00
10	Batman	3/23/2022 9:10:00 PM	\$5.00	2	3/23/2022	\$10.00
11	Trolls World Tour	3/23/2022 4:00:00 PM	\$5.00	5	3/23/2022	\$25.00
12	Dog	3/23/2022 4:25:00 PM	\$5.00	3	3/23/2022	\$15.00
13	Batman	3/23/2022 5:20:00 PM	\$5.00	3	3/23/2022	\$15.00
14	Trolls World Tour	3/23/2022 1:35:00 PM	\$5.00	15	3/23/2022	\$75.00
15	Batman	3/23/2022 5:20:00 PM	\$5.00	8	3/23/2022	\$40.00
16	Uncharted	3/23/2022 7:05:00 PM	\$5.00	2	3/23/2022	\$10.00
17	Spider-Man: No Way Home	3/23/2022 9:35:00 PM	\$5.00	1	3/23/2022	\$5.00
18	Spider-Man: No Way Home	3/23/2022 9:35:00 PM	\$5.00	4	3/23/2022	\$20.00
19	Spider-Man: No Way Home	3/23/2022 6:15:00 PM	\$5.00	5	3/23/2022	\$25.00
20	Uncharted	3/23/2022 7:05:00 PM	\$5.00	3	3/23/2022	\$15.00
21	Spider-Man: No Way Home	3/23/2022 6:15:00 PM	\$5.00	5	3/23/2022	\$25.00
22	Spider-Man: No Way Home	3/23/2022 6:15:00 PM	\$5.00	3	3/23/2022	\$15.00
23	Batman	3/23/2022 7:15:00 PM	\$5.00	2	3/23/2022	\$10.00
24	Dog	3/23/2022 4:25:00 PM	\$5.00	4	3/23/2022	\$20.00
26	Uncharted	3/23/2022 7:05:00 PM	\$5.00	6	3/23/2022	\$30.00
*(New)			\$5.00	0		

## Forms

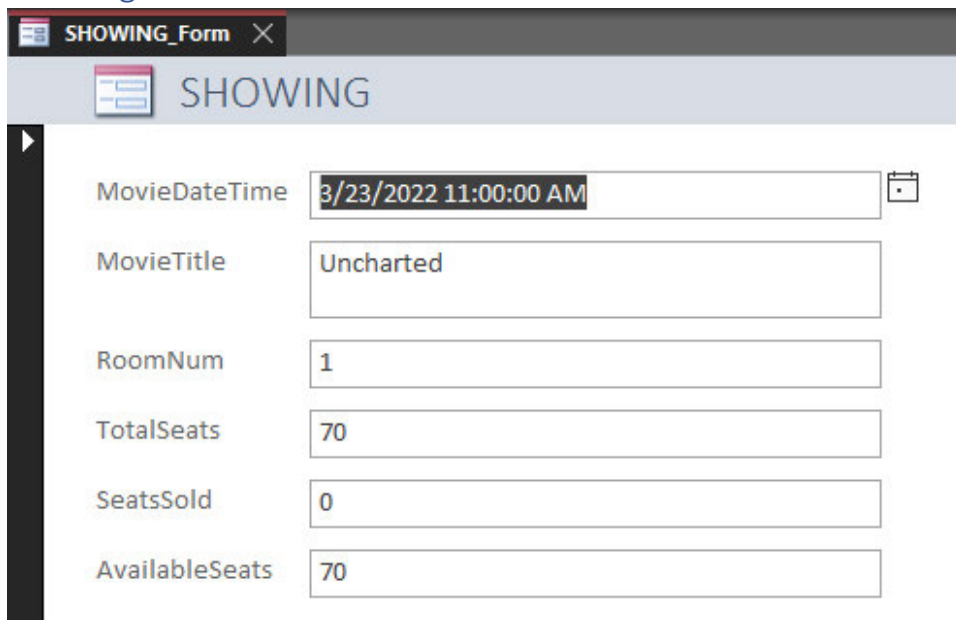
### MovieForm




The screenshot shows a window titled "MOVIE\_Form" with a close button. Below the title bar is a header area with a small icon and the word "MOVIE". To the left of the form fields is a vertical black bar with a white right-pointing triangle. The form contains four input fields, each with a label to its left:

MovieTitle	Batman
Release	3/4/2022
EndDate	6/4/2022
RunTime	193 min

### ShowingForm



The screenshot shows a window titled "SHOWING\_Form" with a close button. Below the title bar is a header area with a small icon and the word "SHOWING". To the left of the form fields is a vertical black bar with a white right-pointing triangle. The form contains six input fields, each with a label to its left:

MovieDateTime	3/23/2022 11:00:00 AM	
MovieTitle	Uncharted	
RoomNum	1	
TotalSeats	70	
SeatsSold	0	
AvailableSeats	70	

## TicketSalesForm

TICKETSALES\_Form

TICKETSALES

▶

OrderNum

1

DatePurchased

3/22/2022

MovieTitle

Uncharted

▼

MovieDateTime

3/23/2022 11:00:00 AM

▼

Price

\$5.00

TicketQuantity

3

TotalCost

\$15.00

## RoomForm

ROOM\_Form

ROOM

▶

RoomNum

1

Capacity

70

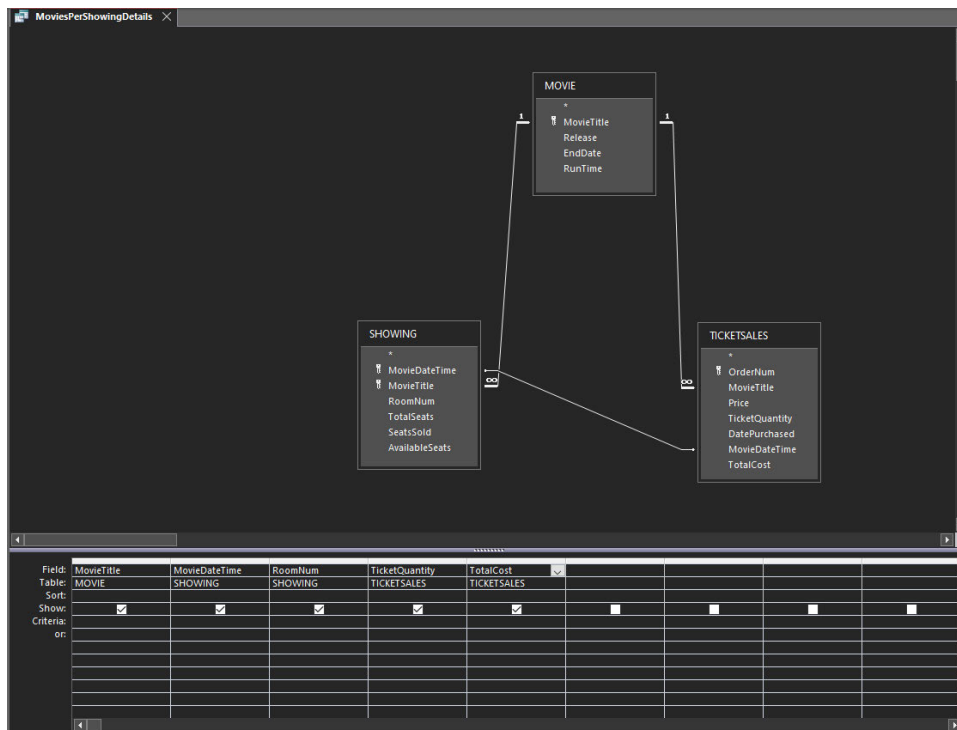
Query #1:

TICKETSALES_TotalTicketsSoldAndTotalOrdersPerShowing				
MovieTitle	MovieDateTime	TotalTicketsSoldPerShowing	TotalOrdersForShowings	
Uncharted	3/23/2022 11:00:00 AM	2	1	
Uncharted	3/23/2022 11:00:00 AM	10	1	
Dog	3/23/2022 11:05:00 AM	2	1	
Dog	3/23/2022 11:05:00 AM	4	1	
Dog	3/23/2022 11:05:00 AM	5	1	
Trolls World Tour	3/23/2022 11:45:00 AM	3	1	
Trolls World Tour	3/23/2022 1:35:00 PM	15	1	
Batman	3/23/2022 3:20:00 PM	1	1	
Batman	3/23/2022 3:20:00 PM	3	1	
Spider-Man: No Way Home	3/23/2022 3:20:00 PM	2	1	
Trolls World Tour	3/23/2022 4:00:00 PM	5	1	
Dog	3/23/2022 4:25:00 PM	3	1	
Dog	3/23/2022 4:25:00 PM	4	1	
Batman	3/23/2022 5:20:00 PM	3	1	
Batman	3/23/2022 5:20:00 PM	8	1	
Spider-Man: No Way Home	3/23/2022 6:15:00 PM	3	1	
Spider-Man: No Way Home	3/23/2022 6:15:00 PM	10	2	
Uncharted	3/23/2022 7:05:00 PM	2	1	
Uncharted	3/23/2022 7:05:00 PM	3	1	
Uncharted	3/23/2022 7:05:00 PM	6	1	
Batman	3/23/2022 7:15:00 PM	2	1	
Batman	3/23/2022 9:10:00 PM	2	1	
Spider-Man: No Way Home	3/23/2022 9:35:00 PM	1	1	
Spider-Man: No Way Home	3/23/2022 9:35:00 PM	4		

[illegible]

## Query #2:

MovieTitle	MovieDateTime	RoomNum	TicketQuantity	TotalCost
Batman	3/23/2022 3:20:00 PM	5	3	\$15.00
Batman	3/23/2022 3:20:00 PM	5	1	\$5.00
Batman	3/23/2022 5:20:00 PM	5	3	\$15.00
Batman	3/23/2022 5:20:00 PM	5	8	\$40.00
Batman	3/23/2022 7:15:00 PM	5	2	\$10.00
Batman	3/23/2022 9:10:00 PM	5	2	\$10.00
Dog	3/23/2022 11:05:00 AM	2	5	\$25.00
Dog	3/23/2022 11:05:00 AM	2	4	\$20.00
Dog	3/23/2022 11:05:00 AM	2	2	\$10.00
Dog	3/23/2022 4:25:00 PM	2	3	\$15.00
Dog	3/23/2022 4:25:00 PM	2	4	\$20.00
Spider-Man: No Way Home	3/23/2022 6:15:00 PM	4	5	\$25.00
Spider-Man: No Way Home	3/23/2022 6:15:00 PM	4	5	\$25.00
Spider-Man: No Way Home	3/23/2022 6:15:00 PM	4	3	\$15.00
Spider-Man: No Way Home	3/23/2022 9:35:00 PM	4	1	\$5.00
Spider-Man: No Way Home	3/23/2022 9:35:00 PM	4	4	\$20.00
Trolls World Tour	3/23/2022 1:35:00 PM	3	15	\$75.00
Trolls World Tour	3/23/2022 4:00:00 PM	3	5	\$25.00
Uncharted	3/23/2022 11:00:00 AM	1	2	\$10.00
Uncharted	3/23/2022 11:00:00 AM	1	10	\$50.00
Uncharted	3/23/2022 7:05:00 PM	1	2	\$10.00
Uncharted	3/23/2022 7:05:00 PM	1	3	\$15.00
Uncharted	3/23/2022 7:05:00 PM	1	6	\$30.00



### Query #3:

TICKETSALES-SHOWING_Important-Info					
MovieTitle	MovieDateTime	RoomNum	TicketSalesPerMovie	SeatsAvailable	
Batman	3/23/2022 3:20:00 PM	5	4	66	
Batman	3/23/2022 5:20:00 PM	5	11	59	
Batman	3/23/2022 7:15:00 PM	5	2	68	
Batman	3/23/2022 9:10:00 PM	5	2	68	
Dog	3/23/2022 11:05:00 AM	2	11	59	
Dog	3/23/2022 4:25:00 PM	2	7	63	
Spider-Man: No Way Home	3/23/2022 3:20:00 PM	5	2	68	
Spider-Man: No Way Home	3/23/2022 6:15:00 PM	4	13	57	
Spider-Man: No Way Home	3/23/2022 9:35:00 PM	4	5	65	
Trolls World Tour	3/23/2022 11:45:00 AM	4	3	67	
Trolls World Tour	3/23/2022 1:35:00 PM	3	15	55	
Trolls World Tour	3/23/2022 4:00:00 PM	3	5	65	
Uncharted	3/23/2022 11:00:00 AM	1	12	58	
Uncharted	3/23/2022 7:05:00 PM	1	11	59	

[illegible]

## Appendix

### Problems Encountered

#### Problem #1:

We had a bit of trouble making sure that the tables connected smoothly to produce proper queries results without issues.

- We could not figure out a way to tally TicketQuantity grouped by MovieDateTime where it would auto-update SeatsSold within the Showings table upon entering new TicketSales data. So, we simplified the query to simply tally the total sales by MovieDateTime and did the calculation of remaining seats within that query.

#### Problem #2:

- While we worked in MS Access for this project, some capabilities we wanted to use weren't available within the program. When we tried to do the things that we wanted to do in SQL Server to see if it worked there, we were able to get the results we were shooting for.