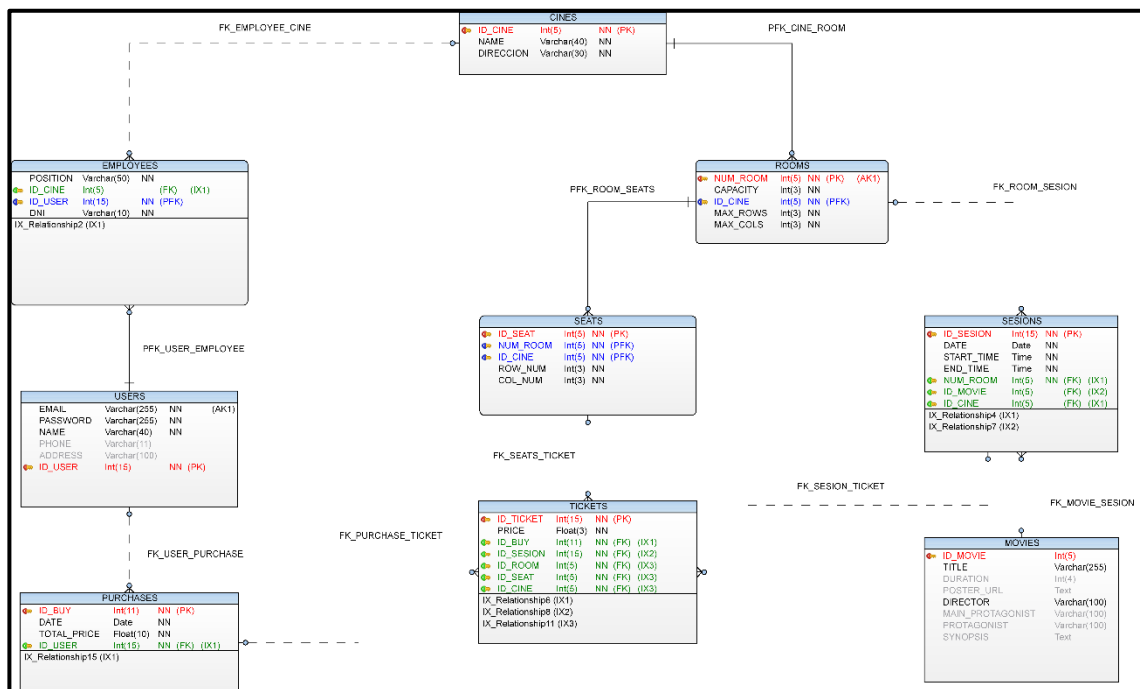


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Título práctica: **Entrega ABP (BBDD)**

- Diseño del modelo de datos:** Creación del diagrama Entidad-Relación (ERD) representando las entidades, relaciones, claves primarias y foráneas necesarias.



Programa utilizado: TOAD Data Modeler

- Tabla de validación:** Inclusión obligatoria de una tabla específica para la autenticación de usuarios, con campos para el nombre de usuario y contraseña.

	Field	Type	Null	Key	Default	Extra
▶	EMAIL	varchar(255)	NO	UNI	NULL	
	PASSWORD	varchar(255)	NO		NULL	
	NAME	varchar(40)	NO		NULL	
	PHONE	varchar(11)	YES		NULL	
	ADDRESS	varchar(100)	YES		NULL	
	ID_USER	int	NO	PRI	NULL	auto_increment

EMAIL	PASSWORD	NAME	PHONE	ADDRESS	ID_USER
ehabeshaw0@jimdo.com	Monlau2025	Ezechiel	34912345678	934 Moulton Junction	1
chinchcliffe1@accuweather.com	Monlau2025	Cacilia	34987654321	6461 Westport Terrace	2
cemnoney2@posterous.com	Monlau2025	Cecilia	34923456789	1054 Gateway Road	3
kkeoghane3@google.cn	Monlau2025	Karil	34956789012	36190 Rieder Drive	4
eitshak4@unicef.org	Monlau2025	Edi	34934567890	5 Dwight Cirde	5
lfegan5@xrea.com	Monlau2025	Lee	34987654321	77735 Claremont Trail	6
ddibling6@mediafire.com	Monlau2025	Dorotea	34923456789	8 Reinke Alley	7
hupfold7@utexas.edu	Monlau2025	Honey	34956789012	574 Melvin Avenue	8
htrassler8@people.com.cn	Monlau2025	Haven	34934567890	31960 Bashford Avenue	9
smanson9@indiegogo.com	Monlau2025	Sheela	34987654321	610 Rutledge Center	10
ohirjaka@usa.gov	Monlau2025	Oriana	34923456789	35435 Moose Junction	11
mdefondb@ebay.com	Monlau2025	Mommy	34956789012	3078 Shopko Park	12
rswaingerc@mail.ru	Monlau2025	Rivkah	34934567890	39474 Pawling Terrace	13
riembcked@oakley.com	Monlau2025	Roxy	34987654321	1782 Anzinger Alley	14
fkleinhandlere@zdnnet.com	Monlau2025	Floyd	34923456789	85426 Cardinal Hill	15
fgodarf@fastcompany.com	Monlau2025	Fabiano	34956789012	004 Pierstorff Park	16
astallebrassg@hexun.com	Monlau2025	Appolonia	34934567890	76460 Ridgeway Trail	17
fhannahh@loc.gov	Monlau2025	Fowler	34987654321	242 Maple Place	18
bchesselli@miitbeian.gov.cn	Monlau2025	Bartie	34923456789	9 Elgar Lane	19
cchadwellj@google.com.au	Monlau2025	Cecelia	34956789012	05 Katie Pass	20
lwinklessk@ucsd.edu	Monlau2025	Lanae	34934567890	8919 Park Meadow Par...	21

Programa utilizado: MySQL Workbench

3. Implementación en MySQL: Creación de las tablas en MySQL desde un servidor

```
[admin-1@localhost ~]$ hostnamectl set-hostname cinefusionLinuxServer
==== AUTHENTICATING FOR org.freedesktop.hostname1.set-static-hostname ====
Authentication is required to set the statically configured local hostname, as well as the pretty hostname.
Authenticating as: Admin-1 (admin-1)
Password:
==== AUTHENTICATION COMPLETE ====
[admin-1@localhost ~]$ _
```

Sistema Operativo: AlmaLinux

4. Linux, utilizando scripts SQL. Se deben insertar datos de prueba.

```
CREATE TABLE `CINES`
(
  `ID_CINE` INT(5) NOT NULL AUTO_INCREMENT,
  `NAME` VARCHAR(40) NOT NULL,
  `ADDRESS` VARCHAR(30) NOT NULL,
  PRIMARY KEY (`ID_CINE`)
)
;

-- TABLE ROOMS

CREATE TABLE `ROOMS`
(
  `NUM_ROOM` INT(5) NOT NULL,
  `CAPACITY` INT(3) NOT NULL,
  `ID_CINE` INT(5) NOT NULL,
  `MAX_ROWS` INT(3) NOT NULL,
  `MAX_COLS` INT(3) NOT NULL
)
;

ALTER TABLE `ROOMS` ADD PRIMARY KEY (`NUM_ROOM`, `ID_CINE`)
;

ALTER TABLE `ROOMS` ADD UNIQUE `NUMERO` (`NUM_ROOM`)
;

-- TABLE SESSIONS

CREATE TABLE `SESSIONS`
(
  `ID_SESSION` INT(15) NOT NULL AUTO_INCREMENT,
  `DATE` DATE NOT NULL,
  `START_TIME` TIME NOT NULL,
  `END_TIME` TIME NOT NULL,
  `NUM_ROOM` INT(5) NOT NULL,
```

```
`ID_MOVIE` INT(5),
`ID_CINE` INT(5),
PRIMARY KEY (`ID_SESSION`)
)
;

CREATE INDEX `IX_RELATIONSHIP4` ON `SESSIONS` (`NUM_ROOM`, `ID_CINE`)
;

CREATE INDEX `IX_RELATIONSHIP7` ON `SESSIONS` (`ID_MOVIE`)
;

-- TABLE EMPLOYEES

CREATE TABLE `EMPLOYEES`
(
  `POSITION` VARCHAR(50) NOT NULL,
  `ID_CINE` INT(5),
  `ID_USER` INT(15) NOT NULL,
  `DNI` VARCHAR(10) NOT NULL
)
;

CREATE INDEX `IX_RELATIONSHIP2` ON `EMPLOYEES` (`ID_CINE`)
;

CREATE INDEX `IX_PFK_USER_EMPLOYEE` ON `EMPLOYEES` (`ID_USER`)
;

ALTER TABLE `EMPLOYEES` ADD PRIMARY KEY (`ID_USER`)
;

-- TABLE PURCHASES

CREATE TABLE `PURCHASES`
(
  `ID_BUY` INT(11) NOT NULL AUTO_INCREMENT,
  `DATE` DATE NOT NULL,
  `TOTAL_PRICE` FLOAT(10) NOT NULL,
  `ID_USER` INT(15) NOT NULL,
  PRIMARY KEY (`ID_BUY`)
)
;

CREATE INDEX `IX_RELATIONSHIP15` ON `PURCHASES` (`ID_USER`)
;
```

```
-- TABLE TICKETS

CREATE TABLE `TICKETS`
(
  `ID_TICKET` INT(15) NOT NULL AUTO_INCREMENT,
  `PRICE` FLOAT(3) NOT NULL,
  `ID_BUY` INT(11) NOT NULL,
  `ID_SESSION` INT(15) NOT NULL,
  `ID_SEAT` INT(5) NOT NULL,
  PRIMARY KEY (`ID_TICKET`)
)
;

CREATE INDEX `IX_RELATIONSHIP6` ON `TICKETS` (`ID_BUY`)
;

CREATE INDEX `IX_RELATIONSHIP8` ON `TICKETS` (`ID_SESSION`)
;

CREATE INDEX `IX_RELATIONSHIP11` ON `TICKETS` (`ID_SEAT`)
;

-- TABLE MOVIES

CREATE TABLE `MOVIES`
(
  `ID_MOVIE` INT(5) NOT NULL AUTO_INCREMENT,
  `TITLE` VARCHAR(255) NOT NULL,
  `DURATION` INT(4),
  `POSTER_URL` TEXT,
  `DIRECTOR` VARCHAR(100) NOT NULL,
  `MAIN_PROTAGONIST` VARCHAR(100),
  `PROTAGONIST` VARCHAR(100),
  `SYNOPSIS` TEXT,
  PRIMARY KEY (`ID_MOVIE`)
)
;

-- TABLE SEATS

CREATE TABLE `SEATS`
(
  `ID_SEAT` INT(5) NOT NULL AUTO_INCREMENT,
  `NUM_ROOM` INT(5) NOT NULL,
  `ID_CINE` INT(5) NOT NULL,
```

```
`ROW_NUM` INT(3) NOT NULL,  
`COL_NUM` INT(3) NOT NULL,  
PRIMARY KEY (`ID_SEAT`)  
)  
;  
  
CREATE INDEX `IX_PFK_ROOM_SEATS` ON `SEATS` (`NUM_ROOM`, `ID_CINE`)  
;  
  
-- TABLE USERS  
  
CREATE TABLE `USERS`  
(  
  `EMAIL` VARCHAR(255) NOT NULL,  
  `PASSWORD` VARCHAR(255) NOT NULL,  
  `NAME` VARCHAR(40) NOT NULL,  
  `PHONE` VARCHAR(11),  
  `ADDRESS` VARCHAR(100),  
  `ID_USER` INT(15) NOT NULL AUTO_INCREMENT,  
  PRIMARY KEY (`ID_USER`)  
)  
;  
  
ALTER TABLE `USERS` ADD UNIQUE `EMAIL` (`EMAIL`)  
;  
  
-- CREATE FOREIGN KEYS (RELATIONSHIPS) SECTION -----  
-----  
  
ALTER TABLE `EMPLOYEES` ADD CONSTRAINT `FK_EMPLOYEE_CINE` FOREIGN KEY (`ID_CINE`)  
REFERENCES `CINES` (`ID_CINE`) ON DELETE RESTRICT ON UPDATE RESTRICT  
;  
  
ALTER TABLE `SESSIONS` ADD CONSTRAINT `FK_ROOM_SESSION` FOREIGN KEY (`NUM_ROOM`,  
`ID_CINE`) REFERENCES `ROOMS` (`NUM_ROOM`, `ID_CINE`) ON DELETE RESTRICT ON UPDATE  
RESTRICT  
;  
  
ALTER TABLE `TICKETS` ADD CONSTRAINT `FK_PURCHASE_TICKET` FOREIGN KEY (`ID_BUY`)  
REFERENCES `PURCHASES` (`ID_BUY`) ON DELETE RESTRICT ON UPDATE RESTRICT  
;  
  
ALTER TABLE `SESSIONS` ADD CONSTRAINT `FK_MOVIE_SESSION` FOREIGN KEY (`ID_MOVIE`)  
REFERENCES `MOVIES` (`ID_MOVIE`) ON DELETE RESTRICT ON UPDATE RESTRICT  
;  

```

```
ALTER TABLE `TICKETS` ADD CONSTRAINT `FK_SESSION_TICKET` FOREIGN KEY (`ID_SESSION`)
REFERENCES `SESSIONS` (`ID_SESSION`) ON DELETE RESTRICT ON UPDATE RESTRICT
;

ALTER TABLE `SEATS` ADD CONSTRAINT `FK_ROOM_SEATS` FOREIGN KEY (`NUM_ROOM`, `ID_CINE`)
REFERENCES `ROOMS` (`NUM_ROOM`, `ID_CINE`) ON DELETE RESTRICT ON UPDATE RESTRICT
;

ALTER TABLE `TICKETS` ADD CONSTRAINT `FK_SEATS_TICKET` FOREIGN KEY (`ID_SEAT`)
REFERENCES `SEATS` (`ID_SEAT`) ON DELETE RESTRICT ON UPDATE RESTRICT
;

ALTER TABLE `ROOMS` ADD CONSTRAINT `PFK_CINE_ROOM` FOREIGN KEY (`ID_CINE`) REFERENCES
`CINES` (`ID_CINE`) ON DELETE RESTRICT ON UPDATE RESTRICT
;

ALTER TABLE `EMPLOYEES` ADD CONSTRAINT `PFK_USER_EMPLOYEE` FOREIGN KEY (`ID_USER`)
REFERENCES `USERS` (`ID_USER`) ON DELETE RESTRICT ON UPDATE RESTRICT
;

ALTER TABLE `PURCHASES` ADD CONSTRAINT `FK_USER_PURCHASE` FOREIGN KEY (`ID_USER`)
REFERENCES `USERS` (`ID_USER`) ON DELETE RESTRICT ON UPDATE RESTRICT
;
```

Script generado con: TOAD Data Modeler

	ID_SEAT	NUM_ROOM	ID_CINE	ROW_NUM	COL_NUM
▶	1	1	1	1	1
	2	1	1	1	2
	3	1	1	1	3
	4	1	1	1	4
	5	1	1	1	5
	6	1	1	1	6
	7	1	1	1	7
	8	1	1	1	8
	9	1	1	1	9
	10	1	1	1	10
	11	1	1	2	1
	12	1	1	2	2
	13	1	1	2	3
	14	1	1	2	4
	15	1	1	2	5
	16	1	1	2	6
	17	1	1	2	7
	18	1	1	2	8
	19	1	1	2	9
	20	1	1	2	10
	21	1	1	3	1

ID_MOVIE	TITLE	DURATION	POSTER_URL	DIRECTOR	MAIN_PROTAGONIST	PROTAGONIST	SYNOPSIS
1	Inception	148	https://m.media-amazon.com/images/M/MV5BM...	Christopher Nolan	Leonardo DiCaprio	NOLAN	A thief who enters the dreams of others to steal secrets.
2	The Matrix	136	https://m.media-amazon.com/images/M/MV5BN...	The Wachowskis	Keanu Reeves	NOLAN	A computer hacker learns from mysterious rebels about the true nature of reality and his role in the war against its controllers.
3	The Dark Knight	152	https://m.media-amazon.com/images/M/MV5BM...	Christopher Nolan	Christian Bale	NOLAN	When the menace known as the Joker emerges from his mysterious past, he wreaks havoc and chaos on the people of Gotham. The Dark Knight must confront him one-on-one.
4	The Lion King	88	https://m.media-amazon.com/images/M/MV5BY...	Jon Favreau	Donald Glover	NOLAN	A young lion prince flees his kingdom only to learn the value of family and leadership after a decade of running away from his responsibilities.
5	Pulp Fiction	154	https://m.media-amazon.com/images/M/MV5BM...	Quentin Tarantino	John Travolta	NOLAN	The lives of two mob hitmen, a boxer, a gangster and a go-go dancer.
6	Forrest Gump	142	https://m.media-amazon.com/images/M/MV5BM...	Robert Zemeckis	Tom Hanks	NOLAN	The presidencies of Kennedy and Johnson, the Vietnam War, the assassination of Martin Luther King Jr., and the life of a simple man who becomes a national icon.
7	Fight Club	139	https://m.media-amazon.com/images/M/MV5BM...	David Fincher	Brad Pitt	NOLAN	An insomniac office worker and a soap salesman living in a seedy city starts a fight club and goes on a power trip.
8	The Shawshank Redemption	142	https://m.media-amazon.com/images/M/MV5BN...	Frank Darabont	Tim Robbins	NOLAN	Two imprisoned men bond over a number of years, finding solace and hope in each other.
9	Schindler's List	195	https://m.media-amazon.com/images/M/MV5BN...	Steven Spielberg	Liam Neeson	NOLAN	In German-occupied Poland during World War II, a Jewish businessman befriends a German industrialist.
10	The Godfather	175	https://m.media-amazon.com/images/M/MV5BM...	Francis Ford Coppola	Marlon Brando	NOLAN	The aging patriarch of an organized crime dynasty in post-war New York City is nearing the end and his sons battle to take over the reins.
11	Goodfellas	146	https://m.media-amazon.com/images/M/MV5BY...	Martin Scorsese	Ray Liotta	NOLAN	The story of Henry Hill and his life in the mob, covering his relationship with his wife and their three kids, his rise to power in the mob, and his eventual fall.
12	Gladiator	155	https://m.media-amazon.com/images/M/MV5BM...	Ridley Scott	Russell Crowe	NOLAN	A betrayed Roman general sets out to exact revenge on the emperor who ordered his death.
13	Interstellar	169	https://m.media-amazon.com/images/M/MV5BZ...	Christopher Nolan	Matthew McConaughey	NOLAN	A team of explorers travel through a wormhole in space in an attempt to ensure humanity's survival.
14	Jurassic Park	127	https://m.media-amazon.com/images/M/MV5BM...	Steven Spielberg	Sam Neill	NOLAN	During a preview tour, a theme park suffers a major power breakdown which allows its escaped dinosaurs to terrorize the park visitors.
15	Avatar	162	https://m.media-amazon.com/images/M/MV5BM...	James Cameron	Sam Worthington	NOLAN	A paraplegic Marine dispatched to the moon Pandora on a unique mission, becomes torn between following orders and protecting an alien civilization.
16	The Avengers	143	https://m.media-amazon.com/images/M/MV5BN...	Joss Whedon	Robert Downey Jr.	NOLAN	Earth's mightiest heroes must come together and learn to fight as a team if they are to stop the mischievous Loki and his alien army from enslaving humanity.
17	Spider-Man: No Way Home	148	https://m.media-amazon.com/images/M/MV5BM...	Jon Watts	Tom Holland	NOLAN	Peter Parker's life and reputation are turned upside down when he is forced to reveal his identity to the world.
18	The Wolf of Wall Street	180	https://m.media-amazon.com/images/M/MV5BM...	Martin Scorsese	Leonardo DiCaprio	NOLAN	A New York stockbroker refuses to cooperate in an investigation of massive fraud, instead continuing to amass a fortune.
19	Deadpool	108	https://m.media-amazon.com/images/M/MV5BY...	Tim Miller	Ryan Reynolds	NOLAN	A wisecracking mercenary gets experimented on and becomes a super hero.

Datos insertados con: ChatGPT y Mockaroo

5. **Consultas:** Se deberán realizar consultas SQL y crear vistas que permitan obtener información relevante de la base de datos.

1. Precio medio de los tickets

Se desea conocer el precio medio de todos los tickets vendidos.

```
SELECT AVG(PRICE) AS PrecioMedioTicket
FROM TICKETS;
```

2. Sala con mayor número de sesiones

Consulta para averiguar qué sala ha albergado el mayor número de sesiones.

```
SELECT ID_CINE, ID_ROOM, COUNT(ID_SESSION) AS NumeroDeSesiones
FROM SESSIONS
GROUP BY ID_CINE, ID_ROOM
ORDER BY NumeroDeSesiones DESC
LIMIT 1;
```

3. Número de tickets en una sesión específica

Consulta que devuelve cuántos tickets se han vendido en una sesión concreta.

Nota: Sustituir X por el identificador de sesión deseado.

```
SELECT COUNT(ID_TICKET) AS CantidadTickets
FROM TICKETS
WHERE ID_SESSION = X; -- Ejemplo: WHERE ID_SESSION = 101;
```

4. Duración media de las películas

Muestra la duración media de todas las películas almacenadas en la base de datos.

```
SELECT AVG(DURATION) AS DuracionMediaPeliculas
FROM MOVIES;
```

5. Ingresos totales del cine

Consulta que calcula la suma total de ingresos obtenidos por la venta de tickets.

```
SELECT SUM(PRICE) AS IngresoTotalCine
FROM TICKETS;
```

6. Día con más sesiones programadas

Permite saber qué día se realizaron más sesiones.

```
SELECT DATE, COUNT(ID_SESSION) AS NumeroDeSesiones
FROM SESSIONS
GROUP BY DATE
ORDER BY NumeroDeSesiones DESC
LIMIT 1;
```

Resultado de las consultas:

1. Precio medio de los tickets, se desea conocer el precio medio de todos los tickets vendidos.

	PrecioMedioTicket
▶	8.416666666666666

2. Sala con mayor número de sesiones.

	ID_CINE	NUM_ROOM	NumeroDeSesiones
▶	NULL	1	6

3. Número de tickets en una sesión específica.

	CantidadTickets
▶	2

4. Duración media de las películas.

	DuracionMediaPeliculas
▶	147.8421

5. Ingresos totales del cine.

	IngresoTotalCine
▶	101

6. Día con más sesiones programadas

	DATE	NumeroDeSesiones
▶	2025-06-10	2

Uso de cliente gráfico: Uso de MySQL Workbench como cliente para conectarse al servidor, gestionar las bases de datos y generar el diagrama ER.



6. Creación de los usuarios de administración de la base de datos:

```
CREATE USER 'API'@'%' IDENTIFIED BY 'Monlau2025@';  
GRANT SELECT, INSERT, UPDATE, DELETE ON CINEFUSION.* TO 'API'@'%';  
  
CREATE USER 'admin-1'@'%' IDENTIFIED BY 'Monlau2025@';  
GRANT ALL PRIVILEGES ON CINEFUSION.* TO 'admin-1'@'%';
```