



SOEN 363: Data Systems for Software Engineers

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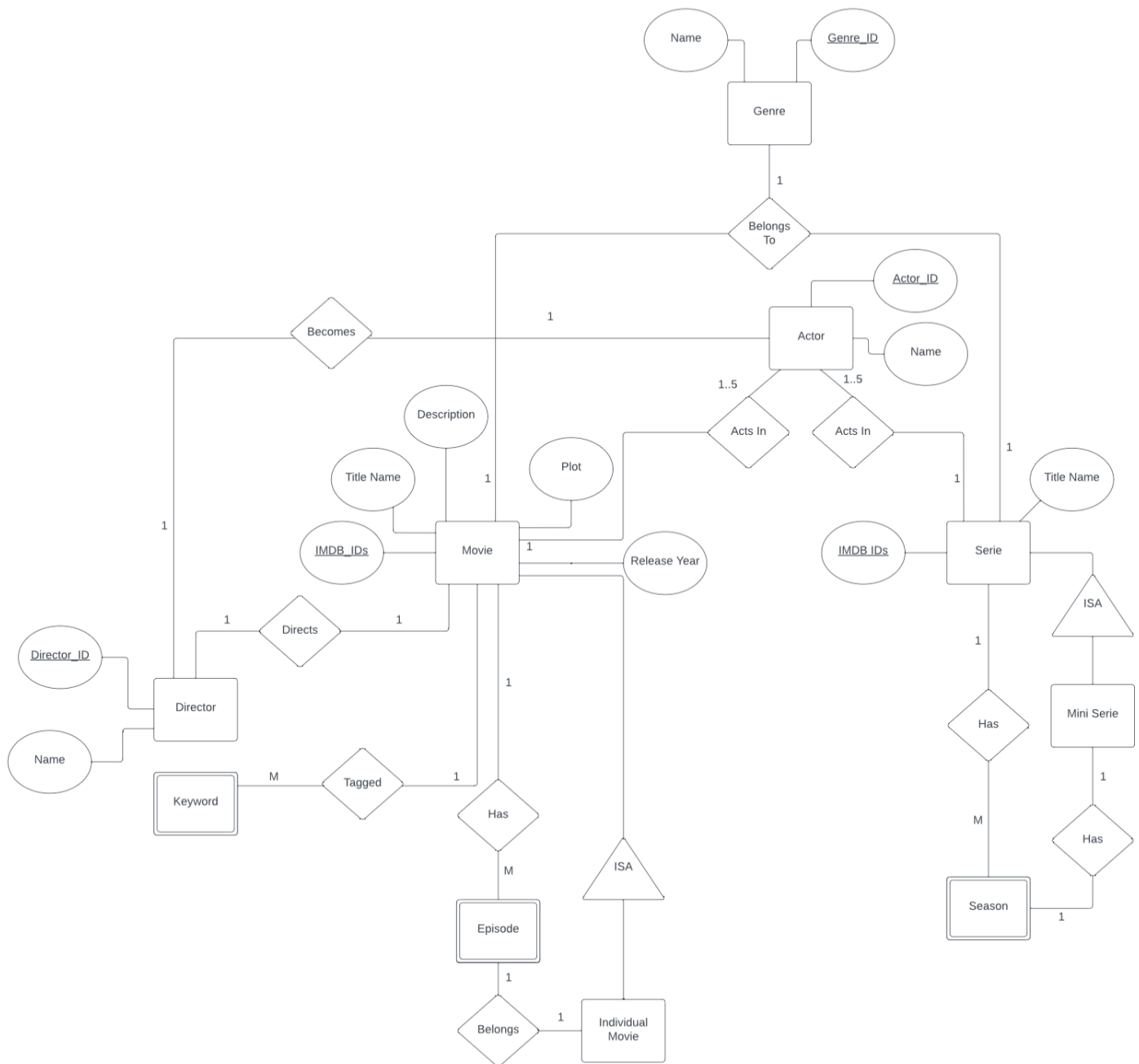
ID: 40135271

Section: S

Presented To: Ali Jannatpour

Fall 2023

A)



B)

	<u>IMDB IDs</u>	Title Name	Description	Plot	Release Year
Movie	123	Documentary: Wildlife in Africa	A documentary showcasing the diverse wildlife in Africa	This documentary explores the natural habitats and wildlife of Africa, narrated by John Smith.	2020

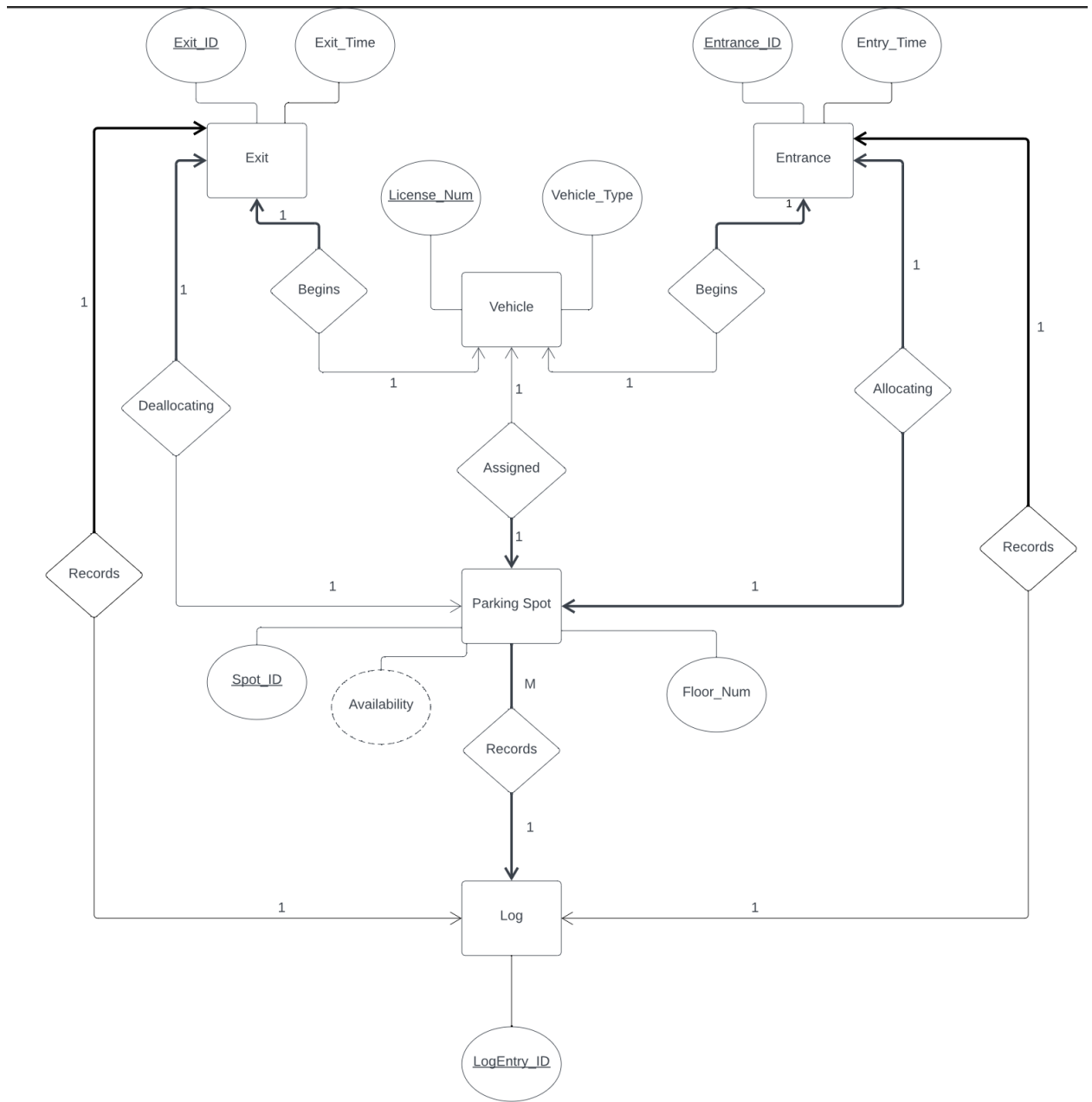
	<u>Genre ID</u>	Name
Genre	1	Documentary

	<u>Director ID</u>	Name
Director	1	John Smith

	<u>Actor ID</u>	Name
Actor	1	John Smith

Q2.

A)



B)

Vehicle	
License_Num (Primary Key)	Integer
Vehicle_Type	String

Parking Spot	
Spot_ID (Primary Key)	Integer
Exit_ID (Foreign Key)	Integer
Entrance_ID (Foreign Key)	Integer
Availability	Integer
Floor_Num	Integer

Log	
LogEntry_ID (Primary Key)	Integer
Entrance_ID (Foreign Key)	Integer
Exit_ID (Foreign Key)	Integer
Spot_ID (Foreign Key)	Integer
License_Num (Foreign Key)	Integer

Entrance	
Entrance_ID (Primary Key)	Integer
License_Num (Foreign Key)	Integer
Entry_Time	Integer

Exit	
Exit_ID (Primary Key)	Integer
License_Num (Foreign Key)	Integer
Exit_Time	Integer

C)

-- Create the Vehicle Table

```
CREATE TABLE Vehicle (  
    License_Num INT PRIMARY KEY,  
    Vehicle_Type VARCHAR(255)  
);
```

-- Create the Parking Spot Table

```
CREATE TABLE Parking_Spot (  
    Spot_ID INT PRIMARY KEY,  
    Exit_ID INT,  
    Entrance_ID INT,  
    Availability INT,  
    Floor_Num INT,  
    FOREIGN KEY (Exit_ID) REFERENCES Exit(Exit_ID),  
    FOREIGN KEY (Entrance_ID) REFERENCES Entrance(Entrance_ID)  
);
```

-- Create the Log Table

```
CREATE TABLE Log (  
    LogEntry_ID INT PRIMARY KEY,  
    Entrance_ID INT,  
    Exit_ID INT,  
    Spot_ID INT,  
    License_Num INT,  
    FOREIGN KEY (Entrance_ID) REFERENCES Entrance(Entrance_ID),  
    FOREIGN KEY (Exit_ID) REFERENCES Exit(Exit_ID),  
    FOREIGN KEY (Spot_ID) REFERENCES Parking_Spot(Spot_ID),  
    FOREIGN KEY (License_Num) REFERENCES Vehicle(License_Num)  
);
```

-- Create the Entrance Table

```
CREATE TABLE Entrance (  
    Entrance_ID INT PRIMARY KEY,  
    License_Num INT,  
    Entry_Time INT,  
    FOREIGN KEY (License_Num) REFERENCES Vehicle(License_Num)  
);
```

-- Create the Exit Table

```
CREATE TABLE Exit (  
    Exit_ID INT PRIMARY KEY,  
    License_Num INT,  
    Exit_Time INT,  
    FOREIGN KEY (License_Num) REFERENCES Vehicle (License_Num)  
);
```

D)

Vehicle Table

License_Num	Vehicle_Type
12345	Sedan
67890	SUV
54321	Hatchback

Parking Spot Table

Spot_ID	Availability	Floor_Num
1	0 (Occupied)	1
2	1 (Empty)	2
3	0 (Occupied)	1
4	1 (Empty)	3

Log Table

LogEntry_ID	Entrance_ID	Exit_ID	Spot_ID	License_Num
1	1		1	12345
2	2	1	2	67890
3	3	2	3	54321
4		3	1	12345

Entrance Table

Entrance_ID	License_Num	Entry_Time
1	67890	158 (means 1:58 pm)
2	54321	630
3	12345	745

Exit Table

Exit_ID	License_Num	Exit_Time
1	67890	830
2	54321	930
3	12345	1030

Cardinalities and degrees of each relation in the instance:

- Between Vehicle and Parking Spot:
 - Cardinality: 1 to 1 (each vehicle is assigned to one spot, and each spot is assigned to one vehicle).
 - Degree: Binary.
- Between Parking Spot and Log:
 - Cardinality: M to 1 (each parking spot can have multiple log entries, but each log entry is related to one parking spot).
 - Degree: Binary.
- Between Entrance and Log:
 - Cardinality: 1 to 1 (each entrance event corresponds to one log entry, and each log entry corresponds to one entrance event).
 - Degree: Binary.
- Between Entrance and Parking Spot:
 - Cardinality: 1 to 1 (each entrance event allocates one parking spot, and each parking spot is allocated by one entrance event).
 - Degree: Binary.
- Between Vehicle and Exit:
 - Cardinality: 1 to 1 (each vehicle begins at one exit, and each exit is the beginning point for one vehicle).
 - Degree: Binary.
- Between Exit and Parking Spot:
 - Cardinality: 1 to 1 (each exit event deallocates one parking spot, and each parking spot is deallocated by one exit event).
 - Degree: Binary.
- Between Exit and Log:
 - Cardinality: 1 to 1 (each exit event corresponds to one log entry, and each log entry corresponds to one exit event).
 - Degree: Binary.

Q3.

