

Project 1

INSY 3304 - 002

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1. First Normal Form (1NF)

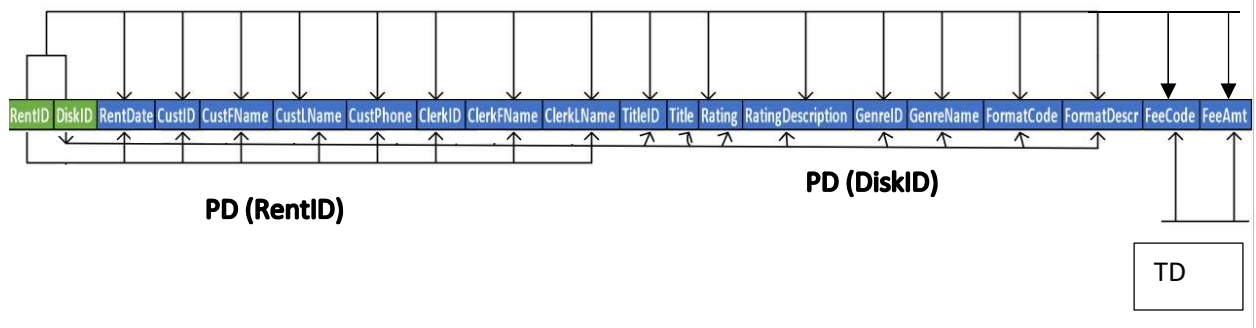
a. 1nf Form

Rental

RentID	RentDate	CustID	CustFName	CustLName	CustPhone	ClerkID	ClerkFName	ClerkLName	DiskID	TitleID	Title	Rating	RatingDescription	GenreID	GenreName	FormatCode	FormatDescr	FeeCode	FeeAmt
1	9/2/2017	23	Jean	Mackey	972-555-1143	15	Mary	Jones	215	92	Hacksaw Ridge	R	Restricted Under 17	AC	Action	D	DVD	A	\$3.00
1	9/2/2017	23	Jean	Mackey	972-555-1143	15	Mary	Jones	191	76	Avengers: Infinity War	PG-13	Inappropriate Under 13	AC	Action	D	DVD	B	\$2.00
2	9/2/2017	102	Jack	Hughes	214-555-2014	15	Mary	Jones	259	119	Insurgent	PG-13	Inappropriate Under 13	AC	Action	B	BLU-RAY	A	\$3.00
3	9/2/2017	154	Alicia	Moore	817-555-1919	21	Mark	White	89	12	Casa Blanca	PG	Parental Guidance	CL	Classics	D	DVD	B	\$2.00
3	9/2/2017	154	Alicia	Moore	817-555-1919	21	Mark	White	96	29	Despicable Me 2	PG	Parental Guidance	FM	Family	D	DVD	B	\$2.00
3	9/2/2017	154	Alicia	Moore	817-555-1919	21	Mark	White	152	42	Frozen	PG	Parental Guidance	FM	Family	D	DVD	B	\$2.00
4	9/3/2017	83	Carrie	Brown	N/A	30	Renee	Smith	86	58	The Specialist	R	Restricted Under 17	AC	Action	B	BLU-RAY	A	\$3.00
5	9/3/2017	23	Jean	Mackey	972-555-1143	15	Mary	Jones	260	119	Insurgent	PG-13	Inappropriate Under 13	AC	Action	D	DVD	A	\$3.00
6	9/4/2017	83	Carrie	Brown	N/A	12	Tim	Shore	301	230	Lone Survivor	R	Restricted Under 17	AC	Action	B	BLU-RAY	A	\$3.00
7	9/4/2017	154	Alicia	Moore	817-555-1919	15	Mary	Jones	376	245	Moana	PG	General	FM	Family	B	BLU-RAY	A	\$3.00
7	9/4/2017	154	Alicia	Moore	817-555-1919	15	Mary	Jones	153	42	Frozen	PG	Parental Guidance	FM	Family	D	DVD	B	\$2.00
8	9/5/2017	53	Ashleigh	Hayes	972-555-0628	12	Tim	Shore	202	159	Boss Baby	PG	Parental Guidance	FM	Family	D	DVD	B	\$2.00
8	9/5/2017	53	Ashleigh	Hayes	972-555-0628	12	Tim	Shore	402	240	It	R	Restricted Under 17	HR	Horror	B	BLU-RAY	A	\$3.00
9	9/5/2017	68	Anthony	Smith	N/A	15	Mary	Jones	381	218	Gone With The Wind	PG	Parental Guidance	CL	Classics	D	DVD	A	\$3.00
9	9/5/2017	68	Anthony	Smith	N/A	15	Mary	Jones	216	92	Hacksaw Ridge	R	Restricted Under 17	AC	Action	B	BLU-RAY	A	\$3.00
10	9/5/2017	23	Jean	Mackey	972-555-1143	21	Mark	White	203	159	Boss Baby	PG	Parental Guidance	FM	Family	D	DVD	B	\$2.00
10	9/5/2017	23	Jean	Mackey	972-555-1143	21	Mark	White	97	29	Despicable Me 2	PG	Parental Guidance	FM	Family	D	DVD	A	\$3.00
11	9/5/2017	72	Shane	Wesley	817-555-0112	42	Nicole	Walker	376	245	Moana	PG	General	FM	Family	B	BLU-RAY	B	\$2.00
11	9/5/2017	72	Shane	Wesley	817-555-0112	42	Nicole	Walker	421	296	The Hurt Locker	R	Restricted Under 17	AC	Action	D	DVD	A	\$3.00
11	9/5/2017	72	Shane	Wesley	817-555-0112	42	Nicole	Walker	299	35	Minions	PG	Parental Guidance	FM	Family	D	DVD	A	\$3.00

b. Dependency diagram

Rental



- RENTAL(**RentID**, **DiskID**, RentDate, CustID, CustFName, CustLName, CustPhone, ClerkID, ClerkFName, ClerkLName, TitleID, Title, Rating, RatingDescription, GenreID, GenreName, FormatCode, FormatDescr, FeeCode, FeeAmt)
- TD = Transitive Dependency
 - FeeCode → FeeAmt
- PD = Partial Dependency
 - **DiskID** → TitleID, Title, Rating, RatingDescription, GenreID, GenreName, FormatCode, FormatDescr
 - **RentID** → RentDate, CustID, CustFName, CustLName, CustPhone, ClerkID, ClerkFName, ClerkLName

For Dependency Diagram notation of the 1NF, we moved the DiskID to the front by RentID for simplification and neatness of the Dependency diagram

2. Second Normal Form (2NF)

a.

- RENTAL(RentID, DiskID, FeeCode, FeeAmt)

RENTAL

RentID	Disk ID	FeeCode	Fee Amt
1	215	A	\$3.00
1	191	B	\$2.00
2	259	A	\$3.00
3	89	B	\$2.00
3	96	B	\$2.00
3	152	B	\$2.00
4	86	A	\$3.00
5	260	A	\$3.00
6	301	A	\$3.00
7	376	A	\$3.00
7	153	B	\$2.00
8	202	B	\$2.00
8	402	A	\$3.00
9	381	A	\$3.00
9	216	A	\$3.00
10	203	B	\$2.00
10	97	A	\$3.00
11	376	B	\$2.00
11	421	A	\$3.00
11	299	A	\$3.00

- CUSTOMER(RentID, RentDate, CustID, CustFName, CustLName, CustPhone, ClerkID, ClerkFName, ClerkLName)

CUSTOMER

RentID	RentDate	CustID	CustFName	CustLName	CustPhone	ClerkID	ClerkFName	ClerkLName
1	9/2/2017	23	Jean	Mackey	972-555-1143	15	Mary	Jones
2	9/2/2017	102	Jack	Hughes	214-555-2014	15	Mary	Jones
3	9/2/2017	154	Alicia	Moore	817-555-1919	21	Mark	White
4	9/3/2017	83	Carrie	Brown	N/A	30	Renee	Smith
5	9/3/2017	23	Jean	Mackey	972-555-1143	15	Mary	Jones
6	9/4/2017	83	Carrie	Brown	N/A	12	Tim	Shore
7	9/4/2017	154	Alicia	Moore	817-555-1919	15	Mary	Jones
8	9/5/2017	53	Ashleigh	Hayes	972-555-0628	12	Tim	Shore
9	9/5/2017	68	Anthony	Smith	N/A	15	Mary	Jones
10	9/5/2017	23	Jean	Mackey	972-555-1143	21	Mark	White
11	9/5/2017	72	Shane	Wesley	817-555-0112	42	Nicole	Walker

- DISK(DiskID, TitleID, Title, Rating, RatingDescription, GenreID, GenreName, FormatCode, FormatDescr)

DISK

DiskID	TitleID	Title	Rating	RatingDescription	GenreID	GenreName	FormatCode	FormatDescr
215	92	Hacksaw Ridge	R	Restricted Under 17	AC	Action	D	DVD
191	76	Avengers: Infinity War	PG-13	Inappropriate Under 13	AC	Action	D	DVD
259	119	Insurgent	PG-13	Inappropriate Under 13	AC	Action	B	BLU-RAY
89	12	Casa Blanca	PG	Parental Guidance	CL	Classics	D	DVD
96	29	Despicable Me 2	PG	Parental Guidance	FM	Family	D	DVD
152	42	Frozen	PG	Parental Guidance	FM	Family	D	DVD
86	58	The Specialist	R	Restricted Under 17	AC	Action	B	BLU-RAY
260	119	Insurgent	PG-13	Inappropriate Under 13	AC	Action	D	DVD
301	230	Lone Survivor	R	Restricted Under 17	AC	Action	B	BLU-RAY
376	245	Moana	PG	General	FM	Family	B	BLU-RAY
153	42	Frozen	PG	Parental Guidance	FM	Family	D	DVD
202	159	Boss Baby	PG	Parental Guidance	FM	Family	D	DVD
402	240	It	R	Restricted Under 17	HR	Horror	B	BLU-RAY
381	218	Gone With The Wind	PG	Parental Guidance	CL	Classics	D	DVD
216	92	Hacksaw Ridge	R	Restricted Under 17	AC	Action	B	BLU-RAY
203	159	Boss Baby	PG	Parental Guidance	FM	Family	D	DVD
97	29	Despicable Me 2	PG	Parental Guidance	FM	Family	D	DVD
376	245	Moana	PG	General	FM	Family	B	BLU-RAY
421	296	The Hurt Locker	R	Restricted Under 17	AC	Action	D	DVD
299	35	Minions	PG	Parental Guidance	FM	Family	D	DVD

b. Dependency Diagram

Table name: RENTAL

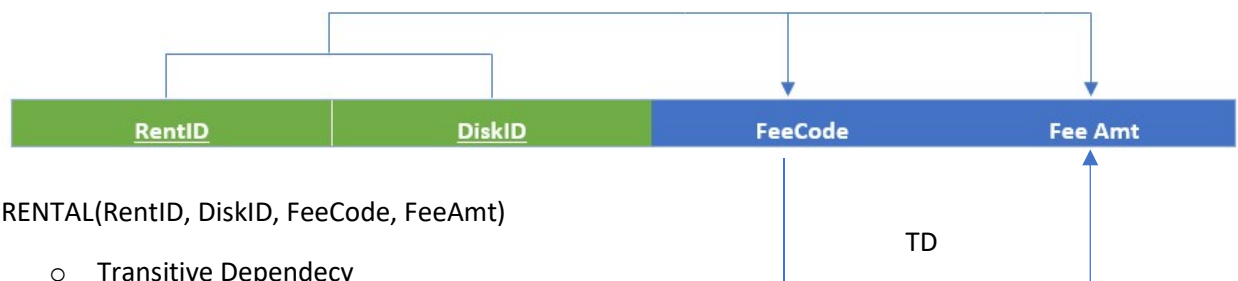


Table name: CUSTOMER



- CUSTOMER(RentID, RentDate, CustID, CustFName, CustLName, CustPhone, ClerkID, ClerkFName, ClerkLName)

Table name: DISK



- DISK(DiskID, TitleID, Title, Rating, RatingDescription, GenreID, GenreName, FormatCode, FormatDescr)

3. Third Normal Form (3NF)

a.

Rental

RentID	Disk ID	FeeCode
1	215	A
1	191	B
2	259	A
3	89	B
3	96	B
3	152	B
4	86	A
5	260	A
6	301	A
7	376	A
7	153	B
8	202	B
8	402	A
9	381	A
9	216	A
10	203	B
10	97	A
11	376	B
11	421	A
11	299	A

Rent_detail

RentID	RentDate	CustID	ClerkID
1	9/2/2017	23	15
2	9/2/2017	102	15
3	9/2/2017	154	21
4	9/3/2017	83	30
5	9/3/2017	23	15
6	9/4/2017	83	12
7	9/4/2017	154	15
8	9/5/2017	53	12
9	9/5/2017	68	15
10	9/5/2017	23	21
11	9/5/2017	72	42

Fee

FeeCode	FeeAmt
A	\$3.00
B	\$2.00

Customer

CustID	CustFName	CustLName	CustPhone
23	Jean	Mackey	972-555-1143
102	Jack	Hughes	214-555-2014
154	Alicia	Moore	817-555-1919
83	Carrie	Brown	N/A
53	Ashleigh	Hayes	972-555-0628
68	Anthony	Smith	N/A
72	Shane	Wesley	817-555-0112

Clerk

ClerkID	ClerkFName	ClerkLName
15	Mary	Jones
21	Mark	White
30	Renee	Smith
12	Tim	Shore
42	Nicole	Walker

Disk

Disk ID	Title ID	RatingID	GenreID	FormatCode
215	92	R	AC	D
191	76	PG-13	AC	D
259	119	PG-13	AC	B
89	12	PG	CL	D
96	29	PG	FM	D
152	42	PG	FM	D
86	58	R	AC	B
260	119	PG-13	AC	D
301	230	R	AC	B
376	245	PG	FM	B
153	42	PG	FM	D
202	159	PG	FM	D
402	240	R	HR	B
381	218	PG	CL	D
216	92	R	AC	B
203	159	PG	FM	D
97	29	PG	FM	D
376	245	PG	FM	B
421	296	R	AC	D
299	35	PG	FM	D

Genre

GenreID	GenreName
AC	Action
HR	Horror
CL	Classics
FM	Family

Format

FormatCode	FormatDesc
D	DVD
B	BLU-RAY

Rating

RatingID	RatingDesc
R	Restricted Under 17
PG-13	Inappropriate Under 13
PG	Parental Guidance

Title

Title ID	Title
92	Hacksaw Ridge
76	Avengers: Infinity War
119	Insurgent
12	Casa Blanca
29	Despicable Me 2
42	Frozen
58	The Specialist
230	Lone Survivor
245	Moana
159	Boss Baby
240	It
218	Gone With The Wind
296	The Hurt Locker
35	Minions

b. Dependency Diagrams



Table Name: Rental
RentID (**RentID**, DiskID, FeeCode)

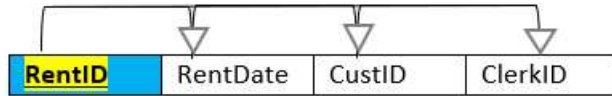


Table Name: Rent_detail
RentID (**RentID**, RentDate, CustID, ClerkID)

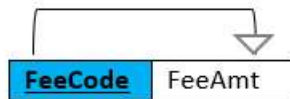


Table name: Fee
FeeCode (**FeeCode**, FeeAmt)

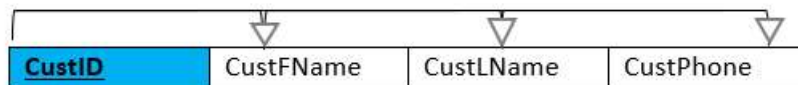


Table name: Customer
Customer (**CustID**, CustFName, CustLName, CustPhone)

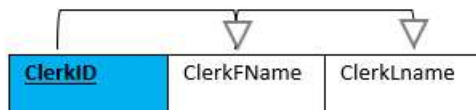


Table Name: Clerk
Clerk (**ClerkID**, ClerkFName, ClerkLName)

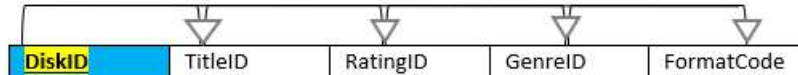


Table Name: Disk
Disk (**DiskID**, TitleID, RatingID, GenreID, FormatCode)

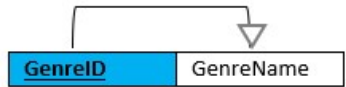


Table Name: Genre
Genre (GenreID, GenreName)

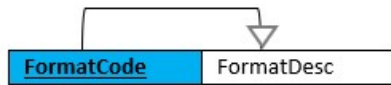


Table Name: Format
Format (FormatCode, FormatDesc)

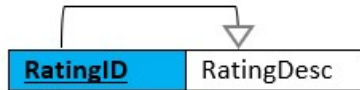


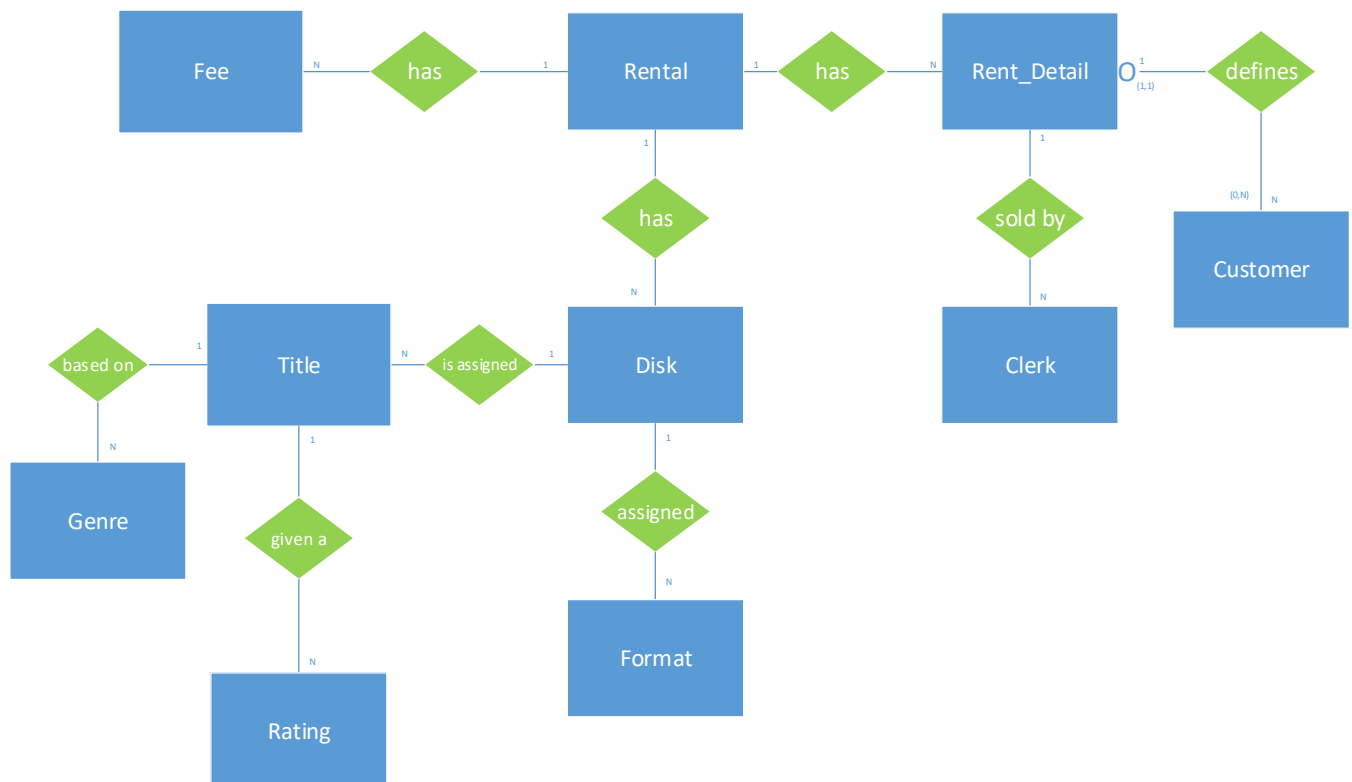
Table Name: Rating
Rating (RatingID, RatingDesc)



Table Name: Title
Title (TitleID, Title)

4. Entity-Relationship Model

a. Chen Diagram



b. Relationship model

