Module Code	
Group	
Module Title	Information System Analysis and design
Assessment Type	Assessment: Implementation Model (50%)
Module Tutor Name	
ID Number	
Date of Submission	

I confirm that this assignment is my own work

Where I have referred to academic sources, I have provided in-text-citations and included the sources in the final reference list.

Loan No.	LN74857						
Borrower No.	BN1721						
Borrower Name	Ben Jones						
Borrower Address	28 Low Road, Nottingham NG5 3PB						
Borrower Total Fine	£0.00						
Borrower Status	Allowed						
Loan Date	06/02/2002						
Total loan Cost	£8.00						
	DVD No.	DN198			DVD No.	DN9829	
	DVD Title	Raiders of the Lost Ark			DVD Title	John Wick	
	DVD Starring Actor	Harrison Ford			DVD Starring Actor	Keanu Reeves	
	DVD Year	1981			DVD Year	2014	
	Rental Category	Adventure			Rental Category	Action	
	Rental Cost	£3.50			Rental Cost	£4.50	
		Copy No	CN1099			Copy No.	CN8739
		Shelf Position	AV123			Shelf Position	AC8728
		DVD Status	On Loan			DVD Status	On Loan
		Return Due Date	13/02/2002			Return Due Date	13/02/2002

Task 1

What is Normalization

Normalization is a database design technique that eliminates undesirable characteristics such as Update, Insertion and Deletion Anomalies. Normalization rules divide larger tables into smaller tables and use relationships to connect them. The goal of SQL normalization is to remove redundant (repetitive) data and ensure that data is stored logically.

Data consumes disc space and causes maintenance issues. If data that exists in more than one location must be changed, the data must be changed in all locations exactly the same way. A change in a customer's address is much easier to implement if the data is only stored in the Customers table and nowhere else in the database.

Advantages of Normalization

As standardization eliminates duplicate information, a smaller information base can be maintained. As a result, the size of the information base is reduced in general.

Narrower tables are possible because standard tables will be manipulated and will have fewer segments, allowing for more information records per page.

To have guaranteed quick support assignments, Fewer files per tables are used

Disadvantages of Normalization

Tables will involve codes rather than genuine information because rehashed data will be stored as lines of codes instead of genuine data. As a result, going to the query table is always required.

As the typical structure type progresses, the exhibition becomes increasingly slow.

1 Normal Form

Lean No	Borrower No.	Borrower name	Borrower Address	Borrower Total Fine	Borrower status	Loan Date	Total loan cost	DVD No.	DVD title	DVD starring actor
Ln74 857	BN1721	Ben Jones	28, Low Road, Nottingham, NG5 3PB	£0.00	Allowed	06/02/2002	£8.00	DN 198	Raiders of the lost Ark	Harrison Ford
LN74 857	BN1721	Ben Jones	28, Low Road Nottingham, NG5 3PB	£0.00	Allowed	06/02/2002	£8.00	DN9829	John wick	Keanu Reeves

DVD year	Rental Category	Rental Cost	Copy No	Shelf Position	DVD Status	Return DUE Date
1981	Adventure	£3.50	CN1099	AV123	On Loan	13/02/2002
2014	Action	£4.50	CN8739	AC8728	On Loan	13/02/2002

2 Normal Form

Loan No.	Borrower No.	Borrower Name	Borrower Address	Borrower Total Fine	Borrower Status	Loan Date	Total Loan Cost
LN74857	BN1721	Ben Jones	28.Low Road, Nottingham, NG5 3PB	£0.00	Allowed	06/02/2002	£8.00

Loan No.	DVD No. (PK)	DVD Title	DVD Starring Actor	DVD Year	Rental Category	Rental Cost
LN74857	DN198	Raiders of The Ark	Harrison Ford	1981	Adventure	£3.50
LN74857	DN9829	John Wick	Keanu Reeves	2014	Action	£4.50

DVD No.	Copy No. (PK)	Shelf Position	DVD Status	Return Due Date
DN198	CN1099	AV123	On Loan	13/02/2002
DN9829	CN8738	AC8728	On Loan	13/02/2002

Normal form 3

Loan Chr

Loan No (PK)	Borrower No. (FK)	Loan Date	Total Loan Cost
LN74857	BN1721	06/02/2002	£8

Bor

Borrower No (PK)	Borrower Name	Borrower Address	Borrower Total Fine	Borrower Status
	Ben Jones	28, Low Road, Nottingham, NG5 3PB	£0.00	Allowed

DVD NUM

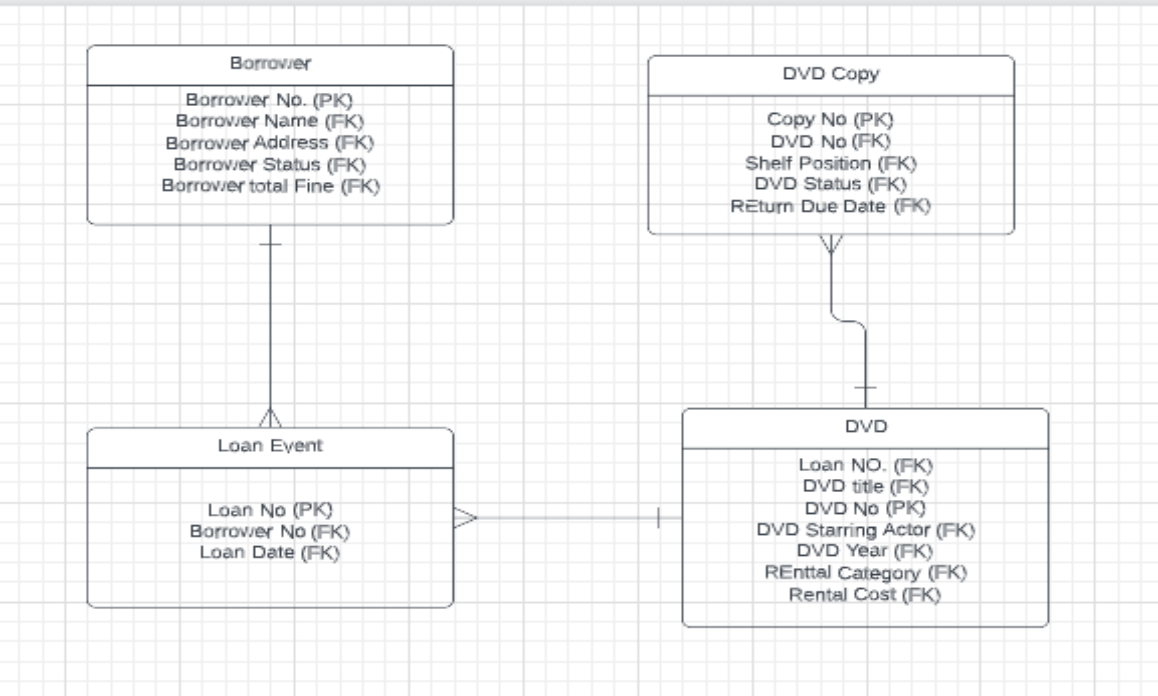
DVD No (PK)	DVD Title	DVD Starring Actor	DVD Year	Rental Category	Copy No.	Rental Cost
DN198	Raider of The Lost Ark	Harrison Ford	1981	Adventure	CN1099	£3.50
DN9829	John Wick	Keanu Reeves	2014	Action	CN8739	£4.50

Copy tbl

Copy No (PK)	DVD No (FK)	Shelf Position	DVD Status	Return Due date
CN1099	DN198	AV123	On loan	13/02/2002
CN8739	DN9829	AC8728	On Loan	13/02/2002

Task 2

ERD



Task 3

Loan Table

CREATE TABLE Loan Chr

(

loanNo varchar (255),

borrowerNo varchar (255),

loanDate varchar (255),

TotalLoanCost varchar (255)

);

INSERT INTO Loan Chr (loanNo,borrowerNo,loanDate,TotalLoanCost)

VALUES ('LN74857','BN1721','13/02/2022','£8.00');

VALUES ('LN1829','BN291','01/04/2022','£8.00');

VALUES ('LN6473','BN181','05/04/2022','£4.00');

VALUES ('LN7873','BN982','06/04/2022','£3.5');

VALUES ('LN8473','BN3647','01/04/2022','£9.00');

VALUES ('LN6312','BN912','07/04/2022','£12.5');

Result:

Number of Records: 8

loanNo	borrowerNo	loanDate	TotalLoanCost
LN74857	BN1721	13/02/2022	£8.00
LN1829	BN291	01/04/2022	£8.00
LN6473	BN181	05/04/2022	£4.00
LN7873	BN982	06/04/2022	£3.5
LN8473	BN3647	01/04/2022	£9.00
LN6312	BN912	07/04/2022	£12.5
LN6373	BN6721	02/04/2022	£4.5

Borrower table

CREATE TABLE Bor

(

BorrowerNo varchar (255),

BorrowerName VARCHAR (255),

BorrowerAddress varchar (255),

BorrowerTotalFine varchar(255),

BorrowerStatus varchar (255)

);

INSERT INTO Bor
(BorrowerNo,BorrowerName,BorrowerAddress,BorrowerTotalFine,BorrowerStatus)

VALUES ('BN1721','Ben Jones','28 low road, Nottingham NG5 3PB','£ 0.00','ALLOWED');

VALUES ('BN291','Anthony Jones','68 Long Row, Nottingham, NG5 6HG','£ 0.00','ALLOWED');

VALUES ('BN181','Simon Smith','89 Kepler Walk, Nottingham, NG2 6BP, ','£ 0.00','ALLOWED');

VALUES ('BN982','Karen Copeland','117 Hampshire Street, Nottingham NG1 3PQ ','£ 0.00','ALLOWED');

VALUES ('BN3647','Chloe Barnes','12 Pickering Avenue, Nottingham, NG7 9RT ','£ 0.00','ALLOWED');

VALUES ('BN912','Abdul Aziz','44 Bogotten Street, Nottingham, NG12 7HT ','£ 0.00','ALLOWED');

VALUES ('BN6721','Karim Edwards','789 Cliton Way, Nottingham, NG8 6GH ','£ 0.00','ALLOWED');

VALUES ('BN8374','Aisha Mitri','3 Brookdale Avenue, Nottingahm, NG2 9SR ','£ 0.00','ALLOWED');

Result:

Number of Records: 7

BorrowerNo	BorrowerName	BorrowerAddress	BorrowerTotalFine	BorrowerStatus
BN1721	Ben Jones	28 low road, Nottingham NG5 3PB	£ 0.00	ALLOWED
BN291	Anthony Jones	68 Long Row, Nottingham, NG5 6HG	£ 0.00	ALLOWED
BN181	Simon Smith	89 Kepler Walk, Nottingham, NG2 6BP,	£ 0.00	ALLOWED
BN982	Karen Copeland	117 Hampshire Street, Nottingham NG1 3PQ	£ 0.00	ALLOWED
BN3647	Chloe Barnes	12 Pickering Avenue, Nottingham, NG7 9RT	£ 0.00	ALLOWED
BN6721	Karim Edwards	789 Cliton Way, Nottingham, NG8 6GH	£ 0.00	ALLOWED
BN8374	Aisha Mitri	3 Brookdale Avenue, Nottingahm, NG2 9SR	£ 0.00	ALLOWED

DVD INTEL

CREATE TABLE DVD NUM

(

loanNo varchar (255),

dvdNo VARCHAR (255),

DVDTittle varchar (255),

dVdStarringActor varchar(255),

DvdYear varchar (255),

rentalCategory varchar(255),

RentalCost varchar (255)

);

```
INSERT INTO DVD NUM
(loanNo,dvdNo,DVDTittle,dVdStarringActor,DvdYear,rentalCategory,RentalCost)
VALUES ('LN74857','DN198','Raiders of the lost ark','Harrison Ford','1981','Adventure','£3.50');
VALUES ('LN74857','DN9829','John Wick','Keanu Reeves','2014','Action','£4.50');
VALUES ('LN7873','DN672','Spiderman: Homecoming','Tom Holland','2017','Action','£4.5');
VALUES ('LN8473','DN768','Us','Lupita Nyong','2019','Horror','£4.5');
VALUES ('LN6312','DN455','Midsommer','Florence Pugh','2019','Horror','£4.5');
VALUES ('LB754','DN121','Some Like it Hot','Matilyn Monroe','1959','Comedy','£3.5');
VALUES ('LB754','DN121','Battle Los Angeles','Aaron Eckhart','2011','Action','£3.5');
VALUES ('LB754','DN1031','Aliens','Sigourney Weaver','1986','Sci-fi','£3.5');
VALUES ('LB754','DN143','Arrival','Amy Adams','2016','Sci-fi','£4.5');
VALUES ('LB754','DN564','Bridesmaids','Kristen Wig','2011','Comedy','£3.5');
VALUES ('LB754','DN432','Crank','Jason Statham','2006','Action','£3.5');
VALUES ('LB754','DN656','Rogue One: A Star Wars Story','Felcity Jones','2016','Sci-fi','£4.5');
VALUES ('LB754','DN899','Dune','Timothee Chalamet','2021','Sci-fi','£4.5');
```

Copy DVD

```
CREATE TABLE Copytbl
(
CopyNo varchar(255),
DVDNo  varchar(255),
ShelfPosition  varchar(255),
DVDStatus  varchar(255),
ReturnDuedate DATE
);

INSERT INTO Copytbl (CopyNo , DVDNo  , ShelfPosition  , DVDStatus  , ReturnDuedate)
VALUES ('CN1099','DN198','AV123','On loan ','13/02/2002 ');
VALUES ('CN8739 ','DN9829 ','AC8728','On loan ','13/02/2002 ');
VALUES ('CN392','DN138','CR121','Available to loan','');
```

VALUES ('CN7182','DN234','AC8272','Available to loan','');

VALUES ('CN1311','DN672','AC7623','Available to loan','');

VALUES ('CN671','DN768','HO214','On Loan','4/4/2022');

VALUES ('CN439','DN455','HO987','Overdue ','4/4/2022 ');

VALUES ('CN7132','DN789','AN172','Available to loan ','');

VALUES ('CN1912','DN121','CO187','On Loan','4/4/2022');

VALUES ('CN837','DN454','SC873','Overdue','4/6/2022');

VALUES ('CN121','DN1031','SC897','On Loan','4/10/2022');

VALUES ('CN762','DN198','SC332','On Loan ','4/8/2022');

VALUES ('CN647','DN198','CO763','On Loan','4/9/2022');

VALUES ('CN647','DN564','CO763','On loan ','4/9/2022');

VALUES ('CN556','DN564','AC831','Available to loan ','');

VALUES ('CN184','DN656','SC982','Available to loan ','');

VALUES ('CN763','DN899','SC1023','Available to loan ','');

Number of Records: 16

CopyNo	DVDNo	ShelfPosition	DVDStatus	ReturnDuedate
CN1099	DN198	AV123	On loan	13/02/2002
CN8739	DN9829	AC8728	On loan	13/02/2002
CN392	DN138	CR121	Available to loan	
CN7182	DN234	AC8272	Available to loan	
CN7182	DN234	AC8272	Available to loan	
CN1311	DN672	AC7623	Available to loan	
CN671	DN768	HO214	On Loan	4/4/2022
CN439	DN455	HO987	Overdue	4/4/2022
CN7132	DN789	AN172	Available to loan	
CN1912	DN121	CO187	On Loan	4/4/2022
CN837	DN454	SC873	Overdue	4/6/2022
CN121	DN1031	SC897	On Loan	4/10/2022
CN762	DN198	SC332	On Loan	4/8/2022

CN647	DN564	CO763	On loan	4/9/2022
CN556	DN564	AC831	Available to loan	
CN184	DN656	SC982	Available to loan	
CN763	DN899	SC1023	Available to loan	

TASK 4

2) **Create a list that shows all borrowers who have over-due loans and rank them highest to lowe**

SELECT CopyNo,DVDNo,ShelfPosition,DVDStatus,ReturnDuedate

from copytbl

order by DVDStatus desc

Result:

Number of Records: 20

CopyNo	DVDNo	ShelfPosition	DVDStatus	ReturnDuedate
CN439	DN455	HO987	Overdue	4/4/2022
CN837	DN454	SC873	Overdue	4/6/2022
CN1099	DN198	AV123	On loan	13/02/2002
CN8739	DN9829	AC8728	On loan	13/02/2002
CN647	DN564	CO763	On loan	4/9/2022
CN762	DN198	SC332	On Loan	4/8/2022
CN671	DN768	HO214	On Loan	4/4/2022
CN1912	DN121	CO187	On Loan	4/4/2022
CN121	DN1031	SC897	On Loan	4/10/2022
CN647	DN198	CO763	On Loan	4/9/2022
CN7132	DN789	AN172	Available to loan	
CN556	DN564	AC831	Available to loan	
CN184	DN656	SC982	Available to loan	
CN763	DN899	SC1023	Available to loan	
CN392	DN138	CR121	Available to loan	
CN7182	DN234	AC8272	Available to loan	
CN763	DN899	SC1023	Available to loan	
CN392	DN138	CR121	Available to loan	
CN7182	DN234	AC8272	Available to loan	
CN7182	DN234	AC8272	Available to loan	
CN1311	DN672	AC7623	Available to loan	
CN556	AC831	CO763	Available to loan	
CN184	AC831	SC982	Available to loan	

3)

SELECT loanNo,dvdNo,DVDTittle,dVdStarringActor,DvdYear,rentalCategory,RentalCost

from DVDNUM

order by rentalCategory desc

Result:

Number of Records: 11

loanNo	dvdNo	DVDTittle	dVdStarringActor	DvdYear	rentalCategory	RentalCost
LB754	DN1031	Aliens	Sigourney Weaver	1986	Sci-fi	£3.5
LB754	DN143	Arrival	Amy Adams	2016	Sci-fi	£4.5
LN8473	DN768	Us	Lupita Nyong	2019	Horror	£4.5
LN6312	DN455	Midsommer	Florence Pugh	2019	Horror	£4.5
LB754	DN121	Some Like it Hot	Matilyn Monroe	1959	Comedy	£3.5
LB754	DN564	Bridesmaids	Kristen Wig	2011	Comedy	£3.5
LN74857	DN198	Raiders of the lost ark	Harrison Ford	1981	Adventure	£3.50
LN74857	DN9829	John Wick	Keanu Reeves	2014	Action	£4.50
LN7873	DN672	Spiderman: Homecoming	Tom Holland	2017	Action	£4.5
LB754	DN121	Battle Los Angeles	Aaron Eckhart	2011	Action	£3.5
LB754	DN121	Battle Los Angeles	Aaron Eckhart	2011	Action	£3.5

4)

SELECT CopyNo,DVDNo,ShelfPosition,DVDStatus,ReturnDuedate

from copytbl

where DVDStatus='Overdue'

Result:

Number of Records: 1

CopyNo	DVDNo	ShelfPosition	DVDStatus	ReturnDuedate
CN837	DN454	SC873	Overdue	4/6/2022