



Applied Databases Normalisation

HIGHER DIPLOMA IN DATA ANALYTICS



Normalisation

- ▶ Normalization is the process of organizing the columns (attributes) and tables (relations) of a relational database to minimize data redundancy.



Normalisation

- Normalization is the process of organizing the columns (attributes) and tables (relations) of a relational database to minimize data redundancy.

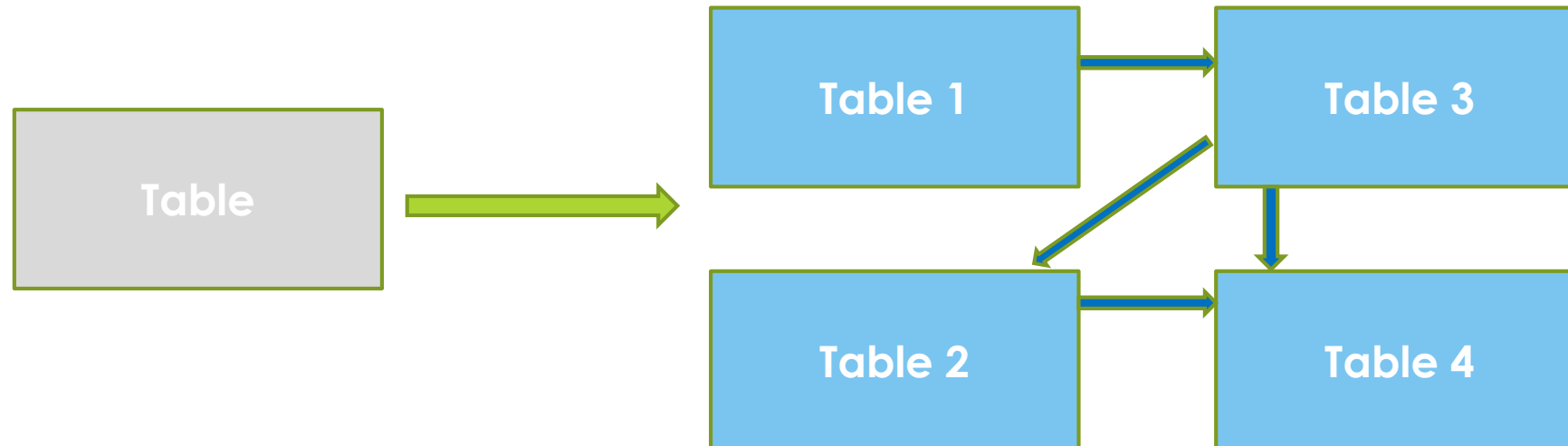


Table



Normalisation

- Normalization is the process of organizing the columns (attributes) and tables (relations) of a relational database to minimize data redundancy.



Normalisation



Normalisation

Hospital

PPSN varchar(10)
Primary Key

First_Name varchar(50)

Surname varchar(50)

Address varchar(200)

Doctor varchar(50)

Doctor_Phone integer



Normalisation

Hospital

PPSN varchar(10)
Primary Key

First_Name varchar(50)

Surname varchar(50)

Address varchar(200)

Doctor varchar(50)

Doctor_Phone integer

Hospital					
PPSN*	First_Name	Surname	Address	Doctor	Doctor_Phone
7629913X	John	Smyth	Athlone	Dr. Jones	12345
9893333F	Alan	Mulligan	Galway	Dr. Murphy	88335
9898823W	Fred	Collins	Castlebar	Dr. Jones	12345



Normalisation

Hospital

PPSN varchar(10)
Primary Key

First_Name varchar(50)

Surname varchar(50)

Address varchar(200)

Doctor varchar(50)

Doctor_Phone integer

Hospital					
PPSN*	First_Name	Surname	Address	Doctor	Doctor_Phone
7629913X	John	Smyth	Athlone	Dr. Jones	12345
9893333F	Alan	Mulligan	Galway	Dr. Murphy	88335
9898823W	Fred	Collins	Castlebar	Dr. Jones	12345



Normalisation

Hospital

PPSN varchar(10)
Primary Key

First_Name varchar(50)

Surname varchar(50)

Address varchar(200)

Doctor varchar(50)

Doctor_Phone integer

Hospital					
PPSN*	First_Name	Surname	Address	Doctor	Doctor_Phone
7629913X	John	Smyth	Athlone	Dr. Jones	12345
9893333F	Alan	Mulligan	Galway	Dr. Murphy	88335
9898823W	Fred	Collins	Castlebar	Dr. Jones	12345
				Dr. Rice	88788



Normalisation

Hospital

PPSN varchar(10)
Primary Key

First_Name varchar(50)

Surname varchar(50)

Address varchar(200)

Doctor varchar(50)

Doctor_Phone integer

Hospital					
PPSN*	First_Name	Surname	Address	Doctor	Doctor_Phone
7629913X	John	Smyth	Athlone	Dr. Jones	12345
9893333F	Alan	Mulligan	Galway	Dr. Murphy	88335
9898823W	Fred	Collins	Castlebar	Dr. Jones	12345
NULL	NULL	NULL	NULL	Dr. Rice	88788



Normalisation

Hospital

PPSN varchar(10)
Primary Key

First_Name varchar(50)

Surname varchar(50)

Address varchar(200)

Doctor varchar(50)

Doctor_Phone integer

Hospital					
PPSN*	First_Name	Surname	Address	Doctor	Doctor_Phone
7629913X	John	Smyth	Athlone	Dr. Jones	12345
9893333F	Alan	Mulligan	Galway	Dr. Murphy	88335
9898823W	Fred	Collins	Castlebar	Dr. Jones	12345
NULL	NULL	NULL	NULL	Dr. Rice	88788



Normalisation

Hospital

PPSN varchar(10)
Primary Key

First_Name varchar(50)

Surname varchar(50)

Address varchar(200)

Doctor varchar(50)

Doctor_Phone integer

Hospital					
PPSN*	First_Name	Surname	Address	Doctor	Doctor_Phone
7629913X	John	Smyth	Athlone	Dr. Jones	12345
9893333F	Alan	Mulligan	Galway	Dr. Murphy	88335
9898823W	Fred	Collins	Castlebar	Dr. Jones	12345



Normalisation



Normalisation

Doctor_Table

DoctorID integer
Primary Key

Name varchar(50)

Phone integer



Normalisation

Patient_Table

PPSN varchar(10)
Primary Key

First_Name varchar(50)

Surname varchar(50)

Address varchar(200)

DoctorID integer

Doctor_Table

DoctorID integer
Primary Key

Name varchar(50)

Phone integer



Normalisation

Patient_Table

PPSN varchar(10)
Primary Key

First_Name varchar(50)

Surname varchar(50)

Address varchar(200)

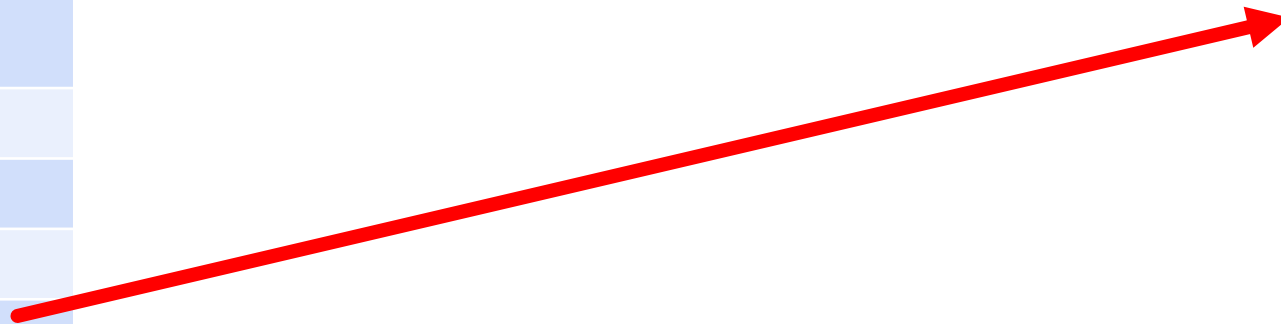
DoctorID integer

Doctor_Table

DoctorID integer
Primary Key

Name varchar(50)

Phone integer



Normalisation

Patient_Table

PPSN varchar(10)
Primary Key

First_Name varchar(50)

Surname varchar(50)

Address varchar(200)

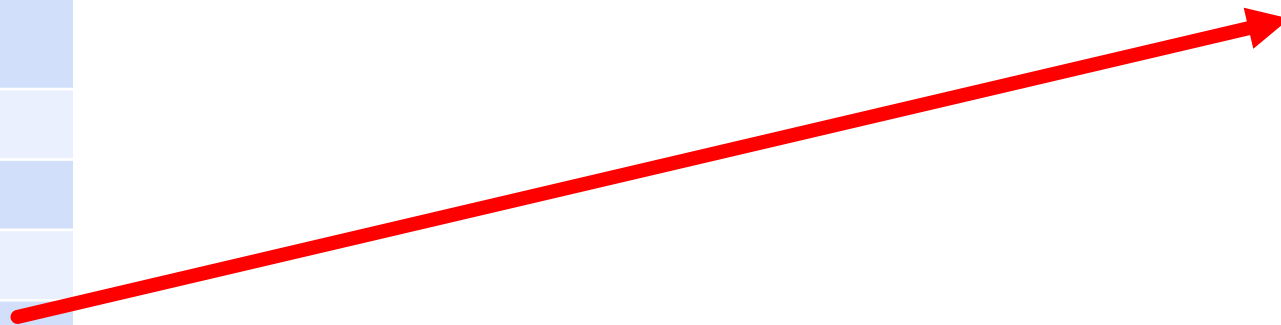
DoctorID integer

Doctor_Table

DoctorID integer
Primary Key

Name varchar(50)

Phone integer



Patient_Table

PPSN*	First_Name	Surname	Address	DoctorID
7629913X	John	Smyth	Athlone	100
9893333F	Alan	Mulligan	Galway	101
9898823W	Fred	Collins	Castlebar	100

Doctor_Table

DoctorID*	Name	Phone
100	Dr. Jones	12345
101	Dr. Murphy	88335



Normalisation

Patient_Table

PPSN varchar(10)
Primary Key

First_Name varchar(50)

Surname varchar(50)

Address varchar(200)

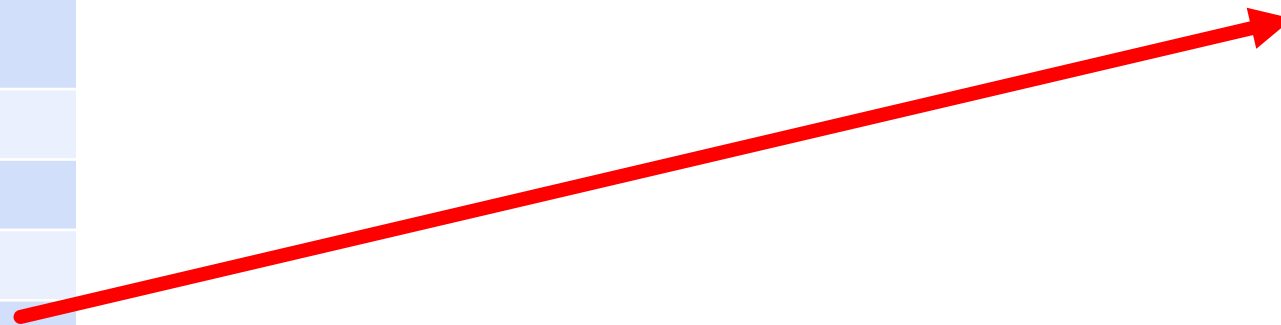
DoctorID integer

Doctor_Table

DoctorID integer
Primary Key

Name varchar(50)

Phone integer



Patient_Table

PPSN*	First_Name	Surname	Address	DoctorID
7629913X	John	Smyth	Athlone	100
9893333F	Alan	Mulligan	Galway	101
9898823W	Fred	Collins	Castlebar	100

Doctor_Table

DoctorID*	Name	Phone
100	Dr. Jones	12345
101	Dr. Murphy	88335



Normalisation

Patient_Table

PPSN varchar(10)
Primary Key

First_Name varchar(50)

Surname varchar(50)

Address varchar(200)

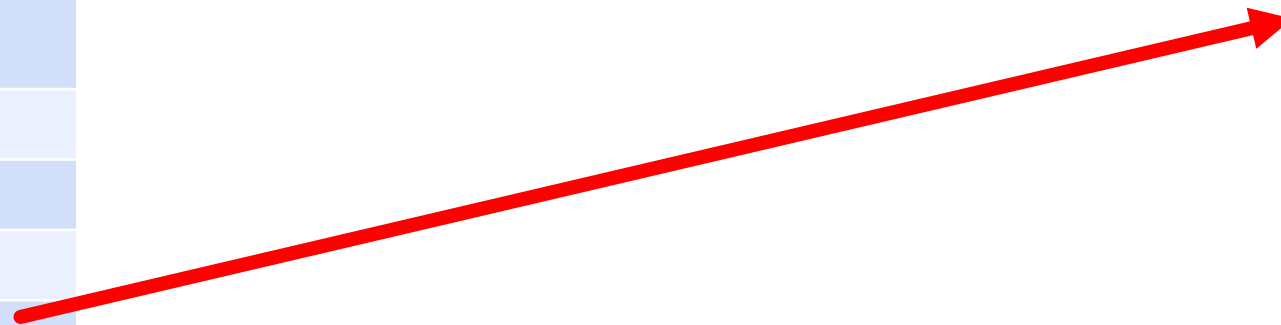
DoctorID integer

Doctor_Table

DoctorID integer
Primary Key

Name varchar(50)

Phone integer

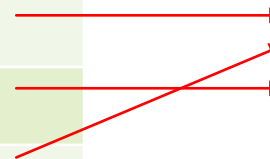


Patient_Table

PPSN*	First_Name	Surname	Address	DoctorID
7629913X	John	Smyth	Athlone	100
9893333F	Alan	Mulligan	Galway	101
9898823W	Fred	Collins	Castlebar	100

Doctor_Table

DoctorID*	Name	Phone
100	Dr. Jones	12345
101	Dr. Murphy	88335



Normalisation

Patient_Table

PPSN varchar(10)
Primary Key

First_Name varchar(50)

Surname varchar(50)

Address varchar(200)

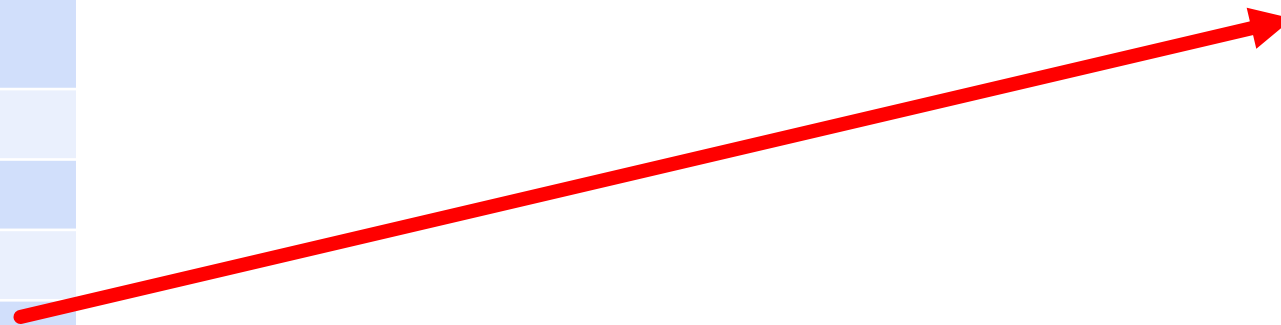
DoctorID integer

Doctor_Table

DoctorID integer
Primary Key

Name varchar(50)

Phone integer

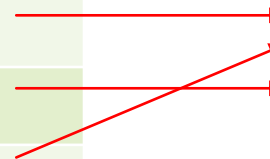


Patient_Table

PPSN*	First_Name	Surname	Address	DoctorID
7629913X	John	Smyth	Athlone	100
9893333F	Alan	Mulligan	Galway	101
9898823W	Fred	Collins	Castlebar	100

Doctor_Table

DoctorID*	Name	Phone
100	Dr. Jones	12345
101	Dr. Murphy	88335



Normalisation

Patient_Table

PPSN varchar(10)
Primary Key

First_Name varchar(50)

Surname varchar(50)

Address varchar(200)

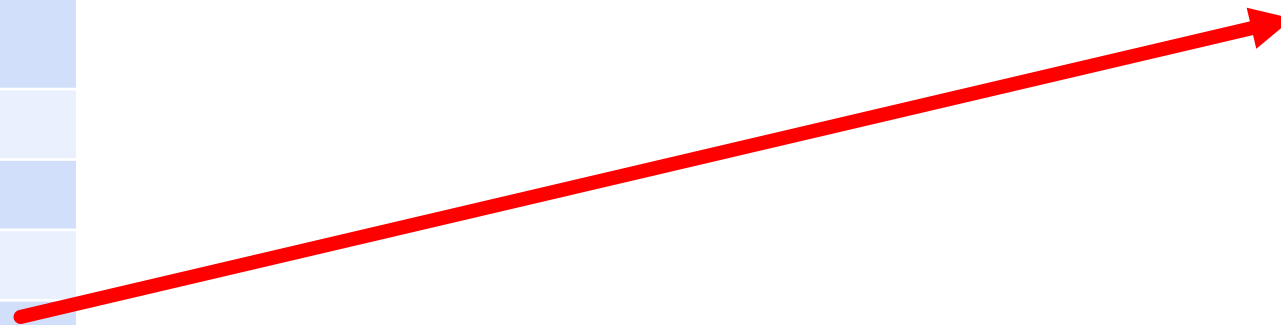
DoctorID integer

Doctor_Table

DoctorID integer
Primary Key

Name varchar(50)

Phone integer

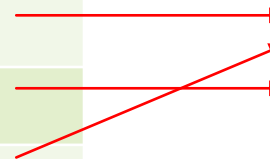


Patient_Table

PPSN*	First_Name	Surname	Address	DoctorID
7629913X	John	Smyth	Athlone	100
9893333F	Alan	Mulligan	Galway	101
9898823W	Fred	Collins	Castlebar	100

Doctor_Table

DoctorID*	Name	Phone
100	Dr. Jones	12345
101	Dr. Murphy	88335
102	Dr. Rice	88788



Normalisation

Patient_Table

PPSN varchar(10)
Primary Key

First_Name varchar(50)

Surname varchar(50)

Address varchar(200)

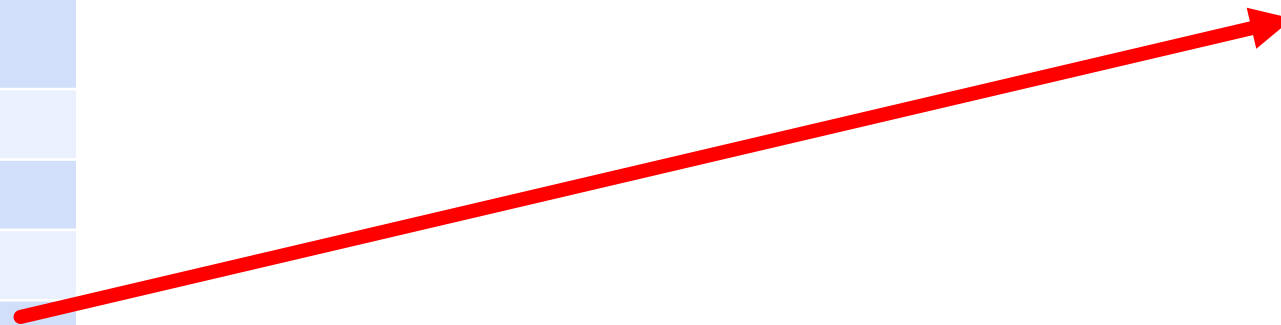
DoctorID integer

Doctor_Table

DoctorID integer
Primary Key

Name varchar(50)

Phone integer

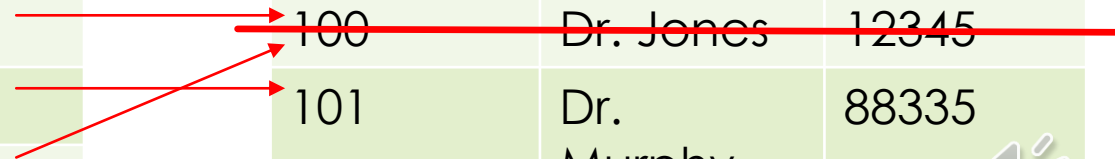


Patient_Table

PPSN*	First_Name	Surname	Address	DoctorID
7629913X	John	Smyth	Athlone	100
9893333F	Alan	Mulligan	Galway	101
9898823W	Fred	Collins	Castlebar	100

Doctor_Table

DoctorID*	Name	Phone
100	Dr. Jones	12345
101	Dr. Murphy	88335
102	Dr. Rice	88788



Normalisation

Patient_Table

PPSN varchar(10)
Primary Key

First_Name varchar(50)

Surname varchar(50)

Address varchar(200)

DoctorID integer

Doctor_Table

DoctorID integer
Primary Key

Name varchar(50)

Phone integer

Patient_Table				
PPSN*	First_Name	Surname	Address	DoctorID
7629913X	John	Smyth	Athlone	101
9893333F	Alan	Mulligan	Galway	101
9898823W	Fred	Collins	Castlebar	100

Doctor_Table		
DoctorID*	Name	Phone
100	Dr. Jones	12345
101	Dr. Murphy	88335
102	Dr. Rice	88788



Normalisation

Patient_Table

PPSN varchar(10)
Primary Key

First_Name varchar(50)

Surname varchar(50)

Address varchar(200)

DoctorID integer

Doctor_Table

DoctorID integer
Primary Key

Name varchar(50)

Phone integer

Patient_Table				
PPSN*	First_Name	Surname	Address	DoctorID
7629913X	John	Smyth	Athlone	101
9893333F	Alan	Mulligan	Galway	101
9898823W	Fred	Collins	Castlebar	NULL

Doctor_Table		
DoctorID*	Name	Phone
100	Dr. Jones	12345
101	Dr. Murphy	88335
102	Dr. Rice	88788



Normalisation

Patient_Table

PPSN varchar(10)
Primary Key

First_Name varchar(50)

Surname varchar(50)

Address varchar(200)

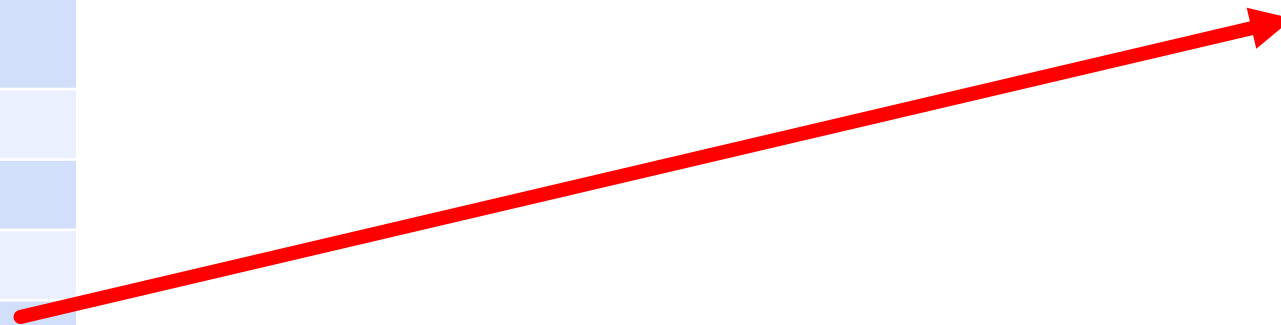
DoctorID integer

Doctor_Table

DoctorID integer
Primary Key

Name varchar(50)

Phone integer



Patient_Table

PPSN*	First_Name	Surname	Address	DoctorID
7629913X	John	Smyth	Athlone	101
9893333F	Alan	Mulligan	Galway	101
9898823W	Fred	Collins	Castlebar	NULL

Doctor_Table

DoctorID*	Name	Phone
100	Dr. Jones	12345
101	Dr. Murphy	88335
102	Dr. Rice	88788



Normalisation

Patient_Table

PPSN varchar(10)
Primary Key

First_Name varchar(50)

Surname varchar(50)

Address varchar(200)

DoctorID integer

FOREIGN KEY REFERENCES doctor_table(DoctorID)

Doctor_Table

DoctorID integer
Primary Key

Name varchar(50)

Phone integer



Normalisation

Patient_Table

PPSN varchar(10)
Primary Key

First_Name varchar(50)

Surname varchar(50)

Address varchar(200)

DoctorID integer

FOREIGN KEY REFERENCES doctor_table(DoctorID)

Doctor_Table

DoctorID integer
Primary Key

Name varchar(50)

Phone integer



Normalisation

Patient_Table

PPSN varchar(10)
Primary Key

First_Name varchar(50)

Surname varchar(50)

Address varchar(200)

DoctorID integer

FOREIGN KEY REFERENCES doctor_table(DoctorID)

Doctor_Table

DoctorID integer
Primary Key

Name varchar(50)

Phone integer

Patient_Table				
PPSN*	First_Name	Surname	Address	DoctorID
7629913X	John	Smyth	Athlone	100
9893333F	Alan	Mulligan	Galway	101
9898823W	Fred	Collins	Castlebar	100

Doctor_Table		
DoctorID*	Name	Phone
100	Dr. Jones	12345
101	Dr. Murphy	88335



Normalisation

Patient_Table

PPSN varchar(10)
Primary Key

First_Name varchar(50)

Surname varchar(50)

Address varchar(200)

DoctorID integer

FOREIGN KEY REFERENCES doctor_table(DoctorID)

Doctor_Table

DoctorID integer
Primary Key

Name varchar(50)

Phone integer

Patient_Table				
PPSN*	First_Name	Surname	Address	DoctorID
7629913X	John	Smyth	Athlone	100
9893333F	Alan	Mulligan	Galway	101
9898823W	Fred	Collins	Castlebar	100
12345F	Alan	Mulligan	Mayo	ABC

Doctor_Table		
DoctorID*	Name	Phone
100	Dr. Jones	12345
101	Dr. Murphy	88335



Normalisation

Patient_Table

PPSN varchar(10)
Primary Key

First_Name varchar(50)

Surname varchar(50)

Address varchar(200)

DoctorID integer

FOREIGN KEY REFERENCES doctor_table(DoctorID)

Doctor_Table

DoctorID integer
Primary Key

Name varchar(50)

Phone integer

Patient_Table				
PPSN*	First_Name	Surname	Address	DoctorID
7629913X	John	Smyth	Athlone	100
9893333F	Alan	Mulligan	Galway	101
9898823W	Fred	Collins	Castlebar	100
12345F	Alan	Mulligan	Mayo	102

Doctor_Table		
DoctorID*	Name	Phone
100	Dr. Jones	12345
101	Dr. Murphy	88335



Normalisation

Patient_Table

PPSN varchar(10)
Primary Key

First_Name varchar(50)

Surname varchar(50)

Address varchar(200)

DoctorID integer

FOREIGN KEY REFERENCES doctor_table(DoctorID)

Doctor_Table

DoctorID integer
Primary Key

Name varchar(50)

Phone integer

Patient_Table				
PPSN*	First_Name	Surname	Address	DoctorID
7629913X	John	Smyth	Athlone	100
9893333F	Alan	Mulligan	Galway	101
9898823W	Fred	Collins	Castlebar	100

Doctor_Table		
DoctorID*	Name	Phone
100	Dr. Jones	12345
101	Dr. Murphy	88335
999	Dr. Rice	9898



SHOW CREATE TABLE

Patient_Table

PPSN varchar(10)
Primary Key

First_Name varchar(50)

Surname varchar(50)

Address varchar(200)

DoctorID integer

FOREIGN KEY REFERENCES doctor_table(DoctorID)

Doctor_Table

DoctorID integer
Primary Key

Name varchar(50)

Phone integer



SHOW CREATE TABLE

Patient_Table

PPSN varchar(10)
Primary Key

First_Name varchar(50)

Surname varchar(50)

Address varchar(200)

DoctorID integer

FOREIGN KEY REFERENCES doctor_table(DoctorID)

Doctor_Table

DoctorID integer
Primary Key

Name varchar(50)

Phone integer

```
mysql> DESCRIBE patient_table;
```

Field	Type	Null	Key	Default	Extra
ppsn	varchar(10)	NO	PRI	NULL	
first_name	varchar(50)	YES		NULL	
surname	varchar(50)	YES		NULL	
address	varchar(200)	YES		NULL	
doctorID	int(11)	YES	MUL	NULL	

5 rows in set (0.00 sec)



SHOW CREATE TABLE

Patient_Table

PPSN varchar(10)
Primary Key

First_Name varchar(50)

Surname varchar(50)

Address varchar(200)

DoctorID integer

FOREIGN KEY REFERENCES doctor_table(DoctorID)

Doctor_Table

DoctorID integer
Primary Key

Name varchar(50)

Phone integer

```
mysql> SHOW CREATE TABLE patient_table;
```

```
| patient_table | CREATE TABLE 'patient_table' (  
  'ppsn' varchar(10) NOT NULL,  
  'first_name' varchar(50) DEFAULT NULL,  
  'surname' varchar(50) DEFAULT NULL,  
  'address' varchar(200) DEFAULT NULL,  
  'doctorID' int(11) DEFAULT NULL,  
  PRIMARY KEY ('ppsn'),  
  KEY 'doctorID' ('doctorID'),  
  CONSTRAINT 'patient_table_ibfk_1' FOREIGN KEY ('doctorID') REFERENCES 'doctor_table' ('doctorID')  
) ENGINE=InnoDB DEFAULT CHARSET=latin1 |
```



SHOW CREATE TABLE

Patient_Table

PPSN varchar(10)
Primary Key

First_Name varchar(50)

Surname varchar(50)

Address varchar(200)

DoctorID integer

FOREIGN KEY REFERENCES doctor_table(DoctorID)

Doctor_Table

DoctorID integer
Primary Key

Name varchar(50)

Phone integer

```
mysql> SHOW CREATE TABLE patient_table;
```

```
| patient_table | CREATE TABLE 'patient_table' (  
  'ppsn' varchar(10) NOT NULL,  
  'first_name' varchar(50) DEFAULT NULL,  
  'surname' varchar(50) DEFAULT NULL,  
  'address' varchar(200) DEFAULT NULL,  
  'doctorID' int(11) DEFAULT NULL,  
  PRIMARY KEY ('ppsn'),  
  KEY 'doctorID' ('doctorID'),  
  CONSTRAINT 'patient_table_ibfk_1' FOREIGN KEY ('doctorID') REFERENCES 'doctor_table' ('doctorID')  
) ENGINE=InnoDB DEFAULT CHARSET=latin1 |
```



SHOW CREATE TABLE

Patient_Table

PPSN varchar(10)
Primary Key

First_Name varchar(50)

Surname varchar(50)

Address varchar(200)

DoctorID integer

FOREIGN KEY REFERENCES doctor_table(DoctorID)

Doctor_Table

DoctorID integer
Primary Key

Name varchar(50)

Phone integer

```
mysql> SHOW CREATE TABLE patient_table;
```

```
| patient_table | CREATE TABLE 'patient_table' (  
  'ppsn' varchar(10) NOT NULL,  
  'first_name' varchar(50) DEFAULT NULL,  
  'surname' varchar(50) DEFAULT NULL,  
  'address' varchar(200) DEFAULT NULL,  
  'doctorID' int(11) DEFAULT NULL,  
  PRIMARY KEY ('ppsn'),  
  KEY 'doctorID' ('doctorID'),  
  CONSTRAINT 'patient_table_ibfk_1' FOREIGN KEY ('doctorID') REFERENCES 'doctor_table' ('doctorID')  
) ENGINE=InnoDB DEFAULT CHARSET=latin1 |
```



SHOW CREATE TABLE

Patient_Table

PPSN varchar(10)
Primary Key

First_Name varchar(50)

Surname varchar(50)

Address varchar(200)

DoctorID integer

FOREIGN KEY REFERENCES doctor_table(DoctorID)

Doctor_Table

DoctorID integer
Primary Key

Name varchar(50)

Phone integer

```
mysql> SHOW CREATE TABLE patient_table;
```

```
| patient_table | CREATE TABLE 'patient_table' (  
  'ppsn' varchar(10) NOT NULL,  
  'first_name' varchar(50) DEFAULT NULL,  
  'surname' varchar(50) DEFAULT NULL,  
  'address' varchar(200) DEFAULT NULL,  
  'doctorID' int(11) DEFAULT NULL,  
  PRIMARY KEY ('ppsn'),  
  KEY 'doctorID' ('doctorID'),  
  CONSTRAINT 'patient_table_ibfk_1' FOREIGN KEY ('doctorID') REFERENCES 'doctor_table' ('doctorID')  
) ENGINE=InnoDB DEFAULT CHARSET=latin1 |
```



Getting information from multiple tables

Patient_Table				
PPSN*	First_Name	Surname	Address	DoctorID
7629913X	John	Smyth	Athlone	100
9893333F	Alan	Mulligan	Galway	101
9898823W	Fred	Collins	Castlebar	100



Doctor_Table		
DoctorID*	Name	Phone
100	Dr. Jones	12345
101	Dr. Murphy	88335



Getting information from multiple tables




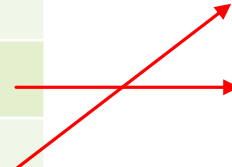
Patient_Table				
PPSN*	First_Name	Surname	Address	DoctorID
7629913X	John	Smyth	Athlone	100
9893333F	Alan	Mulligan	Galway	101
9898823W	Fred	Collins	Castlebar	100

Doctor_Table		
DoctorID*	Name	Phone
100	Dr. Jones	12345
101	Dr. Murphy	88335

Patient & Doctor Information			
PPSN*	First_Name	Name	Phone
7629913X	John	Dr. Jones	12345
9893333F	Alan	Dr. Murphy	88335
9898823W	Fred	Dr. Jones	12345



Getting information from multiple tables

Patient_Table						Doctor_Table		
PPSN*	First_Name	Surname	Address	DoctorID		DoctorID*	Name	Phone
7629913X	John	Smyth	Athlone	100		100	Dr. Jones	12345
9893333F	Alan	Mulligan	Galway	101		101	Dr. Murphy	88335
9898823W	Fred	Collins	Castlebar	100				

Patient & Doctor Information			
PPSN*	First_Name	Name	Phone
7629913X	John	Dr. Jones	12345
9893333F	Alan	Dr. Murphy	88335
9898823W	Fred	Dr. Jones	12345



Getting information from multiple tables

Patient_Table				
PPSN*	First_Name	Surname	Address	DoctorID
7629913X	John	Smyth	Athlone	100
9893333F	Alan	Mulligan	Galway	101
9898823W	Fred	Collins	Castlebar	100



Doctor_Table		
DoctorID*	Name	Phone
100	Dr. Jones	12345
101	Dr. Murphy	88335



Getting information from multiple tables

Patient_Table				
PPSN*	First_Name	Surname	Address	DoctorID
7629913X	John	Smyth	Athlone	100
9893333F	Alan	Mulligan	Galway	101
9898823W	Fred	Collins	Castlebar	100

Doctor_Table		
DoctorID*	Name	Phone
100	Dr. Jones	12345
101	Dr. Murphy	88335

```
SELECT patient_table.ppsn, patient_table.first_name,  
       doctor_table.name, doctor_table.phone
```



Getting information from multiple tables

Patient_Table				
PPSN*	First_Name	Surname	Address	DoctorID
7629913X	John	Smyth	Athlone	100
9893333F	Alan	Mulligan	Galway	101
9898823W	Fred	Collins	Castlebar	100

Doctor_Table		
DoctorID*	Name	Phone
100	Dr. Jones	12345
101	Dr. Murphy	88335

```
SELECT patient_table.ppsn, patient_table.first_name,  
       doctor_table.name, doctor_table.phone  
FROM patient_table
```



Getting information from multiple tables

Patient_Table				
PPSN*	First_Name	Surname	Address	DoctorID
7629913X	John	Smyth	Athlone	100
9893333F	Alan	Mulligan	Galway	101
9898823W	Fred	Collins	Castlebar	100

Doctor_Table		
DoctorID*	Name	Phone
100	Dr. Jones	12345
101	Dr. Murphy	88335

```
SELECT patient_table.ppsn, patient_table.first_name,  
       doctor_table.name, doctor_table.phone  
FROM patient_table  
INNER JOIN doctor_table
```



Getting information from multiple tables

Patient_Table				
PPSN*	First_Name	Surname	Address	DoctorID
7629913X	John	Smyth	Athlone	100
9893333F	Alan	Mulligan	Galway	101
9898823W	Fred	Collins	Castlebar	100

Doctor_Table		
DoctorID*	Name	Phone
100	Dr. Jones	12345
101	Dr. Murphy	88335

```
SELECT patient_table.ppsn, patient_table.first_name,  
       doctor_table.name, doctor_table.phone  
FROM patient_table  
INNER JOIN doctor_table  
       on patient_table.doctorID = doctor_table.doctorID;
```



Getting information from multiple tables

Patient_Table				
PPSN*	First_Name	Surname	Address	DoctorID
7629913X	John	Smyth	Athlone	100
9893333F	Alan	Mulligan	Galway	101
9898823W	Fred	Collins	Castlebar	100

Doctor_Table		
DoctorID*	Name	Phone
100	Dr. Jones	12345
101	Dr. Murphy	88335

```

SELECT patient_table.ppsn, patient_table.first_name,
       doctor_table.name, doctor_table.phone
FROM patient_table
INNER JOIN doctor_table
    on patient_table.doctorID = doctor_table.doctorID;

```



Getting information from multiple tables

Patient_Table				
PPSN*	First_Name	Surname	Address	DoctorID
7629913X	John	Smyth	Athlone	100
9893333F	Alan	Mulligan	Galway	101
9898823W	Fred	Collins	Castlebar	100

Doctor_Table		
DoctorID*	Name	Phone
100	Dr. Jones	12345
101	Dr. Murphy	88335

```
SELECT patient_table.ppsn, patient_table.first_name,
       doctor_table.name, doctor_table.phone
FROM patient_table
INNER JOIN doctor_table
    on patient_table.doctorID = doctor_table.doctorID;
```

```
mysql> SELECT name as doc
-> FROM doctor_table;
+-----+
| doc   |
+-----+
| Dr. Jones |
| Dr. Murphy |
+-----+
2 rows in set (0.00 sec)
```



Getting information from multiple tables

Patient_Table				
PPSN*	First_Name	Surname	Address	DoctorID
7629913X	John	Smyth	Athlone	100
9893333F	Alan	Mulligan	Galway	101
9898823W	Fred	Collins	Castlebar	100

Doctor_Table		
DoctorID*	Name	Phone
100	Dr. Jones	12345
101	Dr. Murphy	88335

```
SELECT pt.ppsn, pt.first_name,
       dt.name, dt.phone
FROM patient_table pt
INNER JOIN doctor_table dt
       on pt.doctorID = dt.doctorID;
```

```
mysql> SELECT name as doc
-> FROM doctor_table;
+-----+
| doc  |
+-----+
| Dr. Jones |
| Dr. Murphy |
+-----+
2 rows in set (0.00 sec)
```



Getting information from multiple tables

Patient_Table				
PPSN*	First_Name	Surname	Address	DoctorID
7629913X	John	Smyth	Athlone	100
9893333F	Alan	Mulligan	Galway	101
9898823W	Fred	Collins	Castlebar	100
2344234S	Mary	Burke	Galway	NULL

Doctor_Table		
DoctorID*	Name	Phone
100	Dr. Jones	12345
101	Dr. Murphy	88335



Getting information from multiple tables

Patient_Table				
PPSN*	First_Name	Surname	Address	DoctorID
7629913X	John	Smyth	Athlone	100
9893333F	Alan	Mulligan	Galway	101
9898823W	Fred	Collins	Castlebar	100
2344234S	Mary	Burke	Galway	NULL

Doctor_Table		
DoctorID*	Name	Phone
100	Dr. Jones	12345
101	Dr. Murphy	88335

```
mysql> SELECT pt.ppsn, pt.first_name, dt.name
-> FROM patient_table pt
-> INNER JOIN doctor_table dt
-> on pt.doctorID = dt.doctorID;
+-----+-----+-----+
| ppsn   | first_name | name      |
+-----+-----+-----+
| 7629913X | John      | Dr. Jones |
| 9898823W | Fred      | Dr. Jones |
| 9893333F | Alan      | Dr. Murphy |
+-----+-----+-----+
3 rows in set (0.00 sec)
```



INNER JOIN v LEFT JOIN

INNER JOIN	LEFT JOIN
Returns rows from two tables only when the JOIN condition is met.	Returns rows from two tables when the JOIN condition is met.
If JOIN condition is NOT met, nothing is returned from either table	If JOIN condition is NOT met, rows from the first (LEFT) table are returned and NULL is returned instead of rows from the second table.



INNER JOIN v LEFT JOIN

Patient_Table				
PPSN*	First_Name	Surname	Address	DoctorID
7629913X	John	Smyth	Athlone	100
9893333F	Alan	Mulligan	Galway	101
9898823W	Fred	Collins	Castlebar	100
2344234S	Mary	Burke	Galway	NULL

Doctor_Table		
DoctorID*	Name	Phone
100	Dr. Jones	12345
101	Dr. Murphy	88335

```
mysql> SELECT pt.ppsn, pt.first_name, dt.name
-> FROM patient_table pt
-> INNER JOIN doctor_table dt
-> on pt.doctorID = dt.doctorID;
```

ppsn	first_name	name
7629913X	John	Dr. Jones
9898823W	Fred	Dr. Jones
9893333F	Alan	Dr. Murphy

```
3 rows in set (0.00 sec)
```



INNER JOIN v LEFT JOIN

Patient_Table				
PPSN*	First_Name	Surname	Address	DoctorID
7629913X	John	Smyth	Athlone	100
9893333F	Alan	Mulligan	Galway	101
9898823W	Fred	Collins	Castlebar	100
2344234S	Mary	Burke	Galway	NULL

Doctor_Table		
DoctorID*	Name	Phone
100	Dr. Jones	12345
101	Dr. Murphy	88335

```
mysql> SELECT pt.ppsn, pt.first_name, dt.name
-> FROM patient_table pt
-> INNER JOIN doctor_table dt
-> on pt.doctorID = dt.doctorID;
```

ppsn	first_name	name
7629913X	John	Dr. Jones
9898823W	Fred	Dr. Jones
9893333F	Alan	Dr. Murphy

3 rows in set (0.00 sec)

```
mysql> SELECT pt.ppsn, pt.first_name, dt.name
-> FROM patient_table pt
-> LEFT JOIN doctor_table dt
-> on pt.doctorID = dt.doctorID;
```

ppsn	first_name	name
7629913X	John	Dr. Jones
9898823W	Fred	Dr. Jones
9893333F	Alan	Dr. Murphy
2344234S	Mary	NULL

4 rows in set (0.02 sec)



INNER JOIN v LEFT JOIN

Patient_Table

PPSN*	First_Name	Surname	Address	DoctorID
7629913X	John	Smyth	Athlone	100
9893333F	Alan	Mulligan	Galway	101
9898823W	Fred	Collins	Castlebar	100
2344234S	Mary	Burke	Galway	NULL

Doctor_Table

DoctorID*	Name	Phone
100	Dr. Jones	12345
101	Dr. Murphy	88335

```
mysql> SELECT pt.ppsn, pt.first_name, dt.name
-> FROM patient_table pt
-> INNER JOIN doctor_table dt
-> on pt.doctorID = dt.doctorID;
```

ppsn	first_name	name
7629913X	John	Dr. Jones
9898823W	Fred	Dr. Jones
989333F	Alan	Dr. Murphy

3 rows in set (0.00 sec)

```
mysql> SELECT pt.ppsn, pt.first_name, dt.name
-> FROM patient_table pt
-> LEFT JOIN doctor_table dt
-> on pt.doctorID = dt.doctorID;
```

ppsn	first_name	name
7629913X	John	Dr. Jones
9898823W	Fred	Dr. Jones
989333F	Alan	Dr. Murphy
2344234S	Mary	NULL

4 rows in set (0.02 sec)

```
mysql> SELECT pt.ppsn, pt.first_name, dt.name
-> FROM doctor_table dt
-> LEFT JOIN patient_table pt
-> on dt.doctorID = pt.doctorID;
```

ppsn	first_name	name
7629913X	John	Dr. Jones
9898823W	Fred	Dr. Jones
989333F	Alan	Dr. Murphy

3 rows in set (0.00 sec)