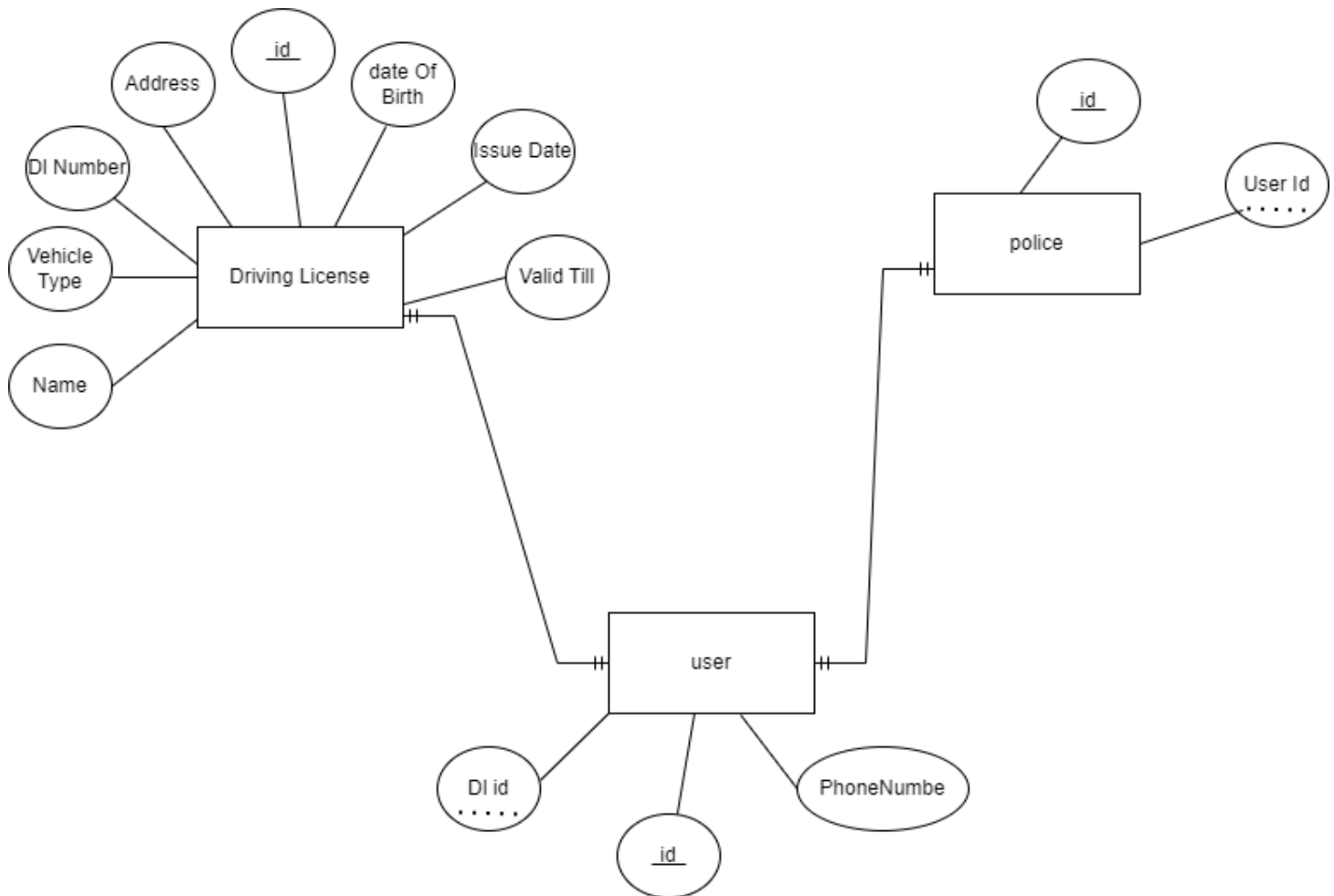


NORMALISATION AND DB SCRIPTS



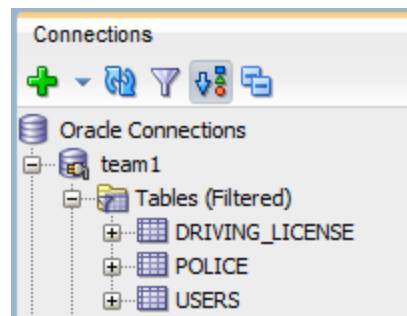
DATABASE DESIGN

NORMALISATION:

A large database defined as a single relation may result in data duplication. This repetition of data may result in:

- Making relations very large.
- It isn't easy to maintain and update data as it would involve searching many records in relation.
- Wastage and poor utilization of disk space and resources.
- The likelihood of errors and inconsistencies increases.

So to handle these problems, we should analyze and decompose the relations with redundant data into smaller, simpler, and well-structured relations that are satisfy desirable properties. Normalization is a process of decomposing the relations into relations with fewer attributes.



First Normal Form (1NF)

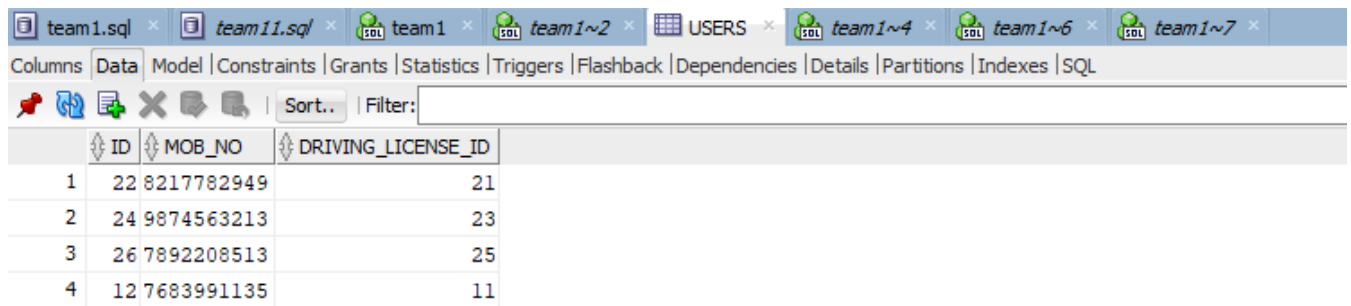
- A relation will be 1NF if it contains an atomic value.
- It states that an attribute of a table cannot hold multiple values. It must hold only single-valued attribute.
- First normal form disallows the multi-valued attribute, composite attribute, and their combinations.

USAGE OF 1 NF:-

ID	ADDRESS	DATEOF_BIRTH	DATEOF_ISSUE	DLNO	NAME	VALID_TILL	VEHICLE
1	20 tumkur	11-OCT-00	04-JAN-23	KA06 65462626256	ritesh	04-JAN-43	ACED0005757...
2	21 mysore	11-NOV-00	04-JAN-23	KA06 20225678912	var...	04-JAN-43	ACED0005757...
3	23 bangalore	12-NOV-00	04-JAN-23	KA06 20225678916	shr...	04-JAN-43	ACED0005757...
4	25 shimogga	12-NOV-00	04-JAN-23	KA06 20225678919	nayana	04-JAN-43	ACED0005757...
5	11 bengaluru	05-JUL-00	04-JAN-23	KA06 19945678912	sindhu	04-JAN-43	ACED0005757...

Second Normal Form (2NF)

- In the 2NF, relational must be in 1NF.
- In the second normal form, all non-key attributes are fully functional dependent on the primary key.



	ID	MOB_NO	DRIVING_LICENSE_ID
1	22	8217782949	21
2	24	9874563213	23
3	26	7892208513	25
4	12	7683991135	11

USAGE OF 2 NF:-

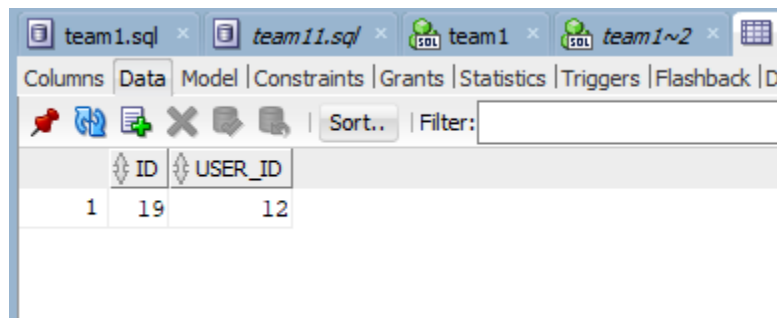
By using driving_license_id in the user table we can get the DL information of that particular user.

Third Normal Form (3NF)

- A relation will be in 3NF if it is in 2NF and not contain any transitive partial dependency.
- 3NF is used to reduce the data duplication. It is also used to achieve the data integrity.

USAGE OF 3 NF:-

User_id acts as referential integrity in police table.



	ID	USER_ID
1	19	12

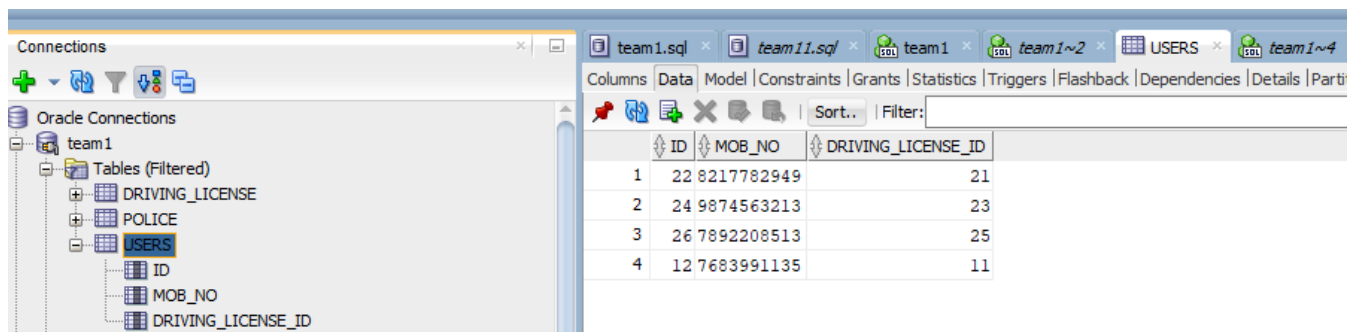
DB_SCRIPTS

-- DDL FOR TABLE USERS

```
CREATE TABLE "TEAM1"."USERS"  
(  
  "ID" NUMBER(10,0),  
  "MOB_NO" VARCHAR2(255 CHAR),  
  "DRIVING_LICENSE_ID" NUMBER(10,0)  
)
```

-- CONSTRAINTS FOR TABLE USERS

```
ALTER TABLE "TEAM1"."USERS" MODIFY ("ID" NOT NULL ENABLE);  
ALTER TABLE "TEAM1"."USERS" ADD PRIMARY KEY ("ID")
```



The screenshot displays the Oracle SQL Developer interface. On the left, the 'Connections' pane shows a tree view with 'team1' expanded, revealing a 'Tables (Filtered)' folder containing 'DRIVING_LICENSE', 'POLICE', and 'USERS'. The 'USERS' table is selected, and its columns (ID, MOB_NO, DRIVING_LICENSE_ID) are listed below it. The main window shows the 'Data' tab for the 'USERS' table, displaying four rows of data. The columns are ID, MOB_NO, and DRIVING_LICENSE_ID.

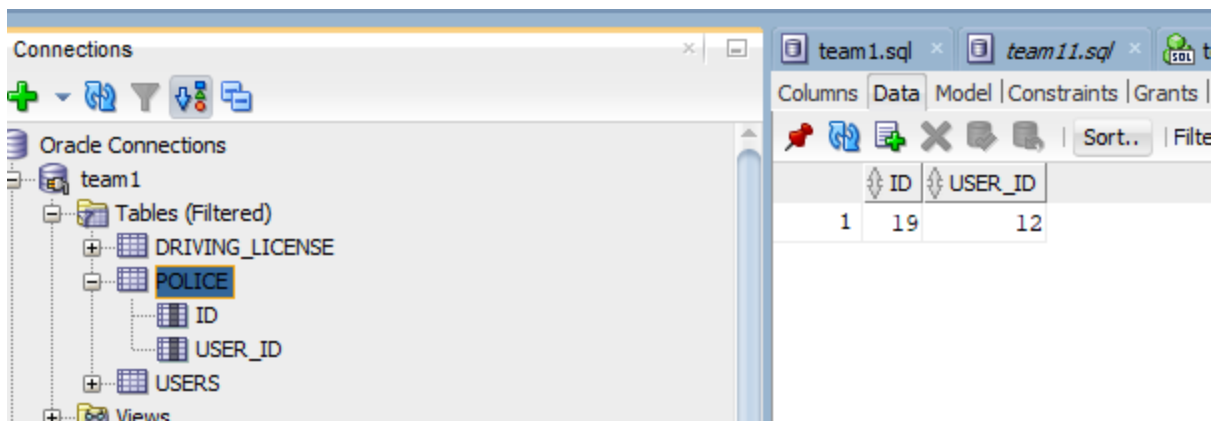
	ID	MOB_NO	DRIVING_LICENSE_ID
1	22	8217782949	21
2	24	9874563213	23
3	26	7892208513	25
4	12	7683991135	11

-- DDL FOR TABLE POLICE

```
CREATE TABLE "TEAM1"."POLICE"  
(  
  "ID" NUMBER(10,0),  
  "USER_ID" NUMBER(10,0)  
)
```

-- CONSTRAINTS FOR TABLE POLICE

```
ALTER TABLE "TEAM1"."POLICE" MODIFY ("ID" NOT NULL ENABLE);  
ALTER TABLE "TEAM1"."POLICE" ADD PRIMARY KEY ("ID")
```

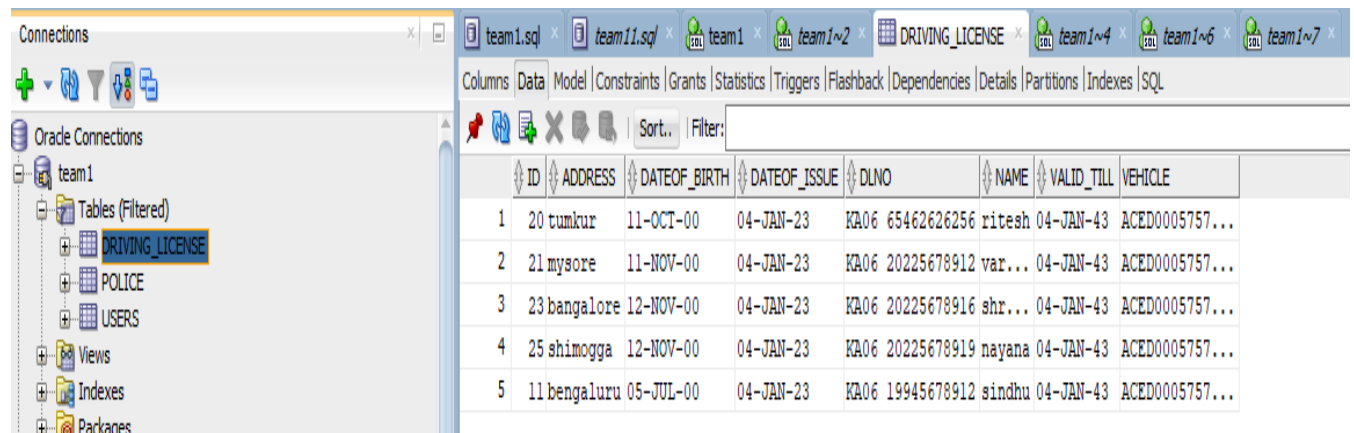


-- DDL FOR TABLE DRIVING_LICENSE

```
CREATE TABLE "TEAM1"."DRIVING_LICENSE"  
(  
  "ID" NUMBER(10,0),  
  "ADDRESS" VARCHAR2(255 CHAR),  
  "DATEOF_BIRTH" DATE,  
  "DATEOF_ISSUE" DATE,  
  "DLNO" VARCHAR2(255 CHAR),  
  "NAME" VARCHAR2(255 CHAR),  
  "VALID_TILL" DATE,  
  "VEHICLE" RAW(255)  
)
```

-- CONSTRAINTS FOR TABLE DRIVING_LICENSE

```
ALTER TABLE "TEAM1"."DRIVING_LICENSE" MODIFY ("ID" NOT NULL ENABLE);  
ALTER TABLE "TEAM1"."DRIVING_LICENSE" ADD PRIMARY KEY ("ID")
```



The screenshot shows the Oracle SQL Developer interface. On the left, the 'Connections' pane shows a tree view with 'team1' selected, containing 'Tables (Filtered)', 'Views', 'Indexes', and 'Packages'. The 'DRIVING_LICENSE' table is highlighted under 'Tables (Filtered)'. The main window displays the 'Data' tab for the 'DRIVING_LICENSE' table. The table has 8 columns: ID, ADDRESS, DATEOF_BIRTH, DATEOF_ISSUE, DLNO, NAME, VALID_TILL, and VEHICLE. There are 5 rows of data displayed.

ID	ADDRESS	DATEOF_BIRTH	DATEOF_ISSUE	DLNO	NAME	VALID_TILL	VEHICLE
1	20 tumkur	11-OCT-00	04-JAN-23	KA06 65462626256	ritesh	04-JAN-43	ACED0005757...
2	21 mysore	11-NOV-00	04-JAN-23	KA06 20225678912	var...	04-JAN-43	ACED0005757...
3	23 bangalore	12-NOV-00	04-JAN-23	KA06 20225678916	shr...	04-JAN-43	ACED0005757...
4	25 shimogga	12-NOV-00	04-JAN-23	KA06 20225678919	nayana	04-JAN-43	ACED0005757...
5	11 bengaluru	05-JUL-00	04-JAN-23	KA06 19945678912	sindhu	04-JAN-43	ACED0005757...

