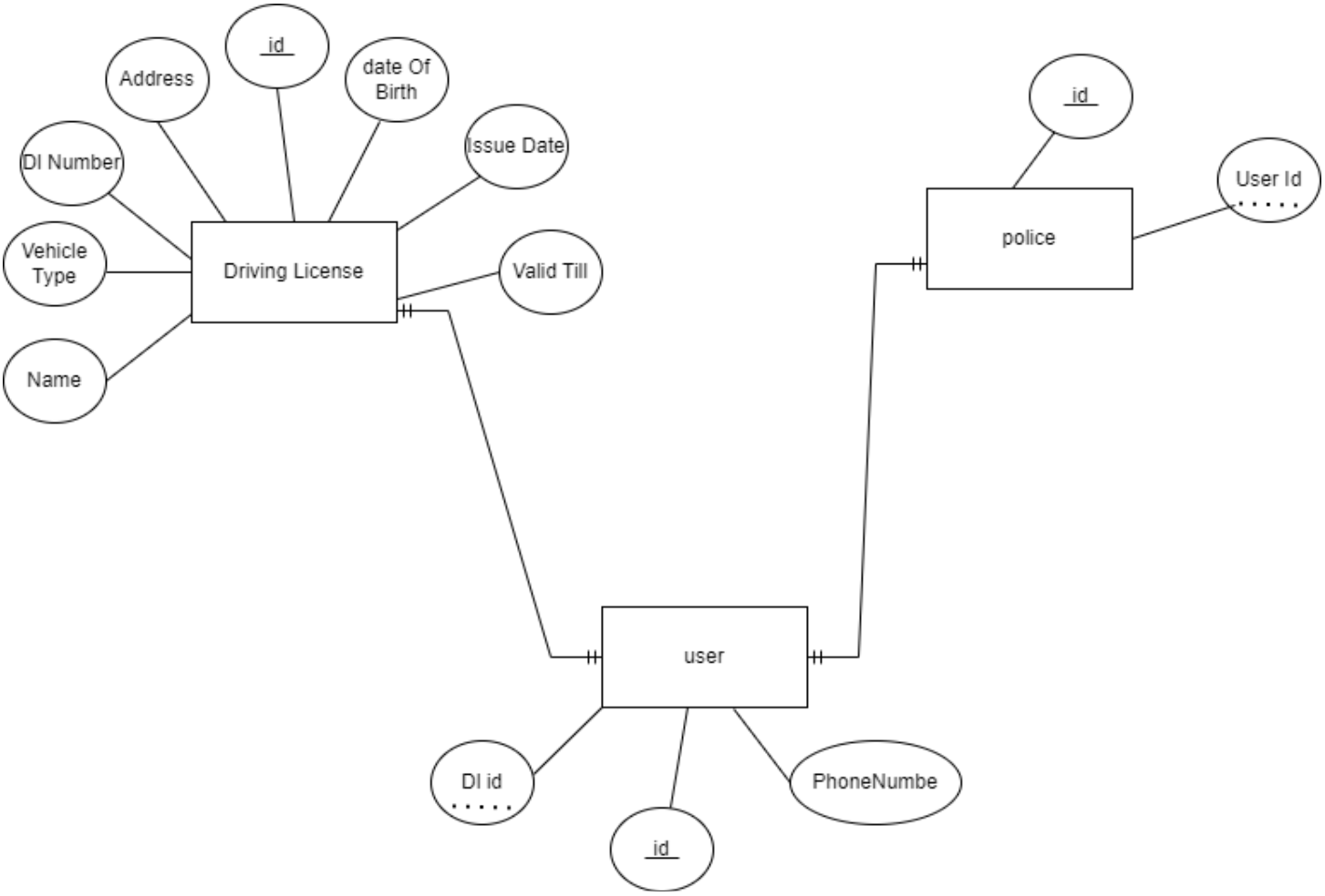
NORMALISATION AND DB SCRIPTS



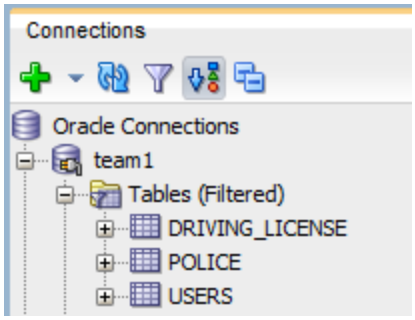
DATABASE DESIGN

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.

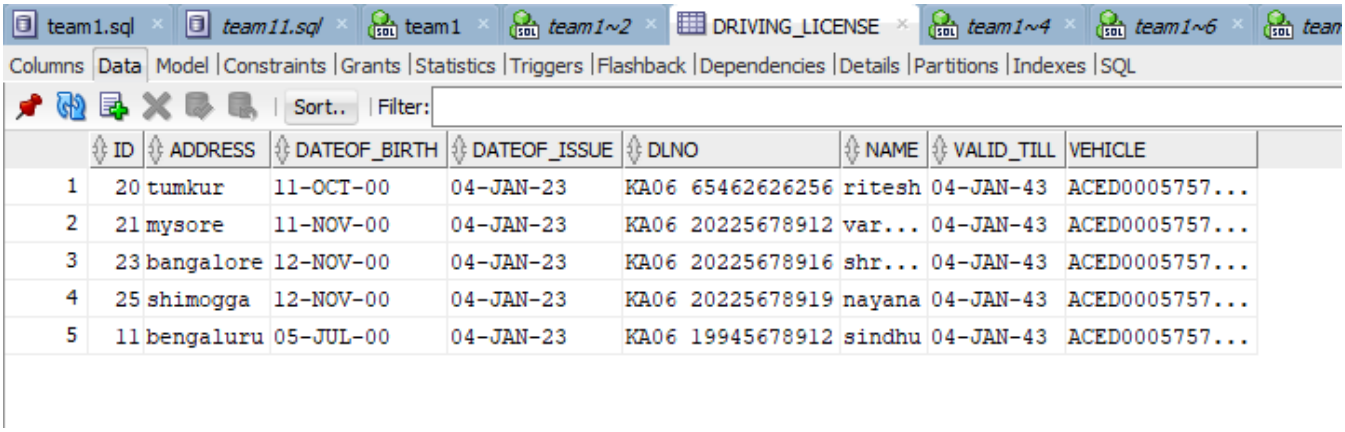
So to handle these problems, we should analyze and decompose the relations with redundant data into smaller, simpler, and well-structured relations that are satisfy desirable properties. Normalization is a process of decomposing the relations into relations with fewer attributes.



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.

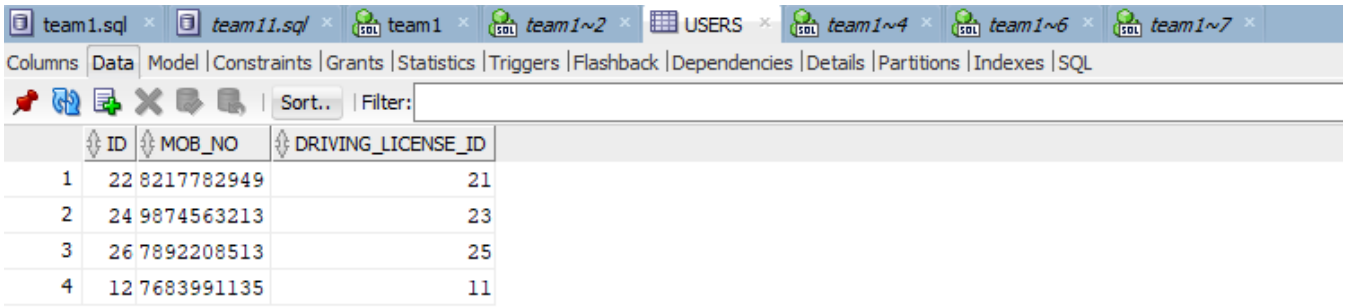
USAGE OF 1 NF:-



	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:-

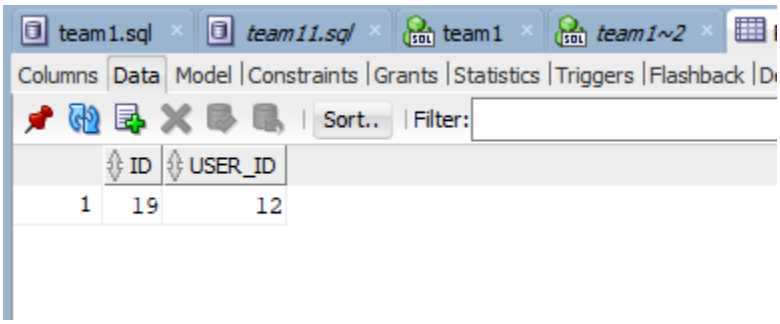
By using driving_license_id in the user table we can get the DL information of that particular user.

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

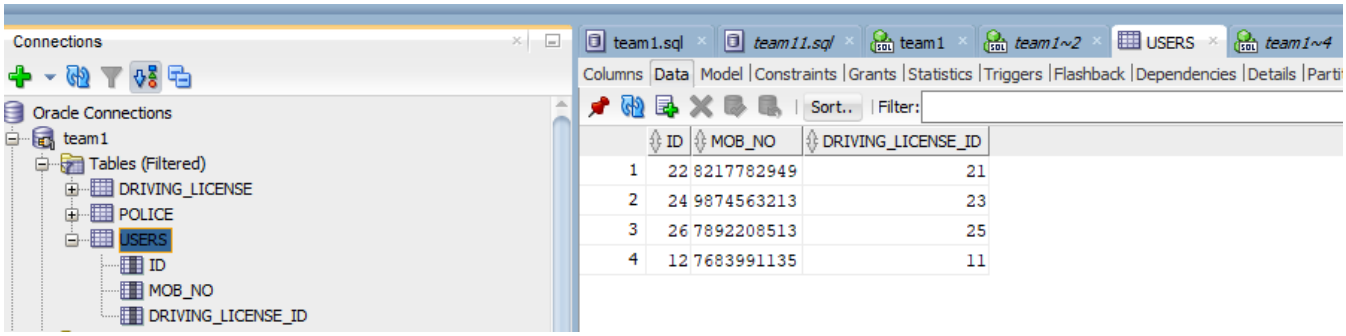
DB_SCRIPTS

-- 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")
```

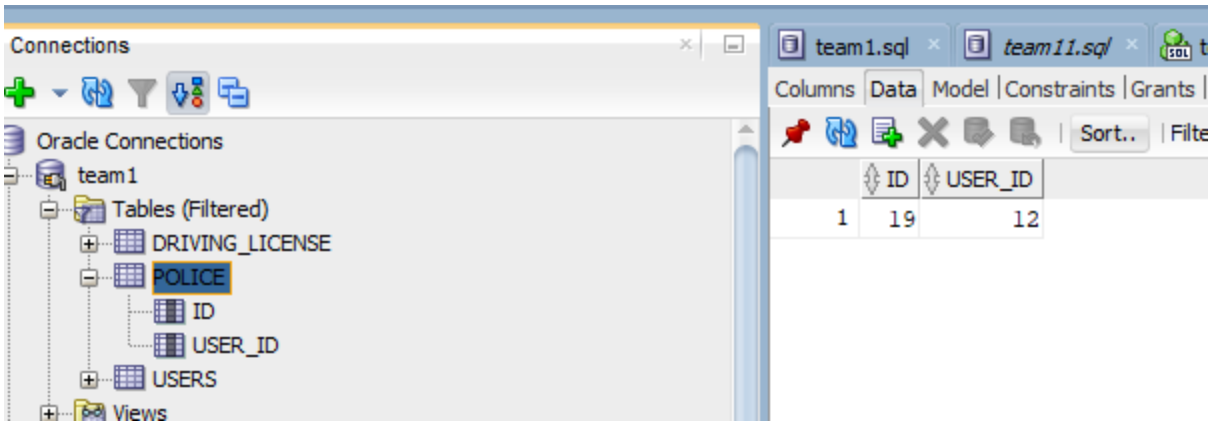


```
--------------------------------------------------------
--  DDL FOR TABLE POLICE
--------------------------------------------------------

  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")
```