Transport Management System

PUCIT

Punjab University College of information technology

Table Of Contents

Transport Management System:

Problem Statement:

➢ This **Transport Management System** will be designed to manage the booking and maintenance of growing transport.

➢ Problem occurs when transports with mechanical problems are rented, vehicles are double booked and there are cases when the wrong vehicle is rented and it is not returned and not serviced.

➢ The current system has redundancy, which is caused by the manual system which uses paper to fill the information.

➢ Data is also not being kept in the secure location. Information lost is common by using manual system.

➢ The efficient planning and management of an organization's transport system is the key to provide an efficient transport network.

➢ Transport systems should ensure accessibility at an acceptable level of safety and comfort, in an environment-friendly manner for the movement of people.

Project Idea:

At present, system of the transportation uses the manual system where needs to fill all records by hands. This work is usually handled by staff to fill all the transport reservation form with handwriting. This procedure gives difficultly to find data when the same customer come to book transport again.

Transport Management System will become a system which will effectively manage information about customer profile and make reservation easily. Customer does not need to register many times because the profile of customer will have been saved into database. This system focus as a reservation form and latest information about the transport availability.

The data that must be sent include pick-up date, drop-off date, transport types, how long to hire, method of payment, and etc. Customer's profile can be updated any time.

Hopefully this system improves customer service and satisfaction.

Introduction:

Our system provides transport facility with administrative support and passenger management. Passenger can select bus and route according to his/her time schedule. Passenger can locate bus and find relative time through GPS. Passenger can also complain through the system.

Business Rule:

- System connect passenger with appropriate bus according to the mentioned schedule by passenger.
- To find bus locate and schedule passenger must have to login system.
- In case of any change of schedule of bus passenger will be notify.

Constraints:

1. Only SQL server database will be used.
2. If a passenger want to use system, he/she must have to login to the system.
3. As the route change, passenger fair will be changed.

ERD

Before normalization
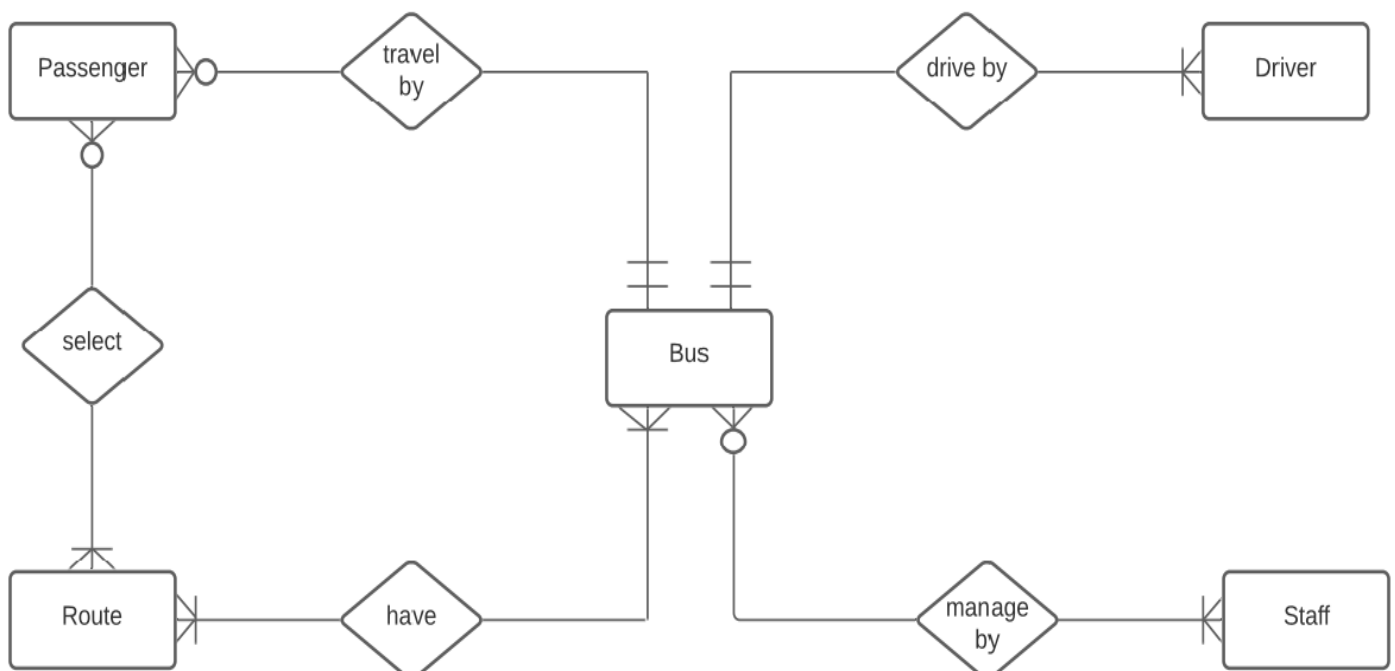
Before normalization

TABLES

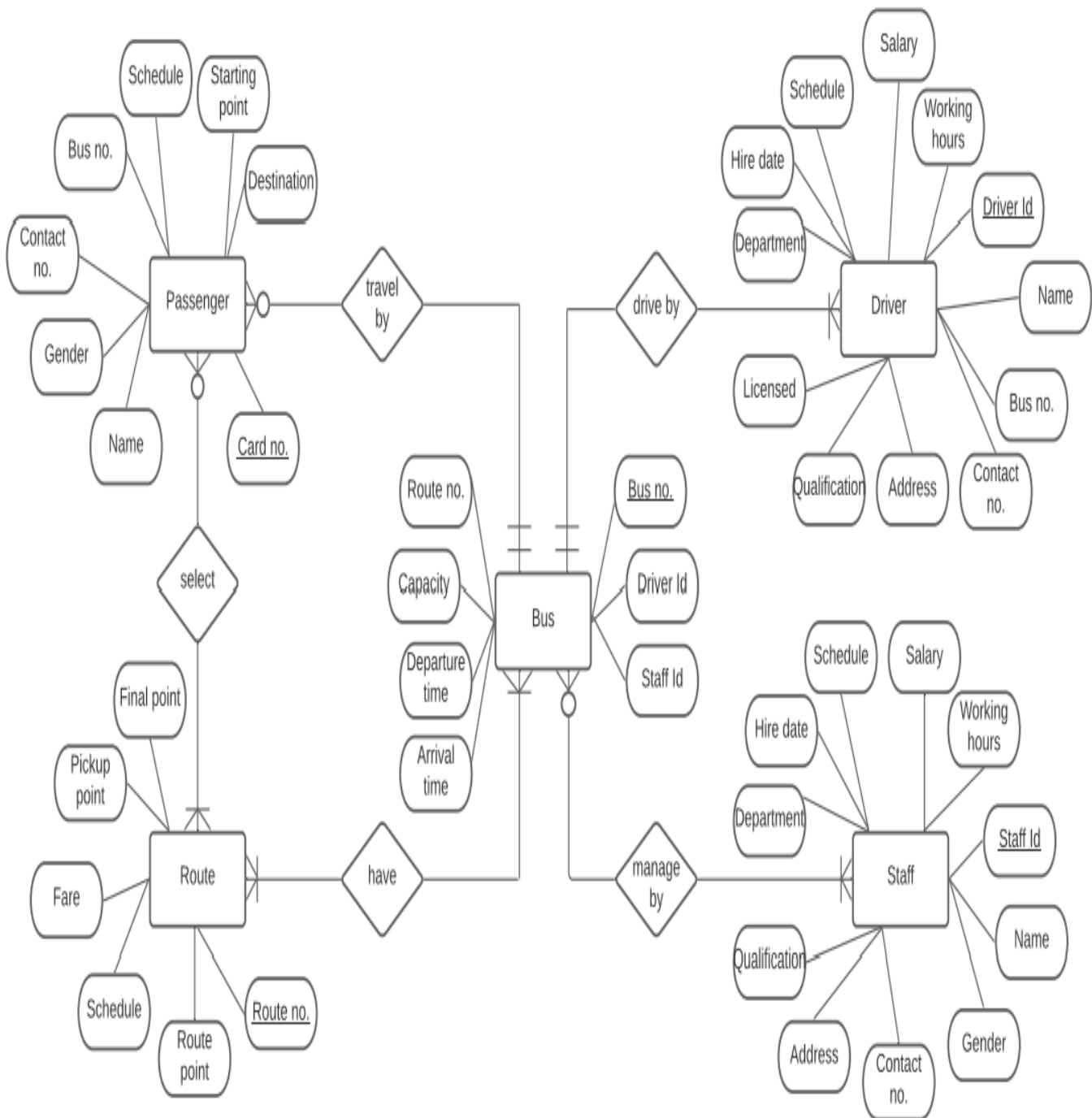| Fields	Datatype	keys	Not null	constraints	other
Bus.no	Number(p, s)	PK			
Driver Id	Number(p, s)	FK			
Staff id		FK			
Route no		FK			
Capacity	Number(p, s)		Not null		
Departure time	Time/date				
Arrival time	Time/date				

BUSES

DRIVER

Field	Datatype	keys	Not null	constraints	other
Driver-ID	Number (p, s)	PK			
name	VARCHAR2(30)		Not null		
Bus.no	Number (p, s)	FK			
Contact.no	Number (p, s)		Not null		
address	VARCHAR2(50)		Not null		
Qualification	VARCHAR2(20)		Not null		
licensed	Number (p, s)		Not null		
department	Number (p, s)		Not null		
Hire date	Date		Not null		
schedule	Time		Not null		
Salary	Number (p, s)		Not null		
Working hours	Number (p, s)		Not null		

STAFF

Field	Datatype	keys	Not null	constraints	other
Staff-ID	Number (p, s)	PK			
name	VARCHAR2(30)		Not null		
gender	VARCHAR2(10)			CHECK	
Contact.no	Number (p, s)		Not null		
Address	VARCHAR2(50)		Not null		
qualification	VARCHAR2(20)		Not null		
Hire-date	Date		Not null		
department	Number (p, s)		Not null		
schedule	Number (p, s)		Not null		
Working hours	Number (p, s)		Not null		
Salary	Number (p, s)		Not null		

ROUTE

Field	Data type	Keys	Not null	Constraint	other
Route no.	NUMBER	PK			
Route point	VARCHAR(20)		Not null		
Schedule	TIME				
Fare	NUMBER			CHECK	
Pick up point	VARCHAR(20)		Not null		
Final point	VARCHAR(25)		Not null		

PASSENGER

Field	Data type	keys	Not null	constraints	other
Card no	Number (p, s)	PK			
name	VARCHAR2(30)		Not null		
gender	VARCHAR2(10)			CHECK	
Contact.no	Number (p, s)		Not null		
Bus no	Number (p, s)		Not null		
schedule	Number (p, s)		Not null		
Starting point	VARCHAR2(20)		Not null		
destination	VARCHAR2(50)		Not null		

SQL QUERIES

BEFORE NORMALIZATION

DRIVER

```
CREATE TABLE DRIVER0
        (DRIVER_ID          NUMBER (20),
         DNAME              VARCHAR2(30) NOT NULL,
         BUS_NUMBER         NUMBER (10),
         CONTACT_NUMBER   NUMBER (14) NOT NULL,
         ADDRESS            VARCHAR2(50) NOT NULL,
         QUALIFICATIONS     VARCHAR2(20) NOT NULL,
         LICENSE            VARCHAR2(5) NOT NULL,
         DEPARTMENT         NUMBER (20) NOT NULL,
         HIRE_DATE          DATE NOT NULL,
           SCHEDULE         VARCHAR2 (30) NOT NULL,
         SALARY             NUMBER (10) NOT NULL,
          WORKING_HOURS     NUMBER (10) NOT NULL,              CONSTRAINTS
         DRIVER0_DRIVER_ID_PK PRIMARY KEY(DRIVER_ID),

         CONSTRAINTS DRIVER0_LICENSE_CK CHECK (LICENSE IN('YES','NO')))
```

```
1    CREATE TABLE DRIVER0
2                       (DRIVER_ID            NUMBER (20),
3                        DNAME                VARCHAR2(30) NOT NULL,
4                        BUS_NUMBER           NUMBER (10),
5                        CONTACT_NUMBER       NUMBER (14) NOT NULL,
6                        ADDRESS              VARCHAR2(50) NOT NULL,
7                        QUALIFICATIONS       VARCHAR2(20) NOT NULL,
8                        LICENSE              VARCHAR2(5) NOT NULL,
9                        DEPARTMENT           NUMBER (20) NOT NULL,
10                       HIRE_DATE            DATE NOT NULL,
11                       SCHEDULE             VARCHAR2 (30) NOT NULL,
12                       SALARY               NUMBER (10) NOT NULL,
13                       WORKING_HOURS        NUMBER (10) NOT NULL,
14                       CONSTRAINTS DRIVER0_DRIVER_ID_PK PRIMARY KEY(DRIVER_ID),
15                       CONSTRAINTS DRIVER0_LICENSE_CK CHECK (LICENSE IN('YES','NO')))
```

Results **Explain** **Describe** **Saved SQL** **History**

Table created.

```
1    DESC DRIVER0;
```

Results **Explain** **Describe** **Saved SQL** **History**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
DRIVER0	DRIVER_ID	NUMBER	-	20	0	1	-	-	-
	DNAME	VARCHAR2	30	-	-	-	-	-	-
	BUS_NUMBER	NUMBER	-	10	0	-	✓	-	-
	CONTACT_NUMBER	NUMBER	-	14	0	-	-	-	-
	ADDRESS	VARCHAR2	50	-	-	-	-	-	-
	QUALIFICATIONS	VARCHAR2	20	-	-	-	-	-	-
	LICENSE	VARCHAR2	5	-	-	-	-	-	-
	DEPARTMENT	NUMBER	-	20	0	-	-	-	-

	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
	DEPARTMENT	NUMBER	-	20	0	-	-	-	-
	HIRE_DATE	DATE	7	-	-	-	-	-	-
	SCHEDULE	VARCHAR2	30	-	-	-	-	-	-
	SALARY	NUMBER	-	10	0	-	-	-	-
	WORKING_HOURS	NUMBER	-	10	0	-	-	-	-

ROUTE

create table Route

   (Route_No NUMBER,

    Route_point VARCHAR(20) NOT NULL,

    Schadule VARCHAR(20) NOT NULL,

Fare NUMBER,

Pick_Up_Point VARCHAR(20) NOT NULL,

Final_Point VARCHAR(25) NOT NULL,

CONSTRAINTS Route_Route_No_PK PRIMARY KEY(Route_No),

CONSTRAINTS Route_Fare_CK CHECK(Fare IN('15','20')));

☑ Autocommit   Display 10 ⌄

```
create table Route
        (Route_No NUMBER,
         Route_point VARCHAR(20) NOT NULL,
         Schadule VARCHAR(20) NOT NULL,
         Fare NUMBER,
         Pick_Up_Point VARCHAR(20) NOT NULL,
         Final_Point VARCHAR(25) NOT NULL,
         CONSTRAINTS Route_Route_No_PK PRIMARY KEY(Route_No),
         CONSTRAINTS Route_Fare_CK CHECK(Fare IN('15','20')));
```

Results   Explain   Describe   Saved SQL   History

Table created.

0.02 seconds

☑ Autocommit   Display 10 ⌄

```
DESC Route
```

Results   Explain   **Describe**   Saved SQL   History

Object Type **TABLE** Object **ROUTE**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
ROUTE	ROUTE_NO	Number	-	-	-	1	-	-	-
	ROUTE_POINT	Varchar2	20	-	-	-	-	-	-
	SCHADULE	Varchar2	20	-	-	-	-	-	-
	FARE	Number	-	-	-	-	✓	-	-
	PICK_UP_POINT	Varchar2	20	-	-	-	-	-	-
	FINAL_POINT	Varchar2	25	-	-	-	-	-	-
									1 - 6

STAFF

```
CREATE TABLE STAFF0
        (STAFF_ID            NUMBER (20),
         SNAME               VARCHAR2(30) NOT NULL,
         GENDER              VARCHAR2(10) ,
         CONTACT_NUMBER  NUMBER (14) NOT NULL,
         ADDRESS             VARCHAR2(50) NOT NULL,
         QUALIFICATIONS     VARCHAR2(20) NOT NULL,
         HIRE_DATE            DATE NOT NULL,
         DEPARTMENT         NUMBER (20) NOT NULL,
          SCHEDULE           NUMBER (30) NOT NULL,
           WORKING_HOURS     NUMBER (10) NOT NULL,
         SALARY               NUMBER (10) NOT NULL,
         CONSTRAINTS STAFF0_STAFF_ID_PK PRIMARY KEY(STAFF_ID),
         CONSTRAINTS STAFF0_GENDER_CK CHECK (GENDER IN('MALE', 'FEMALE')));
```

```sql
1    CREATE TABLE STAFF0
2                      (STAFF_ID                NUMBER (20),
3                       SNAME                      VARCHAR2(30) NOT NULL,
4                       GENDER                  VARCHAR2(10),
5                       CONTACT_NUMBER    NUMBER (14) NOT NULL,
6                       ADDRESS                  VARCHAR2(50) NOT NULL,
7                       QUALIFICATIONS      VARCHAR2(20) NOT NULL,
8                       HIRE_DATE                    DATE NOT NULL,
9                       DEPARTMENT              NUMBER (20) NOT NULL,
10    SCHEDULE              NUMBER (30) NOT NULL,
11    WORKING_HOURS        NUMBER (10) NOT NULL,
12                       SALARY                      NUMBER (10) NOT NULL,
13    CONSTRAINTS STAFF0_STAFF_ID_PK PRIMARY KEY(STAFF_ID),
```

Results   Explain   Describe   Saved SQL   History

Table created.

```
1    DESC STAFF0;
```

Results | Explain | **Describe** | Saved SQL | History

Object Type **TABLE** ?   Object **STAFF0** ?

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
STAFF0	STAFF_ID	NUMBER	-	20	0	1	-	-	-
	SNAME	VARCHAR2	30	-	-	-	-	-	-
	GENDER	VARCHAR2	10	-	-	-	✓	-	-
	CONTACT_NUMBER	NUMBER	-	14	0	-	-	-	-
	ADDRESS	VARCHAR2	50	-	-	-	-	-	-
	QUALIFICATIONS	VARCHAR2	20	-	-	-	-	-	-

	Column	Data Type	Length	Precision	Scale				
	QUALIFICATIONS	VARCHAR2	20	-	-	-	-	-	-
	HIRE_DATE	DATE	7	-	-	-	-	-	-
	DEPARTMENT	NUMBER	-	20	0	-	-	-	-
	SCHEDULE	NUMBER	-	30	0	-	-	-	-
	WORKING_HOURS	NUMBER	-	10	0	-	-	-	-
	SALARY	NUMBER	-	10	0	-	-	-	-

TABLE AFTER NORMALIZATION

Total tables = 5

1) Buses
2) department
3) Driver
4) Staff
5) Passenger
6) Route

BUSES

Bus no.	Driver-id	Staff-id	Route no.	capacity	Arrival time	Departure time

DRIVER

Driver-id	name	Contact no.	address	qualification	Hire-date	Licensed detail	Bus no.

STAFF

Staff-id	name	Contact no.	address	gender	qualification	Hire date

department

Department no.	shift	timing	Working hour	salary

ROUTE				
Route no.	schedule	fare	Pick up point	Final point

passenger						
Card no.	name	gender	Contact no.	schedule	Starting point	destination	Bus no.

ERD

After normalization
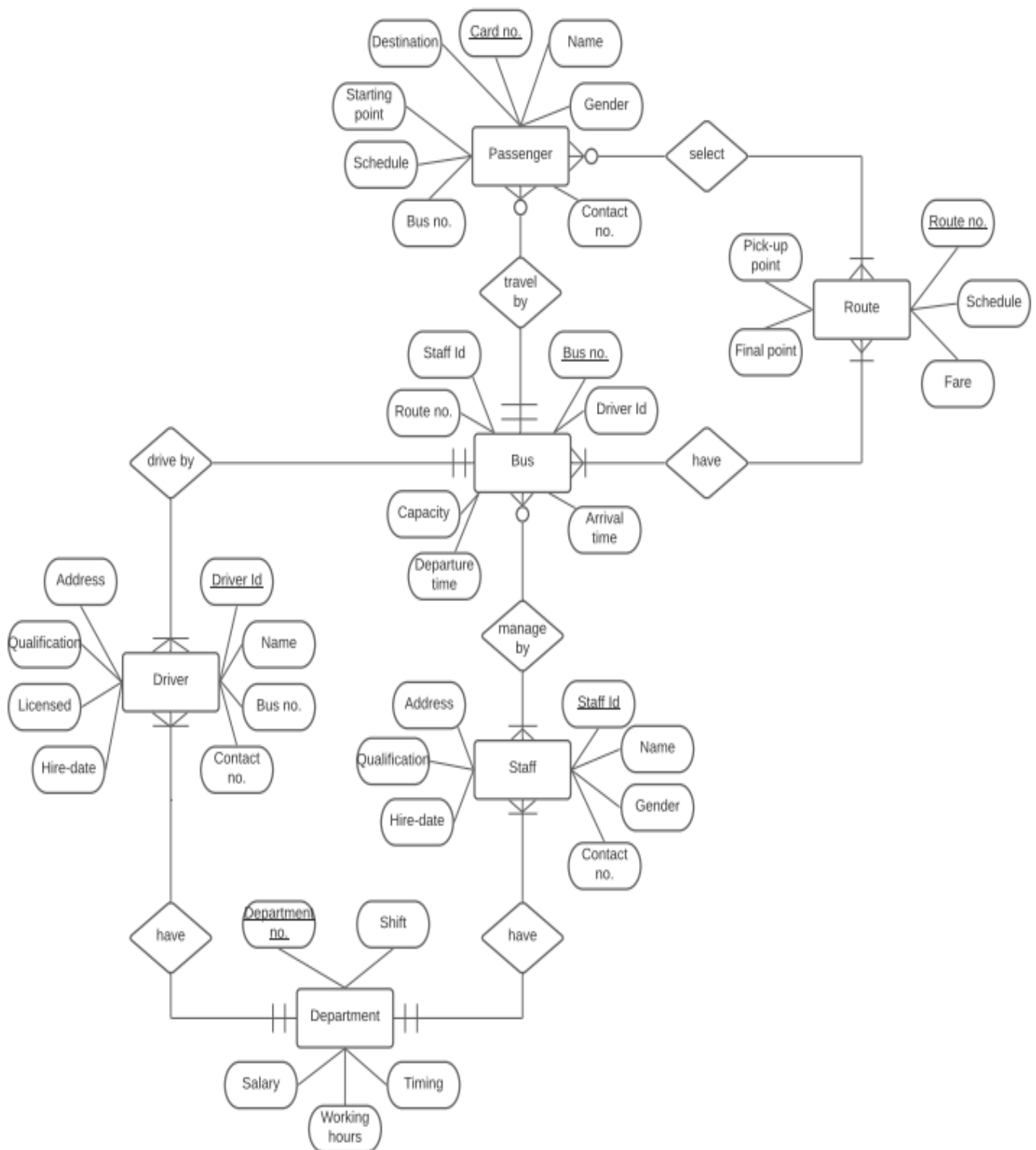
TABLES DESCRIPTION

Object type : Table   Table : Buses

Table	Fields	Datatype	keys	Not null	constraints
Buses	Bus.no	Number(p, s)	PK		
	Driver Id	Number(p, s)	FK		
	Staff id		FK		
	Route no		FK		
	Capacity	Number(p, s)		Not null	
	Departure time	Time/date			
	Arrival time	Time/date			

Description:

Object type : Table   Table : Driver

Description:

Table	Field	Datatype	keys	Not null	constraints
Driver	Driver-ID	Number (p, s)	PK		
	name	VARCHAR2(30)		Not null	
	Bus.no	Number (p, s)	FK		
	Contact.no	Number (p, s)		Not null	
	address	VARCHAR2(50)		Not null	
	Qualification	VARCHAR2(20)		Not null	
	licensed	Number (p, s)		Not null	
	Hire date	Date		Not null	

Object type : Table   Table : Staff

Description:

Table	Field	Datatype	keys	Not null	constraints
Staff	Staff-ID	Number (p, s)	PK		
	name	VARCHAR2(30)		Not null	
	gender	VARCHAR2(10)			CHECK
	Contact.no	Number (p, s)		Not null	
	Address	VARCHAR2(50)		Not null	
	qualification	VARCHAR2(20)		Not null	
	Hire-date	Date		Not null	

Object type : Table   Table : Route

Description:

Table	Field	Data type	Keys	Not null	Constraint
Route	Route no.	Number	PK		
	Schedule	Time			
	Fare	Number			CHECK
	Pick up point	VARCHAR (20)		Not null	
	Final point	VARCHAR (25)		Not null	

Object type : Table   Table : Passenger

Description:

Table	Field	Data type	keys	Not null	constraints
Passenger	Card no	Number (p, s)	PK		
	name	VARCHAR2(30)		NOT NULL	
	gender	VARCHAR2(10)			CHECK
	Contact.no	Number (p, s)		NOT NULL	
	Bus no	Number (p, s)		NOT NULL	
	schedule	Number (p, s)		NOT NULL	
	Starting point	VARCHAR2(20)		NOT NULL	
	destination	VARCHAR2(50)		NOT NULL	

Object type : Table   Table : Department

Description:

Table	Field	Data type	Keys	Not null	Constraint
Department	department no.				
	shift				
	timing				
	Working hours				
	salary				

AFTER NORMALIZATION

DRIVER

1) CREATE TABLE DRIVER

    (DRIVER_ID   NUMBER (20),

    DNAME   VARCHAR2(30) NOT NULL,

    BUS_NUMBER   NUMBER (10),

    CONTACT_NUMBER NUMBER (14) NOT NULL,

    ADDRESS   VARCHAR2(50) NOT NULL,

    QUALIFICATIONS   VARCHAR2(20) NOT NULL,

    LICENSE   VARCHAR2(5) NOT NULL,

    DEPARTMENT   NUMBER (20) NOT NULL,

    HIRE_DATE   DATE NOT NULL,

    CONSTRAINTS DRIVER_DRIVER_ID_PK PRIMARY KEY(DRIVER_ID),

    CONSTRAINTS DRIVER_LICENSE_CK CHECK (LICENSE IN('YES','NO')))

```
1      CREATE TABLE DRIVER
2                    (DRIVER_ID           NUMBER (20),
3                     DNAME               VARCHAR2(30) NOT NULL,
4                     BUS_NUMBER          NUMBER (10),
5                     CONTACT_NUMBER      NUMBER (14) NOT NULL,
6                     ADDRESS             VARCHAR2(50) NOT NULL,
7                     QUALIFICATIONS      VARCHAR2(20) NOT NULL,
8                     LICENSE             VARCHAR2(5) NOT NULL,
9                     DEPARTMENT          NUMBER (20) NOT NULL,
10                    HIRE_DATE           DATE NOT NULL,
11                    CONSTRAINTS DRIVER_DRIVER_ID_PK PRIMARY KEY(DRIVER_ID),
12                    CONSTRAINTS DRIVER_LICENSE_CK CHECK (LICENSE IN('YES','NO')))
```

Results   Explain   Describe   Saved SQL   History

Table created.

0.06 seconds

```
1      DESC DRIVER;
```

Results   Explain   **Describe**   Saved SQL   History

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
DRIVER	DRIVER_ID	NUMBER	-	20	0	1	-	-	-
	DNAME	VARCHAR2	30	-	-	-	-	-	-
	BUS_NUMBER	NUMBER	-	10	0	-	✓	-	-
	CONTACT_NUMBER	NUMBER	-	14	0	-	-	-	-
	ADDRESS	VARCHAR2	50	-	-	-	-	-	-
	QUALIFICATIONS	VARCHAR2	20	-	-	-	-	-	-
	LICENSE	VARCHAR2	5	-	-	-	-	-	-
	DEPARTMENT	NUMBER	-	20	0	-	-	-	-
	HIRE_DATE	DATE	7	-	-	-	-	-	-

ROUTE

create table Route1

        (Route_No NUMBER,

         Schadule VARCHAR(20) NOT NULL,

         Fare NUMBER,

         Pick_Up_Point VARCHAR(20) NOT NULL,

         Final_Point VARCHAR(25) NOT NULL,

```sql
CONSTRAINTS Route1_Route_No_PK PRIMARY KEY(Route_No),

CONSTRAINTS Route1_Fare_CK CHECK(Fare IN('15','20')));
```

☑ Autocommit Display [10 ▾]

```
DESC Route1
```

Results Explain **Describe** Saved SQL History

Object Type **TABLE** Object **ROUTE1**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
ROUTE1	ROUTE_NO	Number	-	-	-	1	-	-	-
	SCHADULE	Varchar2	20	-	-	-	-	-	-
	FARE	Number	-	-	-	-	✓	-	-
	PICK_UP_POINT	Varchar2	20	-	-	-	-	-	-
	FINAL_POINT	Varchar2	25	-	-	-	-	-	-
									1 - 5

ORACLE® Database Express Edition

☑ Autocommit **Display** [10 ▾]

```
create table Route1
            (Route_No NUMBER,
             Schadule VARCHAR(20) NOT NULL,
             Fare NUMBER,
             Pick_Up_Point VARCHAR(20) NOT NULL,
             Final_Point VARCHAR(25) NOT NULL,
             CONSTRAINTS Route1_Route_No_PK PRIMARY KEY(Route_No),
             CONSTRAINTS Route1_Fare_CK CHECK(Fare IN('15','20')));
```

Results Explain Describe Saved SQL History

```
Table created.

0.02 seconds
```

STAFF

CREATE TABLE STAFF

  (STAFF_ID   NUMBER (20),

  SNAME   VARCHAR2(30) NOT NULL,

  CONTACT_NUMBER NUMBER (14) NOT NULL,

  ADDRESS   VARCHAR2(50) NOT NULL,

  GENDER   VARCHAR2(10),

  QUALIFICATIONS VARCHAR2(20) NOT NULL,

  DEPARTMENT   NUMBER (20) NOT NULL,

  HIRE_DATE   DATE NOT NULL,

  CONSTRAINTS STAFF_STAFF_ID_PK PRIMARY KEY(STAFF_ID),

  CONSTRAINTS STAFF_GENDER_CK CHECK (GENDER IN ('MALE', 'FEMALE')));

```
1    CREATE TABLE STAFF
2                    (STAFF_ID              NUMBER (20),
3                     SNAME                    VARCHAR2(30) NOT NULL,
4                     CONTACT_NUMBER    NUMBER (14) NOT NULL,
5                     ADDRESS                  VARCHAR2(50) NOT NULL,
6                     GENDER                   VARCHAR2(10),
7                     QUALIFICATIONS       VARCHAR2(20) NOT NULL,
8                     DEPARTMENT             NUMBER (20) NOT NULL,
9                     HIRE_DATE             DATE NOT NULL,
10                    CONSTRAINTS STAFF_STAFF_ID_PK PRIMARY KEY(STAFF_ID),
11                    CONSTRAINTS STAFF_GENDER_CK CHECK (GENDER     IN ('MALE', 'FEMALE')));
```

Results **Explain** **Describe** **Saved SQL** **History**

Table created.

0.08 seconds

```
1    DESC STAFF;
2
```

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
STAFF	STAFF_ID	NUMBER	-	20	0	1	-	-	-
	SNAME	VARCHAR2	30	-	-	-	-	-	-
	CONTACT_NUMBER	NUMBER	-	14	0	-	-	-	-
	ADDRESS	VARCHAR2	50	-	-	-	-	-	-
	GENDER	VARCHAR2	10	-	-	-	✓	-	-
	QUALIFICATIONS	VARCHAR2	20	-	-	-	-	-	-
	DEPARTMENT	NUMBER	-	20	0	-	-	-	-
	HIRE_DATE	DATE	7	-	-	-	-	-	-

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DEPARTMENT

CREATE TABLE DEPARTMENT

    (DEPARTMENT_NO   NUMBER (20) NOT NULL,

     SCHEDULE   VARCHAR2 (30) NOT NULL,

     SALARY   NUMBER (10) NOT NULL,

     WORKING_HOURS   NUMBER (10) NOT NULL,

     CONSTRAINTS DEPARTMENT_DEPARTMENT_NO_PK PRIMARY
KEY(DEPARTMENT_NO));

```
1        CREATE TABLE DEPARTMENT
2                         (DEPARTMENT_NO          NUMBER (20) NOT NULL,
3                          SCHEDULE               VARCHAR2 (30) NOT NULL,
4                          SALARY                 NUMBER (10) NOT NULL,
5                          WORKING_HOURS          NUMBER (10) NOT NULL,
6                          CONSTRAINTS DEPARTMENT_DEPARTMENT_NO_PK PRIMARY KEY(DEPARTMENT_NO));
7
8
9
```

Results   Explain   Describe   Saved SQL   History

Table created.

0.06 seconds

```
1    DESC DEPARTMENT;
2
```

Results   Explain   **Describe**   Saved SQL   History

Object Type   **TABLE** ⑦   Object   **DEPARTMENT** ⑦

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
DEPARTMENT	DEPARTMENT_NO	NUMBER	-	20	0	1	-	-	-
	SCHEDULE	VARCHAR2	30	-	-	-	-	-	-
	SALARY	NUMBER	-	10	0	-	-	-	-
	WORKING_HOURS	NUMBER	-	10	0	-	-	-	-