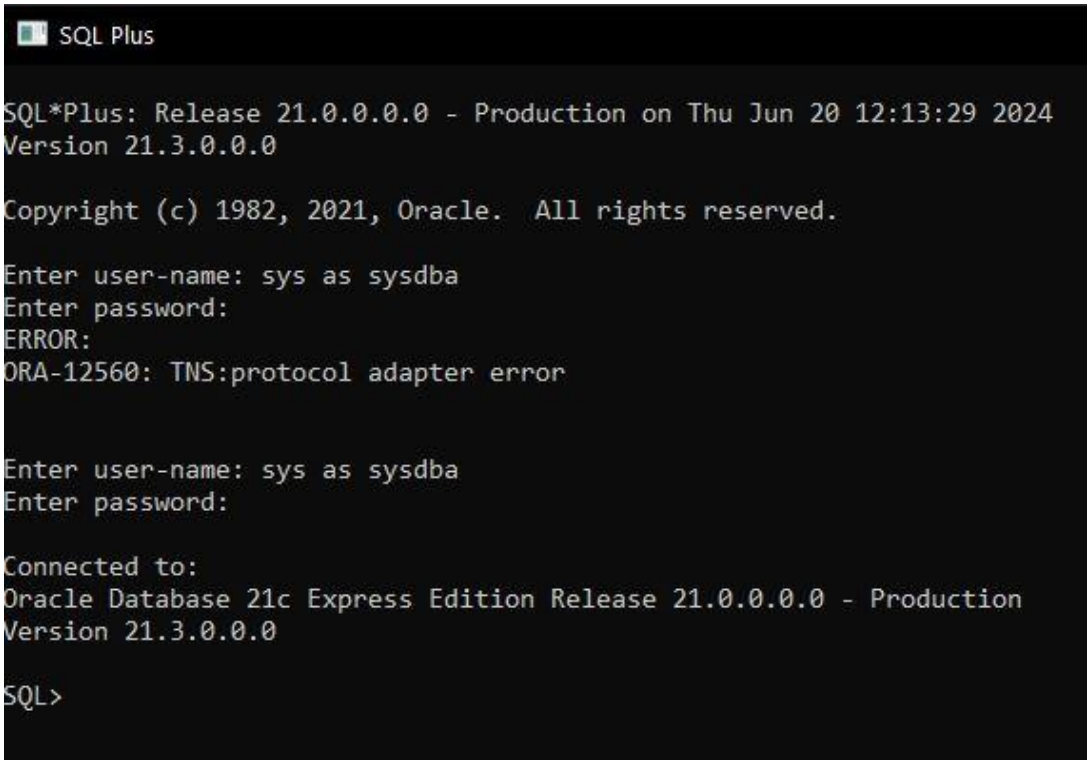
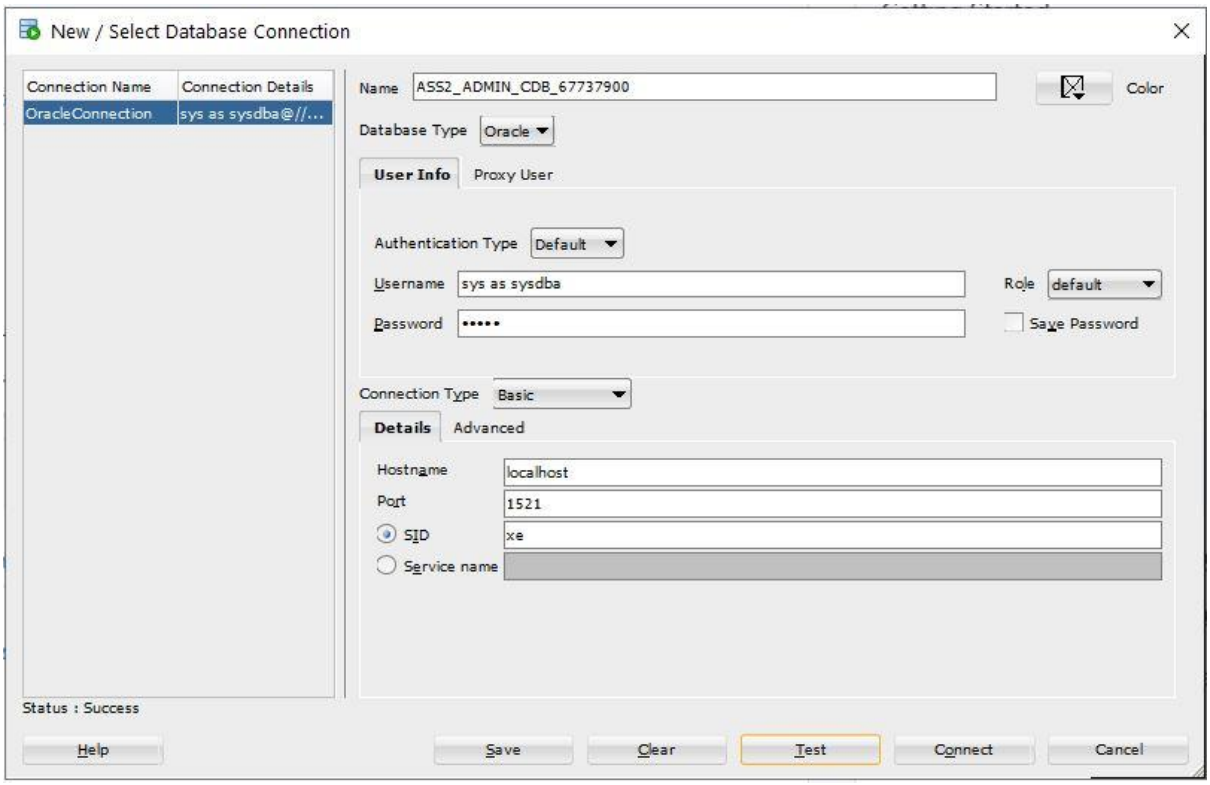
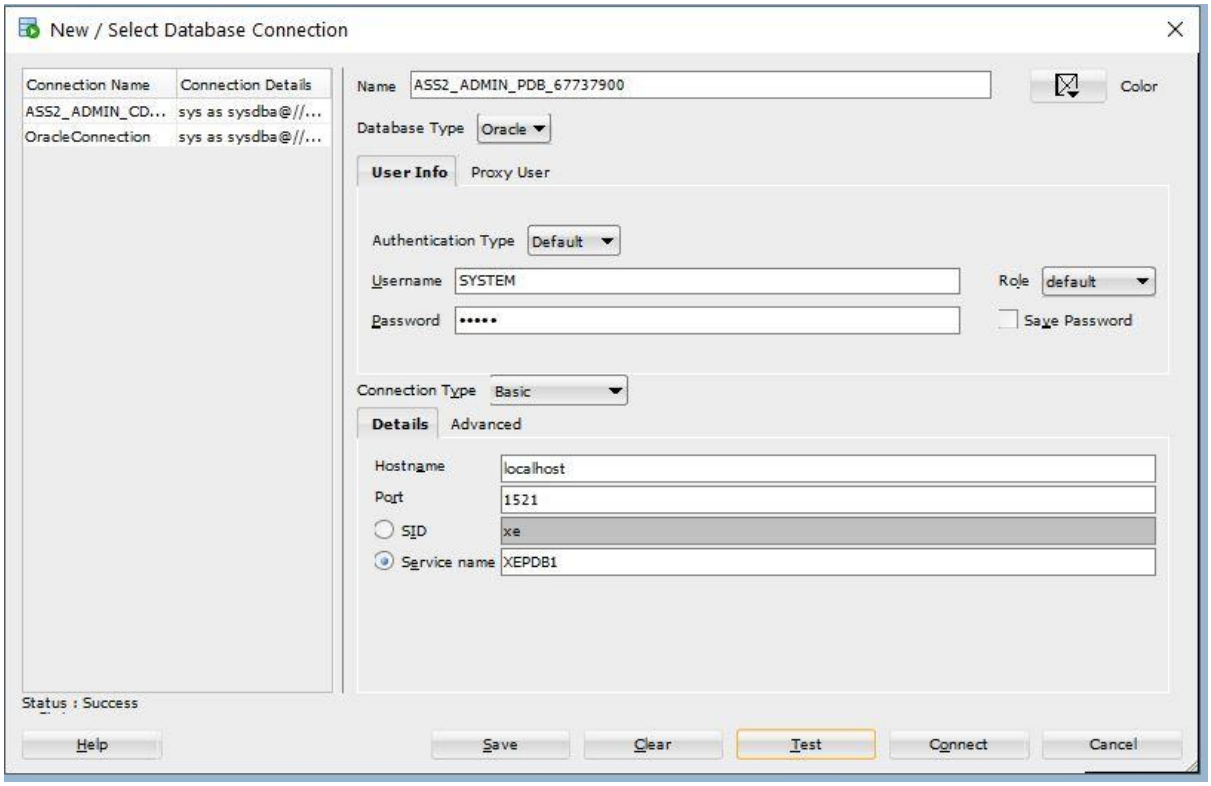
1.1.1.


SQL Plus
SQL*Plus: Release 21.0.0.0.0 - Production on Thu Jun 20 12:13:29 2024
Version 21.3.0.0.0
Copyright (c) 1982, 2021, Oracle. All rights reserved.
Enter user-name: sys as sysdba
Enter password:
ERROR:
ORA-12560: TNS:protocol adapter error
Enter user-name: sys as sysdba
Enter password:
Connected to:
Oracle Database 21c Express Edition Release 21.0.0.0.0 - Production
Version 21.3.0.0.0
SQL>

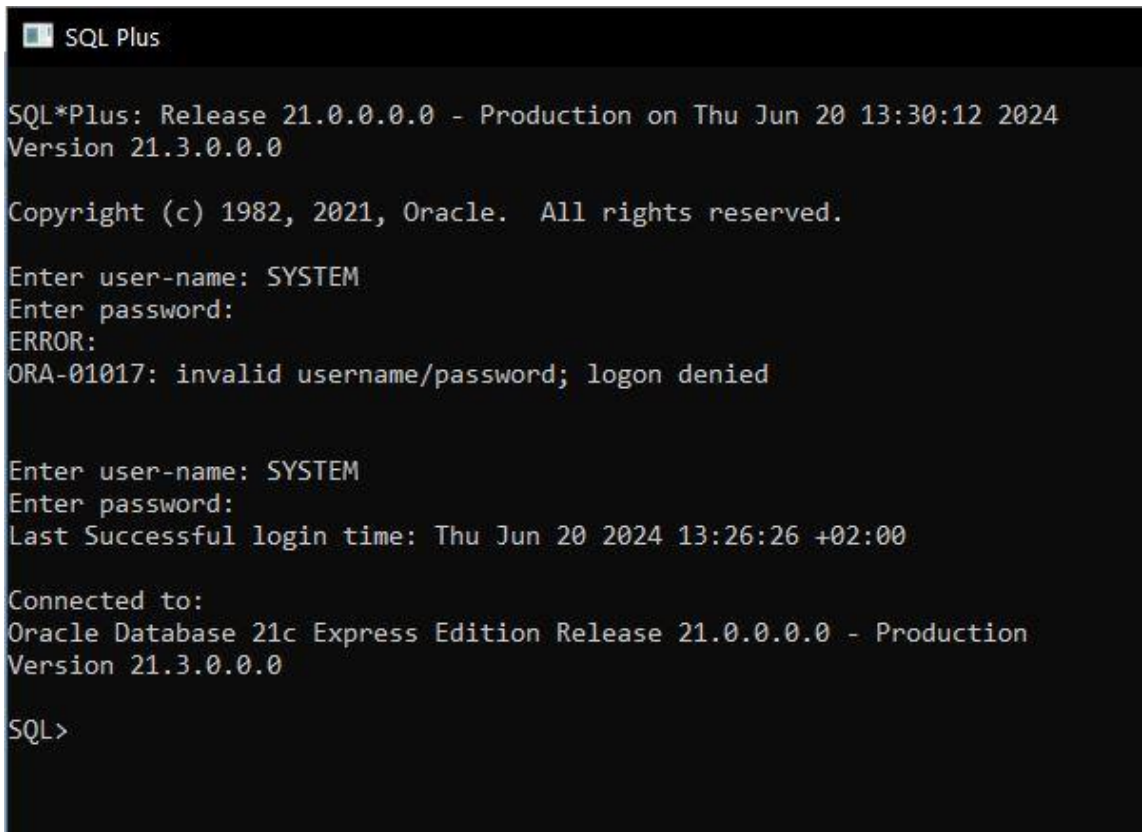
1.1.2.


New / Select Database Connection
Connection Name
Connection Details
OracleConnection
sys as sysdba@//...
Name
ASS2_ADMIN_CDB_67737900
Color
Database Type
Oracle
User Info
Proxy User
Authentication Type
Default
Username
sys as sysdba
Role
default
Password
Save Password
Connection Type
Basic
Details
Advanced
Hostname
localhost
Port
1521
SID
xe
Service name
Status : Success
Help
Save
Clear
Test
Connect
Cancel

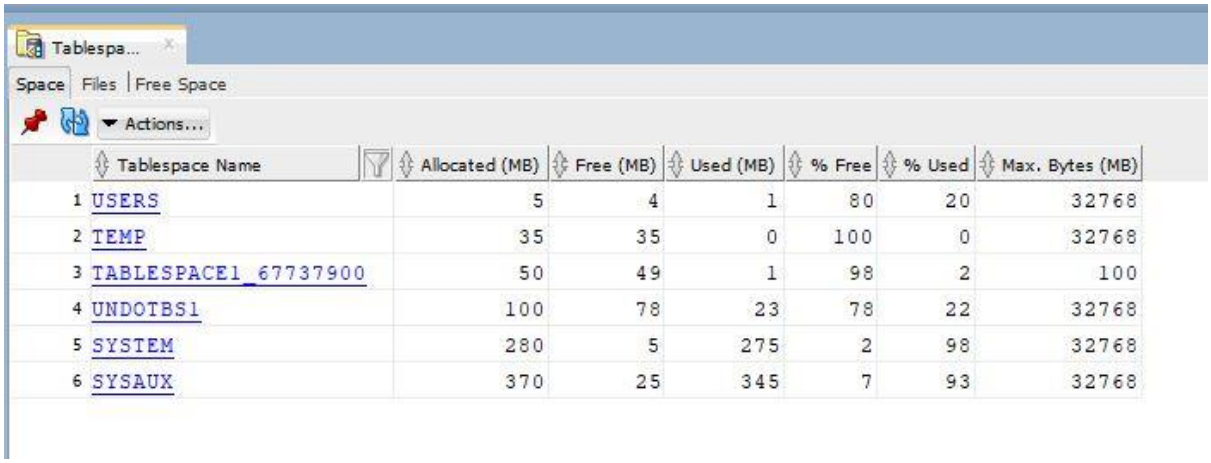
1.2.


New / Select Database Connection
Connection Name
Connection Details
ASS2_ADMIN_CD...
sys as sysdba@//...
OracleConnection
sys as sysdba@//...
Name
ASS2_ADMIN_PDB_67737900
Color
Database Type
Oracle
User Info
Proxy User
Authentication Type
Default
Username
SYSTEM
Role
default
Password
Save Password
Connection Type
Basic
Details
Advanced
Hostname
localhost
Port
1521
SID
xe
Service name
XEPDB1
Status : Success
Help
Save
Clear
Test
Connect
Cancel

1.3.1.


SQL Plus
SQL*Plus: Release 21.0.0.0.0 - Production on Thu Jun 20 13:30:12 2024
Version 21.3.0.0.0
Copyright (c) 1982, 2021, Oracle. All rights reserved.
Enter user-name: SYSTEM
Enter password:
ERROR:
ORA-01017: invalid username/password; logon denied
Enter user-name: SYSTEM
Enter password:
Last Successful login time: Thu Jun 20 2024 13:26:26 +02:00
Connected to:
Oracle Database 21c Express Edition Release 21.0.0.0.0 - Production
Version 21.3.0.0.0
SQL>

1.4.3.

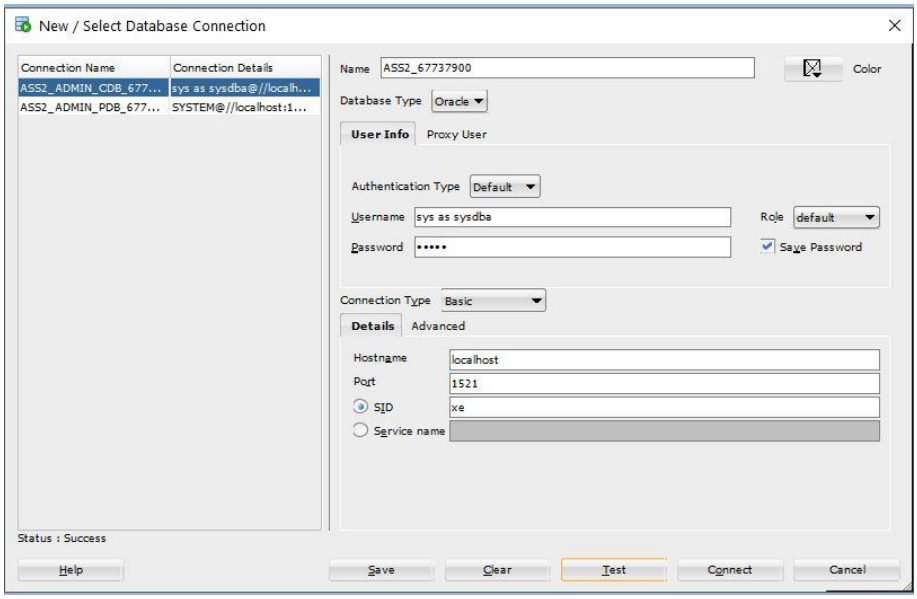


	Tablespace Name	Allocated (MB)	Free (MB)	Used (MB)	% Free	% Used	Max. Bytes (MB)
1	USERS	5	4	1	80	20	32768
2	TEMP	35	35	0	100	0	32768
3	TABLESPACE1_67737900	50	49	1	98	2	100
4	UNDOTBS1	100	78	23	78	22	32768
5	SYSTEM	280	5	275	2	98	32768
6	SYSAUX	370	25	345	7	93	32768

1.5.2

```
SQL> CLEAR
SQL> clear
SQL> ^K
SQL>
SQL> SELECT default_tablespace FROM dba_users WHERE username='ASS2_67737900';

DEFAULT_TABLESPACE
------------------------------
TABLESPACE1_67737900

SQL>
```

1.6.



2.1.1.

2.1.2.

HOM_67737900: Represents individuals like Siya Khumalo and Deacon Willemse who manage the shopping centre's maintenance.

Parking_Attendant_67737900: Represents the parking area staff who work in shifts and may or may not check out POS devices.

POS_67737900: Represents the POS devices that can be checked out by Heads of Maintenance and used by parking attendants.

2.1.3.

HOM_67737900: HOM_ID(PK)

Parking_Attendant_67737900: Attendant_ID(PK)

POS_67737900: Device_ID(PK), HOM_ID(FK1), Attendant_ID(FK2)

2.2.1.

INV_GENERATOR_67737900 Table:

- Business Rule 1: Each invoice line is uniquely identified by the combination of Inv_number and Line_number.
- Business Rule 2: Each line item on an invoice references a service, identified by Service_code, which must exist in the CLEANING_SERVICE_67737900 table.
- Business Rule 3: Each line item on an invoice is part of an invoice identified by Inv_number, which must exist in the INVOICE_67737900 table.

CLEANING_SERVICE_67737900 Table:

- Business Rule 4: Each cleaning service is uniquely identified by Service_code.

- Business Rule 5: Each cleaning service has a description (Service_descript) and a price (Service_Price).

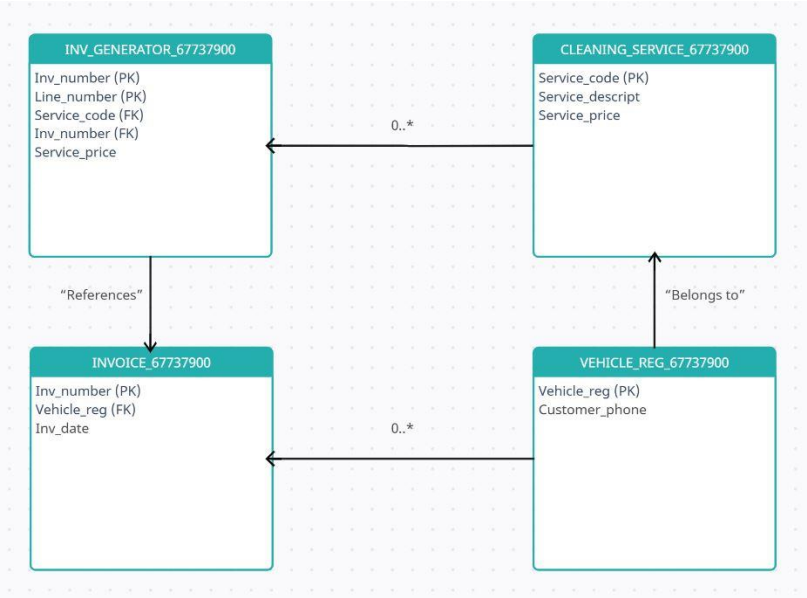
INVOICE_67737900 Table:

- Business Rule 6: Each invoice is uniquely identified by Inv_number.
- Business Rule 7: Each invoice references a vehicle, identified by Vehicle_reg, which must exist in the VEHICLE_REG_67737900 table.
- Business Rule 8: Each invoice records the date (Inv_date) on which the invoice was created.

VEHICLE_REG_67737900 Table:

- Business Rule 9: Each vehicle is uniquely identified by Vehicle_reg.
- Business Rule 10: Each vehicle has an associated customer phone number (Customer_phone).

2.2.2.



3.1.1.

```
CREATE TABLE POS_DEVICE_ 67737900 (
    Device_ID VARCHAR(50) PRIMARY KEY,
    Manufacturer VARCHAR(100)
);
```

3.2.1.

```
CREATE TABLE POS_CHECKOUT_67737900 (
        Shift_ID VARCHAR(50) PRIMARY KEY,
        Device_ID VARCHAR(50) FOREIGN KEY
);
```

3.2.2.

Shift_ID (PK)	Employee_ID	Designation	Shift_Date	Shift_Start_Time	Shift_End_Time
1	E12345	parking attendant service	2024-06-23	08:00	12:00
2	E12345	car cleaning service	2024-06-23	13:00	17:00

3.3.1.

Employee_contact is the multivalued attribute as it can hold multiple contact numbers for an employee.

3.3.2.

Entity name: EMPLOYEE_CONTACTS_ 67737900

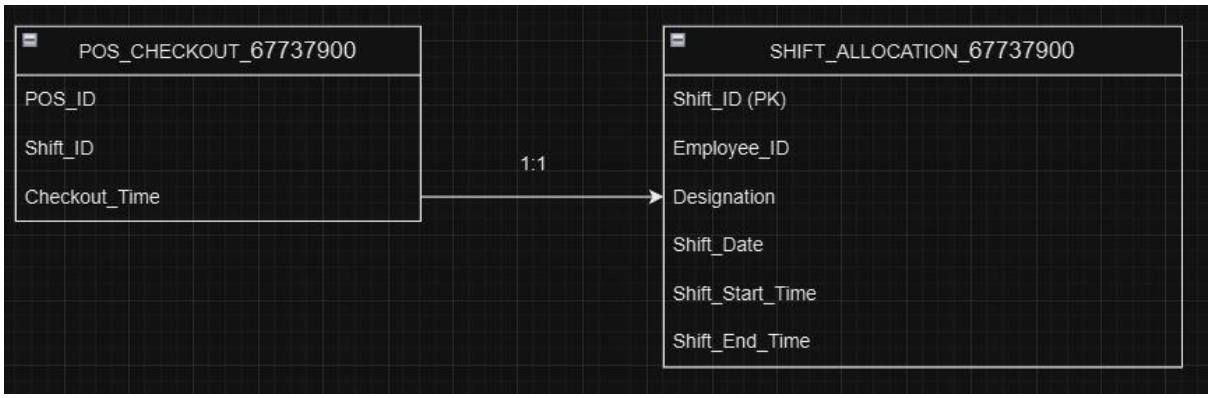
Attributes:

- Contact_ID (PK)
- Employee_ID (FK referencing PARKING_LOT_EMPLOYEES_ 67737900)
- Contact_Number

3.3.3.

```
CREATE TABLE EMPLOYEE_CONTACTS_67737900 (
   Contact_ID INT PRIMARY KEY,
   Employee_ID INT,
   Contact_Number VARCHAR(50),
   FOREIGN KEY (Employee_ID) REFERENCES PARKING_LOT_EMPLOYEES_67737900(Employee_ID)
);
```

3.4.1.



3.4.2.

```
CREATE TABLE SHIFT_ALLOCATION_67737900 (
   Shift_ID INT PRIMARY KEY,
   Employee_ID INT,
   Designation VARCHAR(50),
   Shift_Date DATE,
   Shift_Start_Time TIME,
   Shift_End_Time TIME
);

CREATE TABLE POS_CHECKOUT_67737900 (
   POS_ID INT PRIMARY KEY,
   Shift_ID INT,
   Checkout_Time TIME,
   FOREIGN KEY (Shift_ID) REFERENCES SHIFT_ALLOCATION_67737900(Shift_ID)
);
```

3.5.1.

HOM and POS_Checkout:

- Each Head of Maintenance (HOM) can manage multiple POS checkouts, but each checkout must be supervised by exactly one HOM.
- A POS checkout cannot occur without being supervised by a HOM.

POS_Checkout and POS_Device:

- Each POS device can be checked out multiple times, but each checkout must involve exactly one POS device.
- A POS device must be linked to a checkout record when in use.

POS_Checkout and Shift_Allocation:

- Each shift allocation can have one POS checkout, but the checkout is optional for the shift.
- A checkout record must correspond to exactly one shift allocation.

4.1.1.

```
CREATE TABLE HOM_67737900 (

   HOM_ID VARCHAR(2) PRIMARY KEY,

   HOM_Name VARCHAR(50),

   HOM_Surname VARCHAR(50),

   HOM_Contact VARCHAR(15)

);
```

4.1.2.

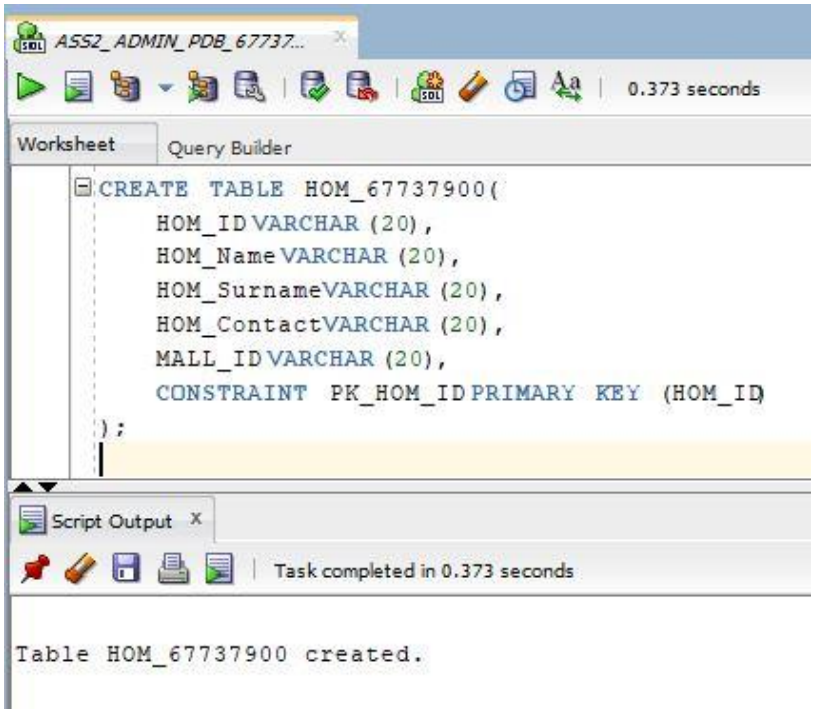
```
CREATE TABLE HOM_67737900 (

   HOM_ID VARCHAR(20) PRIMARY KEY,

   HOM_Name VARCHAR(20),

   HOM_Surname VARCHAR(20),

   HOM_Contact VARCHAR(20),

   MALL_ID VARCHAR(20)

);
```

4.1.3.

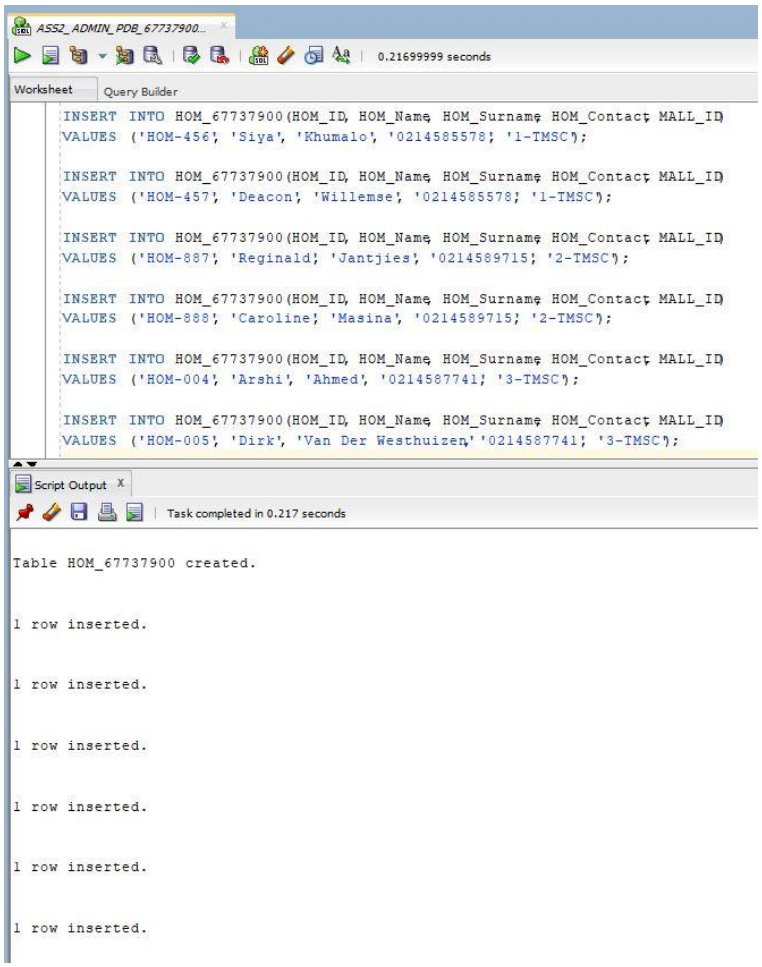
```
CREATE TABLE HOM_67737900 (

   HOM_ID VARCHAR(20),
```

```
    HOM_Name VARCHAR(20),
    HOM_Surname VARCHAR(20),
    HOM_Contact VARCHAR(20),
    MALL_ID VARCHAR(20),
    CONSTRAINT PK_HOM_ID PRIMARY KEY (HOM_ID)
);
```

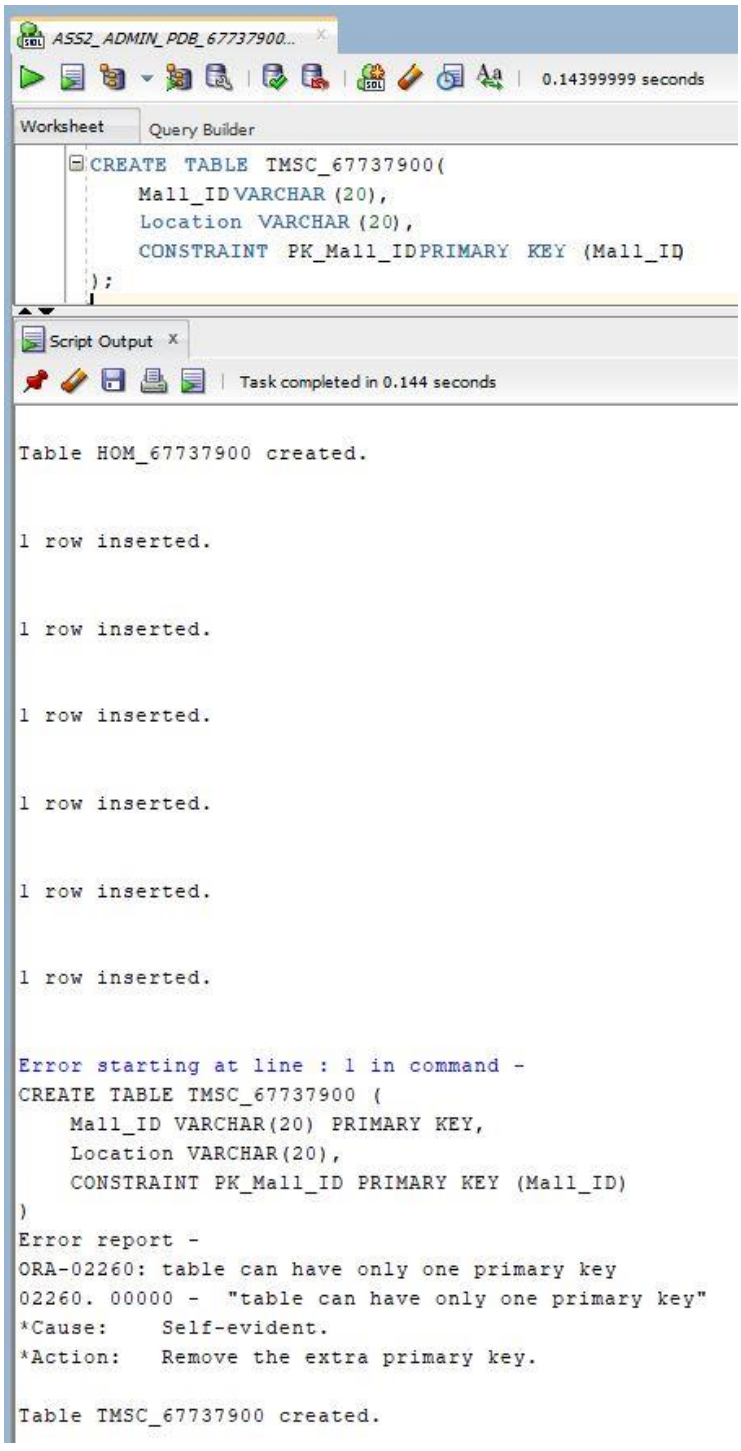
4.1.4.



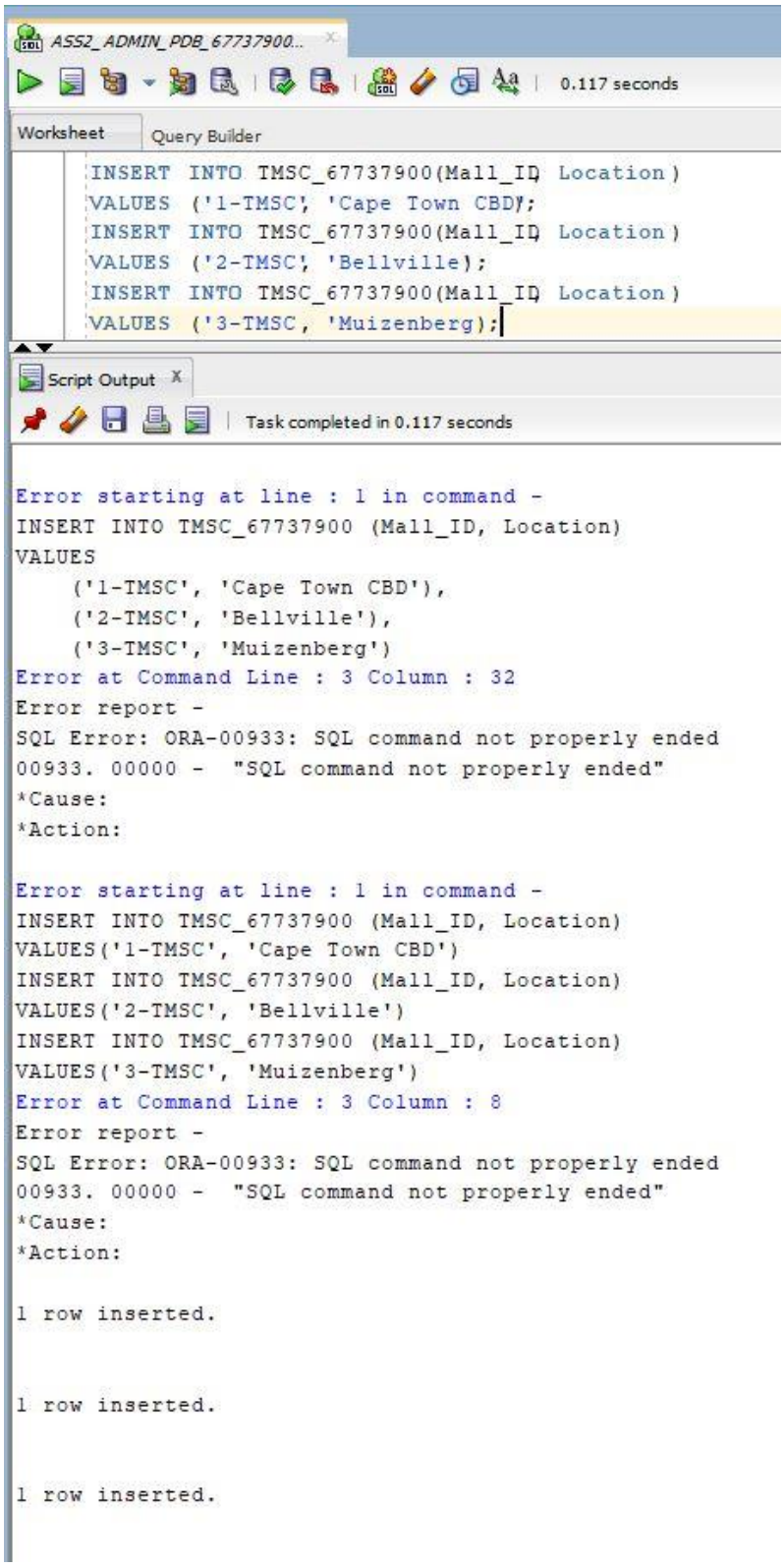
4.2.2.


ASS2_ADMIN_PDB_67737900...
0.21699999 seconds
Worksheet
Query Builder
INSERT INTO HOM_67737900(HOM_ID, HOM_Name, HOM_Surname, HOM_Contact, MALL_ID)
VALUES ('HOM-456', 'Siya', 'Khumalo', '0214585578', '1-TMSC');
INSERT INTO HOM_67737900(HOM_ID, HOM_Name, HOM_Surname, HOM_Contact, MALL_ID)
VALUES ('HOM-457', 'Deacon', 'Willemse', '0214585578', '1-TMSC');
INSERT INTO HOM_67737900(HOM_ID, HOM_Name, HOM_Surname, HOM_Contact, MALL_ID)
VALUES ('HOM-887', 'Reginald', 'Jantjies', '0214589715', '2-TMSC');
INSERT INTO HOM_67737900(HOM_ID, HOM_Name, HOM_Surname, HOM_Contact, MALL_ID)
VALUES ('HOM-888', 'Caroline', 'Masina', '0214589715', '2-TMSC');
INSERT INTO HOM_67737900(HOM_ID, HOM_Name, HOM_Surname, HOM_Contact, MALL_ID)
VALUES ('HOM-004', 'Arshi', 'Ahmed', '0214587741', '3-TMSC');
INSERT INTO HOM_67737900(HOM_ID, HOM_Name, HOM_Surname, HOM_Contact, MALL_ID)
VALUES ('HOM-005', 'Dirk', 'Van Der Westhuizen', '0214587741', '3-TMSC');
Script Output
Task completed in 0.217 seconds
Table HOM_67737900 created.
1 row inserted.
1 row inserted.
1 row inserted.
1 row inserted.
1 row inserted.
1 row inserted.

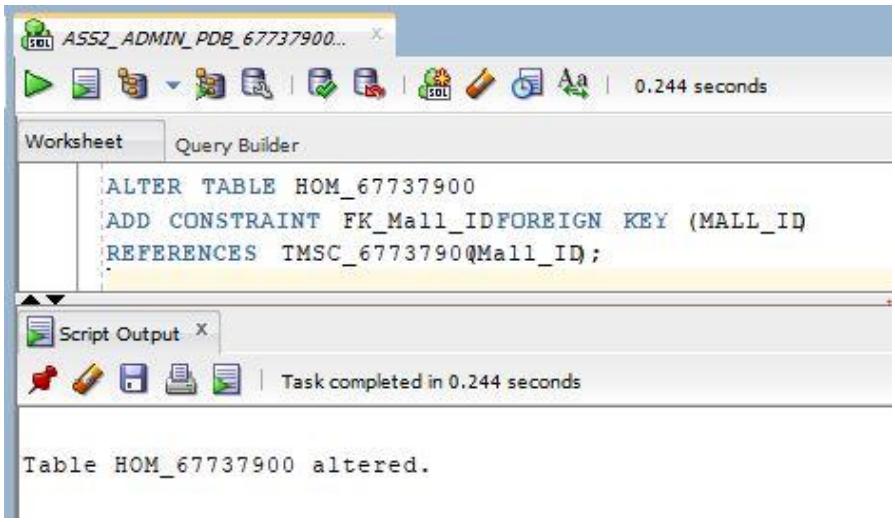
4.3.4.


ASS2_ADMIN_PDB_67737900...
0.14399999 seconds
Worksheet
Query Builder
CREATE TABLE TMSC_67737900(
Mall_ID VARCHAR (20),
Location VARCHAR (20),
CONSTRAINT PK_Mall_ID PRIMARY KEY (Mall_ID)
);
Script Output
Task completed in 0.144 seconds
Table HOM_67737900 created.
1 row inserted.
1 row inserted.
1 row inserted.
1 row inserted.
1 row inserted.
1 row inserted.
Error starting at line : 1 in command -
CREATE TABLE TMSC_67737900 (
Mall_ID VARCHAR(20) PRIMARY KEY,
Location VARCHAR(20),
CONSTRAINT PK_Mall_ID PRIMARY KEY (Mall_ID)
)
Error report -
ORA-02260: table can have only one primary key
02260. 00000 - "table can have only one primary key"
*Cause: Self-evident.
*Action: Remove the extra primary key.
Table TMSC_67737900 created.

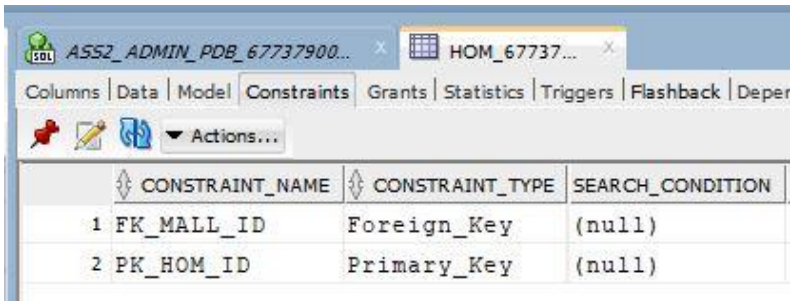
4.4.1.


ASS2_ADMIN_PDB_67737900...
0.117 seconds
Worksheet
Query Builder
INSERT INTO TMSC_67737900(Mall_ID, Location)
VALUES ('1-TMSC', 'Cape Town CBD');
INSERT INTO TMSC_67737900(Mall_ID, Location)
VALUES ('2-TMSC', 'Bellville');
INSERT INTO TMSC_67737900(Mall_ID, Location)
VALUES ('3-TMSC', 'Muizenberg');
Script Output
Task completed in 0.117 seconds
Error starting at line : 1 in command -
INSERT INTO TMSC_67737900 (Mall_ID, Location)
VALUES
('1-TMSC', 'Cape Town CBD'),
('2-TMSC', 'Bellville'),
('3-TMSC', 'Muizenberg')
Error at Command Line : 3 Column : 32
Error report -
SQL Error: ORA-00933: SQL command not properly ended
00933. 00000 - "SQL command not properly ended"
*Cause:
*Action:
Error starting at line : 1 in command -
INSERT INTO TMSC_67737900 (Mall_ID, Location)
VALUES('1-TMSC', 'Cape Town CBD')
INSERT INTO TMSC_67737900 (Mall_ID, Location)
VALUES('2-TMSC', 'Bellville')
INSERT INTO TMSC_67737900 (Mall_ID, Location)
VALUES('3-TMSC', 'Muizenberg')
Error at Command Line : 3 Column : 8
Error report -
SQL Error: ORA-00933: SQL command not properly ended
00933. 00000 - "SQL command not properly ended"
*Cause:
*Action:
1 row inserted.
1 row inserted.
1 row inserted.

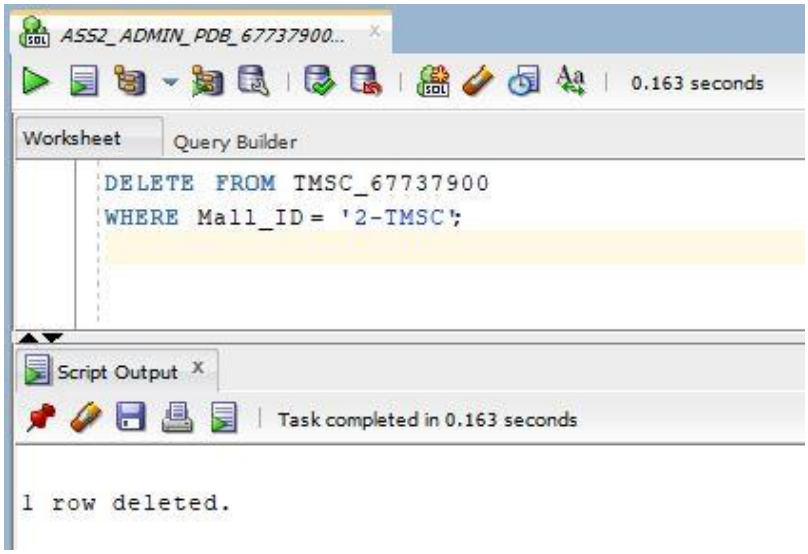
4.5.1


ASS2_ADMIN_PDB_67737900...
0.244 seconds
Worksheet
Query Builder
ALTER TABLE HOM_67737900
ADD CONSTRAINT FK_Mall_IDFOREIGN KEY (MALL_ID)
REFERENCES TMSC_6773790(Mall_ID);
Script Output
Task completed in 0.244 seconds
Table HOM_67737900 altered.

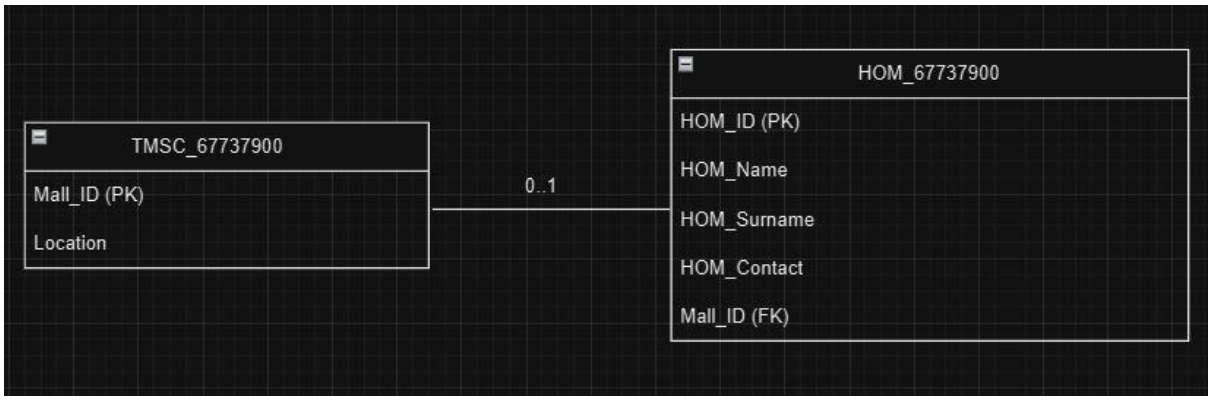
4.6.1.


ASS2_ADMIN_PDB_67737900...
HOM_67737...
Columns
Data
Model
Constraints
Grants
Statistics
Triggers
Flashback
Actions...
CONSTRAINT_NAME
CONSTRAINT_TYPE
SEARCH_CONDITION
1 FK_MALL_ID Foreign_Key (null)
2 PK_HOM_ID Primary_Key (null)

4.7.1.


ASS2_ADMIN_PDB_67737900...
0.163 seconds
Worksheet
Query Builder
DELETE FROM TMSC_67737900
WHERE Mall_ID = '2-TMSC';
Script Output
Task completed in 0.163 seconds
1 row deleted.

4.8.


TMSC_67737900
Mall_ID (PK)
Location
0..1
HOM_67737900
HOM_ID (PK)
HOM_Name
HOM_Surname
HOM_Contact
Mall_ID (FK)