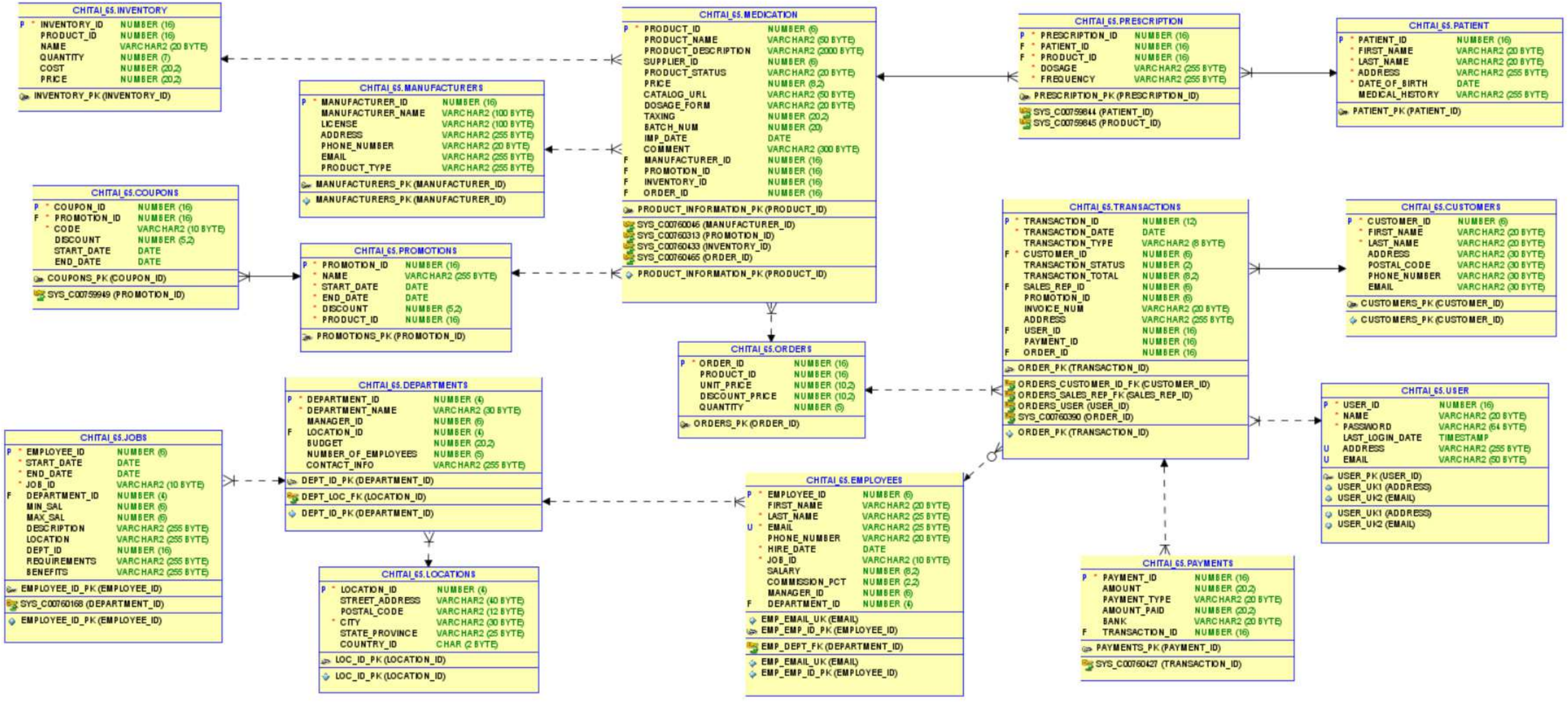

CHITAI_65.INVENTORY
P * INVENTORY_ID NUMBER (16)
PRODUCT_ID NUMBER (16)
NAME VARCHAR2 (20 BYTE)
QUANTITY NUMBER (7)
COST NUMBER (20,2)
PRICE NUMBER (20,2)
INVENTORY_PK (INVENTORY_ID)
CHITAI_65.MEDICATION
P * PRODUCT_ID NUMBER (6)
PRODUCT_NAME VARCHAR2 (50 BYTE)
PRODUCT_DESCRIPTION VARCHAR2 (2000 BYTE)
SUPPLIER_ID NUMBER (6)
PRODUCT_STATUS VARCHAR2 (20 BYTE)
PRICE NUMBER (8,2)
CATALOG_URL VARCHAR2 (50 BYTE)
DOSAGE_FORM VARCHAR2 (20 BYTE)
TAXING NUMBER (20,2)
BATCH_NUM NUMBER (20)
IMP_DATE DATE
COMMENT VARCHAR2 (300 BYTE)
F MANUFACTURER_ID NUMBER (16)
F PROMOTION_ID NUMBER (16)
F INVENTORY_ID NUMBER (16)
F ORDER_ID NUMBER (16)
PRODUCT_INFORMATION_PK (PRODUCT_ID)
SYS_C00760046 (MANUFACTURER_ID)
SYS_C00760313 (PROMOTION_ID)
SYS_C00760433 (INVENTORY_ID)
SYS_C00760465 (ORDER_ID)
PRODUCT_INFORMATION_PK (PRODUCT_ID)
CHITAI_65.PRESCRIPTION
P * PRESCRIPTION_ID NUMBER (16)
F * PATIENT_ID NUMBER (16)
F * PRODUCT_ID NUMBER (16)
* DOSAGE VARCHAR2 (255 BYTE)
* FREQUENCY VARCHAR2 (255 BYTE)
PRESCRIPTION_PK (PRESCRIPTION_ID)
SYS_C00759844 (PATIENT_ID)
SYS_C00759845 (PRODUCT_ID)
CHITAI_65.PATIENT
P * PATIENT_ID NUMBER (16)
* FIRST_NAME VARCHAR2 (20 BYTE)
* LAST_NAME VARCHAR2 (20 BYTE)
* ADDRESS VARCHAR2 (255 BYTE)
* DATE_OF_BIRTH DATE
MEDICAL_HISTORY VARCHAR2 (255 BYTE)
PATIENT_PK (PATIENT_ID)
CHITAI_65.MANUFACTURERS
P * MANUFACTURER_ID NUMBER (16)
MANUFACTURER_NAME VARCHAR2 (100 BYTE)
LICENSE VARCHAR2 (100 BYTE)
ADDRESS VARCHAR2 (255 BYTE)
PHONE_NUMBER VARCHAR2 (20 BYTE)
EMAIL VARCHAR2 (255 BYTE)
PRODUCT_TYPE VARCHAR2 (255 BYTE)
MANUFACTURERS_PK (MANUFACTURER_ID)
MANUFACTURERS_PK (MANUFACTURER_ID)
CHITAI_65.COUPONS
P * COUPON_ID NUMBER (16)
F * PROMOTION_ID NUMBER (16)
* CODE VARCHAR2 (10 BYTE)
DISCOUNT NUMBER (5,2)
START_DATE DATE
END_DATE DATE
COUPONS_PK (COUPON_ID)
SYS_C00759949 (PROMOTION_ID)
CHITAI_65.PROMOTIONS
P * PROMOTION_ID NUMBER (16)
* NAME VARCHAR2 (255 BYTE)
* START_DATE DATE
* END_DATE DATE
* DISCOUNT NUMBER (5,2)
* PRODUCT_ID NUMBER (16)
PROMOTIONS_PK (PROMOTION_ID)
CHITAI_65.ORDERS
P * ORDER_ID NUMBER (16)
PRODUCT_ID NUMBER (16)
UNIT_PRICE NUMBER (10,2)
DISCOUNT_PRICE NUMBER (10,2)
QUANTITY NUMBER (5)
ORDERS_PK (ORDER_ID)
CHITAI_65.TRANSACTIONS
P * TRANSACTION_ID NUMBER (12)
* TRANSACTION_DATE DATE
TRANSACTION_TYPE VARCHAR2 (8 BYTE)
F * CUSTOMER_ID NUMBER (6)
TRANSACTION_STATUS NUMBER (2)
TRANSACTION_TOTAL NUMBER (8,2)
F SALES_REP_ID NUMBER (6)
PROMOTION_ID NUMBER (6)
INVOICE_NUM VARCHAR2 (20 BYTE)
ADDRESS VARCHAR2 (255 BYTE)
F USER_ID NUMBER (16)
PAYMENT_ID NUMBER (16)
F ORDER_ID NUMBER (16)
ORDER_PK (TRANSACTION_ID)
ORDERS_CUSTOMER_ID_FK (CUSTOMER_ID)
ORDERS_SALES_REP_FK (SALES_REP_ID)
ORDERS_USER (USER_ID)
SYS_C00760390 (ORDER_ID)
ORDER_PK (TRANSACTION_ID)
CHITAI_65.CUSTOMERS
P * CUSTOMER_ID NUMBER (6)
* FIRST_NAME VARCHAR2 (20 BYTE)
* LAST_NAME VARCHAR2 (20 BYTE)
ADDRESS VARCHAR2 (30 BYTE)
POSTAL_CODE VARCHAR2 (30 BYTE)
PHONE_NUMBER VARCHAR2 (30 BYTE)
EMAIL VARCHAR2 (30 BYTE)
CUSTOMERS_PK (CUSTOMER_ID)
CUSTOMERS_PK (CUSTOMER_ID)
CHITAI_65.DEPARTMENTS
P * DEPARTMENT_ID NUMBER (4)
* DEPARTMENT_NAME VARCHAR2 (30 BYTE)
MANAGER_ID NUMBER (6)
F LOCATION_ID NUMBER (4)
BUDGET NUMBER (20,2)
NUMBER_OF_EMPLOYEES NUMBER (5)
CONTACT_INFO VARCHAR2 (255 BYTE)
DEPT_ID_PK (DEPARTMENT_ID)
DEPT_LOC_FK (LOCATION_ID)
DEPT_ID_PK (DEPARTMENT_ID)
CHITAI_65.USER
P * USER_ID NUMBER (16)
* NAME VARCHAR2 (20 BYTE)
* PASSWORD VARCHAR2 (64 BYTE)
LAST_LOGIN_DATE TIMESTAMP
U ADDRESS VARCHAR2 (255 BYTE)
U EMAIL VARCHAR2 (50 BYTE)
USER_PK (USER_ID)
USER_UK1 (ADDRESS)
USER_UK2 (EMAIL)
USER_UK1 (ADDRESS)
USER_UK2 (EMAIL)
CHITAI_65.JOBS
P * EMPLOYEE_ID NUMBER (6)
* START_DATE DATE
* END_DATE DATE
* JOB_ID VARCHAR2 (10 BYTE)
F DEPARTMENT_ID NUMBER (4)
MIN_SAL NUMBER (6)
MAX_SAL NUMBER (6)
DESCRIPTION VARCHAR2 (255 BYTE)
LOCATION VARCHAR2 (255 BYTE)
DEPT_ID NUMBER (16)
REQUIREMENTS VARCHAR2 (255 BYTE)
BENEFITS VARCHAR2 (255 BYTE)
EMPLOYEE_ID_PK (EMPLOYEE_ID)
SYS_C00760168 (DEPARTMENT_ID)
EMPLOYEE_ID_PK (EMPLOYEE_ID)
CHITAI_65.EMPLOYEES
P * EMPLOYEE_ID NUMBER (6)
FIRST_NAME VARCHAR2 (20 BYTE)
* LAST_NAME VARCHAR2 (25 BYTE)
U * EMAIL VARCHAR2 (25 BYTE)
PHONE_NUMBER VARCHAR2 (20 BYTE)
* HIRE_DATE DATE
* JOB_ID VARCHAR2 (10 BYTE)
SALARY NUMBER (8,2)
COMMISSION_PCT NUMBER (2,2)
MANAGER_ID NUMBER (6)
F DEPARTMENT_ID NUMBER (4)
EMP_EMAIL_UK (EMAIL)
EMP_EMP_ID_PK (EMPLOYEE_ID)
EMP_DEPT_FK (DEPARTMENT_ID)
EMP_EMAIL_UK (EMAIL)
EMP_EMP_ID_PK (EMPLOYEE_ID)
CHITAI_65.LOCATIONS
P * LOCATION_ID NUMBER (4)
STREET_ADDRESS VARCHAR2 (40 BYTE)
POSTAL_CODE VARCHAR2 (12 BYTE)
* CITY VARCHAR2 (30 BYTE)
STATE_PROVINCE VARCHAR2 (25 BYTE)
COUNTRY_ID CHAR (2 BYTE)
LOC_ID_PK (LOCATION_ID)
LOC_ID_PK (LOCATION_ID)
CHITAI_65.PAYMENTS
P * PAYMENT_ID NUMBER (16)
AMOUNT NUMBER (20,2)
PAYMENT_TYPE VARCHAR2 (20 BYTE)
AMOUNT_PAID NUMBER (20,2)
BANK VARCHAR2 (20 BYTE)
F TRANSACTION_ID NUMBER (16)
PAYMENTS_PK (PAYMENT_ID)
SYS_C00760427 (TRANSACTION_ID)

Database Project

Pharmacy

This database is designed to track and manage various economic aspects of the pharmacy's operations, including customer information, medication inventory, employee information, and financial transactions. Let’s take a loot at some of the more important tables.

The `Medication` table stores detailed information about the pharmacy's medications, including the name, dosage, and instructions for use. This information is used to accurately fill prescriptions and track medication inventory.

The `Prescriptions` table stores information about prescriptions written by doctors and filled by the pharmacy, including the patient's name and medical history, the medication prescribed, and the dosage. This information is used to track the prescriptions filled by the pharmacy and ensure that patients receive the correct medication.

The pharmacy has a coupon system in place to offer discounts to customers. The `Coupons` table stores information about the available coupons, including the discount amount or expiration dates. The `Promotions` table stores information about current promotions, including the products or services being promoted and any applicable discounts.

The `Employees` and `Departments` tables store information about the pharmacy's employees and departments, respectively. This information is used for employee management and to track the performance of different departments.

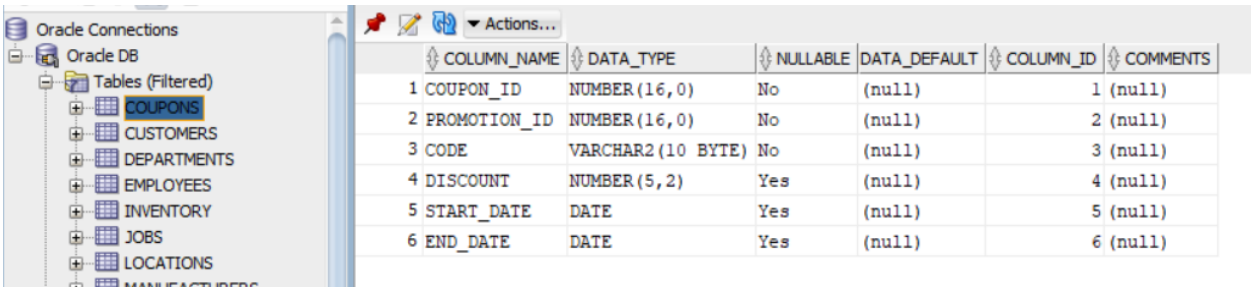
The `Payments` and `Orders` tables store information about payment methods and orders placed by customers, respectively. This information is used to process payments and track customer orders. The `Transactions` table stores information about completed transactions, including the payment method and the total cost of the transaction.

Overall, the pharmacy database is an important tool for managing the economic aspects of the pharmacy's operations and ensuring the smooth and efficient running of the business.

Let’s first take a loot at the database as a whole, after which we can see how all of this was accomplished.

Constructing the database: How it all came to be

When I first created the table most of it was done in a hurry, and I didn't think all the data through, of course the tables that I ended up with were very superficial, let me show some examples on how those tables would have looked like:



	COLUMN_NAME	DATA_TYPE	NULLABLE	DATA_DEFAULT	COLUMN_ID	COMMENTS
1	COUPON_ID	NUMBER(16,0)	No	(null)	1	(null)
2	PROMOTION_ID	NUMBER(16,0)	No	(null)	2	(null)
3	CODE	VARCHAR2(10 BYTE)	No	(null)	3	(null)
4	DISCOUNT	NUMBER(5,2)	Yes	(null)	4	(null)
5	START_DATE	DATE	Yes	(null)	5	(null)
6	END_DATE	DATE	Yes	(null)	6	(null)

The "coupons" table was done poorly, I created it using this command:

```
CREATE TABLE Coupons (
    coupon_id number(16) PRIMARY KEY,
    promotion_id number(16) NOT NULL,
    code varchar2(10) NOT NULL,
    FOREIGN KEY (promotion_id) REFERENCES Promotions(promotion_id)
);

After realizing that my first table was a bit too slim I decided on adding a
few more important things to it.

ALTER TABLE Coupons
ADD (discount NUMBER(5,2),
     start_date date,
     end_date date);

I also created a few more tables like "transactions" and modified the default
"departments" table adding a few more things like, the budget, number of
employees and contact info

CREATE TABLE Transactions (
    transaction_id number(16) PRIMARY KEY,
    employee_id number(16) NOT NULL,
    patient_id number(16) NOT NULL,
    prescription_id number(16) NOT NULL,
    date_of_transaction date NOT NULL,
    FOREIGN KEY (employee_id) REFERENCES Employee(employee_id),
    FOREIGN KEY (patient_id) REFERENCES Patient(patient_id),
    FOREIGN KEY (prescription_id) REFERENCES Prescription(prescription_id)
);

ALTER TABLE Departments
ADD (budget NUMBER(20,2),
     number_of_employees NUMBER(5),
     contact_info VARCHAR2(255));
```

5	BUDGET	NUMBER(20,2)	Yes	(null)	5	(null)
6	NUMBER_OF_EMPLOYEES	NUMBER(5,0)	Yes	(null)	6	(null)
7	CONTACT_INFO	VARCHAR2(255 BYTE)	Yes	(null)	7	(null)

After all of that I realized that one of my tables became obsolete, since it was mostly a duplicate of the "Transactions" table so I decided to drop it using the "Drop table" command, unfortunately, I forgot the name of the table, but I remember that it was something related to the orders, its only purpose was being a "link table" in order to avoid a many-to-many relationship between the "payments" and "orders" tables, something that the new "transactions" table does much better.

Dropping the table was easily accomplished by:

```
DROP TABLE name_of_the_table_that_i_forgot;
```

I also created other tables without much problems and added things that I may have forgotten, like some foreign keys:

```
CREATE TABLE Patient (
    patient_id number(16) PRIMARY KEY,
    first_name varchar2(255) NOT NULL,
    last_name varchar2(255) NOT NULL,
    address varchar2(255) NOT NULL,
    date_of_birth date NOT NULL,
    medical_history TEXT
);

CREATE TABLE Prescription (
    prescription_id number(16) PRIMARY KEY,
    patient_id number(16) NOT NULL,
    medication_id number(16) NOT NULL,
    dosage varchar2(255) NOT NULL,
    frequency varchar2(255) NOT NULL,
    FOREIGN KEY (patient_id) REFERENCES Patient(patient_id),
    FOREIGN KEY (medication_id) REFERENCES Medication(medication_id)
);

ALTER TABLE Jobs
ADD FOREIGN KEY (department_id) REFERENCES Departments(department_id);

ALTER TABLE Medication
ADD (manufacturer_id number(16),
     FOREIGN KEY (manufacturer_id) REFERENCES
Manufacturers(manufacturer_id));
```

All of these commands worked flawlessly, but I unfortunately forgot to take screenshots when I first ran them, running them now on my database will most likely cause problems, but since all of the modifications are present in the database schema there's no doubt that they work.

Oracle DB | PATIENT

Columns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback | Dependencies | Details | Partitions | Indexes | SQL

Actions...

	COLUMN_NAME	DATA_TYPE	NULLABLE	DATA_DEFAULT	COLUMN_ID	COMMENTS
1	PATIENT_ID	NUMBER(16,0)	No	(null)	1	(null)
2	FIRST_NAME	VARCHAR2(20 BYTE)	No	(null)	2	(null)
3	LAST_NAME	VARCHAR2(20 BYTE)	No	(null)	3	(null)
4	ADDRESS	VARCHAR2(255 BYTE)	No	(null)	4	(null)
5	DATE_OF_BIRTH	DATE	No	(null)	5	(null)
6	MEDICAL_HISTORY	VARCHAR2(255 BYTE)	Yes	(null)	6	(null)

Oracle DB | PRESCRIPTION

Columns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback | Dependencies | Details | Partitions | Indexes | SQL

Actions...

	COLUMN_NAME	DATA_TYPE	NULLABLE	DATA_DEFAULT	COLUMN_ID	COMMENTS
1	PRESCRIPTION_ID	NUMBER(16,0)	No	(null)	1	(null)
2	PATIENT_ID	NUMBER(16,0)	No	(null)	2	(null)
3	PRODUCT_ID	NUMBER(16,0)	No	(null)	3	(null)
4	DOSAGE	VARCHAR2(255 BYTE)	No	(null)	4	(null)
5	FREQUENCY	VARCHAR2(255 BYTE)	No	(null)	5	(null)

Oracle DB | JOBS

Columns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback | Dependencies | Details | Partitions | Indexes | SQL

Actions...

	CONSTRAINT_NAME	CONSTRAINT_TYPE	SEARCH_CONDITION	R_OWNER	R_TABLE_NAME	R_CONSTRAINT_NAME	DELETE_RULE	STATUS	
1	EMPLOYEE_ID_PK	Primary_Key	(null)	(null)	(null)	(null)	(null)	ENABLED	N
2	SYS_C00760157	Check	"EMPLOYEE_ID" IS NOT NULL	(null)	(null)	(null)	(null)	ENABLED	N
3	SYS_C00760158	Check	"START_DATE" IS NOT NULL	(null)	(null)	(null)	(null)	ENABLED	N
4	SYS_C00760159	Check	"END_DATE" IS NOT NULL	(null)	(null)	(null)	(null)	ENABLED	N
5	SYS_C00760160	Check	"JOB_ID" IS NOT NULL	(null)	(null)	(null)	(null)	ENABLED	N
6	SYS_C00760168	Foreign_Key	(null)	CHITAI_65	DEPARTMENTS	DEPT_ID_PK	NO ACTION	ENABLED	N

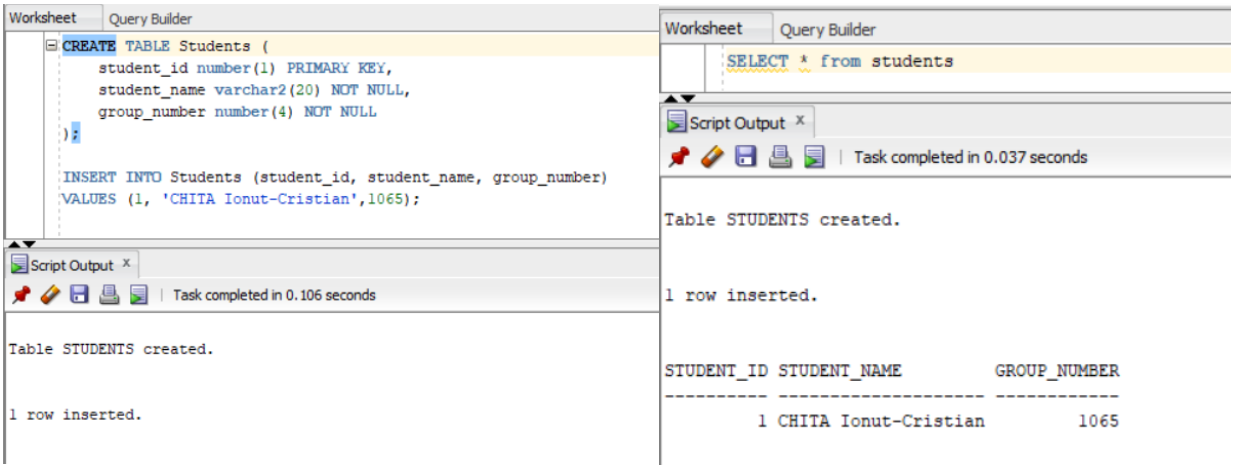
Oracle DB | MEDICATION

Columns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback | Dependencies | Details | Partitions | Indexes | SQL

Actions...

	R_OWNER	R_TABLE_NAME	R_CONSTRAINT_NAME	DELETE_RULE	STATUS	DEFERRABLE	VALIDATED	GENERATED	
1	(null)	(null)	(null)	(null)	ENABLED	NOT DEFERRABLE	VALIDATED	USER NAME	
2	(null)	(null)	(null)	(null)	ENABLED	NOT DEFERRABLE	VALIDATED	USER NAME	
3	CHITAI_65	MANUFACTURERS	MANUFACTURERS_PK	NO ACTION	ENABLED	NOT DEFERRABLE	VALIDATED	GENERATED NAME	
4	CHITAI_65	PROMOTIONS	SYS_C00759944	NO ACTION	ENABLED	NOT DEFERRABLE	VALIDATED	GENERATED NAME	
5	CHITAI_65	INVENTORY	SYS_C00675205	NO ACTION	ENABLED	NOT DEFERRABLE	VALIDATED	GENERATED NAME	
6	CHITAI_65	ORDERS	SYS_C00760382	NO ACTION	ENABLED	NOT DEFERRABLE	VALIDATED	GENERATED NAME	
7	(null)	(null)	(null)	(null)	ENABLED	NOT DEFERRABLE	VALIDATED	USER NAME	

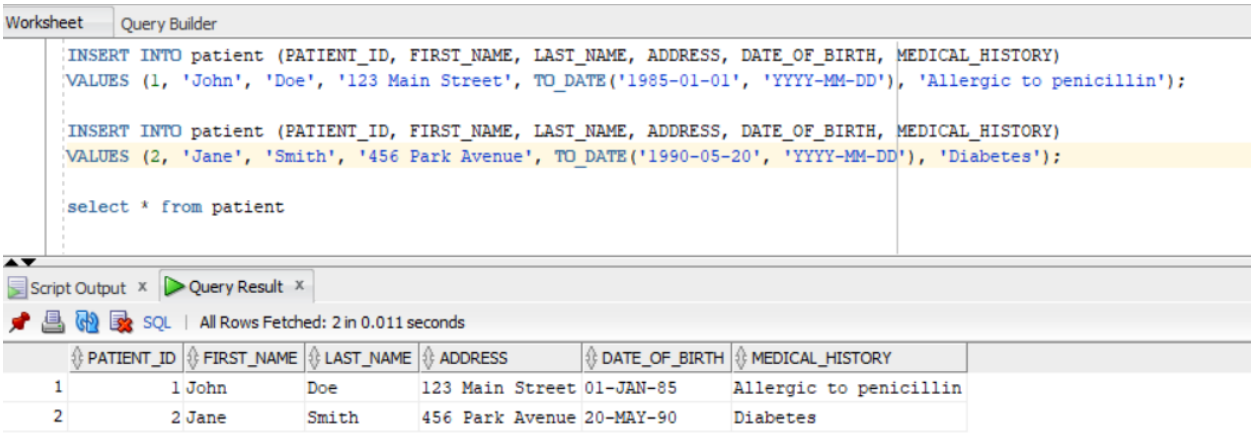
Using DML Elements: Now that we created most of the tables, we also have to put it to use, first I'll create a table called Students, in which I'll insert my name using this command:



It worked! Let's play around some more, next let's insert some data into the "Patients" table:

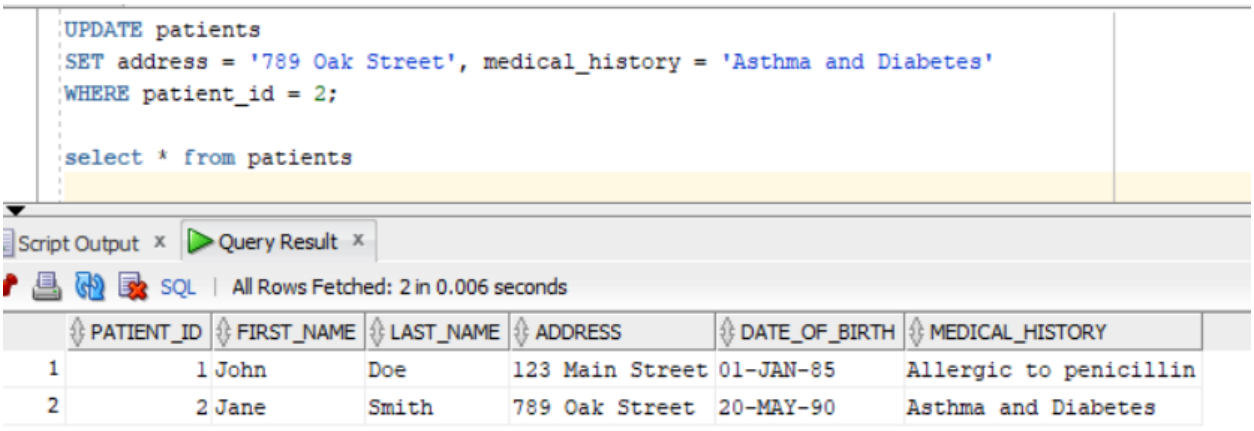
```
INSERT INTO patients (PATIENT_ID, FIRST_NAME, LAST_NAME, ADDRESS,
DATE_OF_BIRTH, MEDICAL_HISTORY)
VALUES (1, 'John', 'Doe', '123 Main Street', TO_DATE('1985-01-01', 'YYYY-MM-
DD'), 'Allergic to penicillin');

INSERT INTO patients (PATIENT_ID, FIRST_NAME, LAST_NAME, ADDRESS,
DATE_OF_BIRTH, MEDICAL_HISTORY)
VALUES (2, 'Jane', 'Smith', '456 Park Avenue', TO_DATE('1990-05-20', 'YYYY-
MM-DD'), 'Diabetes');
```

Note: I'm using the "to date" function because in Oracle, the default date format is `DD-MON-YY`. This let's me change it to whatever date format I wish.



Now, let's say that one of our patients moved out and discovered that they have other ailments too, let's change that too, we'll use the UPDATE statement:

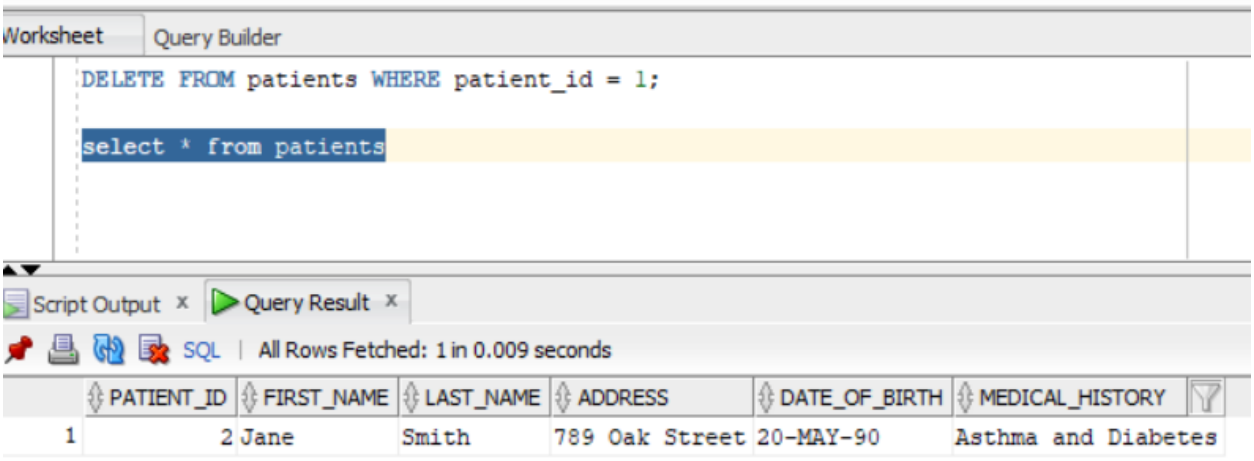
```
UPDATE patients
SET address = '789 Oak Street', medical_history = 'Asthma and Diabetes'
WHERE patient_id = 2;
```



Let's say that one of our patients chose another pharmacy (very unlikely), how would we delete their records ? For this we have the "DELETE" statement, let's try it:

DELETE FROM patients WHERE patient_id = 1;

This will delete the patient with the id = 1, in our case, Mr. John Doe.



We have quite a lot of data on the employees by default, let's play around with that shall we ? We also have quite a few jobs by default, all jobs have a minimum salary and a maximum salary, each job has it's own id, let's give them all a raise using the "MERGE" statement

Oracle DB | JOBS

Columns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback | Dependencies | Details | Partitions | Indexes | SQL

Sort.. | Filter:

	EMPLOYEE_ID	START_DATE	END_DATE	JOB_ID	DEPARTMENT_ID	MIN_SAL	MAX_SAL	DESCRIPTION	LOCATION	DEPT_ID	REQUIREMENTS	BENEFITS
1	101	21-SEP-89	27-OCT-93	AC_ACCOUNT	110	4200	9000	(null)	(null)	(null)	(null)	(null)
2	200	01-JUL-94	31-DEC-98	AC_ACCOUNT	90	4200	9000	(null)	(null)	(null)	(null)	(null)
3	102	13-JAN-93	24-JUL-98	IT_PROG	60	4000	10000	(null)	(null)	(null)	(null)	(null)
4	201	17-FEB-96	19-DEC-99	MK_REP	20	4000	9000	(null)	(null)	(null)	(null)	(null)
5	176	24-MAR-98	31-DEC-98	SA_REP	80	6000	12000	(null)	(null)	(null)	(null)	(null)
6	122	01-JAN-99	31-DEC-99	ST_CLERK	50	2000	5000	(null)	(null)	(null)	(null)	(null)
7	114	24-MAR-98	31-DEC-99	ST_CLERK	50	2000	5000	(null)	(null)	(null)	(null)	(null)

In order to do that we'll have to merge the salaries into the employees table, we can accomplish that by using:

```
MERGE INTO employees e
USING jobs j
ON (e.job_id = j.job_id)
WHEN MATCHED THEN
  UPDATE SET e.salary = j.max_salary
```

This will update the salary of all the rows in the employees table with the corresponding max_salary value from the jobs table. Before running it, let's first take a look at our employees table and look at their salaries:

	EMPLOYEE_ID	FIRST_NAME	LAST_NAME	EMAIL	PHONE_NUMBER	HIRE_DATE	JOB_ID	SALARY	COMMISSION_PCT	MANAGER_ID	DEPARTMENT_ID
77	176	Jonathon	Taylor	JTAYLOR	011.44.1644.429265	24-MAR-98	SA_REP	8600	0.2	149	80
78	177	Jack	Livingston	JLIVINGS	011.44.1644.429264	23-APR-98	SA_REP	8400	0.2	149	80
79	178	Kimberely	Grant	KGRANT	011.44.1644.429263	24-MAY-99	SA_REP	7000	0.15	149	(null)
80	179	Charles	Johnson	CJOHNSON	011.44.1644.429262	04-JAN-00	SA_REP	6200	0.1	149	80
81	180	Winston	Taylor	WTAYLOR	650.507.9876	24-JAN-98	SH_CLERK	3200	(null)	120	50
82	181	Jean	Fleaur	JFLEAUR	650.507.9877	23-FEB-98	SH_CLERK	3100	(null)	120	50
83	182	Martha	Sullivan	MSULLIVA	650.507.9878	21-JUN-99	SH_CLERK	2500	(null)	120	50
84	183	Girard	Geoni	GGEONI	650.507.9879	03-FEB-00	SH_CLERK	2800	(null)	120	50
85	184	Nandita	Sarchand	NSARCHAN	650.509.1876	27-JAN-96	SH_CLERK	4200	(null)	121	50
86	185	Alexis	Bull	ABULL	650.509.2876	20-FEB-97	SH_CLERK	4100	(null)	121	50
87	186	Julia	Dellinger	JDELLING	650.509.3876	24-JUN-98	SH_CLERK	3400	(null)	121	50
88	187	Anthony	Cabrio	ACABRIO	650.509.4876	07-FEB-99	SH_CLERK	3000	(null)	121	50
89	188	Kelly	Chung	KCHUNG	650.505.1876	14-JUN-97	SH_CLERK	3800	(null)	122	50
90	189	Jennifer	Dilly	JDILLY	650.505.2876	13-AUG-97	SH_CLERK	3600	(null)	122	50
91	190	Timothy	Gates	TGATES	650.505.3876	11-JUL-98	SH_CLERK	2900	(null)	122	50
92	191	Randall	Perkins	RPERKINS	650.505.4876	19-DEC-99	SH_CLERK	2500	(null)	122	50
93	192	Sarah	Bell	SBELL	650.501.1876	04-FEB-96	SH_CLERK	4000	(null)	123	50
94	193	Britney	Everett	BEVERETT	650.501.2876	03-MAR-97	SH_CLERK	3900	(null)	123	50
95	194	Samuel	McCain	SMCCAIN	650.501.3876	01-JUL-98	SH_CLERK	3200	(null)	123	50
96	195	Vance	Jones	VJONES	650.501.4876	17-MAR-99	SH_CLERK	2800	(null)	123	50
97	196	Alana	Walsh	AWALSH	650.507.9811	24-APR-98	SH_CLERK	3100	(null)	124	50
98	197	Kevin	Feeney	KFEENEY	650.507.9822	23-MAY-98	SH_CLERK	3000	(null)	124	50
99	198	Donald	OConnell	DOCONNEL	650.507.9833	21-JUN-99	SH_CLERK	2600	(null)	124	50
100	199	Douglas	Grant	DGRANT	650.507.9844	13-JAN-00	SH_CLERK	2600	(null)	124	50
101	200	Jennifer	Whalen	JWHALEN	515.123.4444	17-SEP-87	AD_ASST	4400	(null)	101	10
102	201	Michael	Hartstein	MHARTSTE	515.123.5555	17-FEB-96	MK_MAN	13000	(null)	100	20
103	202	Pat	Fay	PFAY	603.123.6666	17-AUG-97	MK_REP	6000	(null)	201	20
104	203	Susan	Mavris	SMAVRIS	515.123.7777	07-JUN-94	HR_REP	6500	(null)	101	40
105	204	Hermann	Baer	HBAER	515.123.8888	07-JUN-94	PR_REP	10000	(null)	101	70
106	205	Shelley	Higgins	SHIGGINS	515.123.8080	07-JUN-94	AC_MGR	12000	(null)	101	110
107	206	William	Gietz	WGIETZ	515.123.8181	07-JUN-94	AC_ACCOUNT	8300	(null)	205	110

These are some of the lucky guys that will get a raise, Lets run it and see what happens

```
Error report -
ORA-30926: unable to get a stable set of rows in the source tables
```

Looks like it didn't work, this happens because the `MERGE` statement returns multiple rows for a single row in the target table. To fix this error, we need to ensure that we have a `USING` clause that returns at most one row for each row in the target table

```
MERGE INTO employees e
USING (SELECT j.max_salary FROM jobs j WHERE j.job_id = e.job_id) s
ON (1=1)
WHEN MATCHED THEN
  UPDATE SET e.salary = s.max_salary
```

As you can see, this time around it worked:

	EMPLOYEE_ID	FIRST_NAME	LAST_NAME	EMAIL	PHONE_NUMBER	HIRE_DATE	JOB_ID	SALARY	COMMISSION_PCT	MANAGER_ID	DEPARTMENT_ID
77	176	Jonathon	Taylor	JTAYLOR	011.44.1644.429265	24-MAR-98	SA_REP	12000	0.2	149	80
78	177	Jack	Livingston	JLIVINGS	011.44.1644.429264	23-APR-98	SA_REP	12000	0.2	149	80
79	178	Kimberely	Grant	KGRANT	011.44.1644.429263	24-MAY-99	SA_REP	12000	0.15	149	(null)
80	179	Charles	Johnson	CJOHNSON	011.44.1644.429262	04-JAN-00	SA_REP	12000	0.1	149	80
81	180	Winston	Taylor	WTAYLOR	650.507.9876	24-JAN-98	SH_CLERK	3200	(null)	120	50
82	181	Jean	Fleaur	JFLEAUR	650.507.9877	23-FEB-98	SH_CLERK	3100	(null)	120	50
83	182	Martha	Sullivan	MSULLIVA	650.507.9878	21-JUN-99	SH_CLERK	2500	(null)	120	50
84	183	Girard	Geoni	GGEONI	650.507.9879	03-FEB-00	SH_CLERK	2800	(null)	120	50
85	184	Nandita	Sarchand	NSARCHAN	650.509.1876	27-JAN-96	SH_CLERK	4200	(null)	121	50
86	185	Alexis	Bull	ABULL	650.509.2876	20-FEB-97	SH_CLERK	4100	(null)	121	50
87	186	Julia	Dellinger	JDELLING	650.509.3876	24-JUN-98	SH_CLERK	3400	(null)	121	50
88	187	Anthony	Cabrio	ACABRIO	650.509.4876	07-FEB-99	SH_CLERK	3000	(null)	121	50
89	188	Kelly	Chung	KCHUNG	650.505.1876	14-JUN-97	SH_CLERK	3800	(null)	122	50
90	189	Jennifer	Dilly	JDILLY	650.505.2876	13-AUG-97	SH_CLERK	3600	(null)	122	50
91	190	Timothy	Gates	TGATES	650.505.3876	11-JUL-98	SH_CLERK	2900	(null)	122	50
92	191	Randall	Perkins	RPERKINS	650.505.4876	19-DEC-99	SH_CLERK	2500	(null)	122	50
93	192	Sarah	Bell	SBELL	650.501.1876	04-FEB-96	SH_CLERK	4000	(null)	123	50
94	193	Britney	Everett	BEVERETT	650.501.2876	03-MAR-97	SH_CLERK	3900	(null)	123	50
95	194	Samuel	McCain	SMCCAIN	650.501.3876	01-JUL-98	SH_CLERK	3200	(null)	123	50
96	195	Vance	Jones	VJONES	650.501.4876	17-MAR-99	SH_CLERK	2800	(null)	123	50
97	196	Alana	Walsh	AWALSH	650.507.9811	24-APR-98	SH_CLERK	3100	(null)	124	50
98	197	Kevin	Feeney	KFEENEY	650.507.9822	23-MAY-98	SH_CLERK	3000	(null)	124	50
99	198	Donald	OConnell	DOCONNEL	650.507.9833	21-JUN-99	SH_CLERK	2600	(null)	124	50
100	199	Douglas	Grant	DGRANT	650.507.9844	13-JAN-00	SH_CLERK	2600	(null)	124	50
101	200	Jennifer	Whalen	JWHALEN	515.123.4444	17-SEP-87	AD_ASST	4400	(null)	101	10
102	201	Michael	Hartstein	MHARTSTE	515.123.5555	17-FEB-96	MK_MAN	13000	(null)	100	20
103	202	Pat	Fay	PFAY	603.123.6666	17-AUG-97	MK_REP	9000	(null)	201	20
104	203	Susan	Mavris	SMAVRIS	515.123.7777	07-JUN-94	HR_REP	6500	(null)	101	40
105	204	Hermann	Baer	HBAER	515.123.8888	07-JUN-94	PR_REP	10000	(null)	101	70
106	205	Shelley	Higgins	SHIGGINS	515.123.8080	07-JUN-94	AC_MGR	12000	(null)	101	110
107	206	William	Gietz	WGIETZ	515.123.8181	07-JUN-94	AC_ACCOUNT	8300	(null)	205	110

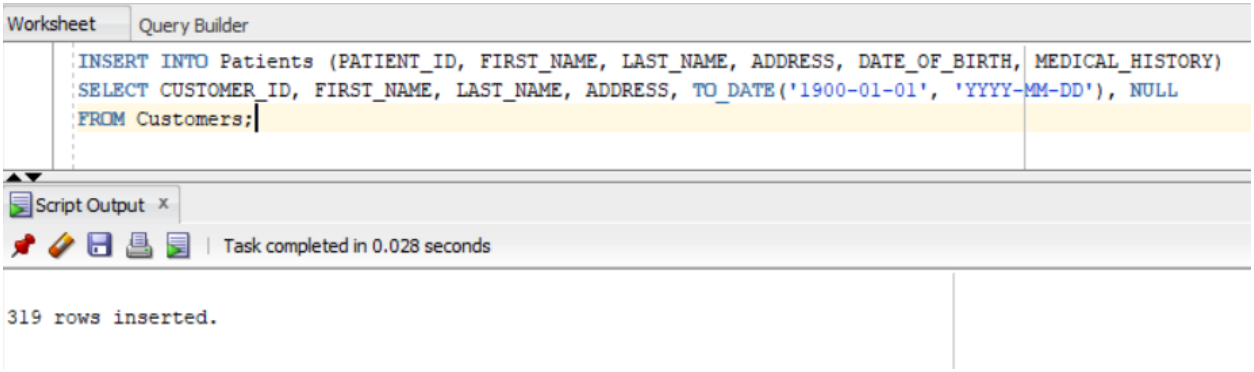
Now, let's also get some more patients, in order to get a bunch of people fast I'll get the data from the "customers" table and insert it into the "patients" table using this command:

```
INSERT INTO Patients (PATIENT_ID, FIRST_NAME, LAST_NAME, ADDRESS,
DATE_OF_BIRTH, MEDICAL_HISTORY)
SELECT CUSTOMER_ID, FIRST_NAME, LAST_NAME, ADDRESS, TO_DATE('1900-01-01',
'YYYY-MM-DD'), NULL
FROM Customers;
```

Note: the reason we use the "to date" function this time is because we first created the "Patients" table we set the date of birth as not null, which means that we have to provide a value, to circumvent that we can either use the "to date" function to set a default value that we can change later on. Alternatively, we can alter the table using:

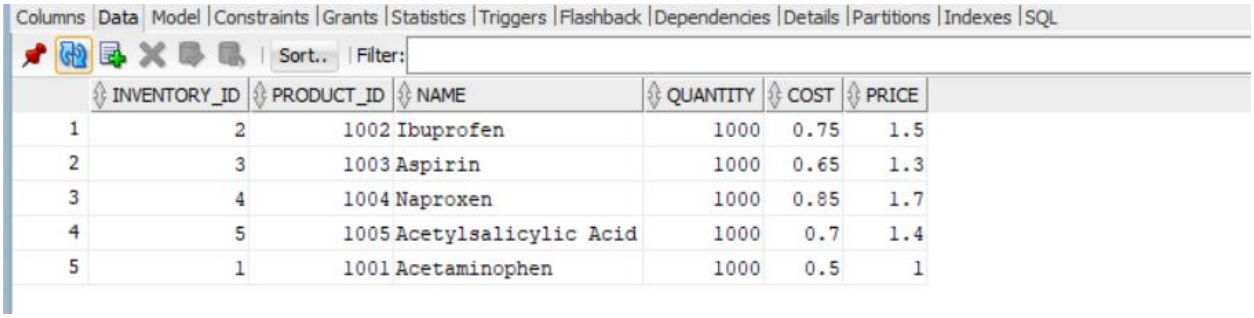
```
ALTER TABLE Patients MODIFY DATE_OF_BIRTH DATE NULL;
```

This removes the constraint and lets us input null data



As you can see, it was a success, now we have some more data to work with. Let's also insert some products into our inventory:

```
INSERT INTO Inventory (INVENTORY_ID, PRODUCT_ID, NAME, QUANTITY, COST, PRICE)
VALUES (2, 1002, 'Ibuprofen', 1000, 0.75, 1.50);

INSERT INTO Inventory (INVENTORY_ID, PRODUCT_ID, NAME, QUANTITY, COST, PRICE)
VALUES (3, 1003, 'Aspirin', 1000, 0.65, 1.30);

INSERT INTO Inventory (INVENTORY_ID, PRODUCT_ID, NAME, QUANTITY, COST, PRICE)
VALUES (4, 1004, 'Naproxen', 1000, 0.85, 1.70);

INSERT INTO Inventory (INVENTORY_ID, PRODUCT_ID, NAME, QUANTITY, COST, PRICE)
VALUES (5, 1005, 'Acetylsalicylic Acid', 1000, 0.70, 1.40);

INSERT INTO Inventory (INVENTORY_ID, PRODUCT_ID, NAME, QUANTITY, COST, PRICE)
VALUES (1, 1001, 'Acetaminophen', 1000, 0.50, 1.00);
```

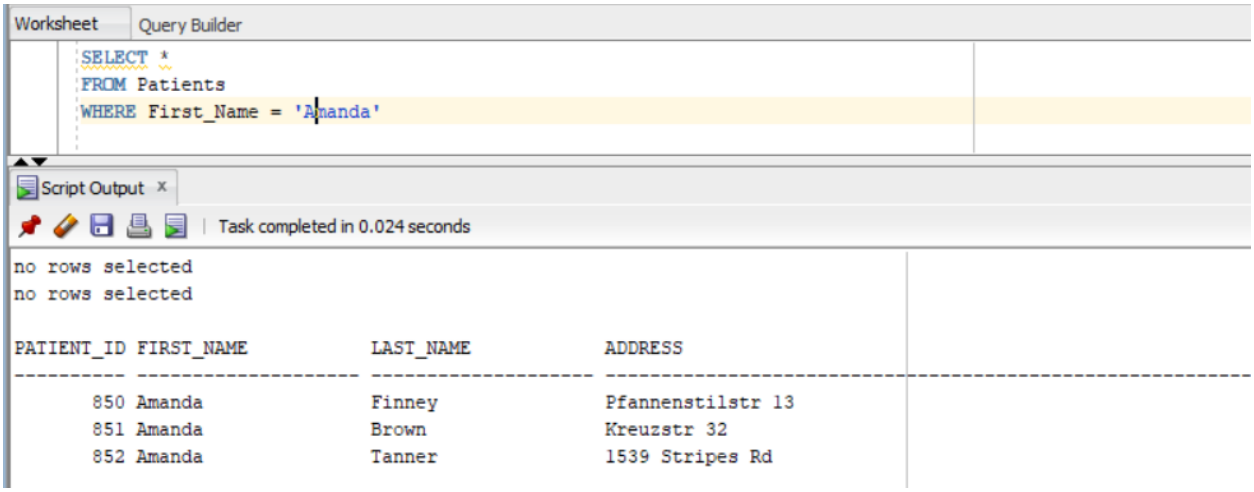


	INVENTORY_ID	PRODUCT_ID	NAME	QUANTITY	COST	PRICE
1	2	1002	Ibuprofen	1000	0.75	1.5
2	3	1003	Aspirin	1000	0.65	1.3
3	4	1004	Naproxen	1000	0.85	1.7
4	5	1005	Acetylsalicylic Acid	1000	0.7	1.4
5	1	1001	Acetaminophen	1000	0.5	1

Now that we have all of this data, let's play around with the SELECT statement:

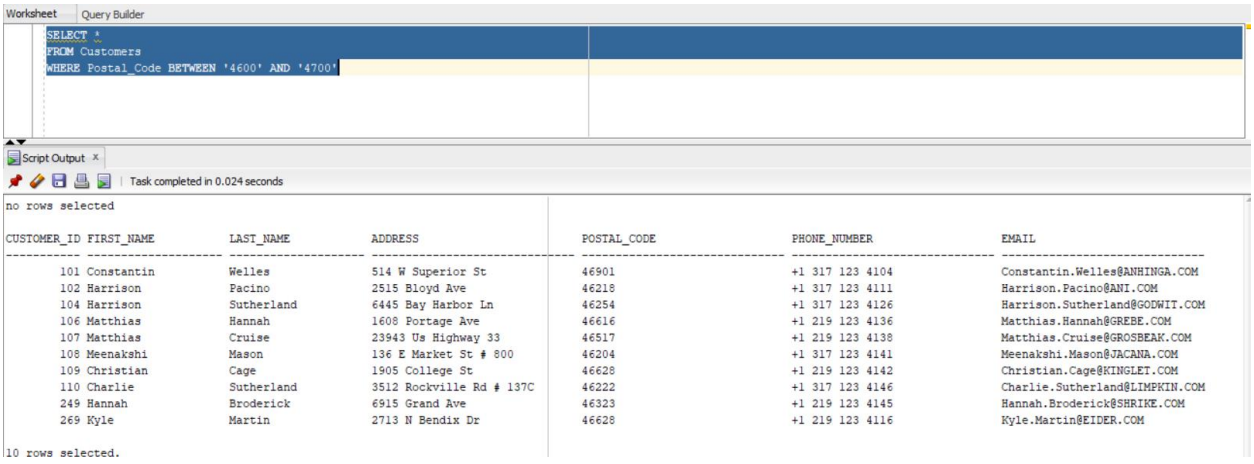
1. Let's first Select all of the patients whose first name is "Amanda"

```
SELECT *
FROM Patients
WHERE First_Name = 'Amanda'
```



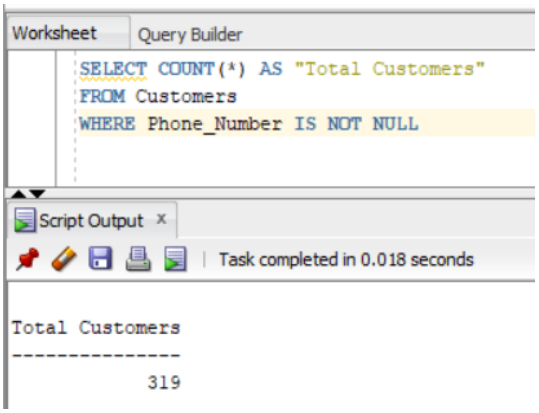
2. What about selecting customers based by their postal code, let's select customers with postal code between 4600 and 4700

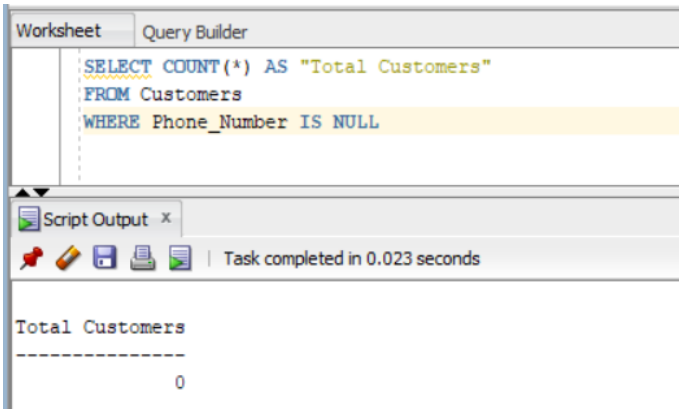
```
SELECT *
FROM Customers
WHERE Postal_Code BETWEEN '4600' AND '4700'
```



3. Let's also count how many of our customers own a phone / phone number

```
SELECT COUNT(*) AS "Total Customers"
FROM Customers
WHERE Phone_Number IS NOT NULL
```

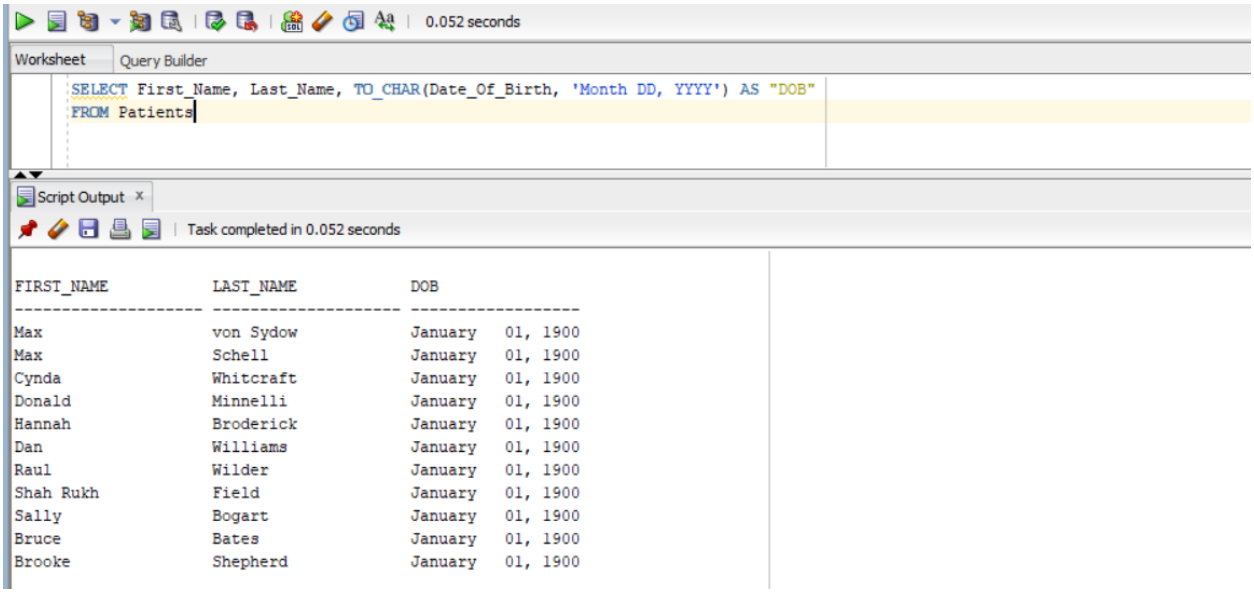




Looks like all of them own a phone, we can see the opposite by slightly altering the condition, replacing IS NOT NULL with IS NULL.

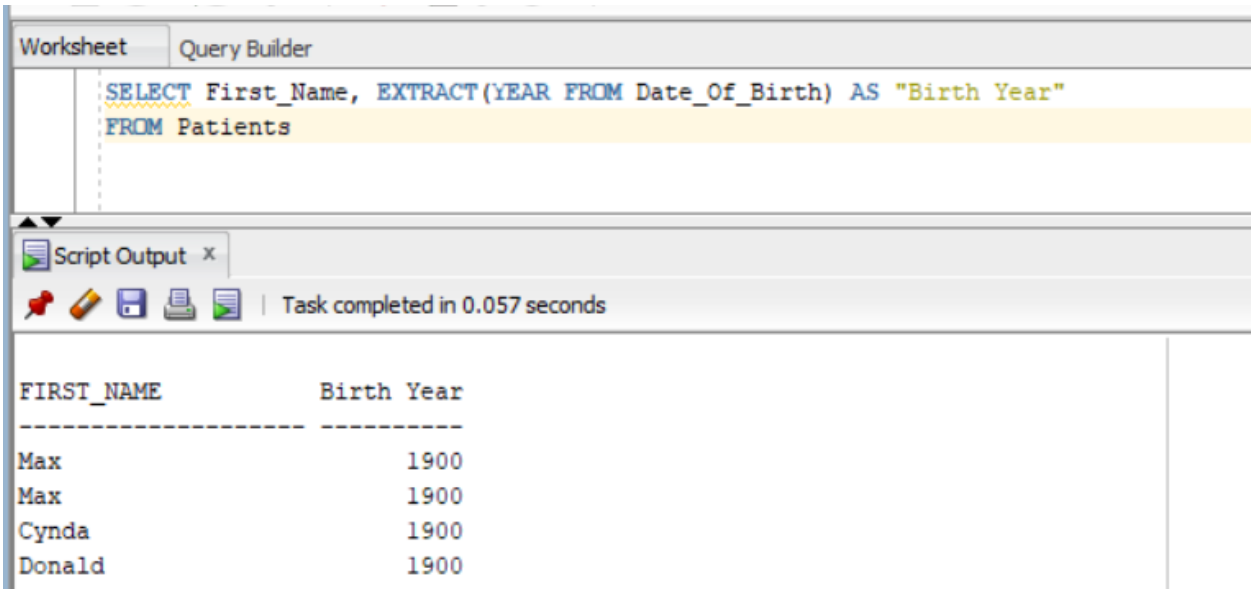
4. What about using the TO_CHAR function, it is used in order to convert a number or a date into a string, let's extract our patients' date of birth and convert it into a string

```
SELECT First_Name, Last_Name, TO_CHAR(Date_Of_Birth, 'Month DD, YYYY') AS
"DOB"
FROM Patients
```



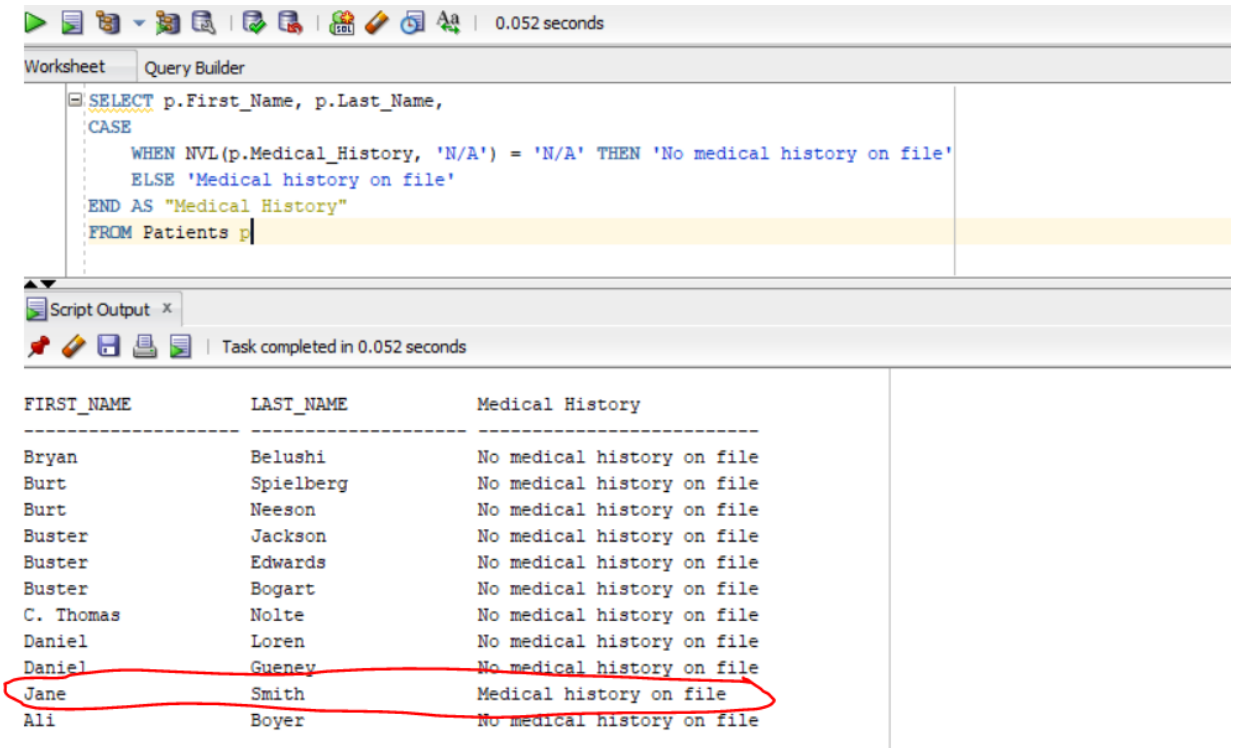
5. But what if we only care about the year ? We can use the EXTRACT function:

```
SELECT First_Name, EXTRACT(YEAR FROM Date_Of_Birth) AS "Birth Year"
FROM Patients
```



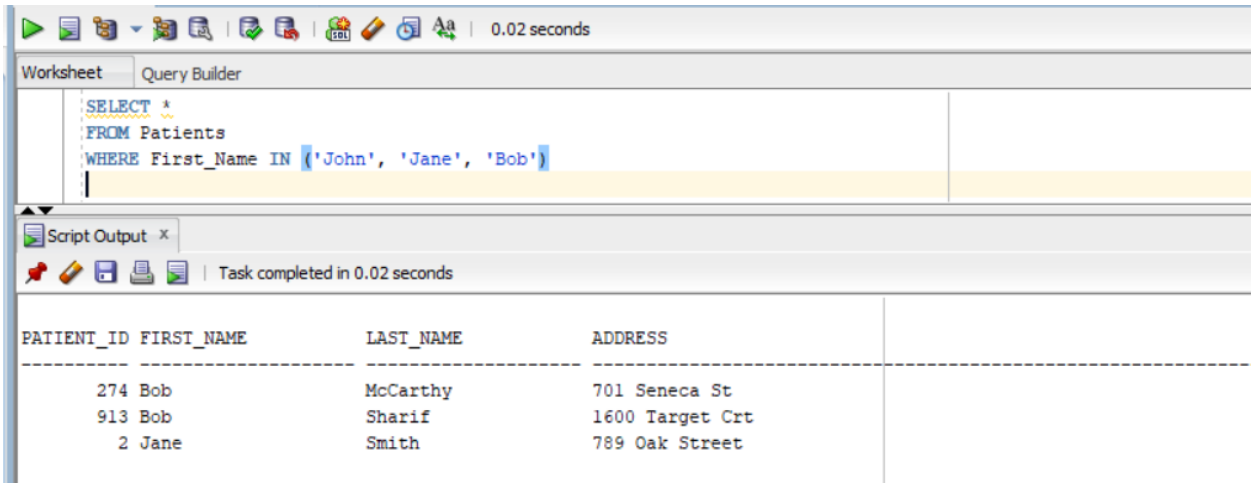
6. Let's do something more daring, shall we ? Let's see whose medical history we have on file and whose we don't. We can do that by using this SELECT statement:

```
SELECT p.First_Name, p.Last_Name,
CASE
    WHEN NVL(p.Medical_History, 'N/A') = 'N/A' THEN 'No medical history on
file'
    ELSE 'Medical history on file'
END AS "Medical History"
FROM Patients p
```



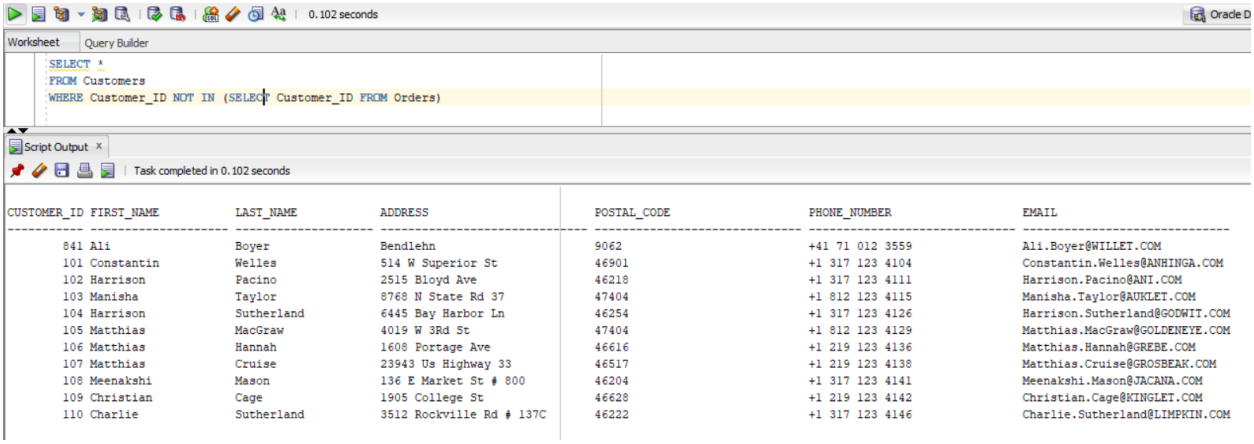
7. Let's try some more functions:

```
SELECT *
FROM Patients
WHERE First_Name IN ('John', 'Jane', 'Bob')
```



8. We can do the opposite of IN by using NOT IN

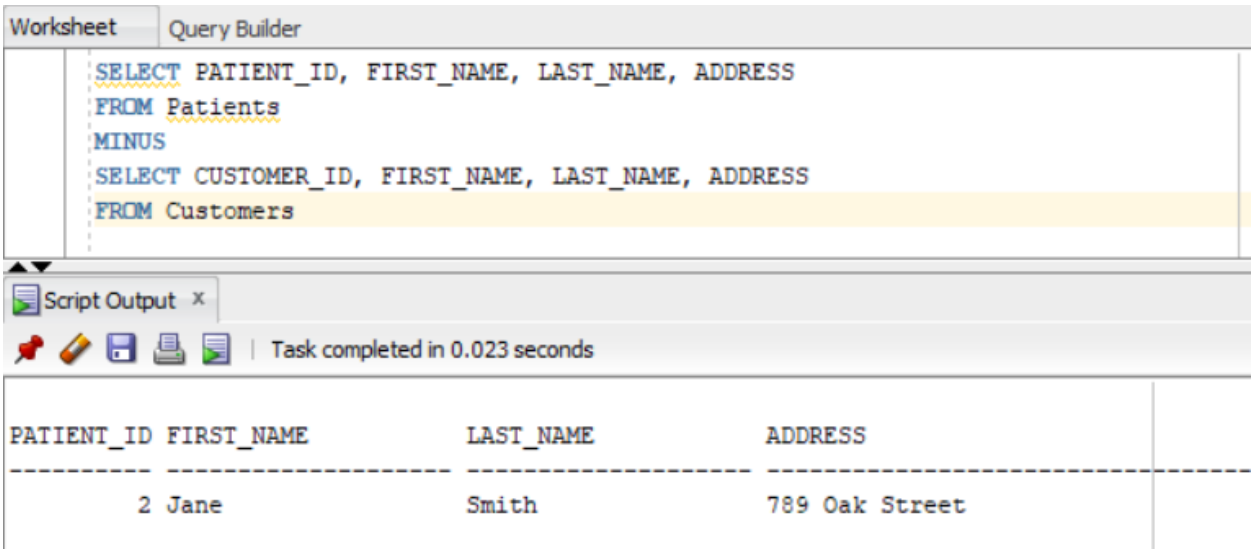
```
SELECT *
FROM Customers
WHERE Customer_ID NOT IN (SELECT Customer_ID FROM Orders)
```



This selects everything from customers whose id doesn't match the ones from the Orders table

9. A bit earlier we added all of our customers to the patients table, but before that, we added jane, let's see if we can find her using the MINUS function

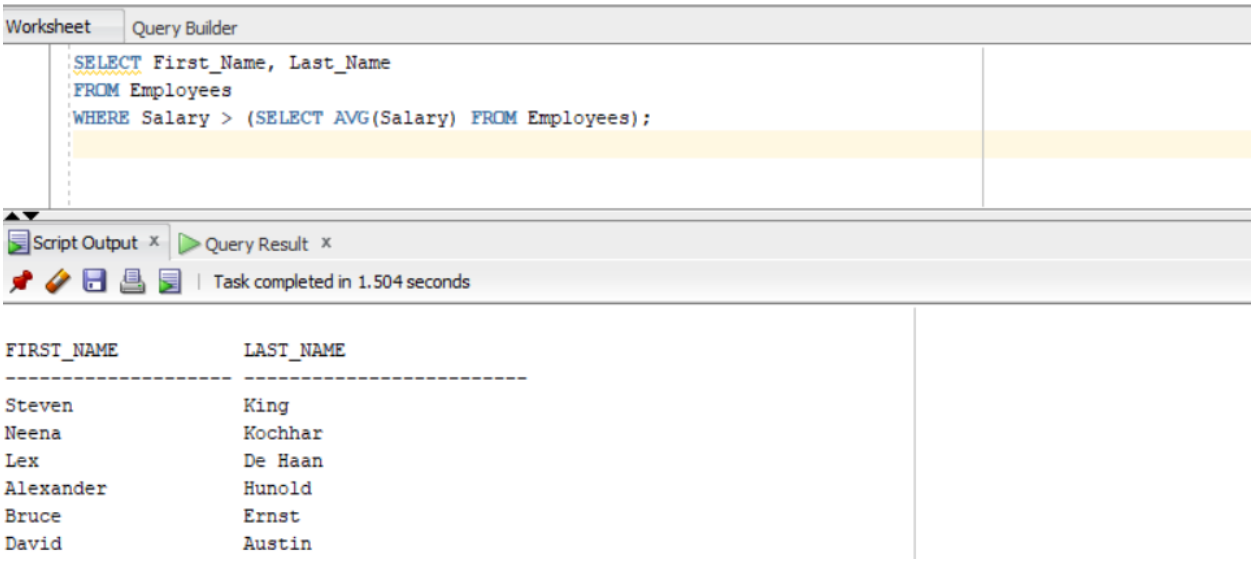
```
SELECT PATIENT_ID, FIRST_NAME, LAST_NAME, ADDRESS
FROM Patients
MINUS
SELECT CUSTOMER_ID, FIRST_NAME, LAST_NAME, ADDRESS
FROM Customers
```



And here she is! Note: We didn't select the whole tables, that's because they have a different number of columns which will cause error ORA-01789 to occur, to fix this we can simply select only the columns that we need.

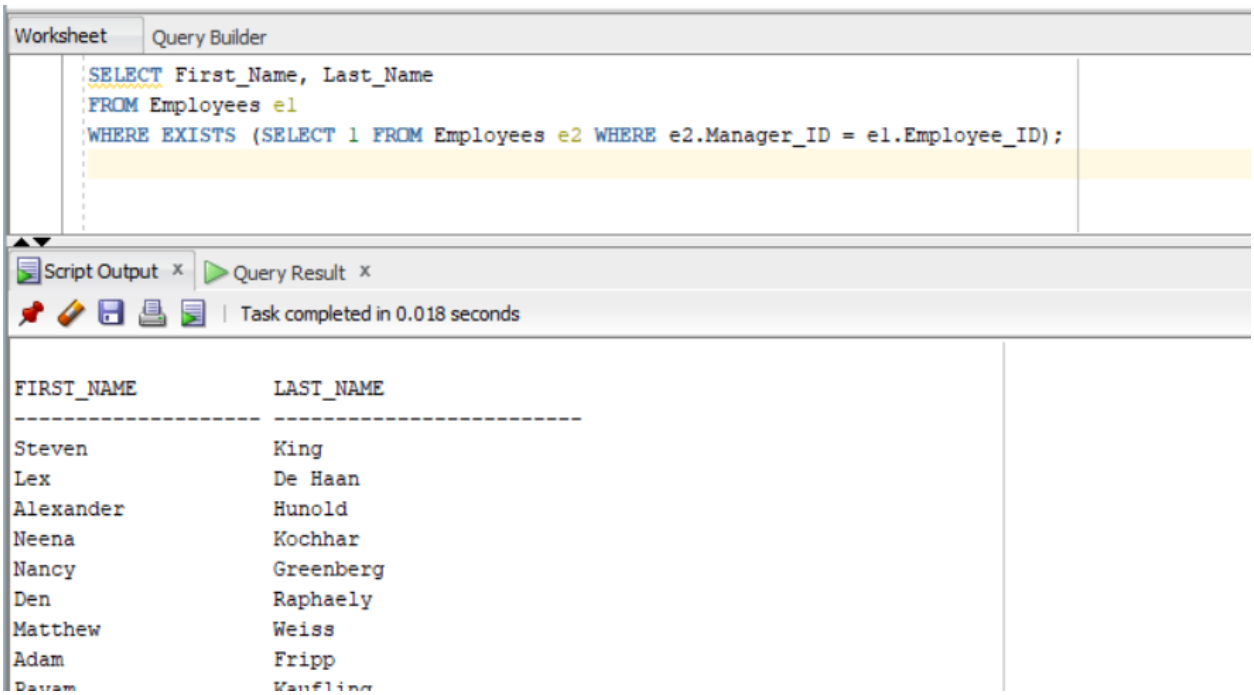
10. Some simple and correlated subqueries: Simple:

```
SELECT First_Name, Last_Name
FROM Employees
WHERE Salary > (SELECT AVG(Salary) FROM Employees);
```



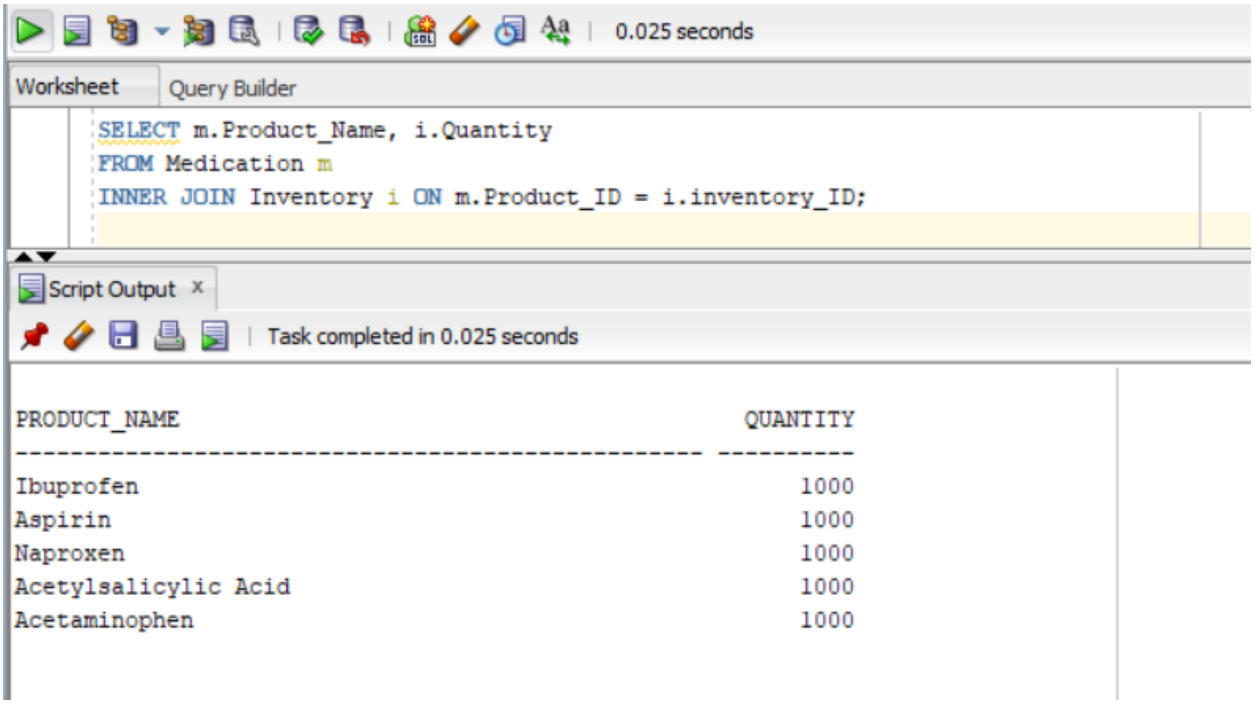
11. Correlated

```
SELECT First_Name, Last_Name
FROM Employees e1
WHERE EXISTS (SELECT 1 FROM Employees e2 WHERE e2.Manager_ID =
e1.Employee_ID);
```

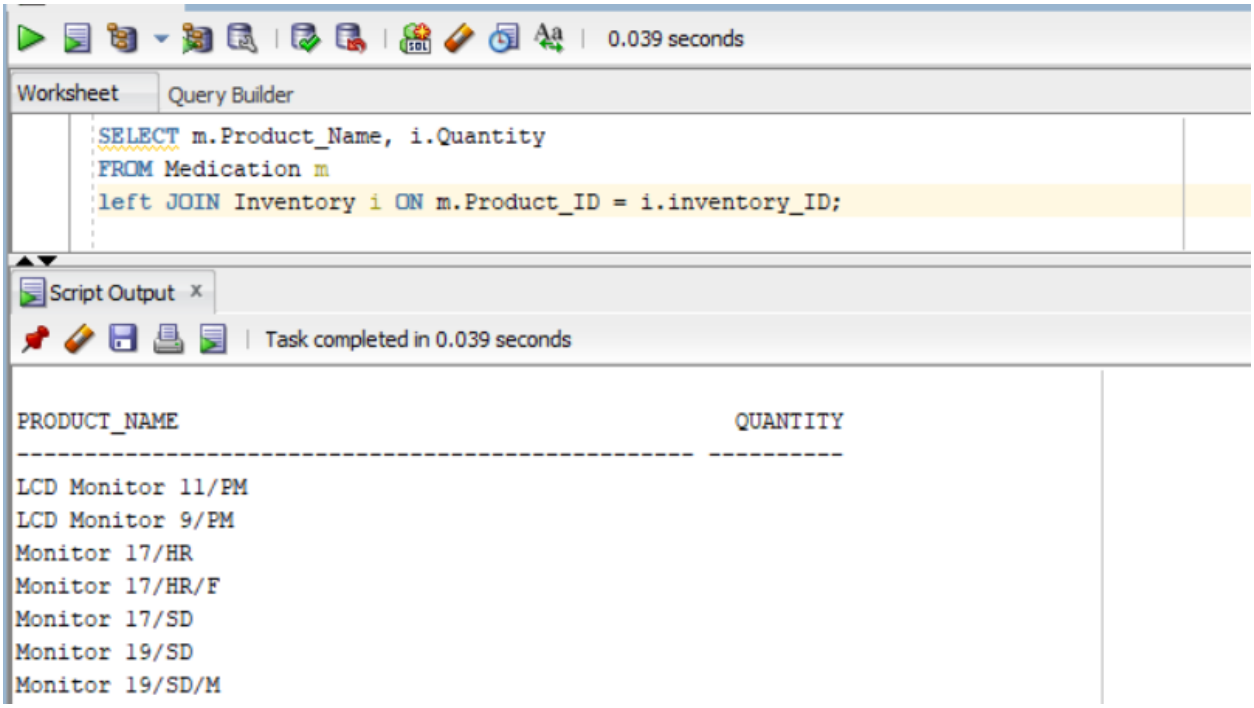


12. Let's also see some inner and outer joints. I'll use an inner join to show what products I have in my inventory and how many:

```
SELECT m.Product_Name, i.Quantity
FROM Medication m
INNER JOIN Inventory i ON m.Product_ID = i.inventory_ID;
```

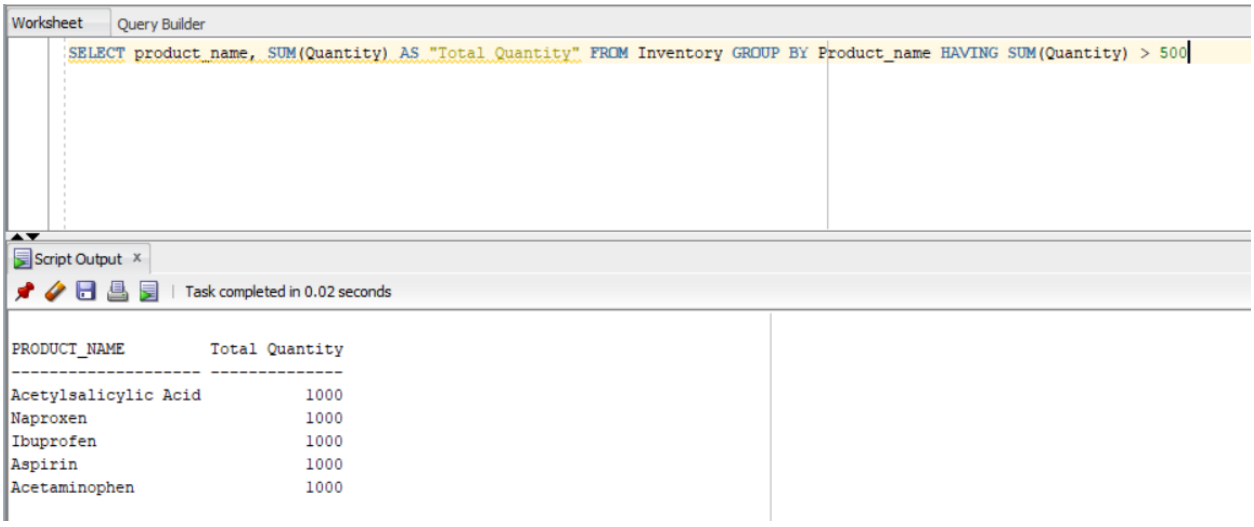


13. Let’s see some outer joints too:



14. Using aggregate function HAVING and GROUP BY

```
SELECT Product_Name, SUM(Quantity) AS "Total Quantity" FROM Inventory GROUP BY Product_Name HAVING SUM(Quantity) > 500
```



15. SUBSTR function

```
SELECT SUBSTR(Last_Name, 1, 3) AS "Last Name Initials", MAX(Salary) FROM Employees GROUP BY Last_Name
```

```
SELECT SUBSTR(Last_Name, 1, 3) AS "Last Name Initials", MAX(Salary) FROM Employees GROUP BY Last_Name
```

Task completed in 0.039 seconds

```
Las MAX(SALARY)
--- -----------
Gre       12000
Mar        5000
Mar        5000
Gee        5000
Phi        5000
Sti        5000
Raj        5000
```

16. Let's see how many employees have a salary over 5000 and who were hired before 2010:

```
SELECT COUNT(*) AS "Number of Employees" FROM Employees WHERE Salary > 5000 AND Hire_Date <= TO_DATE('01-JAN-2010', 'DD-MON-YYYY')
```

Task completed in 0.018 seconds

```
Number of Employees
-------------------
                 61
```

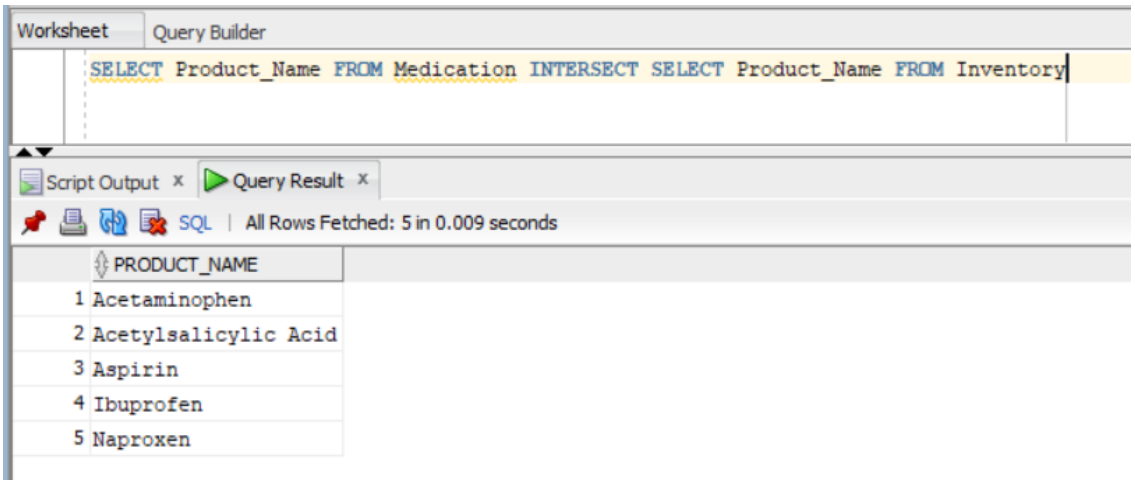
17. What about some taxes? This SELECT statement will compute the tax amount based on the price of the product

```
SELECT Product_Name, Price, (CASE WHEN Taxing = 'y' THEN Price * 0.15 ELSE 0 END) AS "Tax Amount" FROM Medication
```

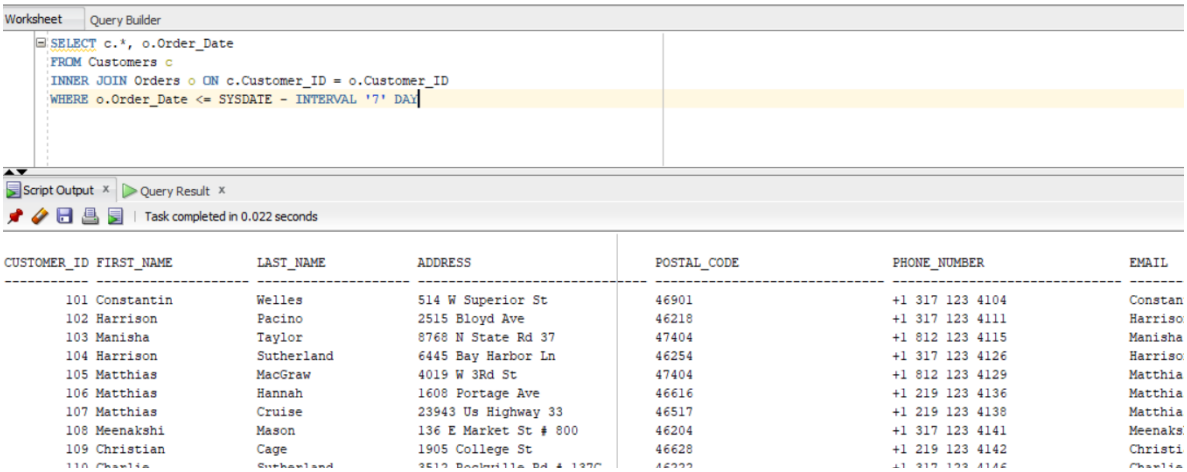
Task completed in 0.049 seconds

```
PRODUCT_NAME                                        PRICE Tax Amount
-------------------------------------------------- ---------- ----------
LCD Monitor 11/PM                                      259      38.85
LCD Monitor 9/PM                                       249      37.35
Monitor 17/HR                                          299      44.85
Monitor 17/HR/F                                        350       52.5
Monitor 17/SD                                          369      55.35
Monitor 19/SD                                          499      74.85
Monitor 19/SD/M                                        512       76.8
Monitor 21/D                                           999     149.85
Monitor 21/HR                                          879     131.85
```

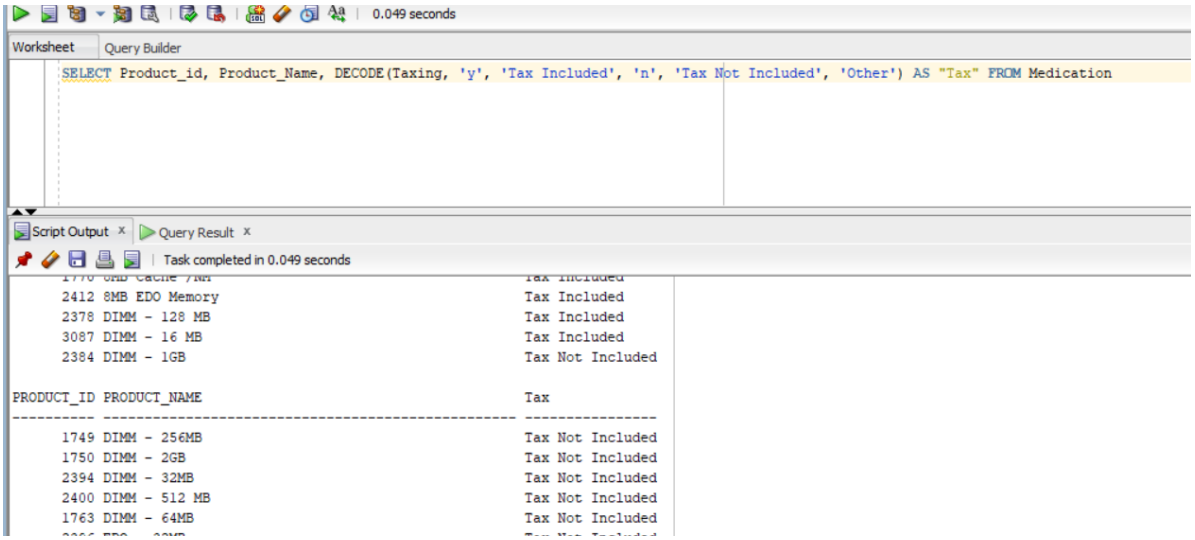
18. Previously we used both a joint and a minus in order to single out some products, let's try using intersect and see how it goes:



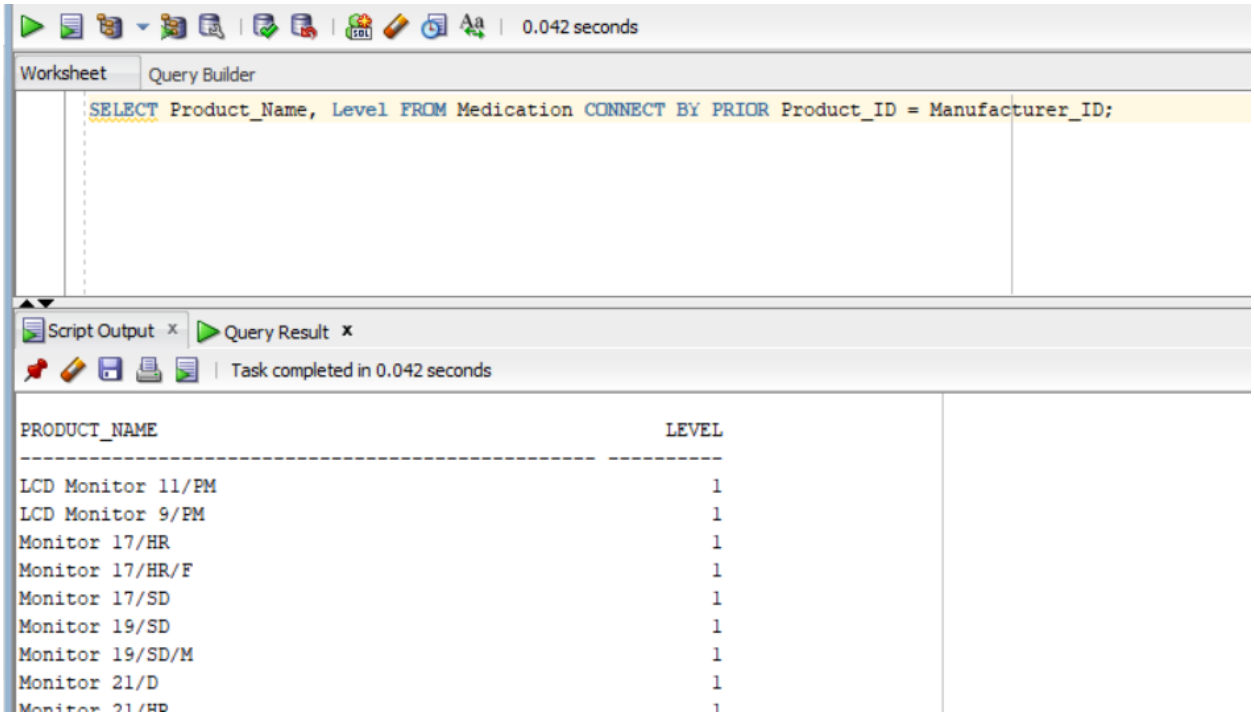
19. Let's also use SYSDATE and an INNER JOIN to show orders that happened in the past



20. Another useful thing to use is DECODE, as the name implies it is used to decode my binary y/n system into something more human readable



21. Hierarchical queries:

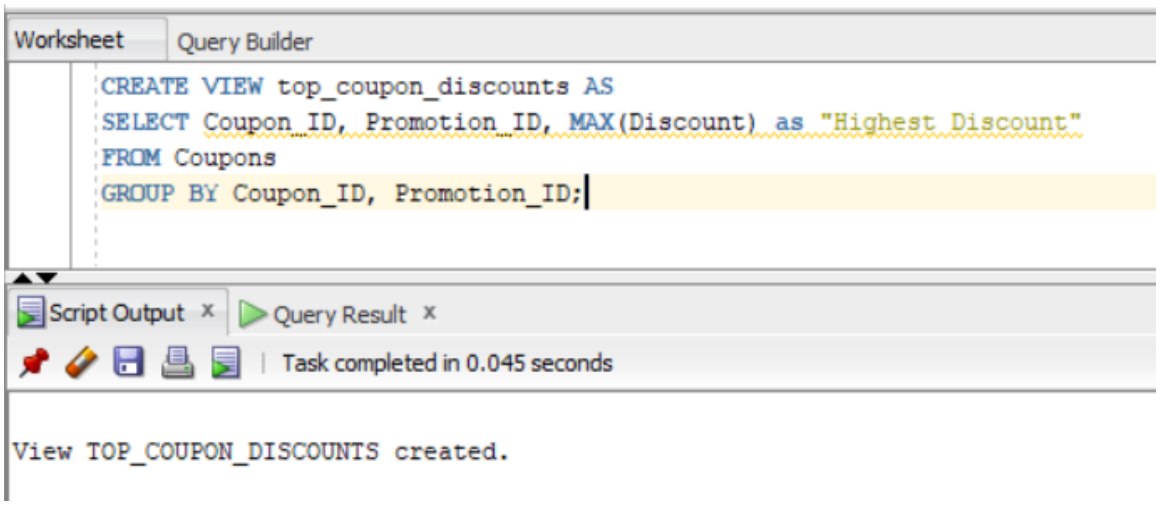


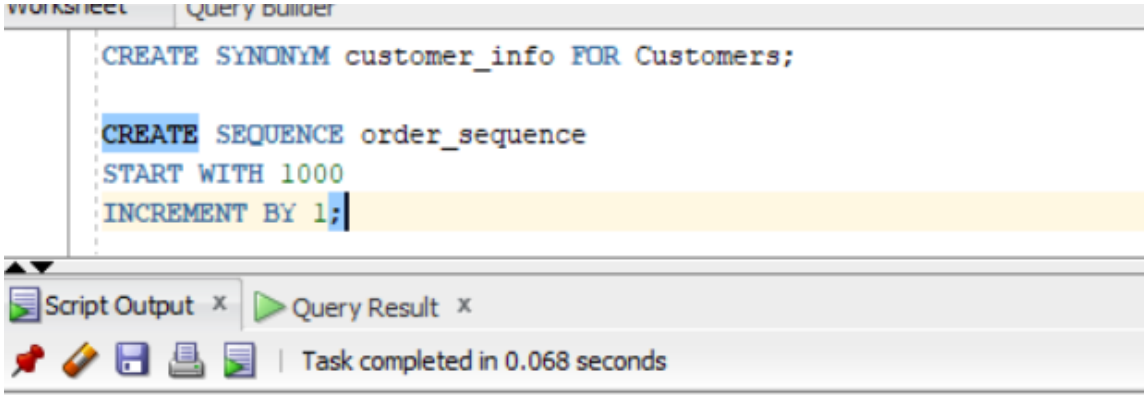
This query retrieves the Product_Name and Level values from the Medication table, and the PRIOR operator is used to specify that the Manufacturer_ID column in the Medication table should be used to connect rows in the hierarchy.

The LEVEL pseudocolumn is used to display the level of each row in the hierarchy.

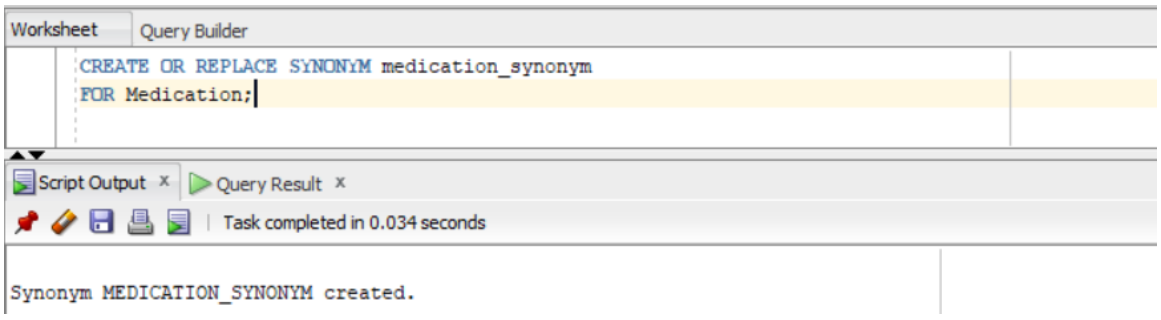
The query returns a result set with a row for each product in the Medication table, and the rows are organized into a hierarchy based on the Manufacturer_ID values. The Level column shows the level of each product in the hierarchy.

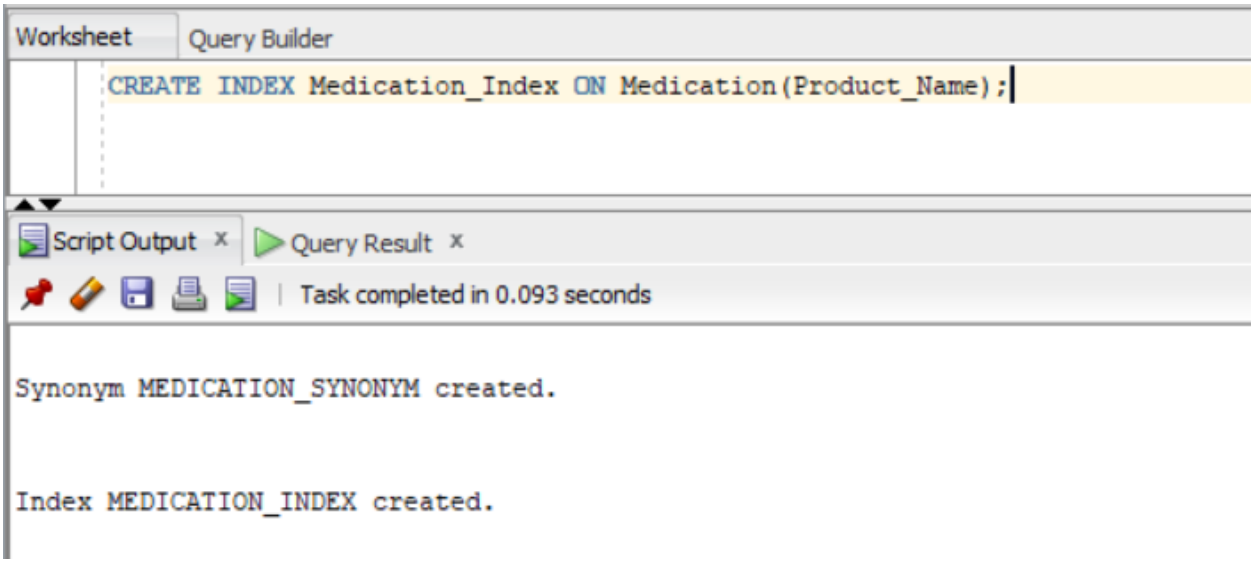
22. Some examples of constructing and manipulating other objects of the database: views, indexes, synonyms and sequences:



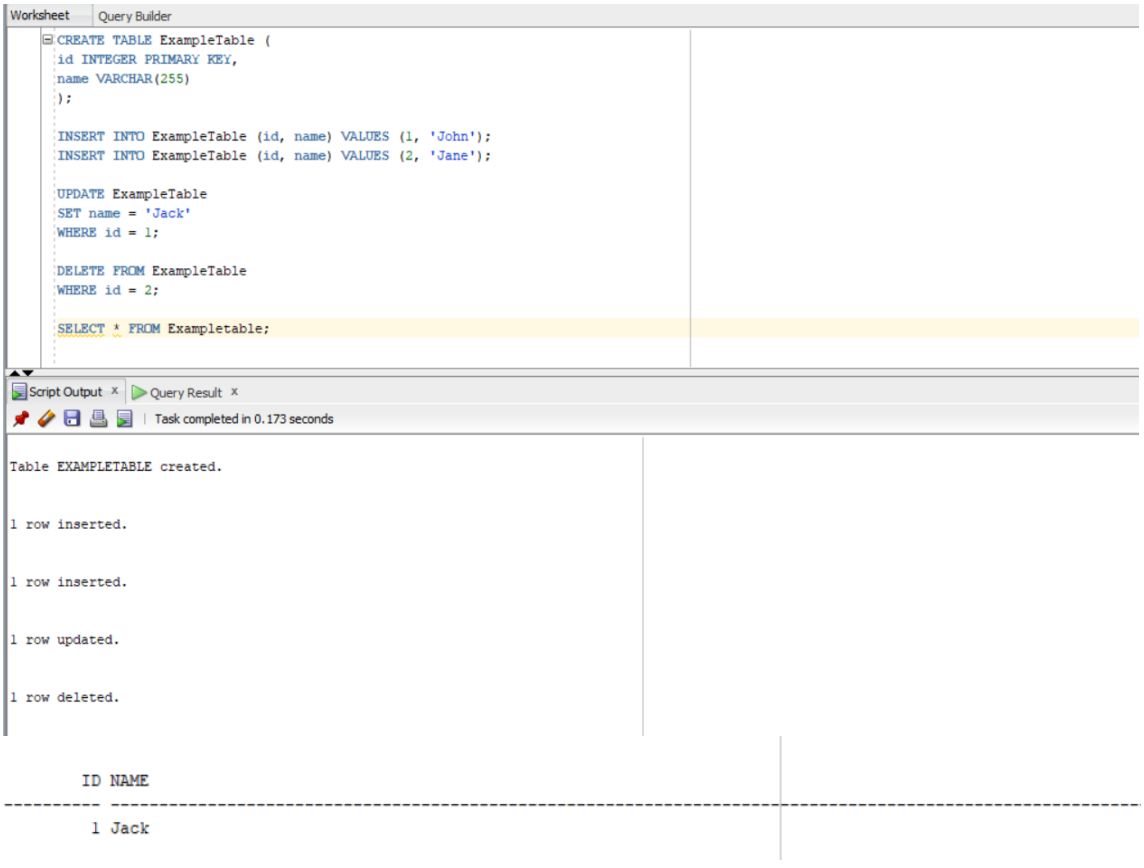



```
View TOP_COUPON_DISCOUNTS created.


Synonym CUSTOMER_INFO created.


Sequence ORDER_SEQUENCE created.
```

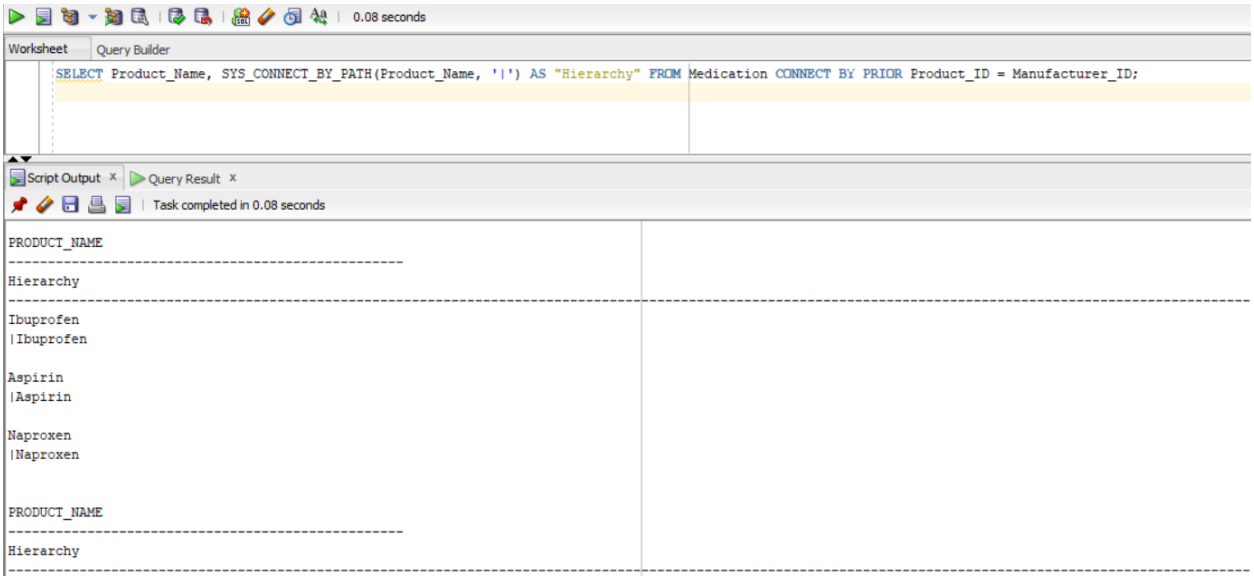




23. Create/Insert/Update/Delete + Select



24. Let's also use SYS_CONNECT_BY_PATH :



This SELECT statement retrieves the Product_Name column values from the Medication table and creates a new column called Hierarchy. The SYS_CONNECT_BY_PATH function is used to generate a string of Product_Name values, separated by the | character, for each row in the Medication table. The CONNECT BY PRIOR clause is used to indicate that the Product_Name values should be connected in a hierarchy, with the Product_ID column serving as the parent key and the Manufacturer_ID column serving as the child key. The resulting hierarchy will show the relationships between the different products in the Medication table, with the Product_Name values of the parent products appearing before the Product_Name values of the child products.

In conclusion, our pharmacy database has proven to be a valuable resource for managing and organizing all aspects of our business. With tables for customers, employees, medication, orders, and more, we have been able to efficiently track and analyze data in order to make informed decisions and improve operations. The use of foreign keys and relationships has ensured the integrity of our data, and the implementation of views, indexes, synonyms, and sequences will allow us to easily access and manipulate the information in our database. Overall, the development and utilization of this database has greatly benefited our pharmacy and we look forward to continuing to use it in the future.