

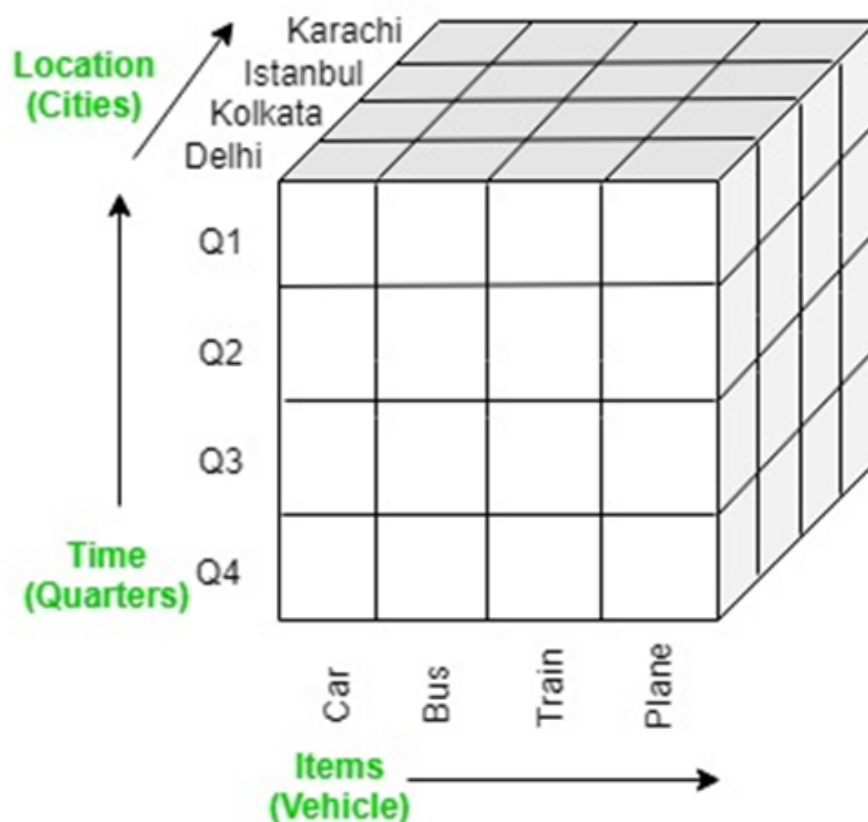
EXPERIMENT. NO: 03

Aim: Implementation of all dimension tables and fact tables and OLAP (in Oracle)

Theory:

In the multidimensional model, the records are organized into various dimensions, and each dimension includes multiple levels of abstraction described by concept hierarchies. This organization support users with the flexibility to view data from various perspectives. Several OLAP data cube operations exist to demonstrate these different views, allowing interactive queries and a search of the record at hand. Hence, OLAP supports a user-friendly environment for interactive data analysis.

Consider the OLAP operations which are to be performed on multidimensional data. The figure shows data cubes for sales of a shop. The cube contains the dimensions, location, time and item, where the location is aggregated about city values, time is aggregated concerning quarters, and an item is aggregated concerning item types.



OLAP operations:

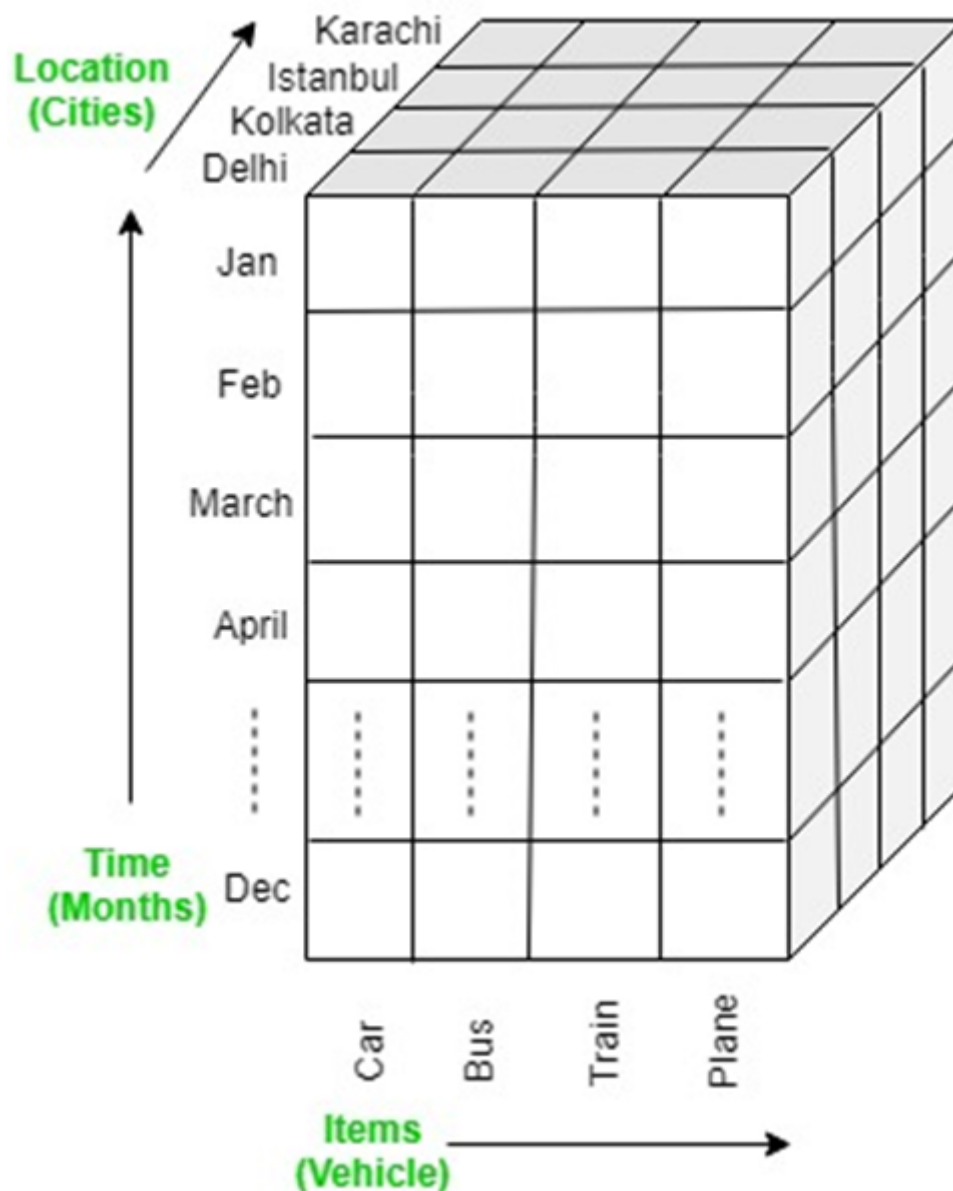
Five basic analytical operations can be performed on an OLAP cube:

1. Drill down:

In drill-down operation, the less detailed data is converted into highly detailed data. It can be done by:

- Moving down in the concept hierarchy
- Adding a new dimension

In the cube given in the overview section, the drill-down operation is performed by moving down in the concept hierarchy of the Time dimension (Quarter -> Month).

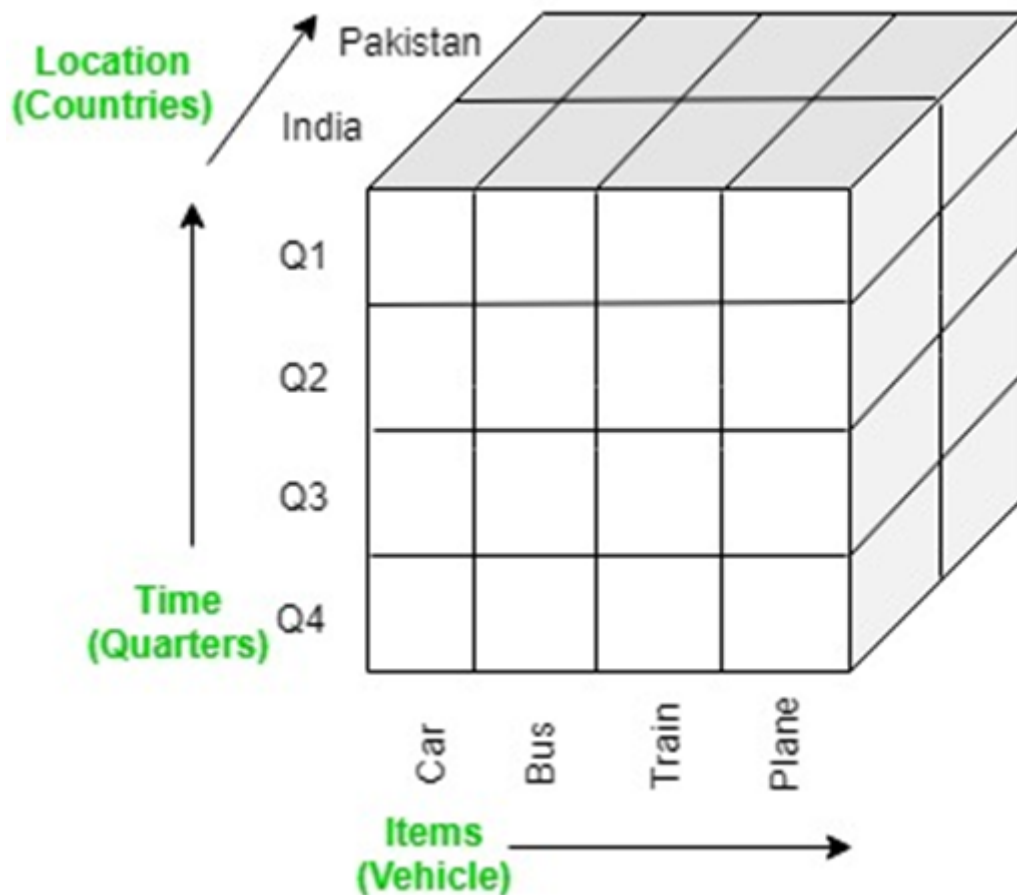


2. Roll up:

It is just the opposite of the drill-down operation. It performs aggregation on the OLAP cube. It can be done by:

- Climbing up in the concept hierarchy
- Reducing the dimensions

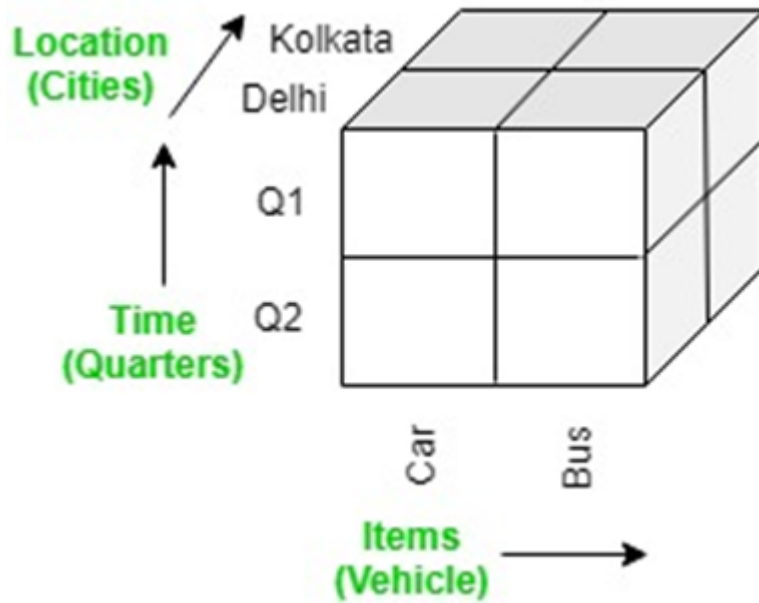
In the cube given in the overview section, the roll-up operation is performed by climbing up in the concept hierarchy of Location dimension (City -> Country).



3. Dice:

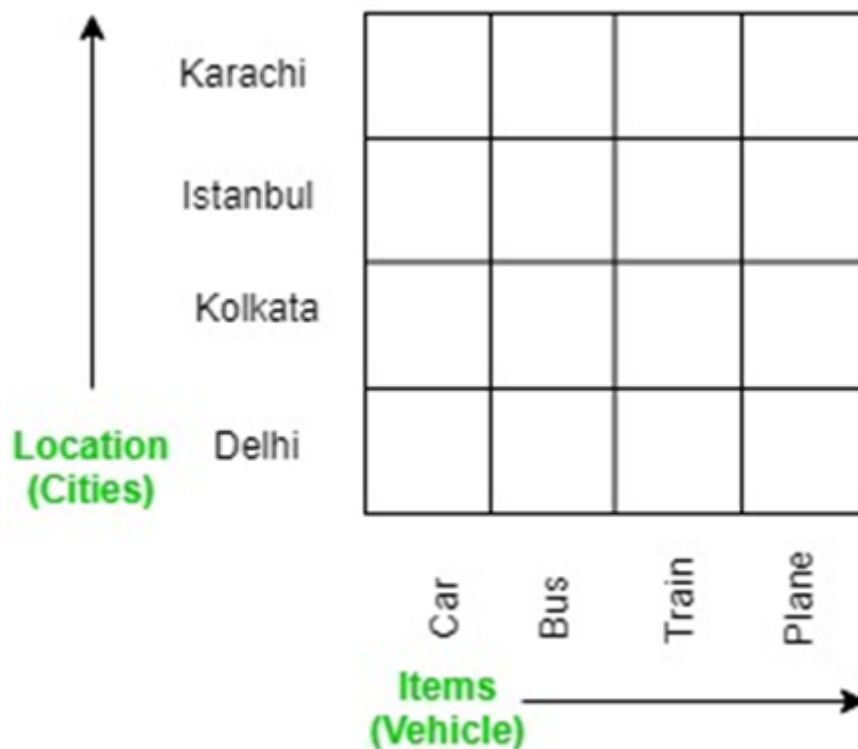
It selects a sub-cube from the OLAP cube by selecting two or more dimensions. In the cube given in the overview section, a sub-cube is selected by selecting the following dimensions with criteria:

- Location = "Delhi" or "Kolkata"
- Time = "Q1" or "Q2"
- Item = "Car" or "Bus"



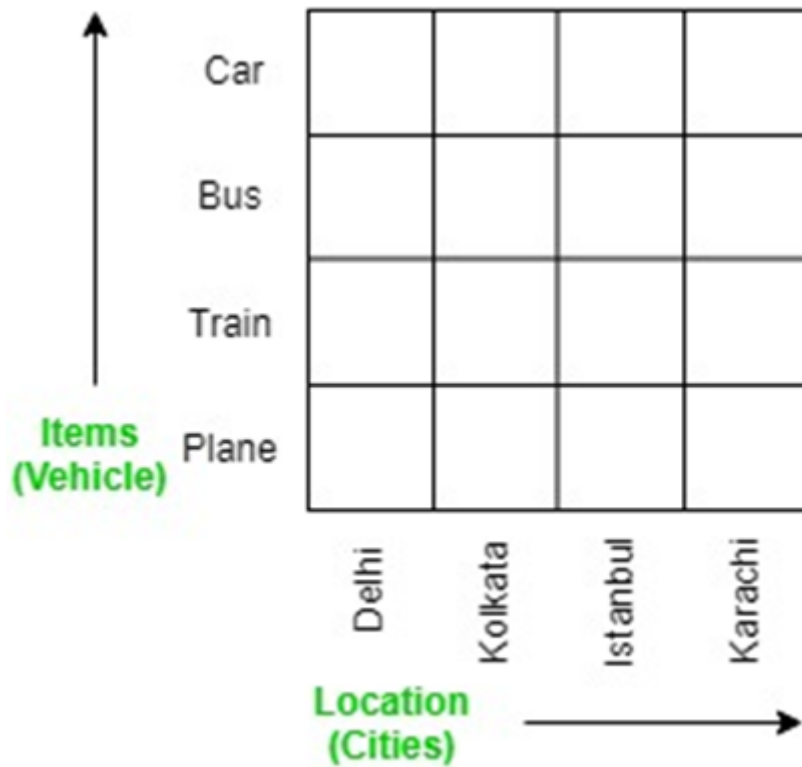
4. Slice:

It selects a single dimension from the OLAP cube which results in a new sub-cube creation. In the cube given in the overview section, Slice is performed on the dimension Time = "Q1".



5. Pivot:

It is also known as rotation operation as it rotates the current view to get a new view of the representation. In the sub-cube obtained after the slice operation, performing the pivot operation gives a new view of it.



Code:

Creating Fact Table and Dimension tables.

DIMENSIONS TABLE – CITY DIMENSIONS

```
CREATE TABLE city_dim (  
    city_id INT PRIMARY KEY,  
    city_name VARCHAR(255),  
    c_state VARCHAR(255),  
    pincode VARCHAR(10)  
);
```

DIMENSIONS TABLE – CONTACT DIMENSIONS

```
CREATE TABLE contact_dim (  
    contact_id VARCHAR(255) PRIMARY KEY,  
    phone VARCHAR(15),  
    email VARCHAR(255)  
);
```

DIMENSIONS TABLE – SUPPLIER DIMENSIONS

```
CREATE TABLE supplier_dim (  
    supplier_id VARCHAR(255) PRIMARY KEY,  
    supplier_name VARCHAR(255),  
    contact_id INT  
);
```

DIMENSIONS TABLE – PRODUCT DIMENSIONS

```
CREATE TABLE product_dim (  
    product_id VARCHAR(255) PRIMARY KEY,
```

```
product_name VARCHAR(255),  
product_category VARCHAR(255),  
product_brand VARCHAR(255)  
);
```

DIMENSIONS TABLE – TRANSACTION_DATE DIMENSIONS

```
CREATE TABLE transaction_date_dim (  
    arrival_date DATE,  
    dispatch_date DATE,  
    duration_in_warehouse INT  
);
```

DIMENSIONS TABLE – WAREHOUSE DIMENSIONS

```
CREATE TABLE warehouse_dim (  
    warehouse_id VARCHAR(255) PRIMARY KEY,  
    warehouse_name VARCHAR(255),  
    warehouse_location VARCHAR(255),  
    city_id INT  
);
```

FACT TABLE - INVENTORY

```
CREATE TABLE inventory_management_fact (  
    transaction_id INT PRIMARY KEY,  
    product_id VARCHAR(255),  
    warehouse_id VARCHAR(255),  
    supplier_id VARCHAR(255),  
    arrival_date_id DATE,  
    dispatch_date_id DATE,
```

```
number_of_boxes INT,  
  
FOREIGN KEY (product_id) REFERENCES product_dim(product_id),  
  
FOREIGN KEY (warehouse_id) REFERENCES warehouse_dim(warehouse_id),  
  
FOREIGN KEY (supplier_id) REFERENCES supplier_dim(supplier_id)  
  
);
```

Inserting Values in the above tables:**city_dimension:**

```
INSERT INTO city_dim (city_id, city_name, c_state, pincode)  
VALUES (7597, 'Mumbai', 'Maharashtra', '400001');  
  
INSERT INTO city_dim (city_id, city_name, c_state, pincode)  
VALUES (7099, 'Bangalore', 'Karnataka', '560001');  
  
INSERT INTO city_dim (city_id, city_name, c_state, pincode)  
VALUES (9293, 'Pune', 'Maharashtra', '411001');  
  
INSERT INTO city_dim (city_id, city_name, c_state, pincode)  
VALUES (6336, 'Hyderabad', 'Telangana', '500001');  
  
INSERT INTO city_dim (city_id, city_name, c_state, pincode)  
VALUES (5676, 'Gurgaon', 'Haryana', '122001');  
  
INSERT INTO city_dim (city_id, city_name, c_state, pincode)  
VALUES (5055, 'Delhi', 'Delhi', '110001');  
  
INSERT INTO city_dim (city_id, city_name, c_state, pincode)  
VALUES (7298, 'Kota', 'Rajasthan', '324001');  
  
INSERT INTO city_dim (city_id, city_name, c_state, pincode)
```



```
VALUES (6244, 'Jaipur', 'Rajasthan', '302001');  
INSERT INTO city_dim (city_id, city_name, c_state, pincode)  
VALUES (4098, 'Chennai', 'Tamil Nadu', '600001');  
INSERT INTO city_dim (city_id, city_name, c_state, pincode)  
VALUES (7544, 'Kolkata', 'West Bengal', '700001');  
INSERT INTO city_dim (city_id, city_name, c_state, pincode)  
VALUES (6003, 'Ahmedabad', 'Gujarat', '380001');  
INSERT INTO city_dim (city_id, city_name, c_state, pincode)  
VALUES (8081, 'Lucknow', 'Uttar Pradesh', '226001');  
INSERT INTO city_dim (city_id, city_name, c_state, pincode)  
VALUES (5210, 'Chandigarh', 'Chandigarh', '160001');  
INSERT INTO city_dim (city_id, city_name, c_state, pincode)  
VALUES (7142, 'Bhopal', 'Madhya Pradesh', '462001');  
INSERT INTO city_dim (city_id, city_name, c_state, pincode)  
VALUES (6001, 'Patna', 'Bihar', '800001');  
INSERT INTO city_dim (city_id, city_name, c_state, pincode)  
VALUES (9012, 'Guwahati', 'Assam', '781001');  
INSERT INTO city_dim (city_id, city_name, c_state, pincode)  
VALUES (7659, 'Trivandrum', 'Kerala', '695001');  
INSERT INTO city_dim (city_id, city_name, c_state, pincode)  
VALUES (7245, 'Bhubaneswar', 'Odisha', '751001');  
INSERT INTO city_dim (city_id, city_name, c_state, pincode)  
VALUES (5222, 'Dehradun', 'Uttarakhand', '248001');  
INSERT INTO city_dim (city_id, city_name, c_state, pincode)  
VALUES (6211, 'Shimla', 'Himachal Pradesh', '171001');
```

The screenshot shows a 'Live SQL' interface. On the left is a sidebar with navigation options: Home, SQL Worksheet (selected), My Session, Schema, Quick SQL, My Scripts, My Tutorials, and Code Library. The main area is titled 'SQL Worksheet' and contains a SQL query: `VALUES (6211, 'Shimla', 'Himachal Pradesh', '171001');` followed by `SELECT * FROM city_dim;`. Below the query, a table of results is displayed with columns: CITY_ID, CITY_NAME, C_STATE, and PINCODE. The table contains 12 rows of data.

CITY_ID	CITY_NAME	C_STATE	PINCODE
7597	Mumbai	Maharashtra	400001
7899	Bangalore	Karnataka	560001
9293	Pune	Maharashtra	411001
6336	Hyderabad	Telangana	500001
5676	Gurgaon	Haryana	122001
5855	Delhi	Delhi	110001
7298	Kota	Rajasthan	324001
6244	Jaipur	Rajasthan	302001
4898	Chennai	Tamil Nadu	600001
7544	Kolkata	West Bengal	700001

contact_dim:

```

INSERT INTO contact_dim (contact_id, phone, email)
VALUES ('C2483', '9988776655', 'xbarrett@example.com');

INSERT INTO contact_dim (contact_id, phone, email)
VALUES ('C8454', '9876543210', 'vhernandez@example.com');

INSERT INTO contact_dim (contact_id, phone, email)
VALUES ('C8265', '8899776644', 'cooperdavid@example.org');

INSERT INTO contact_dim (contact_id, phone, email)
VALUES ('C3118', '7766554433', 'monica66@example.net');

INSERT INTO contact_dim (contact_id, phone, email)
VALUES ('C7283', '9870123456', 'krivera@example.org');

INSERT INTO contact_dim (contact_id, phone, email)
VALUES ('C7667', '9876012345', 'rosarioalbert@example.net');

INSERT INTO contact_dim (contact_id, phone, email)
VALUES ('C1342', '8765432109', 'leejennifer@example.net');

INSERT INTO contact_dim (contact_id, phone, email)
VALUES ('C3989', '8877665544', 'breynolds@example.com');

```

```
INSERT INTO contact_dim (contact_id, phone, email)
VALUES ('C1699', '9988001122', 'thompsonzachary@example.org');

INSERT INTO contact_dim (contact_id, phone, email)
VALUES ('C5700', '9012345678', 'robert84@example.org');

INSERT INTO contact_dim (contact_id, phone, email)
VALUES ('C9238', '9878998899', 'hoffmanbeth@example.net');

INSERT INTO contact_dim (contact_id, phone, email)
VALUES ('C7601', '9988778899', 'sdavis@example.net');

INSERT INTO contact_dim (contact_id, phone, email)
VALUES ('C5895', '9123456789', 'kristina32@example.net');

INSERT INTO contact_dim (contact_id, phone, email)
VALUES ('C9589', '8899889988', 'natalie47@example.org');

INSERT INTO contact_dim (contact_id, phone, email)
VALUES ('C1627', '9900990099', 'longashley@example.org');

INSERT INTO contact_dim (contact_id, phone, email)
VALUES ('C5607', '8765432101', 'coreywilson@example.org');

INSERT INTO contact_dim (contact_id, phone, email)
VALUES ('C9300', '8901234567', 'ebryan@example.com');

INSERT INTO contact_dim (contact_id, phone, email)
VALUES ('C8900', '9876543211', 'burkesharon@example.net');

INSERT INTO contact_dim (contact_id, phone, email)
VALUES ('C2870', '8877665599', 'deborah09@example.org');

INSERT INTO contact_dim (contact_id, phone, email)
VALUES ('C8997', '9876543232', 'dustinpeterperson@example.org');
```

The screenshot shows the Live SQL interface with a sidebar on the left containing navigation options: Home, SQL Worksheet, My Session, Schema, Quick SQL, My Scripts, My Tutorials, and Code Library. The main area is titled 'SQL Worksheet' and contains the following SQL code:

```

37 INSERT INTO contact_dim (contact_id, phone, email)
38 VALUES ('C2870', '8877665599', 'deborah09@example.org');
39 INSERT INTO contact_dim (contact_id, phone, email)
40 VALUES ('C8997', '9876543232', 'dustinpeterson@example.org');
41
42 SELECT * FROM contact_dim
43

```

Below the code, a table is displayed with the following data:

CONTACT_ID	PHONE	EMAIL
C2483	9988776655	xbarrett@example.com
C8454	9876543210	vhernandez@example.com
C8265	8899776644	cooperdavid@example.org
C3118	7766554433	monica66@example.net
C7283	9870123456	krivera@example.org
C7667	9876012345	rosarioalbert@example.net
C1342	8765432109	leejennifer@example.net
C3989	8877665544	brenolds@example.com

At the bottom of the interface, a status bar indicates: '2023 Oracle - Live SQL 23.4.1, running Oracle Database 19c EE Extreme Perf - 19.17.0.0.0 - Database Documentation - Ask Tom - Dev Gym'. Below this, it says 'Built with using Oracle APEX - Privacy - Terms of Use'.

supplier_dimension:

INSERT INTO supplier_dim (supplier_id, supplier_name, contact_id)

VALUES ('S3535', 'Stewart, Clayton and Martinez', 'C2483');

INSERT INTO supplier_dim (supplier_id, supplier_name, contact_id)

VALUES ('S7973', 'Carroll, Brady and Hancock', 'C8454');

INSERT INTO supplier_dim (supplier_id, supplier_name, contact_id)

VALUES ('S2142', 'Singh-Johnson', 'C8265');

INSERT INTO supplier_dim (supplier_id, supplier_name, contact_id)

VALUES ('S3115', 'Boyer Ltd', 'C3118');

INSERT INTO supplier_dim (supplier_id, supplier_name, contact_id)

VALUES ('S8922', 'Davis Ltd', 'C7283');

INSERT INTO supplier_dim (supplier_id, supplier_name, contact_id)

VALUES ('S4540', 'Sandoval, Brown and Peters', 'C7667');

INSERT INTO supplier_dim (supplier_id, supplier_name, contact_id)

VALUES ('S2603', 'Madden Inc', 'C1342');

INSERT INTO supplier_dim (supplier_id, supplier_name, contact_id)

```
VALUES ('S3568', 'Pearson, Wall and Shelton', 'C3989');  
INSERT INTO supplier_dim (supplier_id, supplier_name, contact_id)  
VALUES ('S8035', 'Ellis Ltd', 'C1699');  
INSERT INTO supplier_dim (supplier_id, supplier_name, contact_id)  
VALUES ('S3141', 'Johnson Group', 'C5700');  
INSERT INTO supplier_dim (supplier_id, supplier_name, contact_id)  
VALUES ('S8420', 'Mccoy LLC', 'C9238');  
INSERT INTO supplier_dim (supplier_id, supplier_name, contact_id)  
VALUES ('S1561', 'Smith Ltd', 'C7601');  
INSERT INTO supplier_dim (supplier_id, supplier_name, contact_id)  
VALUES ('S8841', 'Small PLC', 'C5895');  
INSERT INTO supplier_dim (supplier_id, supplier_name, contact_id)  
VALUES ('S3895', 'Carney, Edwards and Chen', 'C9589');  
INSERT INTO supplier_dim (supplier_id, supplier_name, contact_id)  
VALUES ('S9366', 'Ruiz-Garcia', 'C1627');  
INSERT INTO supplier_dim (supplier_id, supplier_name, contact_id)  
VALUES ('S3534', 'Potter and Sons', 'C5607');  
INSERT INTO supplier_dim (supplier_id, supplier_name, contact_id)  
VALUES ('S7178', 'Rowe-Benitez', 'C9300');  
INSERT INTO supplier_dim (supplier_id, supplier_name, contact_id)  
VALUES ('S6126', 'Williamson, Ware and Martin', 'C8900');  
INSERT INTO supplier_dim (supplier_id, supplier_name, contact_id)  
VALUES ('S3284', 'Price, Sparks and Frey', 'C2870');  
INSERT INTO supplier_dim (supplier_id, supplier_name, contact_id)  
VALUES ('S9796', 'Newton Group', 'C8997');
```

The screenshot shows the Oracle Live SQL interface. The top bar includes a 'Live SQL' logo, a 'Feedback' link, a 'Help' link, and a user profile 'omshete0550@gmail.com'. The left sidebar contains navigation links: Home, SQL Worksheet (selected), My Session, Schema, Quick SQL, My Scripts, My Tutorials, and Code Library. The main area is titled 'SQL Worksheet' and contains the following SQL code:

```

57 VALUES ('S2284', 'Price, Sparks and Frey', 'C2490');
58 INSERT INTO supplier_dim (supplier_id, supplier_name, contact_id)
59 VALUES ('S9796', 'Newton Group', 'C8997');
60
61 SELECT * FROM supplier_dim
62

```

Below the code, a table of data is displayed:

SUPPLIER_ID	SUPPLIER_NAME	CONTACT_ID
S3535	Stewart, Clayton and Martinez	C2483
S7973	Carroll, Brady and Hancock	C8454
S2142	Singh-Johnson	C8265
S3115	Boyer Ltd	C3118
S8922	Davis Ltd	C7283
S4548	Sandoval, Brown and Peters	C7667
S2603	Madden Inc	C1342
S3568	Pearson, Wall and Shelton	C3989
S8035	Ellis Ltd	C1699

At the bottom, a footer note reads: '2023 Oracle - Live SQL 23.4.1, running Oracle Database 19c EE Extreme Perf - 19.17.0.0.0 - Database Documentation - Ask Tom - Dev Gym. Built with using Oracle APEX - Privacy - Terms of Use'.

product_dimension:

INSERT INTO product_dim (product_id, product_name, product_category,
product_brand)

VALUES ('P2859', 'Titan T27', 'watches', 'Titan');

INSERT INTO product_dim (product_id, product_name, product_category,
product_brand)

VALUES ('P5937', 'Samsung QLED 21', 'tv', 'Samsung');

INSERT INTO product_dim (product_id, product_name, product_category,
product_brand)

VALUES ('P1553', 'Philips Iron I4', 'Electrical App', 'Philips');

INSERT INTO product_dim (product_id, product_name, product_category,
product_brand)

VALUES ('P7296', 'Nike Nex', 'Wear', 'Nike');

INSERT INTO product_dim (product_id, product_name, product_category,
product_brand)

VALUES ('P9813', 'US Polo Black Denim', 'Wear', 'US Polo');

INSERT INTO product_dim (product_id, product_name, product_category,
product_brand)

VALUES ('P5206', 'Samsung Washing Machine', 'Electrical App', 'Samsung');

INSERT INTO product_dim (product_id, product_name, product_category,
product_brand)

VALUES ('P1489', 'Reliance Hair Dryer', 'Electrical App', 'Reliance');

INSERT INTO product_dim (product_id, product_name, product_category,
product_brand)

VALUES ('P9351', 'LG 42inch P32', 'tv', 'LG');

INSERT INTO product_dim (product_id, product_name, product_category,
product_brand)

VALUES ('P4413', 'Sony Bravia S76', 'tv', 'Sony');

INSERT INTO product_dim (product_id, product_name, product_category,
product_brand)

VALUES ('P3825', 'Fossil F31', 'watches', 'Fossil');

INSERT INTO product_dim (product_id, product_name, product_category,
product_brand)

VALUES ('P7873', 'Giordano G21', 'watches', 'Giordano');

INSERT INTO product_dim (product_id, product_name, product_category,
product_brand)

VALUES ('P1596', 'MI MicroLED M31', 'tv', 'MI');

INSERT INTO product_dim (product_id, product_name, product_category,
product_brand)

VALUES ('P2693', 'Oneplus O8', 'tv', 'Oneplus');

INSERT INTO product_dim (product_id, product_name, product_category,
product_brand)

VALUES ('P4110', 'NutriCook Mixer G21', 'Electrical App', 'NutriCook');

INSERT INTO product_dim (product_id, product_name, product_category,
product_brand)

VALUES ('P1235', 'DNMX Shirt S21', 'Wear', 'DNMX');

```
INSERT INTO product_dim (product_id, product_name, product_category,
product_brand)
```

```
VALUES ('P2301', 'DNMX Hoodie', 'Wear', 'DNMX');
```

```
INSERT INTO product_dim (product_id, product_name, product_category,
product_brand)
```

```
VALUES ('P5882', 'Giordano G26', 'watches', 'Giordano');
```

```
INSERT INTO product_dim (product_id, product_name, product_category,
product_brand)
```

```
VALUES ('P7062', 'Sonata Kid K2', 'watches', 'Sonata');
```

```
INSERT INTO product_dim (product_id, product_name, product_category,
product_brand)
```

```
VALUES ('P8087', 'Oneplus O20', 'tv', 'Oneplus');
```

```
INSERT INTO product_dim (product_id, product_name, product_category,
product_brand)
```

```
VALUES ('P4582', 'Oneplus O85', 'tv', 'Oneplus');
```

The screenshot shows the 'Live SQL' web application interface. On the left is a sidebar with navigation options: Home, SQL Worksheet (selected), My Session, Schema, Quick SQL, My Scripts, My Tutorials, and Code Library. The main area is titled 'SQL Worksheet' and contains a query editor with the following SQL code:

```
41 VALUES ('P4582', 'Oneplus O85', 'tv', 'Oneplus');
42
43 SELECT * FROM product_dim
44
```

Below the editor, a table displays the results of the query. The table has four columns: PRODUCT_ID, PRODUCT_NAME, PRODUCT_CATEGORY, and PRODUCT_BRAND. It contains ten rows of data:

PRODUCT_ID	PRODUCT_NAME	PRODUCT_CATEGORY	PRODUCT_BRAND
P2859	Titan T27	watches	Titan
P5937	Samsung QLED 21	tv	Samsung
P1553	Philips Iron 14	Electrical App	Philips
P7296	Nike Nex	Wear	Nike
P9813	US Polo Black Denim	Wear	US Polo
P5206	Samsung Washing Machine	Electrical App	Samsung
P1489	Reliance Hair Dryer	Electrical App	Reliance
P9351	LG 42inch P32	tv	LG
P4413	Sony Bravia S76	tv	Sony

At the bottom of the interface, there is a footer with the text: '2023 Oracle - Live SQL 23.4.1, running Oracle Database 19c EE Extreme Perf - 19.17.0.0.0 - Database Documentation - Ask Tom - Dev Gym' and 'Built with using Oracle APEX - Privacy - Terms of Use'.

transaction_date_dimension:

```
INSERT INTO transaction_date_dim (arrival_date, dispatch_date,
duration_in_warehouse)
```



```
VALUES (TO_DATE('29-11-2021', 'DD-MM-YYYY'), TO_DATE('15-01-2023',  
'DD-MM-YYYY'), 413);
```

```
INSERT INTO transaction_date_dim (arrival_date, dispatch_date,  
duration_in_warehouse)
```

```
VALUES (TO_DATE('18-09-2021', 'DD-MM-YYYY'), TO_DATE('26-05-2022',  
'DD-MM-YYYY'), 250);
```

```
INSERT INTO transaction_date_dim (arrival_date, dispatch_date,  
duration_in_warehouse)
```

```
VALUES (TO_DATE('14-05-2021', 'DD-MM-YYYY'), TO_DATE('16-05-2022',  
'DD-MM-YYYY'), 367);
```

```
INSERT INTO transaction_date_dim (arrival_date, dispatch_date,  
duration_in_warehouse)
```

```
VALUES (TO_DATE('21-06-2021', 'DD-MM-YYYY'), TO_DATE('13-10-2021',  
'DD-MM-YYYY'), 115);
```

```
INSERT INTO transaction_date_dim (arrival_date, dispatch_date,  
duration_in_warehouse)
```

```
VALUES (TO_DATE('29-10-2022', 'DD-MM-YYYY'), TO_DATE('07-11-2022',  
'DD-MM-YYYY'), 9);
```

```
INSERT INTO transaction_date_dim (arrival_date, dispatch_date,  
duration_in_warehouse)
```

```
VALUES (TO_DATE('04-11-2022', 'DD-MM-YYYY'), TO_DATE('17-11-2022',  
'DD-MM-YYYY'), 13);
```

```
INSERT INTO transaction_date_dim (arrival_date, dispatch_date,  
duration_in_warehouse)
```

```
VALUES (TO_DATE('18-10-2020', 'DD-MM-YYYY'), TO_DATE('16-05-2023',  
'DD-MM-YYYY'), 926);
```

```
INSERT INTO transaction_date_dim (arrival_date, dispatch_date,  
duration_in_warehouse)
```

```
VALUES (TO_DATE('04-08-2022', 'DD-MM-YYYY'), TO_DATE('23-05-2023',  
'DD-MM-YYYY'), 292);
```

```
INSERT INTO transaction_date_dim (arrival_date, dispatch_date,  
duration_in_warehouse)
```

```
VALUES (TO_DATE('01-11-2020', 'DD-MM-YYYY'), TO_DATE('09-10-2022',  
'DD-MM-YYYY'), 712);
```

```
INSERT INTO transaction_date_dim (arrival_date, dispatch_date,  
duration_in_warehouse)
```

```
VALUES (TO_DATE('11-09-2022', 'DD-MM-YYYY'), TO_DATE('20-01-2023',  
'DD-MM-YYYY'), 131);
```

```
INSERT INTO transaction_date_dim (arrival_date, dispatch_date,  
duration_in_warehouse)
```

```
VALUES (TO_DATE('15-03-2020', 'DD-MM-YYYY'), TO_DATE('08-05-2023',  
'DD-MM-YYYY'), 1158);
```

```
INSERT INTO transaction_date_dim (arrival_date, dispatch_date,  
duration_in_warehouse)
```

```
VALUES (TO_DATE('29-10-2022', 'DD-MM-YYYY'), TO_DATE('10-06-2023',  
'DD-MM-YYYY'), 225);
```

```
INSERT INTO transaction_date_dim (arrival_date, dispatch_date,  
duration_in_warehouse)
```

```
VALUES (TO_DATE('23-09-2022', 'DD-MM-YYYY'), TO_DATE('27-10-2022',  
'DD-MM-YYYY'), 34);
```

```
INSERT INTO transaction_date_dim (arrival_date, dispatch_date,  
duration_in_warehouse)
```

```
VALUES (TO_DATE('10-09-2020', 'DD-MM-YYYY'), TO_DATE('25-10-2022',  
'DD-MM-YYYY'), 775);
```

```
INSERT INTO transaction_date_dim (arrival_date, dispatch_date,  
duration_in_warehouse)
```

```
VALUES (TO_DATE('03-01-2020', 'DD-MM-YYYY'), TO_DATE('14-01-2023',  
'DD-MM-YYYY'), 1093);
```

```
INSERT INTO transaction_date_dim (arrival_date, dispatch_date,  
duration_in_warehouse)
```

```
VALUES (TO_DATE('03-04-2020', 'DD-MM-YYYY'), TO_DATE('17-05-2022',  
'DD-MM-YYYY'), 765);
```

```
INSERT INTO transaction_date_dim (arrival_date, dispatch_date,  
duration_in_warehouse)
```

```
VALUES (TO_DATE('29-10-2020', 'DD-MM-YYYY'), TO_DATE('27-11-2022',
'DD-MM-YYYY'), 753);
```

```
INSERT INTO transaction_date_dim (arrival_date, dispatch_date,
duration_in_warehouse)
```

```
VALUES (TO_DATE('20-06-2022', 'DD-MM-YYYY'), TO_DATE('24-06-2023',
'DD-MM-YYYY'), 369);
```

```
INSERT INTO transaction_date_dim (arrival_date, dispatch_date,
duration_in_warehouse)
```

```
VALUES (TO_DATE('23-06-2023', 'DD-MM-YYYY'), TO_DATE('28-06-2023',
'DD-MM-YYYY'), 5);
```

```
INSERT INTO transaction_date_dim (arrival_date, dispatch_date,
duration_in_warehouse)
```

```
VALUES (TO_DATE('23-01-2023', 'DD-MM-YYYY'), TO_DATE('23-05-2023',
'DD-MM-YYYY'), 122);
```

The screenshot shows the Live SQL interface. The SQL Worksheet contains the following query:

```
40 VALUES (TO_DATE('23-01-2023', 'DD-MM-YYYY'), TO_DATE('23-05-2023', 'DD-MM-YYYY'), 122);
41
42 SELECT * FROM transaction_date_dim;
43
```

The results of the query are displayed in a table with the following columns: ARRIVAL_DATE, DISPATCH_DATE, and DURATION_IN_WAREHOUSE.

ARRIVAL_DATE	DISPATCH_DATE	DURATION_IN_WAREHOUSE
29-NOV-21	15-JAN-23	413
18-SEP-21	26-MAY-22	250
14-MAY-21	16-MAY-22	367
21-JUN-21	13-OCT-21	115
29-OCT-22	07-NOV-22	9
04-NOV-22	17-NOV-22	13
18-OCT-20	16-MAY-23	926
04-AUG-22	23-MAY-23	292
01-NOV-20	09-OCT-22	712

At the bottom of the interface, it states: 2023 Oracle - Live SQL 23.4.1, running Oracle Database 19c EE Extreme Perf - 19.17.0.0.0 - Database Documentation - Ask Tom - Dev Gym. Built with using Oracle APEX - Privacy - Terms of Use.

warehouse_dimension:

```
INSERT INTO warehouse_dim (warehouse_id, warehouse_name,
warehouse_location, city_id)
```

```
VALUES ('W7276', 'BombayX', 'Mumbai', 7597);
```

```
INSERT INTO warehouse_dim (warehouse_id, warehouse_name,
warehouse_location, city_id)
```

VALUES ('W7001', 'DelhiCaps', 'Delhi', 7099);

INSERT INTO warehouse_dim (warehouse_id, warehouse_name,
warehouse_location, city_id)

VALUES ('W1296', 'BombayZ', 'Mumbai', 7597);

INSERT INTO warehouse_dim (warehouse_id, warehouse_name,
warehouse_location, city_id)

VALUES ('W8451', 'BangalorIS', 'Bangalore', 9293);

INSERT INTO warehouse_dim (warehouse_id, warehouse_name,
warehouse_location, city_id)

VALUES ('W8571', 'KerelaSwep', 'Kerela', 6336);

INSERT INTO warehouse_dim (warehouse_id, warehouse_name,
warehouse_location, city_id)

VALUES ('W4968', 'GurgaonHDES', 'Gurgaon', 5676);

INSERT INTO warehouse_dim (warehouse_id, warehouse_name,
warehouse_location, city_id)

VALUES ('W1700', 'HyderabadHub', 'Hyderabad', 5055);

INSERT INTO warehouse_dim (warehouse_id, warehouse_name,
warehouse_location, city_id)

VALUES ('W4035', 'BombayX', 'Mumbai', 7597);

INSERT INTO warehouse_dim (warehouse_id, warehouse_name,
warehouse_location, city_id)

VALUES ('W1934', 'DelhiCaps', 'Delhi', 7099);

INSERT INTO warehouse_dim (warehouse_id, warehouse_name,
warehouse_location, city_id)

VALUES ('W2006', 'BombayZ', 'Mumbai', 7597);

INSERT INTO warehouse_dim (warehouse_id, warehouse_name,
warehouse_location, city_id)

VALUES ('W5878', 'BangalorIS', 'Bangalore', 9293);

```
INSERT INTO warehouse_dim (warehouse_id, warehouse_name,  
warehouse_location, city_id)
```

```
VALUES ('W1169', 'KerelaSwep', 'Kerela', 6336);
```

```
INSERT INTO warehouse_dim (warehouse_id, warehouse_name,  
warehouse_location, city_id)
```

```
VALUES ('W6639', 'GurgaonHDES', 'Gurgaon', 5676);
```

```
INSERT INTO warehouse_dim (warehouse_id, warehouse_name,  
warehouse_location, city_id)
```

```
VALUES ('W4150', 'HyderabadHub', 'Hyderabad', 5055);
```

```
INSERT INTO warehouse_dim (warehouse_id, warehouse_name,  
warehouse_location, city_id)
```

```
VALUES ('W5472', 'BombayX', 'Mumbai', 7597);
```

```
INSERT INTO warehouse_dim (warehouse_id, warehouse_name,  
warehouse_location, city_id)
```

```
VALUES ('W8373', 'DelhiCaps', 'Delhi', 7099);
```

```
INSERT INTO warehouse_dim (warehouse_id, warehouse_name,  
warehouse_location, city_id)
```

```
VALUES ('W3067', 'BombayZ', 'Mumbai', 7597);
```

```
INSERT INTO warehouse_dim (warehouse_id, warehouse_name,  
warehouse_location, city_id)
```

```
VALUES ('W1796', 'BangalorIS', 'Bangalore', 9293);
```

```
INSERT INTO warehouse_dim (warehouse_id, warehouse_name,  
warehouse_location, city_id)
```

```
VALUES ('W4563', 'KerelaSwep', 'Kerela', 6336);
```

```
INSERT INTO warehouse_dim (warehouse_id, warehouse_name,  
warehouse_location, city_id)
```

```
VALUES ('W1452', 'GurgaonHDES', 'Gurgaon', 5676);
```

Live SQL

SQL Worksheet

28 VALUES ('W4150', 'HyderabadHub', 'Hyderabad', 5055);
 29 INSERT INTO warehouse_dim (warehouse_id, warehouse_name, warehouse_location, city_id)
 30 VALUES ('W5472', 'BombayX', 'Mumbai', 7597);
 31 INSERT INTO warehouse_dim (warehouse_id, warehouse_name, warehouse_location, city_id)
 32 VALUES ('W8373', 'DelhiCaps', 'Delhi', 7099);
 33 INSERT INTO warehouse_dim (warehouse_id, warehouse_name, warehouse_location, city_id)

WAREHOUSE_ID	WAREHOUSE_NAME	WAREHOUSE_LOCATION	CITY_ID
W7276	BombayX	Mumbai	7597
W7001	DelhiCaps	Delhi	7099
W1296	BombayZ	Mumbai	7597
W8451	BangaloreIS	Bangalore	9293
W8571	KeralaSweep	Kerala	6336
W4968	GurgaonIDES	Gurgaon	5676
W1700	HyderabadHub	Hyderabad	5055
W4035	BombayX	Mumbai	7597

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inventory_fact_table:

CREATE TABLE inventory_management_fact AS

SELECT

1 AS transaction_id,

p.product_id,

w.warehouse_id,

s.supplier_id,

ad.arrival_date,

ad.dispatch_date,

0 AS no_of_boxes

FROM

product_dim p

CROSS JOIN

warehouse_dim w

CROSS JOIN

supplier_dim s

CROSS JOIN

transaction_date_dim ad;

Inserting random values for transaction_id and no_of_boxes

BEGIN

FOR rec IN (SELECT rowid, product_id FROM inventory_management_fact)
LOOP

UPDATE inventory_management_fact

SET

transaction_id = ROUND(DBMS_RANDOM.VALUE(50, 500)),

no_of_boxes = ROUND(DBMS_RANDOM.VALUE(1, 1000))

WHERE rowid = rec.rowid;

END LOOP;

COMMIT;

END;

/

SELECT * FROM inventory_management_fact

Live SQL

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Home SQL Worksheet Clear Find Actions Save Run

SQL Worksheet

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```

31
32 SELECT * FROM inventory_management_fact
33

```

TRANSACTION_ID	PRODUCT_ID	WAREHOUSE_ID	SUPPLIER_ID	ARRIVAL_DATE	DISPATCH_DATE	NO_OF_BOXES
317	P1235	W1169	S1561	29-NOV-21	15-JAN-23	570
320	P1235	W1169	S2142	29-NOV-21	15-JAN-23	174
132	P1235	W1169	S2603	29-NOV-21	15-JAN-23	826
137	P1235	W1169	S3115	29-NOV-21	15-JAN-23	896
286	P1235	W1169	S3141	29-NOV-21	15-JAN-23	233
68	P1235	W1169	S3284	29-NOV-21	15-JAN-23	42
325	P1235	W1169	S3534	29-NOV-21	15-JAN-23	209
66	P1235	W1169	S3535	29-NOV-21	15-JAN-23	64
401	P1235	W1169	S3568	29-NOV-21	15-JAN-23	235
319	P1235	W1169	S3895	29-NOV-21	15-JAN-23	838

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1. Slice:

CREATE MATERIALIZED VIEW mv_slice1 AS

SELECT *

FROM inventory_management_fact

WHERE SUPPLIER_ID = 'S2142';

SELECT * FROM mv_slice1;

Live SQL

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Statement processed.

TRANSACTION_ID	PRODUCT_ID	WAREHOUSE_ID	SUPPLIER_ID	ARRIVAL_DATE	DISPATCH_DATE	NO_OF_BOXES
320	P1235	W1169	S2142	29-NOV-21	15-JAN-23	174
451	P1235	W1296	S2142	29-NOV-21	15-JAN-23	945
256	P1235	W1452	S2142	29-NOV-21	15-JAN-23	988
266	P1235	W1700	S2142	29-NOV-21	15-JAN-23	305
202	P1235	W1796	S2142	29-NOV-21	15-JAN-23	279
160	P1235	W1934	S2142	29-NOV-21	15-JAN-23	791
267	P1235	W2006	S2142	29-NOV-21	15-JAN-23	186
311	P1235	W3067	S2142	29-NOV-21	15-JAN-23	575
158	P1235	W4035	S2142	29-NOV-21	15-JAN-23	289
205	P1235	W4150	S2142	29-NOV-21	15-JAN-23	963

2. Dice

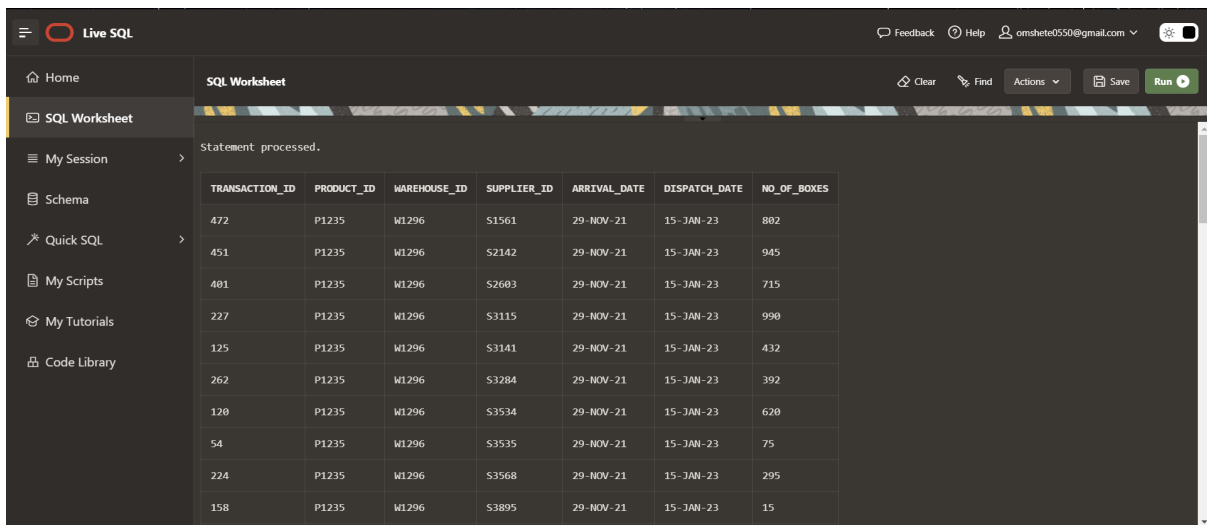
```
CREATE MATERIALIZED VIEW mv_dice AS
```

```
SELECT *
```

```
FROM inventory_management_fact
```

```
WHERE WAREHOUSE_ID = 'W1296' AND PRODUCT_ID = 'P1235';
```

```
SELECT * FROM mv_dice;
```



The screenshot shows a web-based SQL interface with a sidebar on the left containing navigation links: Home, SQL Worksheet, My Session, Schema, Quick SQL, My Scripts, My Tutorials, and Code Library. The main area displays the text 'Statement processed.' above a table with 8 columns: TRANSACTION_ID, PRODUCT_ID, WAREHOUSE_ID, SUPPLIER_ID, ARRIVAL_DATE, DISPATCH_DATE, and NO_OF_BOXES. The table contains 10 rows of data.

TRANSACTION_ID	PRODUCT_ID	WAREHOUSE_ID	SUPPLIER_ID	ARRIVAL_DATE	DISPATCH_DATE	NO_OF_BOXES
472	P1235	W1296	S1561	29-NOV-21	15-JAN-23	802
451	P1235	W1296	S2142	29-NOV-21	15-JAN-23	945
401	P1235	W1296	S2603	29-NOV-21	15-JAN-23	715
227	P1235	W1296	S3115	29-NOV-21	15-JAN-23	990
125	P1235	W1296	S3141	29-NOV-21	15-JAN-23	432
262	P1235	W1296	S3284	29-NOV-21	15-JAN-23	392
120	P1235	W1296	S3534	29-NOV-21	15-JAN-23	620
54	P1235	W1296	S3535	29-NOV-21	15-JAN-23	75
224	P1235	W1296	S3568	29-NOV-21	15-JAN-23	295
158	P1235	W1296	S3895	29-NOV-21	15-JAN-23	15

3. Rollup

```
CREATE OR REPLACE VIEW vw_rollup AS
```

```
SELECT
```

```
CASE
```

```
    WHEN GROUPING(TRANSACTION_ID) = 317 THEN 'Grand Total'
```

```
    ELSE TO_CHAR(TRANSACTION_ID)
```

```
END AS TRANSACTION_ID,
```

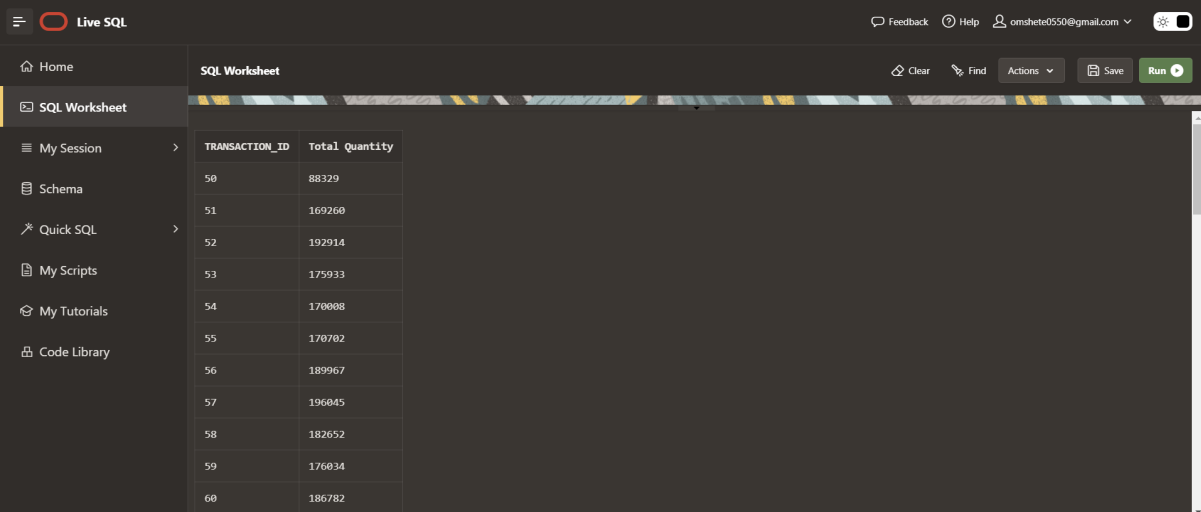
```
SUM(NO_OF_BOXES) AS "Total Quantity"
```

```
FROM inventory_management_fact
```

```
GROUP BY ROLLUP(TRANSACTION_ID);
```

```
CREATE MATERIALIZED VIEW mv_rollup_1 AS
```

```
SELECT * FROM vw_rollup;
```



The screenshot shows the 'Live SQL' web application interface. On the left is a sidebar with navigation links: Home, SQL Worksheet (selected), My Session, Schema, Quick SQL, My Scripts, My Tutorials, and Code Library. The main area is titled 'SQL Worksheet' and displays a table with two columns: 'TRANSACTION_ID' and 'Total Quantity'. The table contains 11 rows of data, with transaction IDs ranging from 50 to 60 and total quantities ranging from 88329 to 186782. At the top right of the interface, there are links for Feedback, Help, and a user profile, along with a settings icon. Below the 'SQL Worksheet' header, there are buttons for Clear, Find, Actions, Save, and a Run button.

TRANSACTION_ID	Total Quantity
50	88329
51	169260
52	192914
53	175933
54	170088
55	170702
56	189967
57	196045
58	182652
59	176034
60	186782

4. Drilldown

```
CREATE OR REPLACE VIEW vw_drilldown AS
```

```
SELECT
```

```
    TRANSACTION_ID,
```

```
    WAREHOUSE_ID,
```

```
    SUM(no_of_boxes) AS "Total Boxes"
```

```
FROM inventory_management_fact
```

```
GROUP BY TRANSACTION_ID, WAREHOUSE_ID;
```

```
CREATE MATERIALIZED VIEW mv_drilldown AS
```

```
SELECT * FROM vw_drilldown;
```

Live SQL

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TRANSACTION_ID	WAREHOUSE_ID	Total Boxes
317	W1169	8719
424	W1169	11037
401	W1296	8584
128	W1296	6300
54	W1296	8180
402	W1296	6163
174	W1296	10231
412	W1452	11205
225	W1452	5051
369	W1452	7497
482	W1452	13760