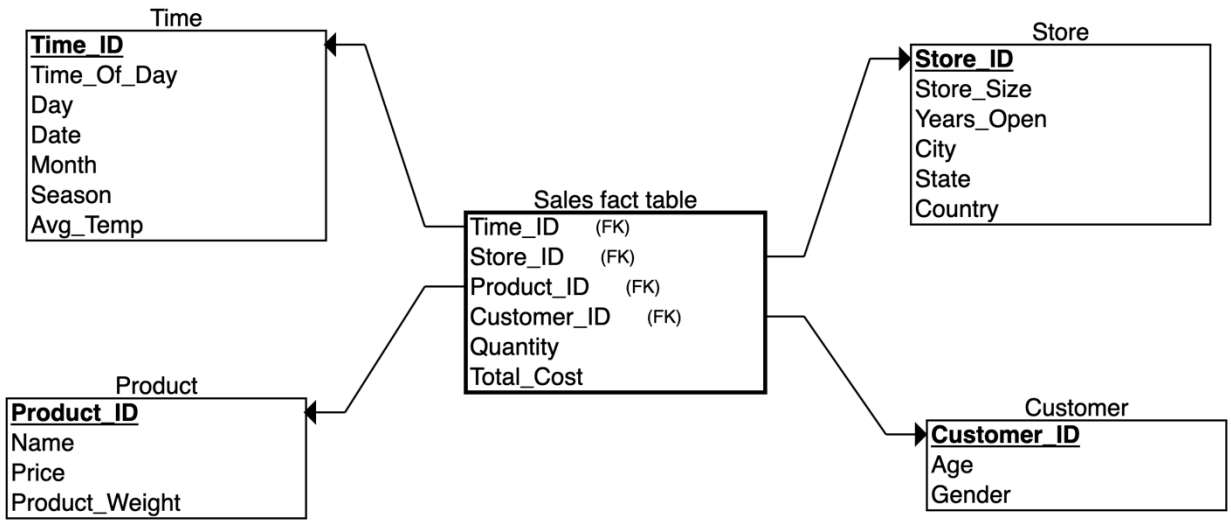
Assignment 11

1. Construct a star schema data model for a data warehouse for sales made at a chain of stores that operates in many countries. The store is interested in analyzing data based on day of the week, month, season, average temperature that day, city, state, country, price, time of the day, product weight, customer age, gender, store size and years store has been open. Use ERDPlus available on the web for your ERDs.



2. Write queries for typical analysis of trends in sales data by day of the week, by city and product weight.

Analysis of trends in sales by day of the day of the week

```
SELECT t.day1,
SUM(s.Total_Cost) AS total_amount,
SUM(s.Quantity) AS total_quantity FROM
Sales s JOIN
Time t ON s.Time_ID = t.Time_ID GROUP BY
t.day1 ORDER BY
t.day1;
```

Results | Explain | Describe | Saved SQL | History

DAY1	TOTAL_AMOUNT	TOTAL_QUANTITY
FRI	39000	79
MON	110900	102
SUN	4770	36
THU	23423	89
TUE	34567	12
WED	1400	2

6 rows returned in 0.02 seconds Download

Analysis of trends in sales by city

```
SELECT st.city,
SUM(s.total_cost) / COUNT(DISTINCT s.time_id) AS average_daily_sales FROM
Sales s JOIN
Store st ON s. Store_ID = st.Store_ID GROUP BY
st.City ORDER BY
average_daily_sales DESC;
```

Results | Explain | Describe | Saved SQL | History

CITY	AVERAGE_DAILY_SALES
CHICAGO	54500
BALTIMORE	34533.5
DC	9941
AURORA	2985
JERSEY CITY	200

5 rows returned in 0.03 seconds Download

Analysis of trends in sales by product weight

```
SELECT
p.product_weight,
COUNT(*) AS num_sales, SUM(s.total_cost) AS total_amount
FROM Sales s
JOIN
Product p ON s.Product_ID = p.Product_ID
GROUP BY p.Product_Weight
ORDER BY p.Product_Weight;
```

Results | Explain | Describe | Saved SQL | History

PRODUCT_WEIGHT	NUM_SALES	TOTAL_AMOUNT
1	2	9070
2	4	38067
3	3	132423
4	1	34500

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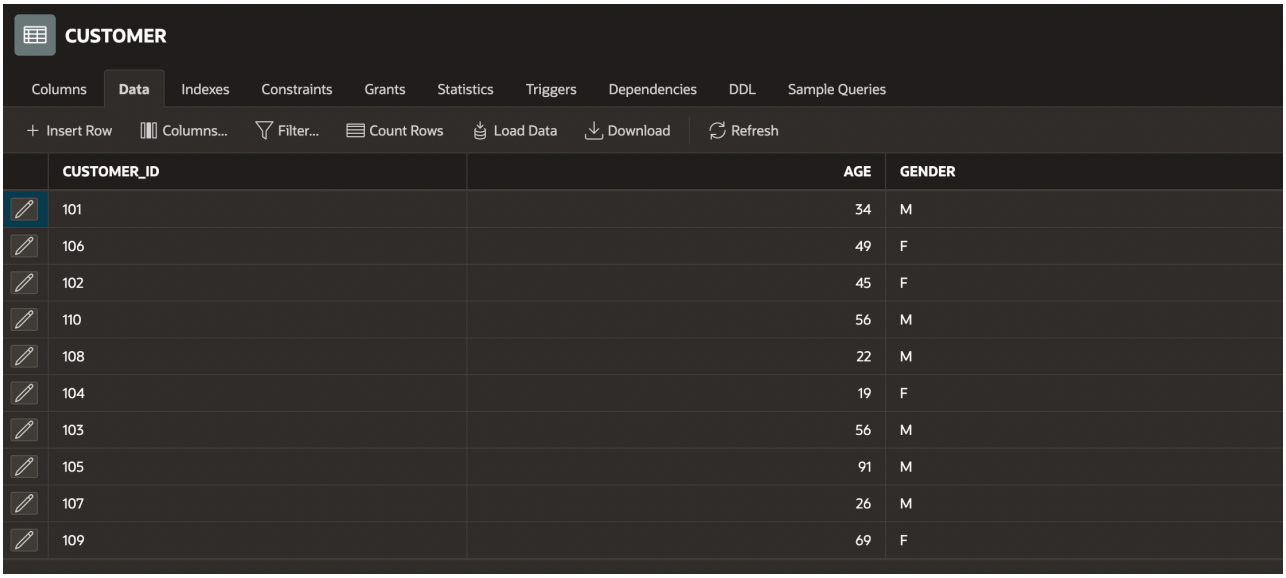
3. Use your ERD to create an Oracle database. Enter data for hundreds of sales into your database.

CUSTOMER



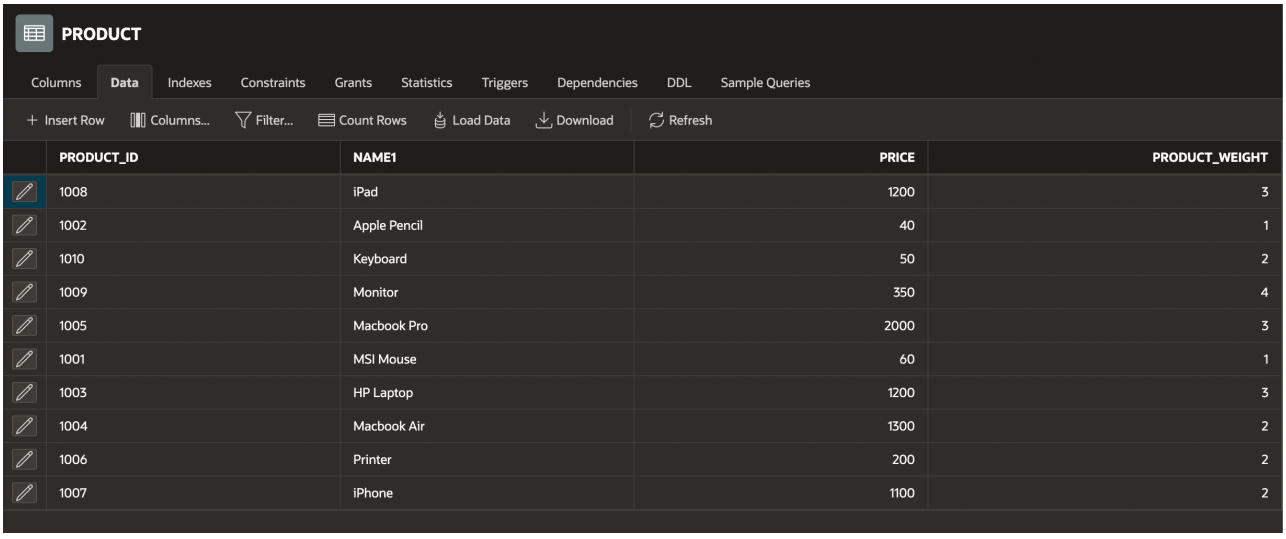
CUSTOMER

Columns | Data | Indexes | Constraints | Grants | Statistics | Triggers | Dependencies | DDL | Sample Queries

+ Insert Row | Columns... | Filter... | Count Rows | Load Data | Download | Refresh

CUSTOMER_ID	AGE	GENDER
101	34	M
106	49	F
102	45	F
110	56	M
108	22	M
104	19	F
103	56	M
105	91	M
107	26	M
109	69	F

PRODUCT



PRODUCT

Columns | Data | Indexes | Constraints | Grants | Statistics | Triggers | Dependencies | DDL | Sample Queries

+ Insert Row | Columns... | Filter... | Count Rows | Load Data | Download | Refresh

PRODUCT_ID	NAME1	PRICE	PRODUCT_WEIGHT
1008	iPad	1200	3
1002	Apple Pencil	40	1
1010	Keyboard	50	2
1009	Monitor	350	4
1005	Macbook Pro	2000	3
1001	MSI Mouse	60	1
1003	HP Laptop	1200	3
1004	Macbook Air	1300	2
1006	Printer	200	2
1007	iPhone	1100	2

SALES

SALES

Columns | Data | Indexes | Constraints | Grants | Statistics | Triggers | Dependencies | DDL | Sample Queries

+ Insert Row | Columns... | Filter... | Count Rows | Load Data | Download | Refresh

QUANTITY	TOTAL_COST	TIME_ID	STORE_ID	PRODUCT_ID	CUSTOMER_ID
35	4570	T1002	S1009	1002	102
1	200	T1006	S1005	1006	106
90	100000	T1003	S1008	1003	103
7	1900	T1010	S1001	1010	110
5	9000	T1008	S1003	1008	108
45	4500	T1001	S1010	1001	101
12	34567	T1004	S1007	1004	104
89	23423	T1005	S1006	1005	105
2	1400	T1007	S1004	1007	107
34	34500	T1009	S1002	1009	109

STORE

STORE

Columns | Data | Indexes | Constraints | Grants | Statistics | Triggers | Dependencies | DDL | Sample Queries

+ Insert Row | Columns... | Filter... | Count Rows | Load Data | Download | Refresh

STORE_ID	STORE_SIZE	YEARS_OPEN	CITY	STATE1	COUNTRY
S1001	30	3	DC	DISTRICT OF COLUMBIA	USA
S1006	89	3	DC	DISTRICT OF COLUMBIA	USA
S1008	36	10	CHICAGO	ILLINOIS	USA
S1004	90	45	AURORA	ILLINOIS	USA
S1007	234	5	BALTIMORE	MARYLAND	USA
S1002	34	10	BALTIMORE	MARYLAND	USA
S1010	90	4	DC	DISTRICT OF COLUMBIA	USA
S1003	46	4	CHICAGO	ILLINOIS	USA
S1005	546	7	JERSEY CITY	NEW JERSEY	USA
S1009	456	45	AURORA	ILLINOIS	USA

TIME

TIME

Columns | Data | Indexes | Constraints | Grants | Statistics | Triggers | Dependencies | DDL | Sample Queries

+ Insert Row | Columns... | Filter... | Count Rows | Load Data | Download | Refresh

TIME_ID	TIME_OF_DAY	DAY1	DATE1	MONTH1	SEASON	AVG_TEMP
T1007	1345	WED	11/8/2023	8	FALL	19
T1009	1330	FRI	27/10/2023	10	FALL	12
T1004	1010	TUE	15/5/2023	5	SUMMER	27
T1005	1530	THU	14/6/2023	6	SUMMER	30
T1008	1240	MON	25/9/2023	9	FALL	14
T1001	1030	FRI	10/2/2023	2	WINTER	23
T1003	1620	MON	10/3/2023	3	WINTER	20
T1010	1450	MON	12/12/2023	12	FALL	1
T1002	1140	SUN	15/2/2023	2	WINTER	23
T1006	1830	SUN	4/7/2023	7	SUMMER	25

4. Write queries for analysis of trends in sales by day of the week, by city and by product weight.

Analysis of trends by day of the week

```
SELECT t.day1 AS Week_Day,
AVG(s.total_cost) AS Average_Sales_Amount
FROM sales s
JOIN
time t ON s.time_id = t.time_id
GROUP BY t.day1
ORDER BY CASE t.day1
WHEN 'MON' THEN 1 WHEN 'TUE' THEN 2 WHEN 'WED' THEN 3 WHEN 'THU' THEN 4 WHEN 'FRI' THEN 5 WHEN 'SAT' THEN 6
WHEN 'SUN' THEN 7 END;
```

Analysis of trends by city

```
SELECT st.City,
SUM(s.Quantity) AS TotalQuantity,
SUM(s.Total_Cost) AS TotalSalesAmount
FROM Sales s
JOIN
Store st ON s.Store_ID = st.Store_ID GROUP BY
st.City ORDER BY
TotalSalesAmount DESC;
```

Analysis of trends by product weight

```sql
SELECT CASE
WHEN p.Product_Weight <= 1 THEN 'less than 1lbs' WHEN p.Product_Weight <= 5 THEN 'less than 5lbs' WHEN p.Product_Weight <= 10 THEN 'less than 10lbs' ELSE '10lbs'
END AS Weight_Range, SUM(s.Quantity) AS TotalQuantity, SUM(s.Total_Cost) AS TotalSalesAmount
FROM Sales s
JOIN
Product p ON s.Product_ID = p.Product_ID
GROUP BY CASE
WHEN p.Product_Weight <= 1 THEN 'less than 1lbs' WHEN p.Product_Weight <= 5 THEN 'less than 5lbs' WHEN p.Product_Weight <= 10 THEN 'less than 10lbs' ELSE '10lbs'
END ORDER BY
Weight_Range;
```

5. Show the results of those queries.

Analysis of trends by day of the week

Results | Explain | Describe | Saved SQL | History

WEEK_DAY	AVERAGE_SALES_AMOUNT
MON	36966.666666666666666666666666666667
TUE	34567
WED	1400
THU	23423
FRI	19500
SUN	2385

6 rows returned in 0.01 seconds Download

Analysis of trends by city

Results | Explain | Describe | Saved SQL | History

CITY	TOTALQUANTITY	TOTALSALESAMOUNT
CHICAGO	95	109000
BALTIMORE	46	69067
DC	141	29823
AURORA	37	5970
JERSEY CITY	1	200

5 rows returned in 0.02 seconds Download

Analysis of trends by product weight

Results | Explain | Describe | Saved SQL | History

WEIGHT_RANGE	TOTALQUANTITY	TOTALSALESAMOUNT
less than 1lbs	80	9070
less than 5lbs	240	204990

2 rows returned in 0.01 seconds Download