Task 3: SQL for Data Analysis

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Objective: Use SQL queries to extract and analyse data from a database.

Tools: MySQL

Dataset: Bike Store Database from Kaggle

1) **Create the Database**

   Code:

   CREATE DATABASE BIKE;

2) **Use the created database**

   Code:
   USE BIKE;

3) **SELECT, WHERE, ORDER BY, GROUP BY**

   Code:
   SELECT * FROM ORDER_ITEMS;

   Output:

order_id	item_id	product_id	quantity	list_price	discount
1	1	20	1	599.99	0.2
1	2	8	2	1799.99	0.07
1	3	10	2	1549	0.05
1	4	16	2	599.99	0.05
1	5	4	1	2899.99	0.2
2	1	20	1	599.99	0.07
2	2	16	2	599.99	0.05
3	1	3	1	999.99	0.05
3	2	20	1	599.99	0.05
4	1	2	2	749.99	0.1
5	1	10	2	1549	0.05

Code:

SELECT ORDER_ID,QUANTITY,LIST_PRICE,DISCOUNT FROM
ORDER_ITEMS WHERE DISCOUNT>0.05;

Output:

	order_id	quantity	list_price	discount
▶	1	1	599.99	0.2
	1	2	1799.99	0.07
	1	1	2899.99	0.2
	2	1	599.99	0.07
	4	2	749.99	0.1
	5	1	429	0.07
	5	1	599.99	0.07
	6	1	449	0.07
	6	1	599.99	0.1
	6	2	999.99	0.07
	6	2	2999.99	0.07

Code:

SELECT ORDER_ID,QUANTITY,LIST_PRICE,DISCOUNT FROM
ORDER_ITEMS WHERE DISCOUNT>0.05 ORDER BY LIST_PRICE ASC;

Output:

	order_id	quantity	list_price	discount
▶	1462	1	89.99	0.2
	1573	2	89.99	0.1
	1425	1	89.99	0.07
	1520	2	89.99	0.1
	1379	2	89.99	0.1
	1346	2	89.99	0.2
	1439	1	89.99	0.2
	1334	2	109.99	0.1
	690	1	109.99	0.2
	1252	1	109.99	0.2
	1137	2	109.99	0.2

Code:

SELECT CUSTOMER_ID, COUNT(ORDER_ID) AS TOTAL_ORDERS FROM
ORDERS GROUP BY CUSTOMER_ID ORDER BY TOTAL_ORDERS DESC;

Output:

customer_id	total_orders
50	3
9	3
7	3
12	3
3	3
19	3
46	3
43	3
32	3
31	3
24	3

4) Inner Join.

Code:
```
SELECT
  O.ORDER_ID,O.ORDER_DATE,
  C.FIRST_NAME,C.LAST_NAME
FROM ORDERS O
INNER JOIN CUSTOMERS C ON O.CUSTOMER_ID = C.CUSTOMER_ID
ORDER BY O.ORDER_DATE;
```

Output:

order_id	order_date	first_name	last_name
2	2016-01-01	Jaqueline	Cummings
1	2016-01-01	Johnathan	Velazquez
3	2016-01-02	Joshua	Robertson
4	2016-01-03	Nova	Hess
5	2016-01-03	Arla	Ellis
8	2016-01-04	Leslie	Higgins
7	2016-01-04	Laureen	Paul
6	2016-01-04	Sharyn	Hopkins
10	2016-01-05	Alane	Munoz

5) Left Join

Code:
```
SELECT
    P.PRODUCT_NAME,C.CATEGORY_NAME
FROM PRODUCTS P
LEFT JOIN CATEGORIES C ON P.CATEGORY_ID = C.CATEGORY_ID
ORDER BY P.PRODUCT_NAME;
```

Output:

	product_name	category_name
▶	Electra Amsterdam Fashion 3i Ladies' - 2017/2018	Cruisers Bicycles
	Electra Amsterdam Fashion 7i Ladies' - 2017	Cruisers Bicycles
	Electra Amsterdam Original 3i - 2015/2017	Cruisers Bicycles
	Electra Amsterdam Original 3i Ladies' - 2017	Cruisers Bicycles
	Electra Amsterdam Royal 8i - 2017/2018	Cruisers Bicycles
	Electra Amsterdam Royal 8i Ladies - 2018	Cruisers Bicycles
	Electra Cruiser 1 - 2016/2017/2018	Cruisers Bicycles
	Electra Cruiser 1 (24-Inch) - 2016	Cruisers Bicycles
	Electra Cruiser 1 (24-Inch) - 2016	Children Bicycles
	Electra Cruiser 1 Ladies' - 2018	Cruisers Bicycles

6) Right Join

Code:
```
SELECT
    C.CATEGORY_NAME, P.PRODUCT_NAME
FROM PRODUCTS P
RIGHT JOIN CATEGORIES C ON P.CATEGORY_ID = C.CATEGORY_ID
ORDER BY C.CATEGORY_NAME;
```

Output:

	category_name	product_name
▶	Children Bicycles	Electra Water Lily 1 (16-inch) - Girl's - 2018
	Children Bicycles	Electra Under-The-Sea 1 16" - 2018"
	Children Bicycles	Electra Treasure 3i 20" - 2018"
	Children Bicycles	Electra Treasure 1 20" - 2018"
	Children Bicycles	Electra Tiger Shark 3i (20-inch) - Boys' - 2018
	Children Bicycles	Electra Tiger Shark 1 (20-inch) - Boys' - 2018
	Children Bicycles	Electra Sweet Ride 3i (20-inch) - Girls' - 2018
	Children Bicycles	Electra Sweet Ride 1 (20-inch) - Girl's - 2018
	Children Bicycles	Electra Superbolt 3i 20" - 2018"
	Children Bicycles	Electra Superbolt 1 20" - 2018"

7) Subqueries

Code:

```
SELECT
  PRODUCT_NAME,
  (SELECT SUM(QUANTITY)
   FROM ORDER_ITEMS OI
   WHERE OI.PRODUCT_ID = P.PRODUCT_ID) AS TOTAL_QUANTITY_SOLD
FROM PRODUCTS P
ORDER BY TOTAL_QUANTITY_SOLD DESC;
```

Output:

product_name	total_quantity_sold
Surly Ice Cream Truck Frameset - 2016	167
Electra Cruiser 1 (24-Inch) - 2016	157
Electra Townie Original 7D EQ - 2016	156
Trek Slash 8 27.5 - 2016	154
Electra Girl's Hawaii 1 (20-inch) - 2015/2016	154
Electra Townie Original 21D - 2016	153
Surly Straggler 650b - 2016	151
Electra Townie Original 7D - 2015/2016	148
Surly Straggler - 2016	147
Trek Conduit+ - 2016	145
Electra Girl's Hawaii 1 (16-inch) - 2015/2016	145

8) Sum()

Code:
```
SELECT  ITEM_ID,SUM(QUANTITY) AS TOTAL_QUANTITY FROM
ORDER_ITEMS GROUP BY ITEM_ID;
```

Output:

item_id	total_quantity
1	2413
2	1962
3	1449
4	873
5	381

9) Avg()

Code:
```
SELECT  ITEM_ID,AVG(LIST_PRICE) AS AVERAGE_PRICE
FROM ORDER_ITEMS GROUP BY ITEM_ID ORDER BY AVERAGE_PRICE;
```

Output:

	item_id	average_price
▶	4	1153.11476764199
	1	1182.5201114551005
	3	1211.1862920167998
	2	1251.7549434815298
	5	1346.3512145748946

10) Views

Code:
```
CREATE VIEW TOP_SELLING_PRODUCTS AS
SELECT
   P.PRODUCT_ID,
   P.PRODUCT_NAME,
   SUM(OI.QUANTITY) AS TOTAL_QUANTITY_SOLD
FROM ORDER_ITEMS OI
JOIN PRODUCTS P ON OI.PRODUCT_ID = P.PRODUCT_ID
GROUP BY P.PRODUCT_ID, P.PRODUCT_NAME
ORDER BY TOTAL_QUANTITY_SOLD DESC;

SELECT * FROM TOP_SELLING_PRODUCTS;
```

Output:

	product_id	product_name	total_quantity_sold
▶	6	Surly Ice Cream Truck Frameset - 2016	167
	13	Electra Cruiser 1 (24-Inch) - 2016	157
	16	Electra Townie Original 7D EQ - 2016	156
	7	Trek Slash 8 27.5 - 2016	154
	23	Electra Girl's Hawaii 1 (20-inch) - 2015/2016	154
	12	Electra Townie Original 21D - 2016	153
	11	Surly Straggler 650b - 2016	151
	25	Electra Townie Original 7D - 2015/2016	148
	10	Surly Straggler - 2016	147
	9	Trek Conduit+ - 2016	145

11) Queries with indexes

Code:
```
CREATE INDEX IDX_CUSTOMER_ID
ON CUSTOMERS(CUSTOMER_ID);

SELECT * FROM CUSTOMERS WHERE CUSTOMER_ID = 105;
```

Output:

customer_id	first_name	last_name	phone	email	street	city	state	zip_code
105	Marget	Hodge	NULL	marget.hodge@msn.com	7199 Selby Lane	Woodhaven	NY	11421