Database project part 2
E-commerce database
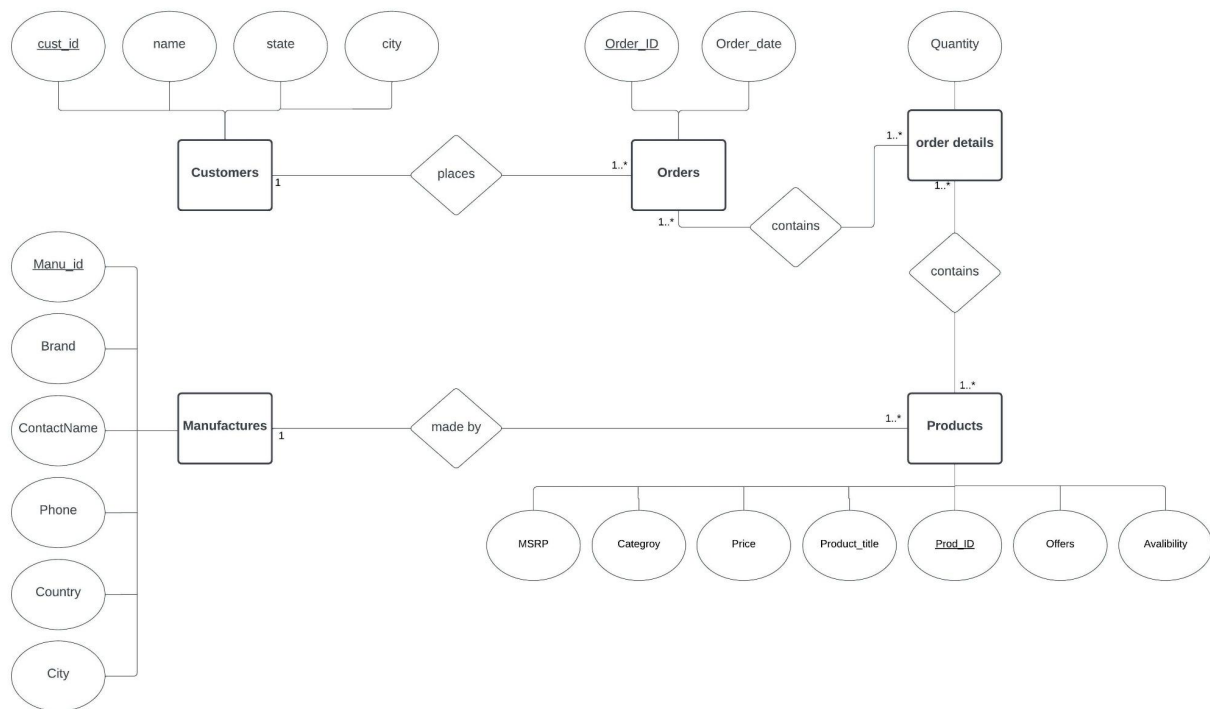
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1)Show that you have successfully installed Postgres and you can use pgAdmin or psql on your local machine or virtual machine (you can provide a screenshot).

```
[supreeth_mudduchetty@supreeths-MacBook-Air Project files % psql
psql (14.5 (Homebrew))
Type "help" for help.

[supreeth_mudduchetty=# \dt
                List of relations
 Schema |     Name      | Type  |       Owner
--------+---------------+-------+--------------------
 public | customers     | table | supreeth_mudduchetty
 public | manufacturers | table | supreeth_mudduchetty
 public | order_details | table | supreeth_mudduchetty
 public | orders        | table | supreeth_mudduchetty
 public | products      | table | supreeth_mudduchetty
 public | test          | table | supreeth_mudduchetty
(6 rows)

supreeth_mudduchetty=#
```

2)ERD

3)Database schema designed with your designed tables, attribute

Customers(cust_id,name,state,city)

- cust_id - varchar(10)
- name - text
- state - text
- city - text

Create table statement -

```
create table customers(cust_id varchar(10),name text, state text, city text );
```

Setting primary key for customers table

```
ALTER TABLE customers
 ADD CONSTRAINT pk_customer
   PRIMARY KEY (cust_id);
```

Loading csv data into the table -

```
\copy customers from Final_Customers.csv with csv header;
```

Orders(order_id,order_date,cust_id)

Foreign key - Orders**.**cust_id is a foreign key referencing Customers.cust_id

- order_id - varchar(10)
- order_date-date
- cust_id-varchar(10)

Create table statement -

```
create table orders(
    order_id varchar(10) CONSTRAINT pk_order PRIMARY KEY,
    order_date DATE,
    cust_id varchar(10));
```

Setting foreign key constraint -

```
ALTER TABLE orders
    ADD CONSTRAINT fk_orders_customers FOREIGN KEY (cust_id) REFERENCES customers
(cust_id);
```

Loading csv data into the table -

```
\copy orders from Final_Order.csv with csv header;
```

Products(prod_id,product_title,category,price,msrp,offers,availability,manu_id)

Foreign key - Products**.**manu_id is a foreign key referencing Manufacturers**.**manu_id

- prod_id-varchar(40)
- product_title-varchar(300)
- category- varchar(50)
- price - numeric
- msrp - numeric
- offers- numeric
- availability- avalibility_type (type ENUM)
    - Accepted values - YES/NO
- manu_id - varchar(10)

Creating enum for availability attribute

```
create type available as ENUM('YES','NO');
```

Create table statement -

```
create table products(
   prod_id varchar(40) CONSTRAINT pk_products PRIMARY KEY,
   category  varchar(50),
   product_title varchar(300),
   manu_id    varchar(10),
   msrp    numeric,
   price    numeric,
   offers   numeric,
   availability available
);
```

Setting foreign key constraint -

```
ALTER TABLE products
   ADD CONSTRAINT fk_products_manufacturers FOREIGN KEY (manu_id) REFERENCES
manufacturers (manu_id);
```

Loading csv data into the table -

```
\copy products from Final_products.csv with csv header;
```

Order_details(<u>order_id</u>,<u>prod_id</u>,quantity)

Foreign key - Order_details**.**cust_id is a foreign key referencing Customers.cust_id

Foreign key - Order_details**.**prod_id is a foreign key referencing Products.prod_id

- <u>order_id - varchar(10)</u>
- <u>prod_id-varchar(40)</u>
- quantity-numeric

Create table statement -

```
create table order_details(
   order_id varchar(10),
   prod_id varchar(40),
   quantity numeric,
   CONSTRAINT order_details_pk PRIMARY KEY (order_id, prod_id)
);
```

Setting foreign key constraint -

```
ALTER TABLE order_details
   ADD CONSTRAINT fk_order_details_orders FOREIGN KEY (order_id) REFERENCES orders
(order_id);
```

```
ALTER TABLE order_details
    ADD CONSTRAINT fk_order_details_products FOREIGN KEY (prod_id) REFERENCES products
(prod_id);
```

Loading CSV data into the table -
```
\copy order_details from Final_Order_details.csv with csv header;
```

Manufacturers(manu_id,brand,contact_name,phone,country,city)
- manu_id - varchar(10)
- brand- varchar(40)
- contact_name-text
- phone-text
- country-text
- city-text

Create table statement -
```
create table manufacturers(
    manu_id varchar(10) CONSTRAINT pk_manufacturers PRIMARY KEY,
    brand varchar(40),
    contact_name text,
    city text,
    country text,
    phone text
)
```

Loading CSV data into the table -
```
\copy manufacturers from Final_Manufactures.csv with csv header;
```

4) Data loading process and data preprocessing and cleaning

Data loading
All data was loaded as csv files using the /copy command. You can find my load commands along with the create table commands.

Data preprocessing
For the customer and order table, the below dataset was broken down in order to populate both these tables
> https://www.kaggle.com/datasets/benroshan/ecommerce-data

Excel was used to do all the data preprocessing.
Steps involved in cleaning the dataset used to populate the **customer** table -
1. Duplicate customer entries were deleted using excels 'remove duplicates' option
2. I generated unique customer IDs for all the rows in the dataset
3. I applied a filter to all the columns and filtered by Null values. Rows with null values were deleted.

Steps involved in cleaning the dataset used to populate the **orders** table-
1. When the above dataset was split into 2 tables, customer and order, the orders table had customer name instead of the customer id. After unique customer ids were generated and added to the customer dataset, the customer names in the orders dataset were replaced with customer ids.
2. The date column's values had to be reformatted as it did not comply with the PSQLs date format. This column was reformted to the in a yyy-mm-dd format using excel's 'format cell' option.

Steps involved in cleaning the dataset used to populate the **Manufactures** table-
1. It was created using the below dataset
   a. https://www.kaggle.com/code/kerneler/starter-manufacturer-sql-dataset-e70be8e3-2/data?select=sample-data.sql
2. It was first cleaned using vscode to remove extra characters and symbols
3. The data was then formatted into csv format and then duplicates and null values were removed using sheets.
4. The company name table was repopulated with the unique list of brand names present in the the products dataset.
5. Random Ids were for all the company names
6. The phone number format was changed from ()-()-() and 123.123.4454 to just 9153351734

Steps involved in cleaning the dataset used to populate the **Products** table-

1. It was created using the below dataset
   a. https://www.kaggle.com/datasets/mukuldeshantri/ecommerce-fashion-dataset
2. It was cleaned using excel.
3. The Uniq column was renamed to prod_id and columns that were not going to be used in the project were deleted (Crawl Timestamp, Site Name, Product Description, Pack Size Or Quantity, Combo Offers, Image URLs)
4. The offer column was in a percentage format, it was reformatted to a floating point to make calculations easier.
5. The Null values as well as rows with special characters were removed.
6. Vlookup was used to populate a new column, Brand ID based on the manufacturer's table

5)Screenshots of the first five rows of all the populated tables. Your screenshots need to show sufficiently show your working environment as well.

Customers table

cust_id	name	state	city
CA01	Bharat	Gujarat	Ahmedabad
CA02	Pearl	Maharashtra	Pune
CA03	Jahan	Madhya Pradesh	Bhopal
CA04	Divsha	Rajasthan	Jaipur
CA05	Kasheen	West Bengal	Kolkata
CA06	Hazel	Karnataka	Bangalore
CA07	Sonakshi	Jammu and Kashmir	Kashmir
CA08	Aarushi	Tamil Nadu	Chennai

Manufacturers table

manu_id	brand	contact_name	city	country	phone
BA023	Homely	Charlotte Cooper	London	UK	5306646402
BA024	FashladyTM	Shelley Burke	New Orleans	USA	9044346942
BA025	Fa	Regina Murphy	Ann Arbor	USA	4895312053
BA026	Veena	Yoshi Nagase	Tokyo	Japan	9153351734
BA027	Homey	Antonio del Valle Saavedra	Oviedo	Spain	5012842321
BA028	Philosophy	Mayumi Ohno	Osaka	Japan	5064579025
BA029	BuyChoice	Ian Devling	Melbourne	Australia	5214886766
BA030	Parag fragrances	Peter Wilson	Manchester	UK	5682018967
BA031	The Saem	Lars Peterson	Göteborg	Sweden	8433706745
BA032	Fashladya	Carlos Diaz	Sao Paulo	Brazil	4187586558

Products table

prod_id	category	product_title	manu_
id	msrp	price	offers	availability		
f8b68a86debc9253226d6a829b865f38	Make up	Homely 100pcs/bag Japan Rough Triangle Metal Circle Stud Rivet Nail Art Decoration 3D Nail Accessories DIY Nail Tools series 11 : 7	BA023
1017	678	0.33	YES			
3100ab4e92077d37b208e1e2da1bb601	Make up	Fashlady™ F019: 2 Folhas De Lavanda Flor Etiqueta Do Prego Decalques De Á Gua Roxo Blooming Slides Diy Projeto Nail Art Decalques De TransferÊ Ncia	BA024
1949	1299	0.33	YES			
b8f4d3a59d5c366d3ccaa94760087d78	Make up	Fashlady™ 1 Sheet Nailmad Diamond Heart Nail Art Sticker Artascope 3D Nail Sticker Triangle Nail Sticker	BA024
1949	1299	0.33	YES			
2e0dfeb33b2d4a154693a1353d716f5	Bath & Shower	Fa Coconut Water Shower Gel – 250ml	BA025
595	495	0.17	NO			
1f41d00d574e35e0636790d24051005c	Make up	Veena OTwoO Brush Set Soft And Easy To Wear Professional Make Up Brush Set Eyebrow Eyeshadow Eyeliner Lip Make Up Tools Kit 12 Pcs9962F01	BA026
1506.4	1065	0.29	NO			

Orders table

order_id	order_date	cust_id
B-25601	2018-01-04	CA01
B-25602	2018-01-04	CA02
B-25603	2018-03-04	CA03
B-25604	2018-03-04	CA04
B-25605	2018-05-04	CA05

Order_details table

order_id	prod_id	quantity
B-25601	bc8645d634457484d7886ce7d88646f2	7
B-25602	bf3a93a3a9db223f54e4d393d32a6ceb	9
B-25602	bc8645d634457484d7886ce7d88646f2	5
B-25603	f0b68a06debc9253226d6a029b065f38	3
B-25604	3100ab4692077d37b288e1e2da1bb601	7

Views

1. View that displays the top 50 products that have the highest absolute discount amount (absolute discount amount = msrp*percent_discount)

```
supreeth_mudduchetty=#   create view absolute_discount as
    select prod_id,substring(product_title from 1 for 20), msrp*offers as absolute_discount_amount
    from products
    order by absolute_discount_amount DESC
    limit 50;
CREATE VIEW
supreeth_mudduchetty=# select * from absolute_discount ;
            prod_id               |       substring       | absolute_discount_amount
----------------------------------+-----------------------+--------------------------
 bd798605b24ef720cbcb08062c454230 | Veena Mermaid Pearl   |
 7557c93c865e976da608212299802182 | ShopUSAIndia DPHUE R  |                 11454.99
 8810b8c593078cd4d955afae6c722c66 | My Beauty Diary Faci  |                  8829.60
 0dbf743638a4ccf6ffe75f1d3fc733ab | Generic Infrared Hea  |                  6541.59
 0c65023309b8f1cd1c83024321113457 |  Fashlady™ D, 0.20Mm  |                  4813.38
 378a76508de3820fe26f4c2404786023 | OTTIE First Swing Re  |                  3220.28
 e28ed4f1291eec2bf44eae24f3fc5b00 | Generic 100PCS B: Co  |                  2431.22
 3ca6b99129ebfdb9f6428791fbf24f67 |  Fashlady™ D, 0.15Mm  |                  2081.64
 cfefeb399fad61f457293262709424c0 |  Generic J, 0.15mm:   |                  1796.11
 436452cfe6e70b2cf24b075cfb5ac5c3 | Fashlady™ Number 3:   |                  1431.21
 77492ebd3735bb7a5aac5c4dc0218799 | FARMERLY 0.2g/box Ga  |                  1337.34
 ab95dc71a7f8ba21a10fdf051442faba |  Fashlady™ C, 0.07Mm  |                  1300.86
 041de28eceb51a7ab13abb788e94aebf | Generic 0.8mm of 4 C  |                  1193.68
 305373e181d9d6807036acbd8ac0d6dc | Fashlady™ Ss2 1440Pc  |                  1171.17
 5ec7adcb042ac18988a2df6b9c08aa60 |  Fashlady™ Aquamarin  |                  1041.15
 0345f95e81c1c6a9d5abb2aa8849dd61 | 50G. UNDERARM CUPCAK  |                  1019.66
 4e969eab7226803c5a80f6b6523c4fe7 | Deve Herbes Pure Jun  |                   989.91
 204424f5d2a8e7d6f1d3c31fe5955aab | Noble Mart Natural a  |                   934.45
 62806229bc505f63a4e0257bb79b8c65 | [the SAEM] Snail Ess  |                   868.40
 b205f4647c9f0b8df6b1ce77fc071f65 |  Fashlady™ C, 0.07Mm  |                   780.78
 e790018c178b94ebb06f5bce8fdf32b8 | Fashlady™ Kads 026:   |                   780.78
 79e712ad43730da319182a815ecfc09b | Fashlady™ Color 26:   |                   780.78
 53256125f5c811a33a4cc28e583ee0f8 | Fashlady™ Silver: 10  |                   780.78
 ef28ea3c2995538032e5f4e210ab2874 | Fashlady™ Immaturity  |                   780.78
 87eebac78056d39dbba8ffe445491bb0 | Fashlady™ 48 Garrafa  |                   780.78
 e9aa4fb33da1b3e5a0709c0f3e7b9035 | Generic 9Pcs Stainle  |                   769.27
 b330b94f025609b1d73c34cf40e4b94c | Fashlady™ Small- Blu  |                   757.35
 854dcd4c6501b8acf24f47ac18e5cfe0 | Makeup Brushes Set -  |                   721.76
 62f9e9106f741c7da412524eef581fd9 | FARMERLY ELECOOL Blo  |                   720.13
 6359a645f5d8cb9a8dabd4c12da4c224 | FARMERLY Holographic  |                   720.13
 700ea5adf035daa753ef46209c58739f | Roger&Gallet Bois DO  |                   662.48
 9aba8d76ddc6735915ba1844b9d6d4f6 | Fashlady™ 16 Silver:  |                   643.17
 8a868e82192ba810a4385684707c1ad1 | Fashlady™ 3: 2G/Box   |                   643.17
 7c6632ac6154f0522db43ca1267cd9ab | Fashlady™ Jt10: 100P  |                   643.17
 b8f4d3a59d5c366d3ccaa94760887d78 | Fashlady™ 1 Sheet Na  |                   643.17
 54e5bc8c693c7a82966e63a10f747f7d | Fashlady™ 2Mm: Jelly  |                   643.17
 3100ab4692077d37b288e1e2da1bb601 | Fashlady™ F019: 2 Fo  |                   643.17
 ac9e8d066dd83fece3b00ff4c09dc0b0 | Fashlady™ 11: 18 Typ  |                   643.17
 01362502f4e6d328944399ad4a60af29 | Fashlady™ 04: Nail A  |                   643.17
 afd82321bcf424baf65191cc6c4c7967 | Fashladyâ„¢ Yellow:   |                   622.63
 71a82fab0905be1d4b5cb0e483830173 | Fashlady™ Black: Mak  |                   605.88
 9a33a2bacdc7b9c1a42d1e3753a427f1 | uber Color RandomSty  |                   605.87
 1aaf36edfd10ef984ef93039a4e2d566 | I TOUCH HERBAL BRAND  |                   602.33
 a22049f96478f8303a8eacef2295b6ff | Nature Republic Supe  |                   600.00
 7372922b2bb348ccd9857c0a7089e9f5 | Generic Eastern Eigh  |                   571.23
 710abf14f6048864f2dcdbbfad6d1068 | Homely Y&W&F 17 Colo  |                   548.13
 c58a84f5ae742337c31bde51f561c454 | Fresh - Sugar Lemon   |                   543.06
 239fa09796ae3fa52e046273647ba6d2 | Fashlady™ 1: 1Pcs Br  |                   520.74
 84d54a788025848f7f281b379e0f3ff3 | Fashlady™ Pj733-100P  |                   504.90
 d196219d0932526b3c1b6347b25b70e0 | Ancy Indian Green Ra  |                   499.00
(50 rows)
```

2. View to display all products that are not in stock

```
supreeth_mudduchetty=# create view unavailability_products as
    select prod_id,substring(product_title from 1 for 20),category
    from products
    where availability='NO';
CREATE VIEW
supreeth_mudduchetty=# select * from unavailability_products ;
             prod_id              |       substring       |        category
----------------------------------+-----------------------+-------------------------
 2e0dfeb33b2484a154693a1353d716f5 | Fa Coconut Water Sho  | Bath & Shower
 1f41d00d574e35e0636798d24051005c | Veena OTwoO Brush Se   | Make up
 bf3a93a3a9db223f54e4d393d32a6ceb | Xplus Bath Loofah(Pa   | Skin Care
 8a868e82192ba810a4385684707c1ad1 | Fashlady™ 3: 2G/Box    | Make up
 f1c0b5475fad9b168a1604c72765c17f |  VLCC COMBO (ANTI TA   | Skin Care
 cd2e5b538cc7cf9980c42ac8c7f67df8 | Atoz prime leader 12   | Make up
 23b2a5133e031483b3ef4f51d2088527 | Vanilla Premium Grad   | Fragrance
 ac9e8d066dd83fece3b00ff4c09dc0b0 | Fashlady™ 11: 18 Typ   | Make up
 cdb82d39dafc574c94eb72a562015481 | Generic 1 PCS Make U   | Make up
 607860f4db732ef80551a08658f5b053 | L.I.P. (Light/Day Pa   | Skin Care
 a289d0fc34c0a20890a57a52d209d964 | The Tiny Hut Black P   | Grocery & Gourmet Foods
 8810b8c593078cd4d955afae6c722c66 | My Beauty Diary Faci   | Skin Care
 b1e73aa2f8d9229edfe272e309007b06 | ASGHAR ALI HABAT AL    | Fragrance
 9a33a2bacdc7b9c1a42d1e3753a427f1 | uber Color RandomSty   | Hair Care
 239fa09796ae3fa52e046273647ba6d2 | Fashlady™ 1: 1Pcs Br   | Make up
 98f0682a4e4e4d04beb98618b8cc1910 |  Astaberry Skin Whit   | Skin Care
 0345f95e81c1c6a9d5abb2aa8849dd61 | 50G. UNDERARM CUPCAK   | Fragrance
 378a76508de3820fe26f4c2404786023 | OTTIE First Swing Re   | Skin Care
 77492ebd3735bb7a5aac5c4dc0218799 | FARMERLY 0.2g/box Ga   | Make up
 ea4144d30d868729258a3f3dd1c41fb7 | Amore Pacific Mise e   | Hair Care
 368bb5f4a04f98552f0021df3d11d222 | Max Green Alchemy Sk   | Bath & Shower
 5ce7f444e2b705b108260a433d400b92 |  Decleor Aroma Exper   | Skin Care
 4bbee86a2e8d67f9253c988c7dad0057 | White: Rhinestone Ey   | Make up
 87eebac78056d39dbba8ffe445491bb0 | Fashlady™ 48 Garrafa   | Make up
 2de033b7470ed15cc5b4c319e2288b76 |  Sundari Thottathu M   | Grocery & Gourmet Foods
 d52e777762aa3581f543ecee5a18caca |  Pantene Silky Smoot   | Hair Care
 62f9e9106f741c7da412524eef581fd9 | FARMERLY ELECOOL Blo   | Make up
 b62205c81ee80e4c16d0cc2f34dced2a | Soft Silicone Facial   | Make up
 dca7af0f9fe6548a0ce5a98479f285d1 | Homely SS3—SS40 Crys   | Make up
 724f63a642c8d023359eaa9270c49f33 | Generic BEILI Black    | Make up
 202bb38f0abed694adeff1ad7d177c8f |  Khadi Natural Ayurv   | Skin Care
 a22049f96478f8303a8eacef2295b6ff | Nature Republic Supe   | Skin Care
 39c5f1ed48aec2dbefdc3822654df644 | Christmas gift for m   | Grocery & Gourmet Foods
(33 rows)
```

6.Questions:

1. When were the largest orders made?
2. Which customers made an order with the most no of items? - done
3. What are the most common items bought within a price range of plus or minus 500 from the average price
4. Which customers made the most expensive order show the count of items in the order too?
5. Which company has done the most sales?
6. How much is the average order cos for each categoryt?
7. Display the product that has been bought by most customers?
8. Which company makes the most number of products ?
9. How many orders has come from each state/city that is more than the average order as well as how much did the total orders cost?
10. How many orders were made each month of a year

1. When were the largest orders made?

```
select  sum(od.quantity*p.price)  as  total_order_amount, TO_CHAR(TO_DATE (EXTRACT(MONTH
FROM o.order_date)::text, 'MM'), 'Mon') as months
from order_details od join orders o
on od.order_id = o.order_id
join products p on
p.prod_id=od.prod_id
group by months
order by total_order_amount;
```

```
total_order_amount | months
-------------------+--------
          17886 | Feb
          28094 | Dec
          29077 | Jan
          41899 | Jul
          44897 | Oct
       47583.04 | Nov
          56727 | Mar
          79243 | Sep
      128000.04 | Aug
      131109.36 | May
      176087.24 | Apr
      224692.96 | Jun
(12 rows)
```

2. Which customers made an order with the most no of items?

```sql
select * from (
    select sum(od.quantity) as sum ,o.cust_id from
    order_details od join orders o on
    o.order_id = od.order_id
    join customers c on
    c.cust_id = o.cust_id
    group by o.cust_id
) as tbl
where tbl.sum = (select max(tbl2.sum) from (
    select sum(od.quantity) as sum ,o.cust_id from
order_details od join orders o on
o.order_id = od.order_id
join customers c on
c.cust_id = o.cust_id
group by o.cust_id
) as tbl2);
```

```
 sum | cust_id
-----+---------
  37 | CA04
(1 row)
```

3. What are the most common items bought within a price range or plus or minus 500 from the average price

```sql
select * from (
    select count(*) as Item_count , p.prod_id , p.product_title , p.price as price
    from products p join order_details od
    on p.prod_id = od.prod_id
    group by  p.prod_id
) as temp
where temp.price >= (
    select (avg(pp.price)-500) from products pp
) and temp.price <= (
    select (avg(pp.price)+500) from products pp
);
```

item_count	prod_id	product_title	price
1	0345f95e81c1c6a9d5abb2aa8849dd61	50G. UNDERARM CUPCAKE CREAM DARK ARMPIT WHITENING DEODORANT BY LITTLE BABY	1990
2	5ec7adcb042ac18988a2df6b9c08aa60	Fashlady™ Aquamarine: Crystal Ab Nail Art Rhinestones, 288Pcs/Lot Ss30 6.5Mm Dmc Glitter Top Quality Flatback Non Hotfix Diy Garment Nails Decoration	2103
4	62f9e9106f741c7da412524eef581fd9	FARMERLY ELECOOL Bloomy Floral Flower Nail Art sticker Decals Stickers Nail Sticker Manicure tool Decoration DIY Styling Wraps Tools: XF1039	1602
5	6359a645f5d8cb9a8dabd4c12da4c224	FARMERLY Holographic Color Feather Transfer Foils Tips Clear Sticker Decal Nail Art Glue Polish 100cm*4cm: 005	1602
2	79e712ad43730da319182a815ecfc09b	Fashlady™ Color 26: Queency Ss20 1440Pcs Crystal Stones For Nails Rhinestones Non Hotfix Flatback Crystal Nail Art Stones Fashion Diy Decorations	1577
6	82340b46d44206b8ec95fe048d0ac913	Generic ELECOOL 1set 5 bits Electric Manicure Machine Nail Drill Pen Manicure Polish Tool Set Pedicure File Nail Art Drill Tool Kits: as picture	1652
2	8810b8c593078cd4d955afae6c722c66	My Beauty Diary Facial Mask Sheets Package (10 sheets) 2016 NEW VERSION	2699.84
1	a22049f96478f8303a8eacef2295b6ff	Nature Republic Super Aqua Max Moisture Watery Cream 2.7Oz/80Ml (2015 New)	2398
1	a53fc0de84b27f41c2a73b3b62d6fabf	Generic 11.11 Hot 15pcs/kit Various Color Makeup Brushes Set Eye Shadow Brow Eyeliner Eyelash Lip Foundation Power Makeup Brush Tool Set: 06	1756
1	abc89020717e7df7b810e0ff75ee1e55	Homely Tanzanite AB all sizes SS3-SS30 Rhinestones for nail Non Hot Fix crystals glitters strass glass stickers for manicure art decor : SS16 1440PCS	2323
1	afd82321bcf424baf65191cc6c4c7967	Fashladyâ„¢ Yellow: Professional Eyeshadow Make Up Brush Eyes Cosmetic Beauty Brushes High Quality Eye Shading Brush	1533
6	cfefeb399fad61f457293262709424c0	Generic J, 0.15mm: GENIE LASH 1 Case All Size volume eyelashes extensions for building false mink individual eyelashes extension supplies	2396
1	ef28ea3c2995538032e5f4e210ab2874	Fashlady™ Immaturity 001: New Arrival 20 Design Feather Fruits Chinese Style Nail Art Stamping Stamp Template Plates Beauty Stencil Tools For Stamping	1577

(13 rows)

4.Which customers made the most expensive order show the count of items in the order too?

```
select * from (
      select sum(od.quantity) as No_of_Items ,o.cust_id , sum(p.price*od.quantity) as
order_amount,o.order_id from
   order_details od join orders o on
   o.order_id = od.order_id
   join customers c on
   c.cust_id = o.cust_id
   join products p on
   p.prod_id=od.prod_id
   group by o.cust_id,o.order_id
) as tbl
where tbl.order_amount = (select max(tbl2.order_amount) from (
  select sum(p.price*od.quantity) as order_amount from
   order_details od join orders o on
   o.order_id = od.order_id
   join customers c on
   c.cust_id = o.cust_id
   join products p on
   p.prod_id=od.prod_id
   group by o.cust_id,o.order_id
) as tbl2);
```

```
no_of_items | cust_id | order_amount | order_id
------------+---------+--------------+----------
         26 | CA99    |        46044 | B-25701
(1 row)
```

5. Which company is doing the most business

```
select * from (
   select m.brand, m.manu_id,sum(od.quantity*p.price) as sales
   from order_details od join products p
   on od.prod_id = p.prod_id
   join manufacturers m
   on m.manu_id=p.manu_id
   group by m.manu_id
) as temp
```

```
where temp.sales = (select max(temp2.sales) from(
   select sum(od.quantity*p.price) as sales
   from order_details od join products p
   on od.prod_id = p.prod_id
   join manufacturers m
   on m.manu_id=p.manu_id
   group by m.manu_id
) as temp2
);
```

```
   brand   | manu_id | sales
-----------+---------+--------
 FashladyTM | BA024   | 148725
(1 row)
```

6. How much is the average order amount per category as well as the total order amount?

```
select          avg(od.quantity*p.price)          as          Average_category_cost
,sum(od.quantity*p.price),p.category as Total_category_cost
from order_details od join products p on
od.prod_id=p.prod_id
group by p.category
order by Total_category_cost;
```

```
average_category_cost  |    sum    |   total_category_cost
-----------------------+-----------+-------------------------
   16208.000000000000 |    48624 | Baby Bath & Hygiene
11052.0000000000000000 |    44208 | Bath & Shower
 4904.6400000000000000 | 19618.56 | Detergents & Dishwash
 3498.8000000000000000 |    17494 | Fragrance
 2531.1000000000000000 |    50622 | Grocery & Gourmet Foods
 6555.0625000000000000 |   104881 | Hair Care
 5091.3493975903614458 |   422582 | Make up
 4954.4346666666666667 | 297266.08 | Skin Care
(8 rows)
```

7. Display the product that has been bought by most customers

```
select * from
(
      select   p.prod_id,   p.product_title   as   product_name,count(o.cust_id)   as
No_of_Cust_who_bought_the_product
   from products p join order_details od
   on p.prod_id=od.prod_id
   join orders o on
   o.order_id = od.order_id
   join customers c on
```

```
        c.cust_id = o.cust_id
    group by p.prod_id
) as temp
where temp.No_of_Cust_who_bought_the_product = (
    select max(temp2.total) from (
            select count(o.cust_id) as total
            from products p join order_details od
            on p.prod_id=od.prod_id
            join orders o on
            o.order_id = od.order_id
            join customers c on
            c.cust_id = o.cust_id
            group by p.prod_id
    ) as temp2
);
```

```
            prod_id             |                         product_name                          | no_of_cust_who_bought_the_product
--------------------------------+---------------------------------------------------------------+-----------------------------------
 cb5c0073bfb9480358605c57830dba69 |  Vagads Khadi Amla, Shikakai, Tulsi Hair Oil Pack (200ml x 3)  |                                 9
(1 row)
```

8. Which company makes the most number of products

```
select * from (
    select m.manu_id, m.brand, count(m.manu_id) as no_of_products from
    products p join manufacturers m on
    p.manu_id=m.manu_id
    join order_details od on
    od.prod_id=p.prod_id
    group by m.manu_id
    order by no_of_products
) as temp
where temp.no_of_products = (
    select max(TEMP.no_of_products) as no_of_products FROM
        (
            select count(m.manu_id) as no_of_products from
            products p join manufacturers m on
            p.manu_id=m.manu_id
            join order_details od on
            od.prod_id=p.prod_id
            group by m.manu_id
```

```
          order by no_of_products
     ) AS TEMP
);
```

```
\ manu_id |  brand  | no_of_products
---------+---------+----------------
 BA036   | Generic |             20
(1 row)
```

9.How many orders has come from each state/city that is more than the average order as well as how much did the total orders cost?

```
select     sum(p.price*od.quantity)    as    total_order_amount,count(o.order_id)    as
no_of_orders, c.state , c.city
from orders o join customers c
on o.cust_id = c.cust_id
join order_details od on
od.order_id = o.order_id
join products p
on p.prod_id = od.prod_id
group by c.state,c.city
having sum(p.price*od.quantity) > (
   select sum(od.quantity*p.price) /count(distinct od.order_id)
   from order_details od join products p
   on p.prod_id=od.prod_id
)
order by total_order_amount;
```

```
 total_order_amount | no_of_orders |       state         |       city
--------------------+--------------+---------------------+--------------------
              9348 |            5 | Uttar Pradesh       | Lucknow
             21098 |            8 | Bihar               | Patna
          23560.84 |            8 | Jammu and Kashmir   | Kashmir
             23782 |           11 | Sikkim              | Gangtok
             34817 |            8 | Punjab              | Chandigarh
             35464 |            4 | Nagaland            | Kohima
          42750.60 |           11 | Goa                 | Goa
             45524 |           10 | Karnataka           | Bangalore
             46401 |            8 | Madhya Pradesh      | Bhopal
             53252 |            9 | West Bengal         | Kolkata
          55047.04 |            8 | Haryana             | Chandigarh
             57685 |           10 | Kerala              | Thiruvananthapuram
             59851 |            8 | Gujarat             | Ahmedabad
             71250 |            7 | Tamil Nadu          | Chennai
          73330.04 |           16 | Rajasthan           | Jaipur
             74402 |           10 | Maharashtra         | Pune
          99489.12 |           24 | Maharashtra         | Mumbai
            168118 |           25 | Madhya Pradesh      | Indore
(18 rows)
```

10. How many orders were made each month of a year along with the no of customers who made orders in that month

```sql
select   count(o.order_id)   as   No_of_Orders,   TO_CHAR(TO_DATE  (EXTRACT(MONTH  FROM
o.order_date)::text,   'MM'),   'Mon')   as   months,   count(distinct   c.cust_id)   as
no_of_customers
from orders o join customers c
on c.cust_id=o.cust_id
group by EXTRACT(MONTH FROM o.order_date)
order by No_of_Orders;
```

```
 no_of_orders | months | no_of_customers
--------------+--------+-----------------
            4 | Oct    |               4
            4 | Feb    |               4
            4 | Dec    |               4
            5 | Jan    |               5
            7 | Jul    |               7
            8 | Nov    |               8
            9 | Sep    |               9
           10 | Mar    |               9
           11 | Aug    |              10
           19 | Jun    |              18
           28 | May    |              27
           40 | Apr    |              36
(12 rows)
```

7.Modifications

The below changes were made to the original question. The changes were made either to make the query more complex or to rephrase it for better clarity

1. When were the largest orders made? **- no changed made**
2. Which customers made an order with the most no of items?**- no changed made**
3. What is the most common item bought within a specific price range
   a. Changed to **What are the most common items bought within a price range of plus or minus 500 from the average price**
4. Display the order contents of a particular customer
   a. Rephrased to **Which customers made the most expensive order show the count of items in the order too?**
5. Which company is doing the most business
   a. Rephrased to **Which company has done the most sales?**
6. How much is the average order cost?
   a. Changed to **How much is the average order cos for each categoryt?**
7. Display all the products that have been bought by a particular customer or by all customer
   a. Changed to **Display the product that has been bought by most customers?**
8. Which company makes the most number of products**- no changed made**
9. How many orders are being made by each customer state/city
   a. Changed to **how many orders has come from each state/city that is more than the average order as well as how much did the total orders cost?**
10. How many orders were made each month of a year**- no changed made**

All changed were notified to and approved by Yeganeh.