

# POS APPLICATION

Presented by : Team 4

Tasfia, Sara, Arjun, Graziella, Remy, Helena

# Overview of the business

1. A retail store
2. Toronto, Canada
3. Sells variety of products – furnitures, office supplies, electronics
4. Various Suppliers
5. Customers – home offices, corporates, individuals
6. Customers pay using cash, credit card, or debit card



# Data Dictionary

table name	attribute name	contents	type	format	range	required	PK or FK	FK referenced table
Customer	customer_id	customer code	varchar(50)	XX-99999		Y	PK	
	customer_name	customer name	varchar(50)	Xxxx Xxxx		Y		
	customer_segment	type of customer	varchar(50)	Xxxx Xxxx				
	customer_phone	phone number of customer	varchar(50)	999-999-9999				

# Data Dictionary

supplier			
Column Name	Data Type	Null...	
* supplier_id	varchar(50)	No	
supplier_name	varchar(50)	Yes	
supplier_pho...	varchar(50)	Yes	
city	varchar(50)	Yes	
country	varchar(50)	Yes	
[postal code]	varchar(50)	Yes	
address	varchar(50)	Yes	

customer *			
Column Name	Data Type	Null...	
* customer_id	varchar(50)	No	
customer_name	varchar(50)	Yes	
customer_segme...	varchar(50)	Yes	
customer_phone	varchar(50)	Yes	

order details			
Column Name	Data Type	Nullable	
* order_number	varchar(...)	No	
* product_id	varchar(...)	No	
quantity	int	Yes	
discount	numeric(...)	No	

order			
Column Name	Data Type	Null...	
* order_numb...	varchar(50)	No	
customer_id	varchar(50)	Yes	
employee_id	varchar(50)	Yes	
order_date	date	Yes	
order_time	time(7)	Yes	

invoices			
Column Name	Data Type	Null...	
* invoice_number	varchar(50)	No	
order_number	varchar(50)	Yes	
invoice_date	date	Yes	
invoice_time	time(7)	Yes	
total_price	numeric(18, 0)	Yes	

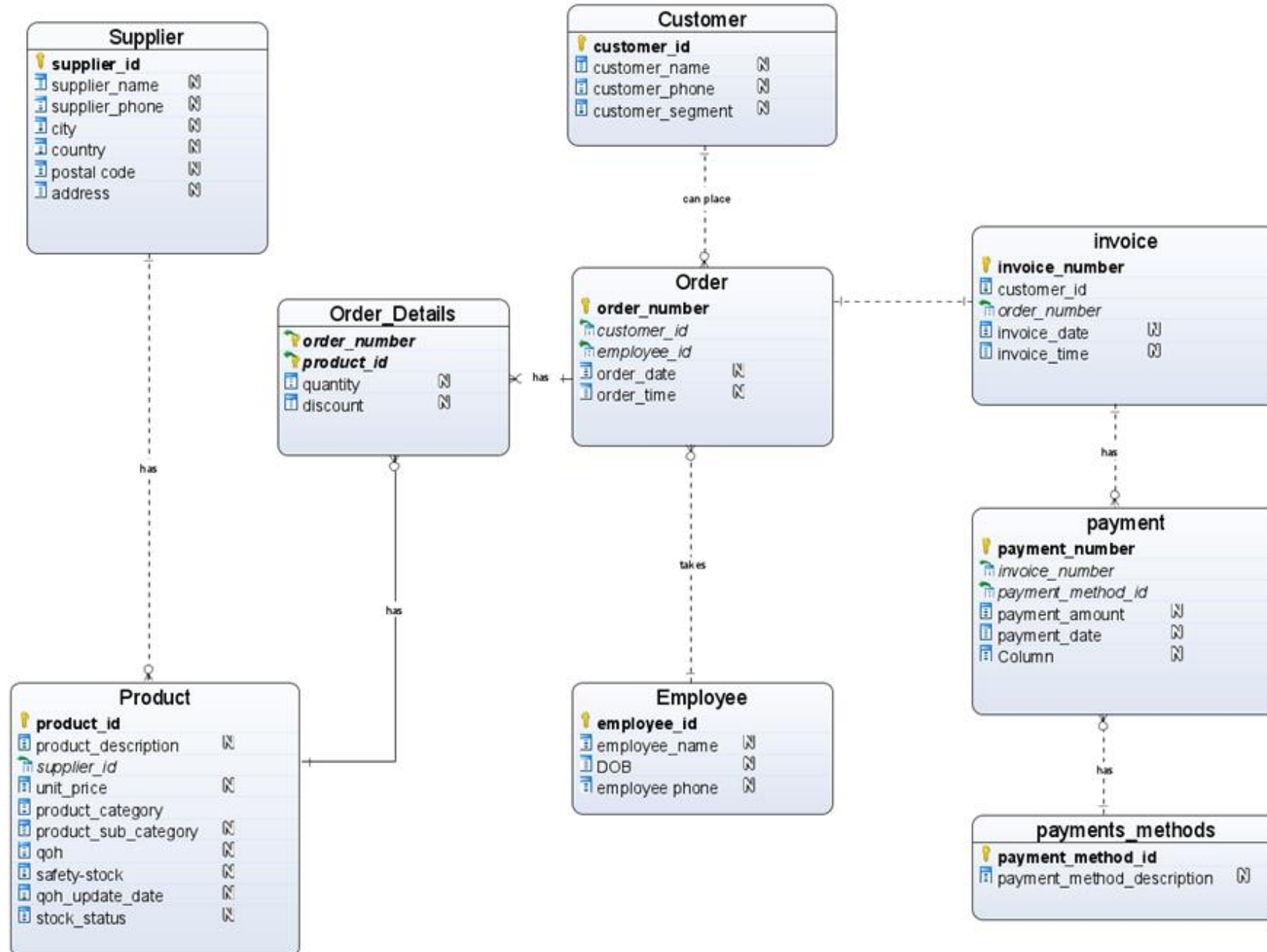
products *			
Column Name	Data Type	Null...	
* product_id	varchar(50)	No	
product_description	varchar(50)	Yes	
supplier_id	varchar(50)	Yes	
unit_price	numeric(18,...)	Yes	
product_category	varchar(50)	Yes	
product_sub_catego...	varchar(50)	Yes	
qoh	int	Yes	
safety_stock	int	Yes	
qoh_update_date	date	Yes	
stock_status	varchar(50)	Yes	

employees			
Column Name	Data Type	Null...	
* employee_id	varchar(50)	No	
employee_name	varchar(50)	Yes	
DOB	date	Yes	
employee_phone	varchar(50)	Yes	

payment			
Column Name	Data Type	Null...	
* payment_number	varchar(50)	No	
invoice_number	varchar(50)	Yes	
payment_method_id	varchar(50)	Yes	
payment_amount	numeric(18,...)	Yes	
payment_date	date	Yes	

payments methods			
Column Name	Data Type	Null...	
* payment_method_id	varchar(50)	No	
payment_method_description	varchar(50)	Yes	

# ERD Diagram



# Business Requirements

1. Find the number of items that each customer has bought
2. Find the amount of sale for each customer
3. Order the products by the amount of sale
4. Find the number of order placed by each customer
5. Update the qoh and the update date when an order is placed
6. Update the stock status if the qoh < safety stock
7. Create a report for each invoice
8. Create a report of the products with a low stock level

# 1- Query : Find the number of products that each customer has bought

```
SELECT customer.customer_name, dbo.[order] .customer_id, SUM(order_details.quantity) AS nbr_of_items_by_customer
FROM      dbo.[order] JOIN
           customer ON dbo.[order] .customer_id = dbo.customer.customer_id JOIN
           order_details ON dbo.[order] .order_number = order_details.order_number JOIN
           products ON order_details.product_id = dbo.products.product_id
GROUP BY customer.customer_name, dbo.[order] .customer_id
ORDER BY nbr_of_items_by_customer DESC
```

108 %

Results Messages

	customer_name	customer_id	nbr_of_items_by_customer
1	Doug Jacobs	DJ-13630	44
2	Allen Arnold	AA-10375	33
3	Alex Grayson	AG-10330	30
4	Sally Hughsby	SH-19975	21
5	Alice McCarthy	AM-10360	19
6	Dave Brooks	DB-13060	18
7	Dean Braden	DB-13210	18
8	Brenda Bowman	BB-11545	15
9	Alyssa Tate	AT-10435	12
10	Mick Hernandez	MH-18115	12
11	David Kendrick	DK-13150	11
12	Emily Phan	EP-13915	10
13	Bill Donatelli	BD-11320	10
14	Brian Moss	BM-11650	10
15	Suzanne McNair	SM-20950	10
16	Victor Preis	VP-21730	10
17	Max Ludwig	ML-17755	9
18	Denise Monton	DM-13345	9



## 2- Query : Find the total amount of sales for each customer

```
- SELECT dbo.[order].customer_id, customer.customer_name,  
SUM((products.unit_price * order_details.quantity - order_details.discount * order_details.quantity)  
+ products.unit_price * order_details.quantity * 13 / 100) AS total_sales_by_customers  
  
FROM      customer JOIN  
          dbo.[order] ON customer.customer_id = dbo.[order].customer_id JOIN  
          order_details ON dbo.[order].order_number = order_details.order_number JOIN  
          products ON order_details.product_id = products.product_id  
  
GROUP BY  dbo.[order].customer_id, customer.customer_name  
ORDER BY  total_sales_by_customers DESC
```

108 %

Results Messages

	customer_id	customer_name	total_sales_by_customers
1	DJ-13630	Doug Jacobs	5709.320000
2	AA-10375	Allen Arnold	1791.050000
3	BB-11545	Brenda Bowman	1391.030000
4	DB-13060	Dave Brooks	1096.140000
5	MH-18115	Mick Hernandez	865.580000
6	TT-21070	Ted Trevino	776.310000
7	RD-19810	Ross DeVincentis	610.200000
8	HP-14815	Harold Pawlan	597.770000
9	BM-11650	Brian Moss	596.640000
10	VP-21730	Victor Preis	558.220000
11	AM-10360	Alice McCarthy	496.070000
12	EP-13915	Emily Phan	470.080000
13	SH-19975	Sally Hughsby	416.270000
14	DK-13150	David Kendrick	410.190000
15	LW-17215	Luke Weiss	401.150000



### 3- View: Find the amount of sales for each product

**order\_details**

☐ \* (All Columns)

☐ order\_number

☒ product\_id

☐ quantity

☐ discount

**products**

☐ \* (All Columns)

☐ product\_id

☒ product\_description

☐ supplier\_id

☐ unit\_price

☐ product\_category

☐ product\_sub\_category

☐ qoh

☐ safety\_stock

Column	Alias	Table	Output	Sort Type	Sort Order	Group By	Filter	Or...	Or...	Or...
product_id		order_details	<input checked="" type="checkbox"/>			Group By				
product_description		products	<input checked="" type="checkbox"/>			Group By				
(dbo.products.unit_price * dbo.order_details.quantity - dbo.order_details.discount * dbo.order_details.quantity) AS product_sales	product_sales		<input checked="" type="checkbox"/>	Descending	1	Sum				

```

SELECT TOP (100) PERCENT dbo.order_details.product_id, dbo.products.product_description, SUM((dbo.products.unit_price * dbo.order_details.quantity - dbo.order_details.discount * dbo.order_details.quantity) AS product_sales)
FROM   dbo.order_details INNER JOIN
       dbo.products ON dbo.order_details.product_id = dbo.products.product_id
GROUP BY dbo.order_details.product_id, dbo.products.product_description
ORDER BY product_sales DESC
    
```

product_id	product_description	product_sales
OFF-ST-10002756	Tennisco Stur-D-Stor Boltless Shelving, 5 Shelves,	4423.950000
FUR-CH-10003968	Novimex Turbo Task Chair	2383.170000
FUR-CH-10000454	Hon Deluxe Fabric Upholstered Stacking Chairs, Rou	2203.500000
FUR-CH-10002647	Situations Contoured Folding Chairs, 4/Set	2079.980000
OFF-AP-10000891	Kensington 7 Outlet MasterPiece HOMEOFFICE Power C	1911.390000
TEC-PH-10004522	Dexim XPower Skin Super-Thin Power Case for iPhone	1835.120000
FUR-CH-10001708	Office Star - Contemporary Swivel Chair with Padde	1291.590000
OFF-PA-10003129	Tops White Computer Printout Paper	880.920000

## 4- View: Find the number of order placed by each customer

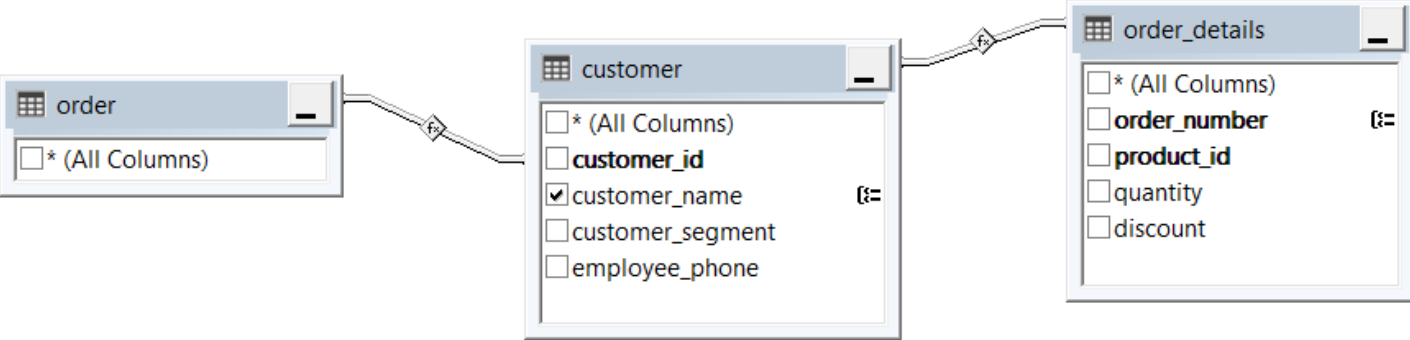


Diagram illustrating the relationship between the **order**, **customer**, and **order\_details** tables. The **order** table is linked to the **customer** table, which is linked to the **order\_details** table. The **order\_details** table has columns: **order\_number**, **product\_id**, **quantity**, and **discount**.

Column	Alias	Table	Output	Sort Type	Sort Order	Group By	Filter
customer_name		customer	<input checked="" type="checkbox"/>			Group By	
order_number		order_details	<input type="checkbox"/>			Group By	
dbo.[order].order_number	number_of_orders_placed	<Unknown>	<input checked="" type="checkbox"/>	Descending	1	Count	
			<input type="checkbox"/>				
			<input type="checkbox"/>				

```
SELECT TOP (100) PERCENT dbo.customer.customer_name, COUNT(dbo.[order].order_number) AS number_of_orders_placed
```

customer_name	number_of_orders_placed
Doug Jacobs	6
Alice McCarthy	5
Dean Braden	4
Dave Brooks	4
Denise Monton	4
Mick Hernandez	4
Allen Arnold	3
Sally Hughsby	3
Emily Phan	3
David Kendrick	3

## 5- Trigger : Update the qoh and the update date when an order is placed

```
USE [POS_Application]
GO

SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO

-- =====
ALTER TRIGGER [dbo].[update_qoh_quantity_and_date]
ON [dbo].[order_details]
AFTER INSERT
AS
BEGIN
    -- SET NOCOUNT ON added to prevent extra result sets from
    -- interfering with SELECT statements.
    SET NOCOUNT ON;

    declare @Order_number int, @quantity int,@product_id varchar(50)

    select    @quantity=upd.quantity, @product_id=upd.product_id
    FROM INSERTED upd ;

    UPDATE products
    SET products.qoh =products.qoh-@quantity
    where products.product_id = @product_id

    UPDATE products
    set products.qoh_update_date=getdate()
    where products.product_id = @product_id

END
```

## 5- Trigger : Update the qoh and the update date when an order is placed

```
SELECT TOP (1000) [product_id]
, [product_description]
, [supplier_id]
, [unit_price]
, [product_category]
, [product_sub_category]
, [qoh]
, [safety_stock]
, [qoh_update_date]
, [stock_stiuation]
FROM [POS_Application].[dbo].[products]
```

89 %

Results Messages

	product_id	product_description	supplier_id	unit_price	product_category	product_sub_category	qoh	safety_stock	qoh_update_date	stock_stiuation
1	FUR-CH-10000454	Hon Deluxe Fabric Upholstered Stacking Chairs, Rou	129104	195	Furniture	Chairs	30	20	2020-12-02	NULL
2	FUR-CH-10001708	Office Star - Contemporary Swivel Chair with Padde	267393	127	Furniture	Chairs	40	20	NULL	NULL
3	FUR-CH-10002602	DMI Arturo Collection Mission-style Design Wood Ch	77882	106	Furniture	Chairs	40	20	NULL	NULL
4	FUR-CH-10002647	Situations Contoured Folding Chairs, 4/Set	45338	71	Furniture	Chairs	40	20	NULL	NULL
5	FUR-CH-10003968	Novimex Turbo Task Chair	129104	57	Furniture	Chairs	27	20	2020-12-01	NULL
6	FUR-CH-10004287	SAFCO Arco Folding Chair	267393	249	Furniture	Chairs	40	20	NULL	NULL
7	FUR-CH-10004983	Office Star - Mid Back Dual function Ergonomic Hig	70549	129	Furniture	Chairs	40	20	NULL	NULL
8	FUR-FU-10000023	Eldon Wave Desk Accessories	115524	6	Furniture	Furnishings	40	20	NULL	NULL
9	FUR-FU-10000308	Deflect-o Glass Clear Studded Chair Mats	76610	62	Furniture	Furnishings	40	20	NULL	NULL
10	FUR-FU-10000521	Seth Thomas 14" Putty-Colored Wall Clock	285132	29	Furniture	Furnishings	40	20	NULL	NULL
11	FUR-FU-10000732	Eldon 200 Class Desk Accessories	267393	6	Furniture	Furnishings	40	20	NULL	NULL
12	FUR-FU-10000820	Tensor Brushed Steel Torchiera Floor Lamp	70549	7	Furniture	Furnishings	40	20	NULL	NULL
13	FUR-FU-10001037	DAX Charcoal/Nickel-Tone Document Frame, 5 x 7	77882	9	Furniture	Furnishings	40	20	NULL	NULL
14	FUR-FU-10001473	DAX Wood Document Frame	45338	14	Furniture	Furnishings	40	20	NULL	NULL
15	FUR-FU-10001487	Eldon Expressions Wood and Plastic Desk Accessorie	76610	7	Furniture	Furnishings	40	20	NULL	NULL
16	FUR-FU-10002298	Rubbermaid ClusterMat Chairmats, Mat Size- 66" x 6	285132	44	Furniture	Furnishings	40	20	NULL	NULL
17	FUR-FU-10003394	Tenex "The Solids" Textured Chair Mats	285132	70	Furniture	Furnishings	40	20	NULL	NULL
18	FUR-FU-10003489	Contemporary Borderless Frame	129104	9	Furniture	Furnishings	40	20	NULL	NULL
19	FUR-FU-10004017	Executive Impressions 13" Chairman Wall Clock	76610	20	Furniture	Furnishings	40	20	NULL	NULL
20	FUR-FU-10004091	Howard Miller 13" Diameter Goldtone Round Wall Clo	77882	47	Furniture	Furnishings	40	20	NULL	NULL
21	FUR-FU-10004963	Eldon 400 Class Desk Accessories, Black Carbon	76610	7	Furniture	Furnishings	40	20	NULL	NULL
22	FUR-TA-10003748	Bevis 36 x 72 Conference Tables	76610	100	Furniture	Tables	40	20	NULL	NULL
23	OFF-AP-10000891	Kensington 7 Outlet MasterPiece HOMEOFFICE Po...	129104	131	Office Supplies	Appliances	40	20	NULL	NULL
24	OFF-AP-10001271	Eureka The Boss Cordless Rechargeable Stick Vac	77882	51	Office Supplies	Appliances	40	20	NULL	NULL

Query executed successfully.

DESKTOP-S9N1T4E\SQLEXPRESS ... | DESKTOP-S9N1T4E\Sara (82) | POS\_Application | 00:00:00 | 1



## 6- Trigger: Update the stock status if the qoh is less than safety stock

```
USE [POS_Application]
GO

SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO

-- =====
ALTER TRIGGER [dbo].[stock_status]
ON [dbo].[products]
AFTER UPDATE
AS
BEGIN
    -- SET NOCOUNT ON added to prevent extra result sets from
    -- interfering with SELECT statements.
    SET NOCOUNT ON;

    DECLARE @qoh int, @safety_stock int, @product_id varchar(50)
    SELECT @qoh=upd.qoh, @safety_stock=upd.safety_stock, @product_id=upd.product_id
    FROM INSERTED upd ;

    if @qoh<@safety_stock

    update products
    Set products.stock_stiuation= 'low stock'
    WHERE products.product_id=@product_id
```

## 6- Trigger : Update the stock status if the qoh is less than safety stock

Results Messages										
	product_id	product_description	supplier_id	unit_price	product_category	product_sub_category	qoh	safety_stock	qoh_update_date	stock_situation
1	FUR-CH-10000454	Hon Deluxe Fabric Upholstered Stacking Chairs, Rou	129104	195	Furniture	Chairs	19	20	2020-12-02	low stock
2	FUR-CH-10001708	Office Star - Contemporary Swivel Chair with Padde	267393	127	Furniture	Chairs	40	20	NULL	low stock
3	FUR-CH-10002602	DMI Arturo Collection Mission-style Design Wood Ch	77882	106	Furniture	Chairs	40	20	NULL	NULL
4	FUR-CH-10002647	Situations Contoured Folding Chairs, 4/Set	45338	71	Furniture	Chairs	40	20	NULL	NULL
5	FUR-CH-10003968	Novimex Turbo Task Chair	129104	57	Furniture	Chairs	30	20	2020-12-01	low stock
6	FUR-CH-10004287	SAFCO Arco Folding Chair	267393	249	Furniture	Chairs	40	20	NULL	NULL
7	FUR-CH-10004983	Office Star - Mid Back Dual function Ergonomic Hig	70549	129	Furniture	Chairs	40	20	NULL	NULL
8	FUR-FU-10000023	Eldon Wave Desk Accessories	115524	6	Furniture	Furnishings	40	20	NULL	NULL
9	FUR-FU-10000308	Deflect-o Glass Clear Studded Chair Mats	76610	62	Furniture	Furnishings	40	20	NULL	NULL
10	FUR-FU-10000521	Seth Thomas 14" Putty-Colored Wall Clock	285132	29	Furniture	Furnishings	40	20	NULL	NULL
11	FUR-FU-10000732	Eldon 200 Class Desk Accessories	267393	6	Furniture	Furnishings	40	20	NULL	NULL
12	FUR-FU-10000820	Tensor Brushed Steel Torchiera Floor Lamp	70549	7	Furniture	Furnishings	40	20	NULL	NULL
13	FUR-FU-10001037	DAX Charcoal/Nickel-Tone Document Frame, 5 x 7	77882	9	Furniture	Furnishings	40	20	NULL	NULL
14	FUR-FU-10001473	DAX Wood Document Frame	45338	14	Furniture	Furnishings	40	20	NULL	NULL
15	FUR-FU-10001487	Eldon Expressions Wood and Plastic Desk Accessorie	76610	7	Furniture	Furnishings	40	20	NULL	NULL
16	FUR-FU-10002298	Rubbermaid ClusterMat Chairmats, Mat Size- 66" x 6	285132	44	Furniture	Furnishings	40	20	NULL	NULL
17	FUR-FU-10003394	Tenex "The Solids" Textured Chair Mats	285132	70	Furniture	Furnishings	40	20	NULL	NULL
18	FUR-FU-10003489	Contemporary Borderless Frame	129104	9	Furniture	Furnishings	40	20	NULL	NULL
19	FUR-FU-10004017	Executive Impressions 13" Chairman Wall Clock	76610	20	Furniture	Furnishings	40	20	NULL	NULL
20	FUR-FU-10004091	Howard Miller 13" Diameter Goldtone Round Wall Clo	77882	47	Furniture	Furnishings	40	20	NULL	NULL
21	FUR-FU-10004963	Eldon 400 Class Desk Accessories, Black Carbon	76610	7	Furniture	Furnishings	40	20	NULL	NULL
22	FUR-TA-10003748	Bevis 36 x 72 Conference Tables	76610	100	Furniture	Tables	40	20	NULL	NULL
23	OFF-AP-10000891	Kensington 7 Outlet MasterPiece HOMEOFFICE Power C	129104	131	Office Supplies	Appliances	40	20	NULL	NULL
24	OFF-AP-10001271	Eureka The Boss Cordless Rechargeable Stick Vac	77882	51	Office Supplies	Appliances	40	20	NULL	NULL
25	OFF-AP-10001394	Harmony Air Purifier	285132	189	Office Supplies	Appliances	40	20	NULL	NULL
26	OFF-AP-10002765	Fellowes Advanced Computer Series Surge Protectors	70549	26	Office Supplies	Appliances	40	20	NULL	NULL
27	OFF-AR-10000122	Newell 314	129104	6	Office Supplies	Art	40	20	NULL	NULL
28	OFF-AR-10000462	Sanford Pocket Accent Highlighters	76610	2	Office Supplies	Art	40	20	NULL	NULL
29	OFF-AR-10000817	Manco Dry-Lighter Erasable Highlighter	115524	2	Office Supplies	Art	40	20	NULL	NULL
30	OFF-AR-10001315	Newell 310	285132	1	Office Supplies	Art	40	20	NULL	NULL
31	OFF-AR-10001860	BIC Liqua Brite Liner	285132	7	Office Supplies	Art	40	20	NULL	NULL
32	OFF-AR-10001868	Prang Dustless Chalk Sticks	267393	2	Office Supplies	Art	40	20	NULL	NULL
33	OFF-AR-10002280	Staples in misc. colors	70549	6	Office Supplies	Art	40	20	NULL	NULL

## 7- Stored procedure : Report that generates invoice

```
ALTER PROCEDURE [dbo].[Invoice_Report]
as

SET NOCOUNT ON;

DECLARE @unit_price numeric(10,2), @discount numeric(10,2), @product_id VARCHAR(50),@product_description VARCHAR(50)
,@invoice_number VARCHAR(50),@invoice_date VARCHAR(50),@total_discount numeric(10,2),
@order_number VARCHAR(80),@quantity int,@tax numeric(10,2),@total_before_tax numeric(10,2),
@total_after_tax numeric(10,2);
select @tax=0, @total_before_tax=0, @total_after_tax=0,@total_discount=0
PRINT '----- Invoice -----';

DECLARE Invoice_info CURSOR FOR
SELECT invoice_number=1004 , invoice_date,order_number
FROM invoices

OPEN Invoice_info

FETCH NEXT FROM Invoice_info
INTO @invoice_number,@invoice_date,@order_number

WHILE @@FETCH_STATUS = 0
BEGIN
    PRINT ' '
    PRINT '----- Invoice Number : ' + @invoice_number
    PRINT ' '
    PRINT '----- Invoice Date : ' + @invoice_date
```

## 7- Stored procedure : Report that generates invoice

----- Invoice -----

----- Invoice Number : 1003

----- Invoice Date : 2019-12-29

product\_id: FUR-CH-10003968 ---- product\_name: Novimex Turbo Task Chair  
unit price: 57.00  
quantity: 7  
discount: 0.00

-----  
product\_id: OFF-BI-10000050 ---- product\_name: Angle-D Binders with Locking Rings, Label Holders  
unit price: 6.00  
quantity: 3  
discount: 0.00

-----  
product\_id: TEC-AC-10001998 ---- product\_name: Logitech® LS21 Speaker System - PC Multimedia - 2.  
unit price: 20.00  
quantity: 2  
discount: 0.00

-----  
Total: 457.00  
Total discount: 0.00  
Tax: 59.41  
Amount to pay: 516.41

(1 row affected)

Completion time: 2020-12-02T00:16:02.8387730-05:00|



## 8- Stored procedure : Report of the products with low stock level

```
DECLARE @stock_status varchar(50),@product_id varchar(50),@product_description varchar(50), @qoh int, @safety_stock int

Select @stock_status='low stock'
-- Insert statements for procedure here

PRINT '----- low stock items -----';

DECLARE stock_status CURSOR FOR
SELECT product_id,product_description,qoh,safety_stock
FROM products
WHERE products.stock_stiuation=@stock_status
OPEN stock_status
FETCH NEXT FROM stock_status
INTO @product_id,@product_description,@qoh,@safety_stock

WHILE @@FETCH_STATUS = 0
BEGIN

    PRINT '----- '
    PRINT ' product_id :      ' + @product_id + '-----' + @product_description
    PRINT ' quantity on hand: ' + CAST( @qoh AS VARCHAR(10))
    PRINT ' safety stock: ' + CAST( @safety_stock AS VARCHAR(10))

    FETCH NEXT FROM stock_status
    INTO @product_id,@product_description,@qoh,@safety_stock
END

CLOSE stock_status;
DEALLOCATE stock_status;
END
```

## 8- Stored procedure : Report of the products with low stock level

```
----- low stock items -----  
-----  
product_id :      FUR-CH-10000454-----Hon Deluxe Fabric Upholstered Stacking Chairs, Rou  
quantity on hand: 19  
safety stock: 20  
-----  
product_id :      FUR-CH-10001708-----Office Star - Contemporary Swivel Chair with Padde  
quantity on hand: 40  
safety stock: 20  
-----  
product_id :      FUR-CH-10003968-----Novimex Turbo Task Chair  
quantity on hand: 30  
safety stock: 20  
  
(1 row affected)  
  
Completion time: 2020-12-02T01:35:42.6652855-05:00  
|
```

The background is a light blue gradient with a pattern of semi-transparent blue squares of various sizes. Overlaid on this are numerous thin, white, slightly curved lines that create a sense of depth and movement. Two bright, multi-pointed starburst or lens flare effects are positioned on the left side, one near the top and one near the bottom.

**THANK YOU**  
Questions?