Supply Chain Dataset
Name: Linh Tran

The Tables

Change Name of columns

OrderList

Order ID	*Order_ID*
Order Date	*Order_Date*
Origin Port	*Orig_Port*
Carrier	
TPT	*TPT_Day_Count*
Service Level	*Service_Level*
Ship ahead day count	*Ship_Ahead_Day_Count*
Ship Late Day count	*Ship_Late_Day_Count*
Customer	
Product ID	*Product_ID*
Plant Code	*Plant_Code*
Destination Port	*Dest_Port*
Unit quantity	*Unit_Quant*
Weight	

FreightRates

Carrier	
orig_port_cd	*Orig_Port*
dest_port_cd	*Dest_Port*
minm_wgh_qty	*Min_Weight_Quant*
max_wgh_qty	*Max_Weight_Quant*
svc_cd	*Service_Level*
minimum cost	*Min_Cost*
rate	*Rate*
mode_dsc	*Mode_DSC*
tpt_day_cnt	*TPT_Day_Count*
Carrier type	*Carrier_Type*

WhCosts

WH	*Plant_Code*
Cost/unit	*Cost_Per_Unit*

WhCapacities

Plant ID	*Plant_Code*
Daily Capacity	*Daily_Capacity*

ProductsPerPlant

Plant Code	*Plant_Code*
Product ID	*Product_ID*

VmiCustomers

Plant Code	*Plant_Code*
Customers	*Customer*

PlantPorts

Plant Code	*Plant_Code*
Port	Port

Dataset Details

OrderList

Order_ID	Order_Date	Orig_Port	Carrier	TPT_Day_Count	Service_Level	Ship_Ahead_Day_Count	Ship_Late_Day_Count	Customer	Product_ID	Plant_Code	Dest_Port	Unit_Quant	Weight
1447296447	5/26/2013	PORT09	V44_3	1	CRF	3	0	V55555_53	1700106	PLANT16	PORT09	808	14.3
1447158015	5/26/2013	PORT09	V44_3	1	CRF	3	0	V55555_53	1700106	PLANT16	PORT09	3188	87.94
1447138899	5/26/2013	PORT09	V44_3	1	CRF	3	0	V55555_53	1700106	PLANT16	PORT09	2331	61.2
1447363528	5/26/2013	PORT09	V44_3	1	CRF	3	0	V55555_53	1700106	PLANT16	PORT09	847	16.16
1447363981	5/26/2013	PORT09	V44_3	1	CRF	3	0	V55555_53	1700106	PLANT16	PORT09	2163	52.34
1447351441	5/26/2013	PORT09	V44_3	1	CRF	3	0	V55555_53	1700106	PLANT16	PORT09	3332	92.8
1447320236	5/26/2013	PORT09	V44_3	1	CRF	3	0	V55555_53	1700106	PLANT16	PORT09	1782	46.9
1447158019	5/26/2013	PORT09	V44_3	1	CRF	3	0	V55555_53	1700106	PLANT16	PORT09	427	2.86
1447219341	5/26/2013	PORT09	V44_3	1	CRF	3	0	V55555_53	1700106	PLANT16	PORT09	1291	26.6
1447398416	5/26/2013	PORT09	V44_3	1	CRF	3	0	V55555_53	1700106	PLANT16	PORT09	2294	62.2
1447381679	5/26/2013	PORT09	V44_3	1	CRF	3	0	V55555_53	1700106	PLANT16	PORT09	2766	75.5
1447170785	5/26/2013	PORT09	V44_3	1	CRF	3	0	V55555_53	1700106	PLANT16	PORT09	798	14.3
1447155056	5/26/2013	PORT09	V44_3	1	CRF	3	0	V55555_53	1697884	PLANT16	PORT09	739	73.9
1447257265	5/26/2013	PORT09	V44_3	1	CRF	3	0	V55555_53	1697884	PLANT16	PORT09	280	7.8
1447240989	5/26/2013	PORT09	V44_3	1	CRF	3	0	V55555_53	1697884	PLANT16	PORT09	574	59.5
1447257231	5/26/2013	PORT09	V44_3	1	CRF	3	0	V55555_53	1697884	PLANT16	PORT09	556	52.7
1447260653	5/26/2013	PORT09	V44_3	1	CRF	3	0	V55555_53	1697884	PLANT16	PORT09	544	58.5
1447139375	5/26/2013	PORT09	V44_3	1	CRF	3	0	V55555_53	1697884	PLANT16	PORT09	1151	181.7
1447308590	5/26/2013	PORT09	V44_3	1	CRF	3	0	V55555_53	1697884	PLANT16	PORT09	1404	227.2
1447191271	5/26/2013	PORT09	V44_3	1	CRF	3	0	V55555_53	1697884	PLANT16	PORT09	662	74.1
1447191284	5/26/2013	PORT09	V44_3	1	CRF	3	0	V55555_53	1699336	PLANT16	PORT09	836	80.43
1447352426	5/26/2013	PORT09	V44_3	1	CRF	3	0	V55555_53	1702652	PLANT16	PORT09	2063	265.1
1447211829	5/26/2013	PORT09	V44_3	1	CRF	3	0	V55555_53	1699337	PLANT16	PORT09	2114	267.1
1447232833	5/26/2013	PORT09	V44_3	1	CRF	3	0	V55555_53	1699337	PLANT16	PORT09	2108	271.1
1447205081	5/26/2013	PORT09	V44_3	1	CRF	3	0	V55555_53	1699336	PLANT16	PORT09	1120	112.6
1447365980	5/26/2013	PORT09	V44_3	1	CRF	3	0	V55555_53	1702654	PLANT16	PORT09	706	61.8
1447157118	5/26/2013	PORT09	V44_3	1	CRF	3	0	V55555_53	1699336	PLANT16	PORT09	889	107.88
1447398413	5/26/2013	PORT09	V44_3	1	CRF	3	0	V55555_53	1702652	PLANT16	PORT09	1793	216.57
1447377319	5/26/2013	PORT09	V44_3	1	CRF	3	0	V55555_53	1702652	PLANT16	PORT09	491	27.81

FreightRates

Carrier	Orig_Port	Dest_Port	Min_Weight_Quant	Max_Weight_Quant	Service_Level	Min_Cost	Rate	Mode_DSC	TPT_Day_Count	Carrier_Type
V444_6	PORT08	PORT09	250	499.99	DTD	$43.23	$0.71	AIR	2	V88888888_0
V444_6	PORT08	PORT09	65	69.99	DTD	$43.23	$0.75	AIR	2	V88888888_0
V444_6	PORT08	PORT09	60	64.99	DTD	$43.23	$0.79	AIR	2	V88888888_0
V444_6	PORT08	PORT09	50	54.99	DTD	$43.23	$0.83	AIR	2	V88888888_0
V444_6	PORT08	PORT09	35	39.99	DTD	$43.23	$1.06	AIR	2	V88888888_0
V444_6	PORT08	PORT09	100	249.99	DTD	$43.23	$0.71	AIR	2	V88888888_0
V444_6	PORT08	PORT09	500	1999.99	DTD	$43.23	$0.68	AIR	2	V88888888_0
V444_6	PORT08	PORT09	55	59.99	DTD	$43.23	$0.83	AIR	2	V88888888_0
V444_6	PORT08	PORT09	25	29.99	DTD	$43.23	$1.25	AIR	2	V88888888_0
V444_6	PORT08	PORT09	30	34.99	DTD	$43.23	$1.13	AIR	2	V88888888_0
V444_6	PORT08	PORT09	70	99.99	DTD	$43.23	$0.75	AIR	2	V88888888_0
V444_6	PORT08	PORT09	10	14.99	DTD	$43.23	$1.83	AIR	2	V88888888_0
V444_6	PORT08	PORT09	0	4.99	DTD	$43.23	$1.83	AIR	2	V88888888_0
V444_6	PORT08	PORT09	5	9.99	DTD	$43.23	$1.83	AIR	2	V88888888_0
V444_6	PORT08	PORT09	2000	99999.99	DTD	$43.23	$0.64	AIR	2	V88888888_0
V444_6	PORT08	PORT09	45	49.99	DTD	$43.23	$0.94	AIR	2	V88888888_0
V444_6	PORT08	PORT09	20	24.99	DTD	$43.23	$1.32	AIR	2	V88888888_0
V444_6	PORT08	PORT09	40	44.99	DTD	$43.23	$0.98	AIR	2	V88888888_0
V444_6	PORT08	PORT09	15	19.99	DTD	$43.23	$1.59	AIR	2	V88888888_0
V444_6	PORT10	PORT09	65	69.99	DTD	$43.23	$0.75	AIR	2	V88888888_0
V444_6	PORT10	PORT09	45	49.99	DTD	$43.23	$0.94	AIR	2	V88888888_0
V444_6	PORT10	PORT09	50	54.99	DTD	$43.23	$0.83	AIR	2	V88888888_0
V444_6	PORT10	PORT09	250	499.99	DTD	$43.23	$0.71	AIR	2	V88888888_0
V444_6	PORT10	PORT09	500	1999.99	DTD	$43.23	$0.68	AIR	2	V88888888_0
V444_6	PORT10	PORT09	100	249.99	DTD	$43.23	$0.71	AIR	2	V88888888_0
V444_6	PORT10	PORT09	40	44.99	DTD	$43.23	$0.98	AIR	2	V88888888_0
V444_6	PORT10	PORT09	20	24.99	DTD	$43.23	$1.32	AIR	2	V88888888_0
V444_6	PORT10	PORT09	60	64.99	DTD	$43.23	$0.79	AIR	2	V88888888_0
V444_6	PORT10	PORT09	35	39.99	DTD	$43.23	$1.06	AIR	2	V88888888_0

WhCosts

Plant_Code	Cost_Per_Unit
PLANT15	1.42
PLANT17	0.43
PLANT18	2.04
PLANT05	0.49
PLANT02	0.48
PLANT01	0.57
PLANT06	0.55
PLANT10	0.49
PLANT07	0.37
PLANT14	0.63
PLANT16	1.92
PLANT12	0.77
PLANT11	0.56
PLANT09	0.47
PLANT03	0.52
PLANT13	0.47
PLANT19	0.64
PLANT08	0.52
PLANT04	0.43

VmiCustomers

Plant_Code	Customer
PLANT02	V5555555555555_16
PLANT02	V555555555555555_29
PLANT02	V555555555_3
PLANT02	V55555555555555_8
PLANT02	V55555555_9
PLANT02	V55555_10
PLANT02	V55555555_5
PLANT06	V555555555555555_18
PLANT06	V55555_10
PLANT10	V555555555555555_29
PLANT10	V555555_34
PLANT10	V5555555555555555555_54
PLANT10	V55555_10
PLANT11	V5555555555555555555_54

PlanPorts

Plant_Code	Port
PLANT01	PORT01
PLANT01	PORT02
PLANT02	PORT03
PLANT03	PORT04
PLANT04	PORT05
PLANT05	PORT06
PLANT06	PORT06
PLANT07	PORT01
PLANT07	PORT02
PLANT08	PORT04
PLANT09	PORT04
PLANT10	PORT01
PLANT10	PORT02
PLANT11	PORT04
PLANT12	PORT04
PLANT13	PORT04
PLANT14	PORT07
PLANT15	PORT08
PLANT16	PORT09
PLANT17	PORT10
PLANT18	PORT11
PLANT19	PORT04

WhCapacities

Plant_Code	Daily_Capacity
PLANT15	11
PLANT17	8
PLANT18	111
PLANT05	385
PLANT02	138
PLANT01	1070
PLANT06	49
PLANT10	118
PLANT07	265
PLANT14	549
PLANT16	457
PLANT12	209
PLANT11	332
PLANT09	11
PLANT03	1013
PLANT13	490
PLANT19	7
PLANT08	14
PLANT04	554

ProductsPerPlant

Plant_Code	Product_ID
PLANT15	1698815
PLANT17	1664419
PLANT17	1664426
PLANT17	1672826
PLANT17	1674916
PLANT17	1674918
PLANT17	1675507
PLANT17	1676151
PLANT17	1676152
PLANT17	1677864
PLANT17	1677865
PLANT17	1679124
PLANT17	1685369
PLANT17	1685370
PLANT17	1685378
PLANT17	1685979
PLANT17	1691969
PLANT17	1694139
PLANT17	1694217
PLANT17	1696107
PLANT17	1697052
PLANT18	1660883
PLANT18	1664500
PLANT18	1666994
PLANT18	1668792
PLANT18	1669083
PLANT18	1669095
PLANT18	1669740
PLANT18	1669741

Creating The Snowflake Schema

The Tables

FreightRates

- Carrier
- Orig_Port
- Dest_Port
- Min_Weight_Quant
- Max_Weight_Quant
- Service_Level
- Min_Cost
- Rate
- Mode_DSC
- TPT_Day_Count
- Carrier_Type

OrderList

- Order_ID
- Order_Date
- Orig_Port
- Carrier
- TPT_Day_Count
- Service_Level
- Ship_Ahead_Day_Count
- Ship_Late_Day_Count
- Customer
- Product_ID
- Plant_Code
- Dest_Port
- Unit_Quant
- Weight

WhCosts

- Plant_Code
- Cost_Per_Unit

WhCapacities

- Plant_Code
- Daily_Capacity

ProductsPerPlant

- Plant_Code
- Product_ID

VmiCustomers

- Plant_Code
- Customer

PlantPorts

- Plant_Code
- Port

Create PlantConstraints Table,
Add Primary Key to Table

WhCosts

Plant_Code

Cost_Per_Unit

WhCapacities

Plant_Code

Daily_Capacity

ProductsPerPlant

Plant_Code

Product_ID

VmiCustomers

Plant_Code
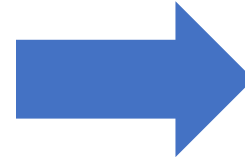
Customer

PlantPorts

Plant_Code

Port

PlantConstraints

PlantCode_Constraint_ID

Plant_Code

Cost_Per_Unit

Daily_Capacity

Product_ID

Customer

Port

Step 1

SQL Code (1/4)

```sql
-- Create the PlantConstraints Table
CREATE TABLE PlantConstraints (
    Plant_Code VARCHAR(26),
    Cost_Per_Unit FLOAT,
    Daily_Capacity NUMBER(38),
    Product_ID NUMBER(38),
    Customer VARCHAR(26),
    Port VARCHAR(26)
);
-- Insert data from WhCosts
INSERT INTO PlantConstraints (Plant_Code, Cost_Per_Unit)
SELECT Plant_Code, Cost_Per_Unit
FROM WhCosts;
```

Step 1

SQL Code (2/4)

```sql
-- Insert data from WhCapacities
INSERT INTO PlantConstraints (Plant_Code, Daily_Capacity)
SELECT Plant_Code, Daily_Capacity
FROM WhCapacities;
-- Insert data from VmiCustomers
INSERT INTO PlantConstraints (Plant_Code, Customer)
SELECT Plant_Code, Customer
FROM VmiCustomers;
-- Insert data from ProductsPerPlant
INSERT INTO PlantConstraints (Plant_Code, Product_ID)
SELECT Plant_Code, Product_ID
FROM ProductsPerPlant;
```

Step 1

SQL Code (3/4)

```sql
-- Insert data from PlantPorts
INSERT INTO PlantConstraints (Plant_Code, Port)
SELECT Plant_Code, Port
FROM PlantPorts;

-- Create a Sequence to Generate the Numbers
CREATE SEQUENCE Seq_X
START WITH 1
INCREMENT BY 1;
```

Step 1

SQL Code (4/4)

```sql
-- Add New Column to Table
ALTER TABLE PlantConstraints
ADD (PlantCode_Constraint_ID NUMBER(38));

-- Populate the New Column
UPDATE PlantConstraints
SET PlantCode_Constraint_ID = Seq_X.NEXTVAL;

-- Drop Old Tables
DROP TABLE WhCosts;
DROP TABLE WhCapacities;
DROP TABLE VmiCustomers;
DROP TABLE ProductsPerPlant;
DROP TABLE PlantPorts;
```

Step 1

Updated Tables

FreightRates

Carrier
Orig_Port
Dest_Port
Min_Weight_Quant
Max_Weight_Quant
Service_Level
Min_Cost
Rate
Mode_DSC
TPT_Day_Count
Carrier_Type

OrderList

Order_ID
Order_Date
Orig_Port
Carrier
TPT_Day_Count
Service_Level
Ship_Ahead_Day_Count
Ship_Late_Day_Count
Customer
Product_ID
Plant_Code
Dest_Port
Unit_Quant
Weight

PlantConstraints

PlantCode_Constraint_ID
Plant_Code
Cost_Per_Unit
Daily Capacity
Product_ID
Customer
Port

Step 1

Add Primary Key Column to FreightRates

FreightRates
Freight_Rates_ID
Carrier
Orig_Port
Dest_Port
Min_Weight_Quant
Max_Weight_Quant
Service_Level
Min_Cost
Rate
Mode_DSC
TPT_Day_Count
Carrier_Type

OrderList
Order_ID
Order_Date
Orig_Port
Carrier
TPT_Day_Count
Service_Level
Ship_Ahead_Day_Count
Ship_Late_Day_Count
Customer
Product_ID
Plant_Code
Dest_Port
Unit_Quant
Weight

PlantConstraints
PlantCode_Constraint_ID
Plant_Code
Cost_Per_Unit
Daily Capacity
Product_ID
Customer
Port

Step 2

SQL Code

```sql
-- Add New Column to Table
ALTER TABLE FreightRates
ADD (Freight_Rates_ID NUMBER(38));
-- Populate the New Column
UPDATE FreightRates
SET Freight_Rates_ID = Seq_X.NEXTVAL;
```

Step 2

Updated Tables

FreightRates
Freight_Rates_ID
Carrier
Orig_Port
Dest_Port
Min_Weight_Quant
Max_Weight_Quant
Service_Level
Min_Cost
Rate
Mode_DSC
TPT_Day_Count
Carrier_Type

OrderList
Order_ID
Order_Date
Orig_Port
Carrier
TPT_Day_Count
Service_Level
Ship_Ahead_Day_Count
Ship_Late_Day_Count
Customer
Product_ID
Plant_Code
Dest_Port
Unit_Quant
Weight

PlantConstraints
PlantCode_Constraint_ID
Plant_Code
Cost_Per_Unit
Daily Capacity
Product_ID
Customer
Port

Step 2

Create 2 New Dimension Tables, Add Foreign Keys to Necessary Tables

FreightRates

Freight_Rates_ID

PortCarrier_ID

~~*Carrier*~~

~~*Orig_Port*~~

~~*Dest_Port*~~

Min_Weight_Quant

Max_Weight_Quant

~~*Service_Level*~~

Min_Cost

Rate

Mode_DSC

TPT_Day_Count

Carrier_Type

OrderList

Order_ID

PlantProdCust_ID

PortCarrier_ID

Order_Date

~~*Orig_Port*~~

~~*Carrier*~~

TPT_Day_Count

~~*Service_Level*~~

Ship_Ahead_Day_Count

Ship_Late_Day_Count

~~*Customer*~~

~~*Product_ID*~~

~~*Plant_Code*~~

~~*Dest_Port*~~

Unit_Quant

Weight

PlantProdCust

PlantProdCust_ID

Plant_Code

Product_ID

Customer

PortCarrier

PortCarrier_ID

Carrier

Orig_Port

Dest_Port

Service_Level

PlantConstraints

PlantCode_Constraint_ID

PlantProdCust_ID

~~*Plant_Code*~~

Cost_Per_Unit

Daily_Capacity

~~*Product_ID*~~

~~*Customer*~~

Port

Step 3

SQL Code 1/8 (PlantProdCust)

```sql
-- Create PlantProdCust Table
CREATE TABLE PlantProdCust(

        PlantProdCust_ID NUMBER(38),

        Plant_Code       VARCHAR(26),

        Product_ID       NUMBER(38),

        Customer         VARCHAR(26)

);
-- Insert OrderList Data Into PlantProdCust Table
INSERT INTO PlantProdCust (PlantProdCust.Plant_Code, PlantProdCust.Product_ID, PlantProdCust.Customer)

SELECT OrderList.Plant_Code, OrderList.Product_ID, OrderList.Customer

FROM OrderList;

-- Insert PlantConstraints Data Into PlantProdCust Table

INSERT INTO PlantProdCust (PlantProdCust.Plant_Code,PlantProdCust.Product_ID,PlantProdCust.Customer)

SELECT PlantConstraints.Plant_Code, PlantConstraints.Product_ID, PlantConstraints.Customer

FROM PlantConstraints;
```

Step 3

SQL Code 2/8 (PlantProdCust)

```sql
-- Populate the New Column
UPDATE PlantConstraints
SET PlantCode_Constraint_ID = Seq_X.NEXTVAL;
-- Replace NULL Value in PlantProdCust.Product_ID, PlantProdCust.Customer, PlantConstraints.Product_ID,
PlantConstraints.Customer With The Numeric Value 0
UPDATE PlantProdCust SET Product_ID=0 WHERE Product_ID IS NULL;
UPDATE PlantProdCust SET Customer=0 WHERE Customer IS NULL;
UPDATE PlantConstraints SET Customer=0 WHERE Customer IS NULL;
UPDATE PlantConstraints SET Product_ID=0 WHERE Product_ID IS NULL;


-- Create a New Table with Unique Rows
CREATE TABLE PlantProdCust_New AS
SELECT PlantProdCust_ID, Plant_Code, Product_ID, Customer
FROM (
    SELECT PlantProdCust_ID,
           Plant_Code,
           Product_ID,
           Customer,
           ROW_NUMBER() OVER (PARTITION BY Plant_Code, Product_ID, Customer ORDER BY PlantProdCust_ID ASC) AS RowNum
    FROM PlantProdCust
) AS RowNumTable
WHERE RowNum = 1;
```

Step 3

SQL Code (3/8) (PlantProdCust)

```sql
-- Swap the Tables
ALTER TABLE PlantProdCust SWAP WITH PlantProdCust_New;
-- Drop the Temporary Table
DROP TABLE IF EXISTS PlantProdCust_New;
-- Populate The Primary Key Column
UPDATE PlantProdCust SET PlantProdCust_ID = Seq_X.NEXTVAL;
-- Add PlantProdCust_ID to OrderList
ALTER TABLE OrderList
ADD PlantProdCust_ID NUMBER(38);
-- Populate Foreign Key in PlantConstraints Correctly
UPDATE OrderList AS A
SET PlantProdCust_ID = B.PlantProdCust_ID
FROM PlantProdCust AS B
WHERE A.Plant_Code = B.Plant_Code
  AND A.Product_ID = B.Product_ID
  AND A.Customer = B.Customer;
-- Drop Plant_Code, Product_ID, & Customer Columns From PlantConstraints
ALTER TABLE PlantConstraints DROP COLUMN Plant_Code;
ALTER TABLE PlantConstraints DROP COLUMN Product_ID;
ALTER TABLE PlantConstraints DROP COLUMN Customer;
```

Step 3

SQL Code (4/8) (PlantProdCust)

```sql
-- Add PlantProdCust_ID to PlantConstraints
ALTER TABLE PlantConstraints
ADD PlantProdCust_ID NUMBER(38);


-- Populate Foreign Key in PlantConstraints Correctly
UPDATE PlantConstraints AS A
SET PlantProdCust_ID = B.PlantProdCust_ID
FROM PlantProdCust AS B
WHERE A.Plant_Code = B.Plant_Code
  AND A.Product_ID = B.Product_ID
  AND A.Customer = B.Customer;


-- Drop Plant_Code, Product_ID, & Customer Columns From PlantConstraints
ALTER TABLE PlantConstraints DROP COLUMN Plant_Code;
ALTER TABLE PlantConstraints DROP COLUMN Product_ID;
ALTER TABLE PlantConstraints DROP COLUMN Customer;
```

Step 3

SQL Code (5/8) (PortCarrier)

```sql
-- Create PortCarrier Table
CREATE TABLE PortCarrier (
    PortCarrier_ID  NUMBER(38),
    Carrier         VARCHAR(26),
    Orig_Port       VARCHAR(26),
    Dest_Port       VARCHAR(26),
    Service_Level   VARCHAR(26)
);
-- Insert OrderList Data Into PortCarrier Table
INSERT INTO PortCarrier (PortCarrier.Carrier, PortCarrier.Orig_Port, PortCarrier.Dest_Port,
PortCarrier.Service_Level)
SELECT OrderList.Carrier, OrderList.Orig_Port, OrderList.Dest_Port, OrderList.Service_Level
FROM OrderList;


-- Insert FreightRates Data Into PortCarrier Table
INSERT INTO PortCarrier (PortCarrier.Carrier, PortCarrier.Orig_Port, PortCarrier.Dest_Port,
PortCarrier.Service_Level)
SELECT FreightRates.Carrier, FreightRates.Orig_Port, FreightRates.Dest_Port,
FreightRates.Service_Level
FROM FreightRates;
```

Step 3

SQL Code (6/8) (PortCarrier)

```sql
-- Create a New Table with Unique Rows
CREATE TABLE PortCarrier_New AS
SELECT PortCarrier_ID, Carrier, Orig_Port, Dest_Port, Service_Level
FROM (
    SELECT PortCarrier_ID,
            Carrier,
            Orig_Port,
            Dest_Port,
            Service_Level,
            ROW_NUMBER() OVER (PARTITION BY Carrier, Orig_Port, Dest_Port, Service_Level ORDER BY PortCarrier_ID) AS RowNum
    FROM PortCarrier
) AS RowNumTable
WHERE RowNum = 1;
-- Swap the Tables
ALTER TABLE PortCarrier SWAP WITH PortCarrier_New;
-- Drop the Temporary Table
DROP TABLE IF EXISTS PortCarrier_New;
-- Populate The Primary Key Column
UPDATE PortCarrier SET PortCarrier_ID = Seq_X.NEXTVAL;
```

Step 3

SQL Code (7/8) (PortCarrier)

```sql
-- Populate Foreign Key in OrderList Correctly
UPDATE OrderList AS A
SET PortCarrier_ID = B.PortCarrier_ID
FROM PortCarrier AS B
WHERE A.Carrier = B.Carrier
  AND A.Orig_Port = B.Orig_Port
  AND A.Dest_Port = B.Dest_Port
  AND A.Service_Level = B.Service_Level;

-- Drop Carrier, Orig_Port, Service_Level, & Dest_Port Columns From OrderList
ALTER TABLE OrderList DROP COLUMN Orig_Port;
ALTER TABLE OrderList DROP COLUMN Dest_Port;
ALTER TABLE OrderList DROP COLUMN Carrier;
ALTER TABLE OrderList DROP COLUMN Service_Level;
```

Step 3

SQL Code (8/8) (PortCarrier)

```sql
-- Add PortCarrier_ID to FreightRates
ALTER TABLE FreightRates
ADD PortCarrier_ID NUMBER(38);


-- Populate Foreign Key in FreightRates Correctly
UPDATE FreightRates AS A
SET PortCarrier_ID = B.PortCarrier_ID
FROM PortCarrier AS B
WHERE A.Carrier = B.Carrier
  AND A.Orig_Port = B.Orig_Port
  AND A.Dest_Port = B.Dest_Port
  AND A.Service_Level = B.Service_Level;


-- Drop Carrier, Orig_Port, Service_Level & Dest_Port Columns From OrderList
ALTER TABLE FreightRates DROP COLUMN Orig_Port;
ALTER TABLE FreightRates DROP COLUMN Dest_Port;
ALTER TABLE FreightRates DROP COLUMN Carrier;
ALTER TABLE FreightRates DROP COLUMN Service_Level;
```

Step 3

Updated Tables

FreightRates
Freight_Rates_ID
PortCarrier_ID
Min_Weight_Quant
Max_Weight_Quant
Min_Cost
Rate
Most_DSC
TPT_Day_Count
Carrier_Type

OrderList
Order_ID
PlantProdCust_ID
PortCarrier_ID
Order_Date
TPT_Day_Count
Ship_Ahead_Day_Count
Ship_Late_Day_Count
Unit_Quant
Weight

PlantProdCust
PlantProdCust_ID
Plant_Code
Product_ID
Customer

PortCarrier
PortCarrier_ID
Carrier
Orig_Port
Dest_Port
Service_Level

PlantConstraints
PlantCode_Constraint_ID
PlantProdCust_ID
Cost_Per_Unit
Daily_Capacity
Port

Step 3

Create Fact Table With Facts & Foreign Keys

FactTable
PlantCode_Constraint_ID
Order_ID
Freight_Rates_ID
Min_Weight_Quant
Max_Weight_Quant
Min_Cost
Rate
TPT_Day_Quant
Cost_Per_Unit
Daily_Capacity
Ship_Ahead_Day_Count
Ship_Late_Day_Count
Unit_Quant
Weight

OrderList
Order_ID
PlantProdCust_ID
PortCarrier_ID
Order_Date
~~TPT_Day_Count~~
~~Ship_Ahead_Day_Count~~
~~Ship_Late_Day_Count~~
~~Unit_Quant~~
~~Weight~~

PlantProdCust
PlantProdCust_ID
Plant_Code
Product_ID
Customer

PortCarrier
PortCarrier_ID
Carrier
Orig_Port
Dest_Port
Service_Level

PlantConstraints
PlantCode_Constraint_ID
PlantProdCust_ID
~~Cost_Per_Unit~~
~~Daily_Capacity~~
Port

FreightRates
Freight_Rates_ID
PortCarrier_ID
~~Min_Weight_Quant~~
~~Max_Weight_Quant~~
~~Min_Cost~~
~~Rate~~
Mode_DSC
~~TPT_Day_Count~~
Carrier_Type

Step 4

SQL Code 1/ 3

```sql
-- Create Fact Table
CREATE OR REPLACE TABLE FactTable (
        PlantCode_Constraint_ID NUMBER(38),
        Order_ID                NUMBER(38),
        Freight_Rates_ID        NUMBER(38),
        Min_Weight_Quant        NUMBER(38),
        Max_Weight_Quant        VARCHAR,
        Min_Cost                VARCHAR,
        Rate                    VARCHAR,
        TPT_Day_Count           NUMBER(38),
        Cost_Per_Unit           NUMBER(38),
        Daily_Capacity          NUMBER(38),
        Ship_Ahead_Day_Count    NUMBER(38),
        Ship_Late_Day_Count     NUMBER(38),
        Unit_Quant              NUMBER(38),
        Weight                  NUMBER(38)
);
```

Step 4

SQL Code 2/3

```sql
-- Insert Into FactTable Data From FreightRates
INSERT INTO FactTable (FactTable.Freight_Rates_ID, FactTable.Min_Weight_Quant,
FactTable.Max_Weight_Quant, FactTable.Min_Cost, FactTable.Rate,
FactTable.TPT_Day_Count)
SELECT FreightRates.Freight_Rates_ID, FreightRates.Min_Weight_Quant,
FreightRates.Max_Weight_Quant,
FreightRates.Min_Cost, FreightRates.Rate, FreightRates.TPT_Day_Count
FROM FreightRates;


-- Insert Into FactTable Data From PlantConstraints
INSERT INTO FactTable (FactTable.PlantCode_Constraint_ID, FactTable.Cost_Per_Unit,
FactTable.Daily_Capacity)
SELECT PlantConstraints.PlantCode_Constraint_ID, PlantConstraints.Cost_Per_Unit,
PlantConstraints.Daily_Capacity
FROM PlantConstraints;
```

Step 4

SQL Code 3/3

```sql
-- Insert Into FactTable Data From OrderList
INSERT INTO FactTable (FactTable.Order_ID, FactTable.Ship_Ahead_Day_Count,

FactTable.Ship_Late_Day_Count, FactTable.Unit_Quant, FactTable.Weight,
FactTable.TPT_Day_Count)

SELECT OrderList.Order_ID, OrderList.Ship_Ahead_Day_Count,
OrderList.Ship_Late_Day_Count,

OrderList.Unit_Quant, OrderList.Weight, OrderList.TPT_Day_Count

FROM OrderList;


-- Dropping Columns
ALTER TABLE FreightRates DROP (Min_Weight_Quant, Max_Weight_Quant, Min_Cost, Rate,
TPT_Day_Count);

ALTER TABLE PlantConstraints DROP (Cost_Per_Unit, Daily_Capacity);

ALTER TABLE OrderList DROP (TPT_Day_Count, Ship_Ahead_Day_Count, Ship_Late_Day_Count,
Unit_Quant, Weight);
```

Step 4

Updated Tables

FreightRates
Freight_Rates_ID
PortCarrier_ID
Mode_DSC
Carrier_Type

PlantConstraints
PlantCode_Constraint_ID
PlantProdCust_ID
Port

PortCarrier
PortCarrier_ID
Carrier
Orig_Port
Dest_Port
Service_Level

FactTable
PlantCode_Constraint_ID
Order_ID
Freight_Rates_ID
Min_Weight_Quant
Max_Weight_Quant
Min_Cost
Rate
TPT_Day_Count
Cost_Per_Unit
Daily_Capacity
Ship_Ahead_Day_Count
Ship_Late_Day_Count
Unit_Quant
Weight

OrderList
Order_ID
PortCarrier_ID
PlantProdCust_ID
Order_Date

PlantProdCust
PlantProdCust_ID
Plant_Code
Product_ID
Customer

Step 4

Set Primary Keys and Foreign Keys

FactTable
- *PlantCode_Constraint_ID*
- *Order_ID*
- *Freight_Rates_ID*
- Min_Weight_Quant
- Max_Weight_Quant
- Min_Cost
- Rate
- TPT_Day_Count
- Cost_Per_Unit
- Daily_Capacity
- Ship_Ahead_Day_Count
- Ship_Late_Day_Count
- Unit_Quant
- Weight

OrderList
- *Order_ID*
- **PortCarrier_ID**
- **PlantProdCust_ID**
- Order_Date

PlantProdCust
- *PlantProdCust_ID*
- Plant_Code
- Product_ID
- Customer

FreightRates
- *Freight_Rates_ID*
- *PortCarrier_ID*
- Mode_DSC
- Carrier_Type

PlantConstraints
- *PlantCode_Constraint_ID*
- *PlantProdCust_ID*
- Port

PortCarrier
- *PortCarrier_ID*
- Carrier
- Orig_Port
- Dest_Port
- Service_Level

⬭ = Foreign Key

⬭ = Primary Key

Step 5

SQL Code 1/3

```sql
-- Set The Primary Keys
ALTER TABLE FreightRates ADD PRIMARY KEY (Freight_Rates_ID);

ALTER TABLE PlantConstraints ADD PRIMARY KEY (PlantCode_Constraint_ID);

ALTER TABLE PortCarrier ADD PRIMARY KEY (PortCarrier_ID);

ALTER TABLE OrderList ADD PRIMARY KEY (Order_ID);

ALTER TABLE PlantProdCust ADD PRIMARY KEY (PlantProdCust_ID);
```

Step 5

SQL Code 2/3

```sql
-- Set The Foreign Keys in the FactTable
ALTER TABLE FactTable
ADD FOREIGN KEY (PlantCode_Constraint_ID)
REFERENCES PlantConstraints(PlantCode_Constraint_ID);


ALTER TABLE FactTable
ADD FOREIGN KEY (Order_ID)
REFERENCES OrderList (Order_ID)
ENABLE NOVALIDATE;


ALTER TABLE FactTable
ADD FOREIGN KEY (Freight_Rates_ID)
REFERENCES FreightRates (Freight_Rates_ID);
```

Step 5

SQL Code 3/3

```sql
-- Set The Foreign Keys in The Dimension Tables
ALTER TABLE FreightRates
ADD FOREIGN KEY (PortCarrier_ID)
REFERENCES PortCarrier(PortCarrier_ID);


ALTER TABLE PlantConstraints
ADD FOREIGN KEY (PlantProdCust_ID)
REFERENCES PlantProdCust(PlantProdCust_ID);


ALTER TABLE OrderList
ADD FOREIGN KEY (PortCarrier_ID)
REFERENCES PortCarrier(PortCarrier_ID);


ALTER TABLE OrderList
ADD FOREIGN KEY (PlantProdCust_ID)
REFERENCES PlantProdCust(PlantProdCust_ID);
```

Step 5

Going back to Excel

Create 5 New Tables: Dates, Customers_SH (Customer "Short-Hand"), Orig_Port_Locations, Dest_Port_Locations, Plant_Locations, Port_Locations

Dates

DATE_ID	ORDER_ID	ORDER_DATE	MONTH_NUM	MONTH_NAME	QUARTER	YEAR_
1	1.45E+09	6/10/2018	6	Jun	2	2018
2	1.45E+09	4/24/2018	4	Apr	2	2018
3	1.45E+09	9/20/2018	9	Sep	3	2018
4	1.45E+09	5/25/2018	5	May	2	2018
5	1.45E+09	6/30/2018	6	Jun	2	2018
6	1.45E+09	12/21/2018	12	Dec	4	2018
7	1.45E+09	8/9/2018	8	Aug	3	2018
8	1.45E+09	7/26/2018	7	Jul	3	2018
9	1.45E+09	9/21/2018	9	Sep	3	2018
10	1.45E+09	6/16/2018	6	Jun	2	2018
11	1.45E+09	1/19/2018	1	Jan	1	2018
12	1.45E+09	6/15/2018	6	Jun	2	2018
13	1.45E+09	12/7/2018	12	Dec	4	2018
14	1.45E+09	4/22/2018	4	Apr	2	2018

Customers_SH

CUSTOMERS	CUSTOMERS_SH
V55_13	Customer_01
V55_37	Customer_02
V55_39	Customer_03
V55_47	Customer_04
V555_15	Customer_05
V555_41	Customer_06
V5555_20	Customer_07
V5555_25	Customer_08
V5555_33	Customer_09
V5555_36	Customer_10
V5555_38	Customer_11
V55555_10	Customer_12
V55555_2	Customer_13
V55555_26	Customer_14
V55555_4	Customer_15
V55555_53	Customer_16
V555555_11	Customer_17
V555555_24	Customer_18
V555555_34	Customer_19
V555555_40	Customer_20
V555555_6	Customer_21
V5555555_12	Customer_22
V5555555_19	Customer_23
V5555555_22	Customer_24
V5555555_30	Customer_25
V55555555_0	Customer_26
V55555555_32	Customer_27
V55555555_5	Customer_28
V55555555_7	Customer_29

Orig_Port_Locations

ORIG_PORT_LOCATION_ID	ORIG_PORT	ORIG_PORT_CITY	ORIG_PORT_STATE_NAME	ORIG_PORT_STATE	ORIG_PORT_LONGITUDE	ORIG_PORT_LATITUDE
1	PORT01	Camden	New Jersey	NJ	-75.12338257	39.93738174
2	PORT02	Philadelphia	Pennsylvania	PA	-75.09488	39.979031
3	PORT03	Boston	Massachusetts	MA	-71.0389415	42.3481664
4	PORT04	Miami	Florida	FL	-80.1779964	25.778567
5	PORT05	Wilmington	North Carolina	NC	-77.9479854	34.196556
6	PORT06	Baltimore	Maryland	MD	-76.6096734	39.2860811
7	PORT07	Bayonne	New Jersey	NJ	-74.547283	40.287226
8	PORT08	Charleston	South Carolina	SC	-79.9257181	32.7808424
9	PORT09	San Pedro	California	CA	-118.2813644	33.73823547
10	PORT10	Savannah	Georgia	GA	-81.150809	32.123742
11	PORT11	New York	New York	NY	-74.0056639	40.6830965

Dest_Port_Locations

DEST_PORT_LOCATION_ID	DEST_PORT	DEST_PORT_CITY	DEST_PORT_STATE_NAME	DEST_PORT_STATE	DEST_PORT_LONGITUDE	DEST_PORT_LATITUDE
1	PORT01	Camden	New Jersey	NJ	-75.12338257	39.93738174
2	PORT02	Philadelphia	Pennsylvania	PA	-75.09488	39.979031
3	PORT03	Boston	Massachusetts	MA	-71.0389415	42.3481664
4	PORT04	Miami	Florida	FL	-80.1779964	25.778567
5	PORT05	Wilmington	North Carolina	NC	-77.9479854	34.196556
6	PORT06	Baltimore	Maryland	MD	-76.6096734	39.2860811
7	PORT07	Bayonne	New Jersey	NJ	-74.547283	40.287226
8	PORT08	Charleston	South Carolina	SC	-79.9257181	32.7808424
9	PORT09	San Pedro	California	CA	-118.2813644	33.73823547
10	PORT10	Savannah	Georgia	GA	-81.150809	32.123742
11	PORT11	New York	New York	NY	-74.0056639	40.6830965

Port_Locations

PORT_LOCATION_ID	PORTS	PORT_CITY	PORT_STATE_NAME	PORT_STATE	PORT_LONGITUDE	PORT_LATITUDE
1	PORT01	Camden	New Jersey	NJ	-75.12338257	39.93738174
2	PORT02	Philadelphia	Pennsylvania	PA	-75.09488	39.979031
3	PORT03	Boston	Massachusetts	MA	-71.0389415	42.3481664
4	PORT04	Miami	Florida	FL	-80.1779964	25.778567
5	PORT05	Wilmington	North Carolina	NC	-77.9479854	34.196556
6	PORT06	Baltimore	Maryland	MD	-76.6096734	39.2860811
7	PORT07	Bayonne	New Jersey	NJ	-74.547283	40.287226
8	PORT08	Charleston	South Carolina	SC	-79.9257181	32.7808424
9	PORT09	San Pedro	California	CA	-118.2813644	33.73823547
10	PORT10	Savannah	Georgia	GA	-81.150809	32.123742
11	PORT11	New York	New York	NY	-74.0056639	40.6830965

Plant_Locations

PLANT_LOCATION_ID	PLANT_CODE	PLANT_CITY	PLANT_STATE_NAME	PLANT_STATE	PLANT_LONGITUDE	PLANT_LATITUDE
12	PLANT01	Pottsville	Pennsylvania	PA	-76.182344	40.690894
13	PLANT02	Raymond	New Hampshire	NH	-71.1661286	43.0274128
14	PLANT03	Fort Pierce	Florida	FL	-80.3827964	27.4118942
15	PLANT04	Henderson	North Carolina	NC	-78.39128113	36.28921127
16	PLANT05	Smyrna	Delaware	DE	-75.626646	39.2888684
17	PLANT06	Williamsport	Maryland	MD	-77.807916	39.619286
18	PLANT07	Bethlehem	Pennsylvania	PA	-75.3227189	40.6112545
19	PLANT08	Arcadia	Florida	FL	-81.851939	27.239609
20	PLANT09	Mebane	North Carolina	NC	-79.262621	36.102563
21	PLANT10	Pedricktown	New Jersey	NJ	-75.408412	39.733769
22	PLANT11	Winter Haven	Florida	FL	-81.7556018	28.0462827
23	PLANT12	Davenport	Florida	FL	-81.74889	27.995134
24	PLANT13	Brooksville	Florida	FL	-82.2200794	28.5186767
25	PLANT14	Harrison	New Jersey	NJ	-74.161783	40.742177
26	PLANT15	Ridgeville	South Carolina	SC	-80.311951	33.102683
27	PLANT16	Mira Loma	California	CA	-117.558152	34.012427
28	PLANT17	Port Wentworth	Georgia	GA	-81.163168	32.149092
29	PLANT18	Johnsontown	New York	NY	-74.4067541	42.9868881
30	PLANT19	Alachua	Florida	FL	-82.468558	29.760911

Drop Order_Date column

FreightRates
Freight_Rates_ID

PortCarrier_ID

Mode_DSC

Carrier_Type

PlantConstraints
PlantCode_Constraint_ID

PlantProdCust_ID

Port

PortCarrier
PortCarrier_ID

Carrier

Orig_Port

Dest_Port

Service_Level

FactTable
PlantCode_Constraint_I
D

Order_ID

Freight_Rates_ID

Min_Weight_Quant

Max_Weight_Quant

Min_Cost

Rate

TPT_Day_Count

Cost_Per_Unit

Daily_Capacity

Ship_Ahead_Day_Count

Ship_Late_Day_Count

Unit_Quant

Weight

OrderList
Order_ID

PortCarrier_ID

PlantProdCust_ID

~~Order_Date~~

Make Order_Date
Column NULL in SQL

PlantProdCust
PlantProdCust_ID

Plant_Code

Product_ID

Customer

Step 6

Drop Order_Date column

FreightRates

FreightRates
Freight_Rates_ID
PortCarrier_ID
Mode_DSC
Carrier_Type

PlantConstraints

PlantConstraints
PlantCode_Constraint_ID
PlantProdCust_ID
Port

PortCarrier

PortCarrier
PortCarrier_ID
Carrier
Orig_Port
Dest_Port
Service_Level

FactTable

FactTable
PlantCode_Constraint_ID
Order_ID
Freight_Rates_ID
Min_Weight_Quant
Max_Weight_Quant
Min_Cost
Rate
TPT_Day_Count
Cost_Per_Unit
Daily_Capacity
Ship_Ahead_Day_Count
Ship_Late_Day_Count
Unit_Quant
Weight

OrderList

OrderList
Order_ID
PortCarrier_ID
PlantProdCust_ID
~~Order_Date~~

Going to randomly populate dates All of the dates are the same for each Order_ID, this is simply going to make the data more interesting

PlantProdCust

PlantProdCust
PlantProdCust_ID
Plant_Code
Product_ID
Customer

Step 6

SQL Code

```sql
-- Drop Order_Date from OrderList

ALTER TABLE OrderList DROP COLUMN Order_Date;
```

Step 6

Updated Tables

Port_Locations

Port_Location_ID

Port

Port_City

Port_State_Name

Port_State

Port_Longitude

Port_Latitude

Customers_SH

Customers

Customers_SH

Plant_Location

Plant_Location_ID

Plant_Code

Plant_City

Plant_State_Name

Plant_State

Plant_Longitude

Plant_Latitude

PlantConstraints

PlantCode_Constraint_ID

PlantProdCust_ID

Port

PortCarrier

PortCarrier_ID

Carrier

Orig_Port

Dest_Port

Service_Level

FreightRates

Freight_Rates_ID

PortCarrier_ID

Mode_DSC

Carrier_Type

FactTable

PlantCode_Constraint_ID

Order_ID

Freight_Rates_ID

Min_Weight_Quant

Max_Weight_Quant

Min_Cost

Rate

TPT_Day_Count

Cost_Per_Unit

Daily_Capacity

Ship_Ahead_Day_Count

Ship_Late_Day_Count

Unit_Quant

Weight

OrderList

Order_ID

PortCarrier_ID

PlantProdCust_ID

PlantProdCust

PlantProdCust_ID

Plant_Code

Product_ID

Customer

Dates

Order_ID

Order_Date

Month_Num

Month_Name

Quarter

Year

Dest_Port_Locations

Dest_Port_Location_ID

Dest_Port

Dest_Port_City

Dest_Port_State_Name

Dest_Port_State

Dest_Port_Longitude

Dest_Port_Latitude

Orig_Port_Locations

Orig_Port_Location_ID

Orig_Port

Orig_Port_City

Orig_Port_State_Name

Orig_Port_State

Orig_Port_Longitude

Orig_Port_Latitude

Step 6

SQL Code (PlantConstraints)

```sql
-- Create New Column, Port_Location_ID in PlantConstraints
ALTER TABLE PlantConstraints ADD Port_Location_ID NUMBER(38);


-- Populate The Port_Location_ID in PlantConstraints Correctly
MERGE INTO SUPPLYCHAIN.PUBLIC.PLANTCONSTRAINTS A
USING SUPPLYCHAIN.PUBLIC.PORT_LOCATIONS B
ON A.Port = B.Port
WHEN MATCHED THEN
UPDATE SET A.Port_Location_ID = B.Port_Location_ID;
```

Step 7

SQL Code (PortCarrier)

```sql
- Create 2 New Columns, Orig_Location_ID & Dest_Location_ID, in PortCarrier
 ALTER TABLE PortCarrier ADD Orig_Port_Location_ID NUMBER(38);
 ALTER TABLE PortCarrier ADD Dest_Port_Location_ID NUMBER(38);
-- Populate The Orig_Port_Location_ID in PortCarrier Correctly
MERGE INTO PortCarrier A
USING Orig_Port_Locations B
ON A.Orig_Port = B.Orig_Port
WHEN MATCHED THEN
UPDATE SET A.Orig_Port_Location_ID = B.Orig_Port_Location_ID;


-- Populate The Dest_Port_Location_ID in PortCarrier Correctly
MERGE INTO PortCarrier A
USING Dest_Port_Locations B
ON A.Dest_Port = B.Dest_Port
WHEN MATCHED THEN
UPDATE SET A.Dest_Port_Location_ID = B.Dest_Port_Location_ID;
```

Step 7

SQL Code (PlantProdCust)

```sql
-- Create New Column, Plant_Location_ID, in PlantProdCust
 ALTER TABLE PlantProdCust ADD Plant_Location_ID NUMBER(38);
-- Populate The Plant_Location_ID in PlantProdCust Correctly
MERGE INTO PlantProdCust A
USING Plant_Locations B
ON A.Plant_Code = B.Plant_Code
WHEN MATCHED THEN
UPDATE SET A.Plant_Location_ID = B.Plant_Location_ID;
```

Step 7

Updated Tables

Customers_SH

Customers

Customers_SH

Port_Locations

Port_Location_ID

Port

Port_City

Port_State_Name

Port_State

Port_Longitude

Port_Latitude

PlantConstraints

PlantCode_Constraint_ID

PlantProdCust_ID

Port_Location_ID

Port

Plant_Location

Plant_Location_ID

Plant_Code

Plant_City

Plant_State_Name

Plant_State

Plant_Longitude

Plant_Latitude

PortCarrier

PortCarrier_ID

Orig_Port_Location_ID

Dest_Port_Location_ID

Carrier

Orig_Port

Dest_Port

Service_Level

FreightRates

Freight_Rates_ID

PortCarrier_ID

Mode_DSC

Carrier_Type

FactTable

PlantCode_Constraint_ID

Order_ID

Freight_Rates_ID

Min_Weight_Quant

Max_Weight_Quant

Min_Cost

Rate

TPT_Day_Count

Cost_Per_Unit

Daily_Capacity

Ship_Ahead_Day_Count

Ship_Late_Day_Count

Unit_Quant

Weight

OrderList

Order_ID

PortCarrier_ID

PlantProdCust_ID

PlantProdCust

PlantProdCust_ID

Plant_Location_ID

Plant_Code

Product_ID

Customer

Dates

Order_ID

Order_Date

Month_Num

Month_Name

Quarter

Year

Dest_Port_Locations

Dest_Port_Location_ID

Dest_Port

Dest_Port_City

Dest_Port_State_Name

Dest_Port_State

Dest_Port_Longitude

Dest_Port_Latitude

Orig_Port_Locations

Orig_Port_Location_ID

Orig_Port

Orig_Port_City

Orig_Port_State_Name

Orig_Port_State

Orig_Port_Longitude

Orig_Port_Latitude

Step 7

Drop Redundant Columns in PlantConstraints (Ports), PortCarrier (Orig_Port, Dest_Port) and PlantProdCust (Plant_Code)

Customers_SH
- Customers
- Customers_SH

PlantConstraints
- PlantCode_Constraint_ID
- PlantProdCust_ID
- Port_Location_ID
- ~~Port~~

Port_Locations
- Port_Location_ID
- Port
- Port_City
- Port_State_Name
- Port_State
- Port_Longitude
- Port_Latitude

Plant_Location
- Plant_Location_ID
- Plant_Code
- Plant_City
- Plant_State_Name
- Plant_State
- Plant_Longitude
- Plant_Latitude

PortCarrier
- PortCarrier_ID
- Orig_Port_Location_ID
- Dest_Port_Location_ID
- Carrier
- ~~Orig_Port~~
- ~~Dest_Port~~
- Service_Level

FreightRates
- Freight_Rates_ID
- PortCarrier_ID
- Mode_DSC
- Carrier_Type

FactTable
- PlantCode_Constraint_ID
- Order_ID
- Freight_Rates_ID
- Min_Weight_Quant
- Max_Weight_Quant
- Min_Cost
- Rate
- TPT_Day_Count
- Cost_Per_Unit
- Daily_Capacity
- Ship_Ahead_Day_Count
- Ship_Late_Day_Count
- Unit_Quant
- Weight

OrderList
- Order_ID
- PortCarrier_ID
- PlantProdCust_ID

PlantProdCust
- PlantProdCust_ID
- Plant_Location_ID
- ~~Plant_Code~~
- Product_ID
- Customer

Dates
- Order_ID
- Order_Date
- Month_Num
- Month_Name
- Quarter
- Year

Dest_Port_Locations
- Dest_Port_Location_ID
- Dest_Port
- Dest_Port_City
- Dest_Port_State_Name
- Dest_Port_State
- Dest_Port_Longitude
- Dest_Port_Latitude

Orig_Port_Locations
- Orig_Port_Location_ID
- Orig_Port
- Orig_Port_City
- Orig_Port_State_Name
- Orig_Port_State
- Orig_Port_Longitude
- Orig_Port_Latitude

Step 8

SQL Code

```sql
-- Drop Ports From PlantConstraints
ALTER TABLE PlantConstraints DROP COLUMN Port;
-- Drop Orig_Port, Dest_Port From PortCarrier
ALTER TABLE PortCarrier DROP COLUMN Orig_Port;
ALTER TABLE PortCarrier DROP COLUMN Dest_Port;
-- Drop Plant_Code From PlantProdCust
ALTER TABLE PlantProdCust DROP COLUMN Plant_Code;
```

Step 8

Updated Tables

Customers_SH

Customers

Customers_SH

Port_Locations

Port_Location_ID

Port

Port_City

Port_State_Name

Port_State

Port_Longitude

Port_Latitude

PlantConstraints

PlantCode_Constraint_ID

PlantProdCust_ID

Port_Location_ID

Plant_Location

Plant_Location_ID

Plant_Code

Plant_City

Plant_State_Name

Plant_State

Plant_Longitude

Plant_Latitude

PortCarrier

PortCarrier_ID

Orig_Port_Location_ID

Dest_Port_Location_ID

Carrier

Service_Level

FreightRates

Freight_Rates_ID

PortCarrier_ID

Mode_DSC

Carrier_Type

FactTable

PlantCode_Constraint_ID

Order_ID

Freight_Rates_ID

Min_Weight_Quant

Max_Weight_Quant

Min_Cost

Rate

TPT_Day_Count

Cost_Per_Unit

Daily_Capacity

Ship_Ahead_Day_Count

Ship_Late_Day_Count

Unit_Quant

Weight

OrderList

Order_ID

PortCarrier_ID

PlantProdCust_ID

PlantProdCust

PlantProdCust_ID

Plant_Location_ID

Product_ID

Customer

Dates

Order_ID

Order_Date

Month_Num

Month_Name

Quarter

Year

Dest_Port_Locations

Dest_Port_Location_ID

Dest_Port

Dest_Port_City

Dest_Port_State_Name

Dest_Port_State

Dest_Port_Longitude

Dest_Port_Latitude

Orig_Port_Locations

Orig_Port_Location_ID

Orig_Port

Orig_Port_City

Orig_Port_State_Name

Orig_Port_State

Orig_Port_Longitude

Orig_Port_Latitude

Step 8

Insert Order_Date, Month_Num, Month_Name, Quarter, & Year From Dates Into OrderList, Drop Dates Table

Customers_SH
Customers
Customers_SH

PlantConstraints
PlantCode_Constraint_ID
PlantProdCust_ID
Port_Location_ID

Port_Locations
Port_Location_ID
Port
Port_City
Port_State_Name
Port_State
Port_Longitude
Port_Latitude

Plant_Location
Plant_Location_ID
Plant_Code
Plant_City
Plant_State_Name
Plant_State
Plant_Longitude
Plant_Latitude

PortCarrier
PortCarrier_ID
Orig_Port_Location_ID
Dest_Port_Location_ID
Carrier
Service_Level

OrderList
Order_ID
PortCarrier_ID
PlantProdCust_ID
Month_Num
Month_Name
Quarter
Year

FactTable
PlantCode_Constraint_ID
Order_ID
Freight_Rates_ID
Min_Weight_Quant
Max_Weight_Quant
Min_Cost
Rate
TPT_Day_Count
Cost_Per_Unit
Daily_Capacity
Ship_Ahead_Day_Count
Ship_Late_Day_Count
Unit_Quant
Weight

FreightRates
Freight_Rates_ID
PortCarrier_ID
Mode_DSC
Carrier_Type

PlantProdCust
PlantProdCust_ID
Plant_Location_ID
Product_ID
Customer

Dates
~~*Order_ID*~~
~~*Order_Date*~~
~~*Month_Num*~~
~~*Month_Name*~~
~~*Quarter*~~
~~*Year*~~

Dest_Port_Locations
Dest_Port_Location_ID
Dest_Port
Dest_Port_City
Dest_Port_State_Name
Dest_Port_State
Dest_Port_Longitude
Dest_Port_Latitude

Orig_Port_Locations
Orig_Port_Location_ID
Orig_Port
Orig_Port_City
Orig_Port_State_Name
Orig_Port_State
Orig_Port_Longitude
Orig_Port_Latitude

Step 9

SQL Code (1/3)

```sql
-- Create Month_Num, Month_Name, Quarter, & Year Columns in Table OrderList
ALTER TABLE OrderList ADD Order_Date DATE;

ALTER TABLE OrderList ADD Month_Num NUMBER(38);

ALTER TABLE OrderList ADD Month_Name VARCHAR2(26);

ALTER TABLE OrderList ADD Quarter NUMBER(38);

ALTER TABLE OrderList ADD Year_ NUMBER(38);
```

Step 9

SQL Code (2/3)

```sql
-- Insert Order_Date, Month_Num, Month_Name, Quarter, & Year Data From Table Dates Into Table OrderList
MERGE INTO OrderList A
USING Dates B
ON A.Order_ID = B.Order_ID
WHEN MATCHED THEN
UPDATE SET A.Order_Date = B.Order_Date;


MERGE INTO OrderList A
USING Dates B
ON A.Order_ID = B.Order_ID
WHEN MATCHED THEN
UPDATE SET A.Month_Num = B.Month_Num;


MERGE INTO OrderList A
USING Dates B
ON A.Order_ID = B.Order_ID
WHEN MATCHED THEN
UPDATE SET A.Month_Name = B.Month_Name;
```

Step 9

SQL Code 3/3

```sql
MERGE INTO OrderList A
USING Dates B
ON A.Order_ID = B.Order_ID
WHEN MATCHED THEN
UPDATE SET A.Quarter = B.Quarter;

MERGE INTO OrderList A
USING Dates B
ON A.Order_ID = B.Order_ID
WHEN MATCHED THEN
UPDATE SET A.Year_ = B.Year_;

-- Rename Year_ Column to Year
 ALTER TABLE ORDERLIST RENAME COLUMN YEAR_ TO YEAR;
-- Drop Dates Table
 DROP TABLE DATES;
```

Step 9

Updated Tables

Customers_SH

Customers

Customers_SH

Port_Locations

Port_Location_ID

Port

Port_City

Port_State_Name

Port_State

Port_Longitude

Port_Latitude

PlantConstraints

PlantCode_Constraint_ID

PlantProdCust_ID

Port_Location_ID

Plant_Location

Plant_Location_ID

Plant_Code

Plant_City

Plant_State_Name

Plant_State

Plant_Longitude

Plant_Latitude

PortCarrier

PortCarrier_ID

Orig_Port_Location_ID

Dest_Port_Location_ID

Carrier

Service_Level

OrderList

Order_ID

PortCarrier_ID

PlantProdCust_ID

Month_Num

Month_Name

Quarter

Year

FactTable

PlantCode_Constraint_ID

Order_ID

Freight_Rates_ID

Min_Weight_Quant

Max_Weight_Quant

Min_Cost

Rate

TPT_Day_Count

Cost_Per_Unit

Daily_Capacity

Ship_Ahead_Day_Count

Ship_Late_Day_Count

Unit_Quant

Weight

FreightRates

Freight_Rates_ID

PortCarrier_ID

Mode_DSC

Carrier_Type

PlantProdCust

PlantProdCust_ID

Plant_Location_ID

Product_ID

Customer

Dest_Port_Locations

Dest_Port_Location_ID

Dest_Port

Dest_Port_City

Dest_Port_State_Name

Dest_Port_State

Dest_Port_Longitude

Dest_Port_Latitude

Orig_Port_Locations

Orig_Port_Location_ID

Orig_Port

Orig_Port_City

Orig_Port_State_Name

Orig_Port_State

Orig_Port_Longitude

Orig_Port_Latitude

Step 9

Add Customers_SH to
PlantProdCust, Drop
Customers_SH Table

Customers_SH

Customers

Customers_SH

Port_Locations

Port_Location_ID

Port

Port_City

Port_State_Name

Port_State

Port_Longitude

Port_Latitude

PlantConstraints

PlantCode_Constraint_ID

PlantProdCust_ID

Port_Location_ID

Plant_Location

Plant_Location_ID

Plant_Code

Plant_City

Plant_State_Name

Plant_State

Plant_Longitude

Plant_Latitude

PortCarrier

PortCarrier_ID

Orig_Port_Location_ID

Dest_Port_Location_ID

Carrier

Service_Level

OrderList

Order_ID

PortCarrier_ID

PlantProdCust_ID

Month_Num

Month_Name

Quarter

Year

FactTable

PlantCode_Constraint_ID

Order_ID

Freight_Rates_ID

Min_Weight_Quant

Max_Weight_Quant

Min_Cost

Rate

TPT_Day_Count

Cost_Per_Unit

Daily_Capacity

Ship_Ahead_Day_Count

Ship_Late_Day_Count

Unit_Quant

Weight

FreightRates

Freight_Rates_ID

PortCarrier_ID

Mode_DSC

Carrier_Type

PlantProdCust

PlantProdCust_ID

Plant_Location_ID

Product_ID

Customer

Customers_SH

Dest_Port_Locations

Dest_Port_Location_ID

Dest_Port

Dest_Port_City

Dest_Port_State_Name

Dest_Port_State

Dest_Port_Longitude

Dest_Port_Latitude

Orig_Port_Locations

Orig_Port_Location_ID

Orig_Port

Orig_Port_City

Orig_Port_State_Name

Orig_Port_State

Orig_Port_Longitude

Orig_Port_Latitude

Step 10

SQL Code

```sql
-- Add New Column to PlantProdCust, Customers_SH (Short-Hand)
 ALTER TABLE PlantProdCust ADD Customers_SH VARCHAR2(26);
 -- Populate the Customers_SH Column
MERGE INTO PlantProdCust A
USING Customers_SH B
ON A.Customer = B.Customers
WHEN MATCHED THEN
UPDATE SET A.Customers_SH = B.Customers_SH;


-- Drop the Customers_SH Table
 DROP TABLE Customers_SH;
```

Step 10

Updated Tables

Port_Locations

Port_Location_ID

Port

Port_City

Port_State_Name

Port_State

Port_Longitude

Port_Latitude

PlantConstraints

PlantCode_Constraint_ID

PlantProdCust_ID

Port_Location_ID

Plant_Location

Plant_Location_ID

Plant_Code

Plant_City

Plant_State_Name

Plant_State

Plant_Longitude

Plant_Latitude

PortCarrier

PortCarrier_ID

Orig_Port_Location_ID

Dest_Port_Location_ID

Carrier

Service_Level

OrderList

Order_ID

PortCarrier_ID

PlantProdCust_ID

Month_Num

Month_Name

Quarter

Year

FactTable

PlantCode_Constraint_ID

Order_ID

Freight_Rates_ID

Min_Weight_Quant

Max_Weight_Quant

Min_Cost

Rate

TPT_Day_Count

Cost_Per_Unit

Daily_Capacity

Ship_Ahead_Day_Count

Ship_Late_Day_Count

Unit_Quant

Weight

FreightRates

Freight_Rates_ID

PortCarrier_ID

Mode_DSC

Carrier_Type

PlantProdCust

PlantProdCust_ID

Plant_Location_ID

Product_ID

Customer

Customers_SH

Dest_Port_Locations

Dest_Port_Location_ID

Dest_Port

Dest_Port_City

Dest_Port_State_Name

Dest_Port_State

Dest_Port_Longitude

Dest_Port_Latitude

Orig_Port_Locations

Orig_Port_Location_ID

Orig_Port

Orig_Port_City

Orig_Port_State_Name

Orig_Port_State

Orig_Port_Longitude

Orig_Port_Latitude

Step 10

Drop Customer Column,
Change Name of
Customers_SH to Customer

Port_Locations

Port_Location_ID

Port

Port_City

Port_State_Name

Port_State

Port_Longitude

Port_Latitude

PlantConstraints

PlantCode_Constraint_ID

PlantProdCust_ID

Port_Location_ID

Plant_Location

Plant_Location_ID

Plant_Code

Plant_City

Plant_State_Name

Plant_State

Plant_Longitude

Plant_Latitude

PortCarrier

PortCarrier_ID

Orig_Port_Location_ID

Dest_Port_Location_ID

Carrier

Service_Level

OrderList

Order_ID

PortCarrier_ID

PlantProdCust_ID

Month_Num

Month_Name

Quarter

Year

FactTable

PlantCode_Constraint_ID

Order_ID

Freight_Rates_ID

Min_Weight_Quant

Max_Weight_Quant

Min_Cost

Rate

TPT_Day_Count

Cost_Per_Unit

Daily_Capacity

Ship_Ahead_Day_Count

Ship_Late_Day_Count

Unit_Quant

Weight

FreightRates

Freight_Rates_ID

PortCarrier_ID

Mode_DSC

Carrier_Type

PlantProdCust

PlantProdCust_ID

Plant_Location_ID

Product_ID

Customer

Customers_SH

Change
Name to
"Customer"

Dest_Port_Locations

Dest_Port_Location_ID

Dest_Port

Dest_Port_City

Dest_Port_State_Name

Dest_Port_State

Dest_Port_Longitude

Dest_Port_Latitude

Orig_Port_Locations

Orig_Port_Location_ID

Orig_Port

Orig_Port_City

Orig_Port_State_Name

Orig_Port_State

Orig_Port_Longitude

Orig_Port_Latitude

Step 11

SQL Code

```
-- Drop the Customer Column in PlantProdCust

 ALTER TABLE PlantProdCust DROP COLUMN Customer;

-- Change The Name of the Customers_SH Column in the PlantProdCust Table to
Customer

 ALTER TABLE PlantProdCust RENAME COLUMN "CUSTOMERS_SH" to Customer;
```

Step 11

Updated Tables

Port_Locations
- Port_Location_ID
- Port
- Port_City
- Port_State_Name
- Port_State
- Port_Longitude
- Port_Latitude

PlantConstraints
- PlantCode_Constraint_ID
- PlantProdCust_ID
- Port_Location_ID

Plant_Location
- Plant_Location_ID
- Plant_Code
- Plant_City
- Plant_State_Name
- Plant_State
- Plant_Longitude
- Plant_Latitude

PortCarrier
- PortCarrier_ID
- Orig_Port_Location_ID
- Dest_Port_Location_ID
- Carrier
- Service_Level

OrderList
- Order_ID
- PortCarrier_ID
- PlantProdCust_ID
- Month_Num
- Month_Name
- Quarter
- Year

FactTable
- PlantCode_Constraint_ID
- Order_ID
- Freight_Rates_ID
- Min_Weight_Quant
- Max_Weight_Quant
- Min_Cost
- Rate
- TPT_Day_Count
- Cost_Per_Unit
- Daily_Capacity
- Ship_Ahead_Day_Count
- Ship_Late_Day_Count
- Unit_Quant
- Weight

FreightRates
- Freight_Rates_ID
- PortCarrier_ID
- Mode_DSC
- Carrier_Type

PlantProdCust
- PlantProdCust_ID
- Plant_Location_ID
- Product_ID
- Customer

Dest_Port_Locations
- Dest_Port_Location_ID
- Dest_Port
- Dest_Port_City
- Dest_Port_State_Name
- Dest_Port_State
- Dest_Port_Longitude
- Dest_Port_Latitude

Orig_Port_Locations
- Orig_Port_Location_ID
- Orig_Port
- Orig_Port_City
- Orig_Port_State_Name
- Orig_Port_State
- Orig_Port_Longitude
- Orig_Port_Latitude

Step 11

Step 12

SQL Code (1/2)

```sql
-- Set Primary Key for Port_Locations, Plant_Locations, Dest_Port_Locations,
Orig_Port_Locations

ALTER TABLE Port_Locations ADD PRIMARY KEY (Port_Location_ID);

ALTER TABLE Plant_Locations ADD PRIMARY KEY (Plant_Location_ID);

ALTER TABLE Dest_Port_Locations ADD PRIMARY KEY (Dest_Port_Location_ID);

ALTER TABLE Orig_Port_Locations ADD PRIMARY KEY (Orig_Port_Location_ID);
```

Step 12

SQL Code (2/2)

```sql
-- Set Foreign Key in PlantProdCust
ALTER TABLE PlantProdCust ADD FOREIGN KEY (Plant_Location_ID)
REFERENCES Plant_Locations(Plant_Location_ID);
-- Set Foreign Key in PlantConstraints
ALTER TABLE PlantConstraints ADD FOREIGN KEY (Port_Location_ID)
REFERENCES Port_Locations(Port_Location_ID);
-- Set Foreign Key in PortCarrier [Orig_Port]
ALTER TABLE PortCarrier ADD FOREIGN KEY (Orig_Port_Location_ID)
REFERENCES Orig_Port_Locations(Orig_Port_Location_ID);
-- Set Foreign Key in PortCarrier [Dest_Port]
ALTER TABLE PortCarrier ADD FOREIGN KEY (Dest_Port_Location_ID)
REFERENCES Dest_Port_Locations(Dest_Port_Location_ID);
```

Step 12

The End