

Logistics Dataset

The Tables

Change Name of Columns

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

FreightRates	
Carrier	
orig_port_cd	<i>Orig_Port</i>
dest_port_cd	<i>Dest_Port</i>
minm_wgh_qty	<i>Min_Weight_Quant</i>
max_wgh_qty	<i>Max_Weight_Quant</i>
svc_cd	<i>Service_Level</i>
minimum cost	<i>Min_Cost</i>
rate	<i>Rate</i>
mode_dsc	<i>Mode_DSC</i>
tpt_day_cnt	<i>TPT_Day_Count</i>
Carrier type	<i>Carrier_Type</i>

WhCosts	
WH	<i>Plant_Code</i>
Cost/unit	<i>Cost_Per_Unit</i>

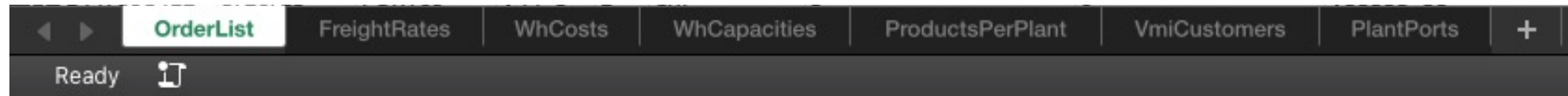
WhCapacities	
Plant ID	<i>Plant_Code</i>
Daily Capacity	<i>Daily_Capacity</i>

ProductsPerPlant	
Plant Code	<i>Plant_Code</i>
Product ID	<i>Product_ID</i>

VmiCustomers	
Plant Code	<i>Plant_Code</i>
Customers	<i>Customer</i>

PlantPorts	
Plant Code	<i>Plant_Code</i>
Port	<i>Ports</i>

Excel Workbook With Worksheets



Need to split-up the worksheets in
the Excel workbook into sperate CSV
files

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	5/26/13	PORT09	V44_3	1	CRF	3	0	V55555_53	1700106	PLANT16	PORT09	808	14.3
1447158015	5/26/13	PORT09	V44_3	1	CRF	3	0	V55555_53	1700106	PLANT16	PORT09	3188	87.94
1447138899	5/26/13	PORT09	V44_3	1	CRF	3	0	V55555_53	1700106	PLANT16	PORT09	2331	61.2
1447363528	5/26/13	PORT09	V44_3	1	CRF	3	0	V55555_53	1700106	PLANT16	PORT09	847	16.16
1447363981	5/26/13	PORT09	V44_3	1	CRF	3	0	V55555_53	1700106	PLANT16	PORT09	2163	52.34
1447351441	5/26/13	PORT09	V44_3	1	CRF	3	0	V55555_53	1700106	PLANT16	PORT09	3332	92.8
1447320236	5/26/13	PORT09	V44_3	1	CRF	3	0	V55555_53	1700106	PLANT16	PORT09	1782	46.9
1447158019	5/26/13	PORT09	V44_3	1	CRF	3	0	V55555_53	1700106	PLANT16	PORT09	427	2.86
1447219341	5/26/13	PORT09	V44_3	1	CRF	3	0	V55555_53	1700106	PLANT16	PORT09	1291	26.6
1447398416	5/26/13	PORT09	V44_3	1	CRF	3	0	V55555_53	1700106	PLANT16	PORT09	2294	62.2
1447381679	5/26/13	PORT09	V44_3	1	CRF	3	0	V55555_53	1700106	PLANT16	PORT09	2766	75.5
1447170785	5/26/13	PORT09	V44_3	1	CRF	3	0	V55555_53	1700106	PLANT16	PORT09	798	14.3
1447155056	5/26/13	PORT09	V44_3	1	CRF	3	0	V55555_53	1697884	PLANT16	PORT09	739	73.9
1447257265	5/26/13	PORT09	V44_3	1	CRF	3	0	V55555_53	1697884	PLANT16	PORT09	280	7.8
1447240989	5/26/13	PORT09	V44_3	1	CRF	3	0	V55555_53	1697884	PLANT16	PORT09	574	59.5
1447257231	5/26/13	PORT09	V44_3	1	CRF	3	0	V55555_53	1697884	PLANT16	PORT09	556	52.7
1447260653	5/26/13	PORT09	V44_3	1	CRF	3	0	V55555_53	1697884	PLANT16	PORT09	544	58.5
1447139375	5/26/13	PORT09	V44_3	1	CRF	3	0	V55555_53	1697884	PLANT16	PORT09	1151	181.7
1447308590	5/26/13	PORT09	V44_3	1	CRF	3	0	V55555_53	1697884	PLANT16	PORT09	1404	227.2
1447191271	5/26/13	PORT09	V44_3	1	CRF	3	0	V55555_53	1697884	PLANT16	PORT09	662	74.1
1447191284	5/26/13	PORT09	V44_3	1	CRF	3	0	V55555_53	1699336	PLANT16	PORT09	836	80.43
1447352426	5/26/13	PORT09	V44_3	1	CRF	3	0	V55555_53	1702652	PLANT16	PORT09	2063	265.1
1447211829	5/26/13	PORT09	V44_3	1	CRF	3	0	V55555_53	1699337	PLANT16	PORT09	2114	267.1
1447232833	5/26/13	PORT09	V44_3	1	CRF	3	0	V55555_53	1699337	PLANT16	PORT09	2108	271.1
1447205081	5/26/13	PORT09	V44_3	1	CRF	3	0	V55555_53	1699336	PLANT16	PORT09	1120	112.6
1447365980	5/26/13	PORT09	V44_3	1	CRF	3	0	V55555_53	1702654	PLANT16	PORT09	706	61.8
1447157118	5/26/13	PORT09	V44_3	1	CRF	3	0	V55555_53	1699336	PLANT16	PORT09	889	107.88
1447398413	5/26/13	PORT09	V44_3	1	CRF	3	0	V55555_53	1702652	PLANT16	PORT09	1793	216.57
1447377319	5/26/13	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	Customers
PLANT02	V55555555555555_16
PLANT02	V55555555555555_29
PLANT02	V555555555_3
PLANT02	V55555555555555_8
PLANT02	V55555555_9
PLANT02	V55555_10
PLANT02	V55555555_5
PLANT06	V55555555555555_18
PLANT06	V55555_10
PLANT10	V55555555555555_29
PLANT10	V555555_34
PLANT10	V555555555555555555_54
PLANT10	V55555_10
PLANT11	V55555555555555555555_54

PlantPorts

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

WhCapacities

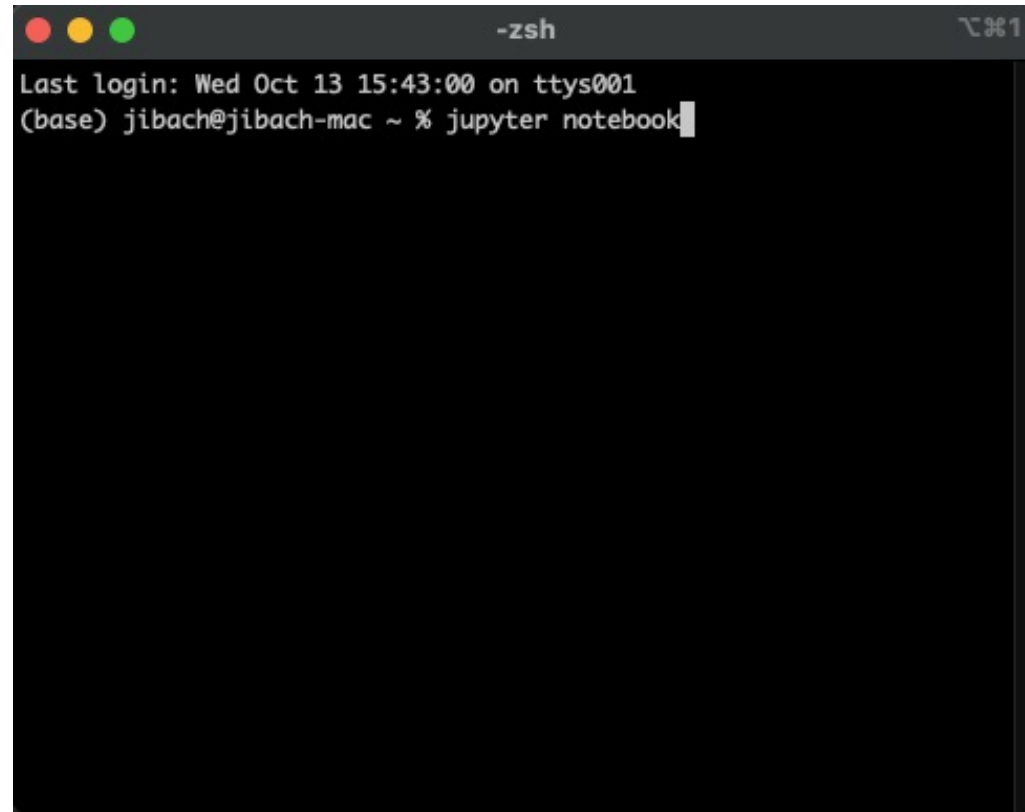
Plant_Code	Daily_Capacity
PLANT15	11
PLANT17	8
PLANT18	111
PLANT05	385
PLANT02	138
PLANT01	1070
PLANT06	49
PLANT10	118
PLANT07	265
PLANT14	549
PLANT16	457
PLANT12	209
PLANT11	332
PLANT09	11
PLANT03	1013
PLANT13	490
PLANT19	7
PLANT08	14
PLANT04	554

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

Split-Up Excel Worksheet


Open Jupyter Notebook



```
-zsh 1
Last login: Wed Oct 13 15:43:00 on ttys001
(base) jibach@jibach-mac ~ % jupyter notebook
```

A terminal window with a dark background and a light gray title bar. The title bar contains three colored window control buttons (red, yellow, green) on the left, the text "-zsh" in the center, and a keyboard shortcut icon followed by "1" on the right. The terminal content shows a login message "Last login: Wed Oct 13 15:43:00 on ttys001" and a command prompt "(base) jibach@jibach-mac ~ % jupyter notebook" with a white cursor at the end of the command.

Navigate to the LogisticsDataset Directory

 jupyter


QuitLogout

FilesRunningClusters

Select items to perform actions on them.

UploadNew ↕ ↺






☐ 0 ▾

 / Documents / GitHub / LogisticsDataset

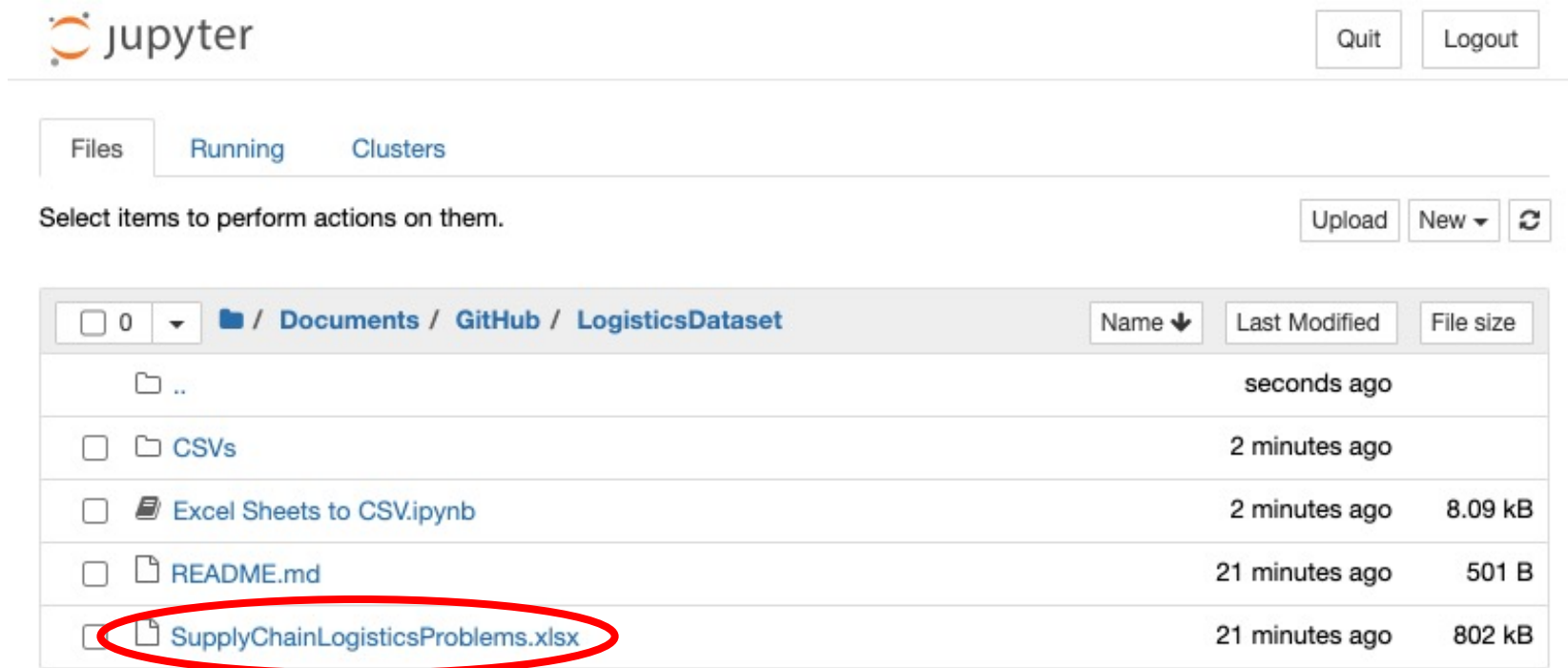
Name ▾

Last Modified

File size

	..		seconds ago	
<input type="checkbox"/>	 CSVs		2 minutes ago	
<input type="checkbox"/>	 Excel Sheets to CSV.ipynb		2 minutes ago	8.09 kB
<input type="checkbox"/>	 README.md		21 minutes ago	501 B
<input type="checkbox"/>	 SupplyChainLogisticsProblems.xlsx		21 minutes ago	802 kB

Navigate to the LogisticsDataset Directory

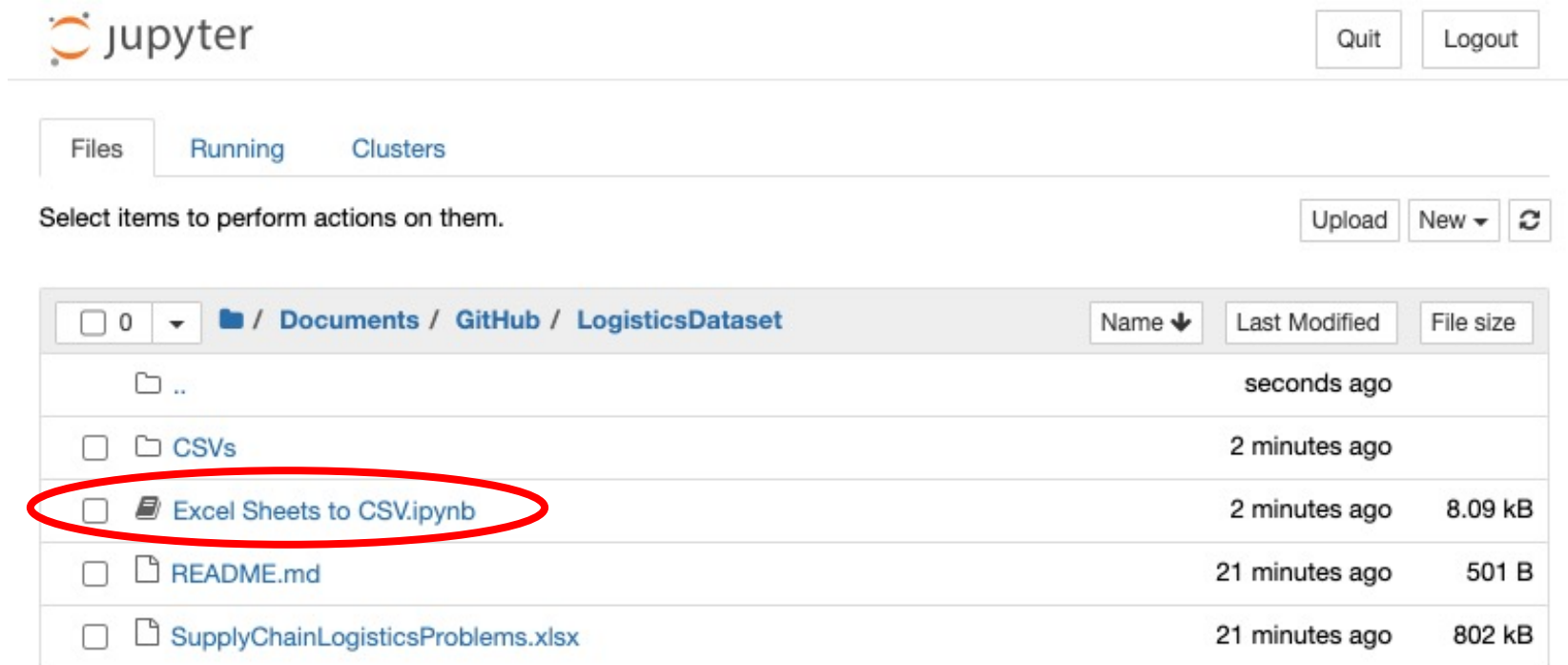


The screenshot shows the JupyterLab interface. At the top, there's a Jupyter logo and 'Quit' and 'Logout' buttons. Below that, there are tabs for 'Files', 'Running', and 'Clusters'. A message says 'Select items to perform actions on them.' with 'Upload', 'New', and a refresh icon. The file browser shows the path '/ Documents / GitHub / LogisticsDataset'. It lists several files and folders: '..', 'CSVs', 'Excel Sheets to CSV.ipynb', 'README.md', and 'SupplyChainLogisticsProblems.xlsx'. The last file is circled in red.

	Name	Last Modified	File size
<input type="checkbox"/>	..	seconds ago	
<input type="checkbox"/>	CSVs	2 minutes ago	
<input type="checkbox"/>	Excel Sheets to CSV.ipynb	2 minutes ago	8.09 kB
<input type="checkbox"/>	README.md	21 minutes ago	501 B
<input type="checkbox"/>	SupplyChainLogisticsProblems.xlsx	21 minutes ago	802 kB

The original Excel spreadsheet with
all of the tables as worksheets

Navigate to the LogisticsDataset Directory

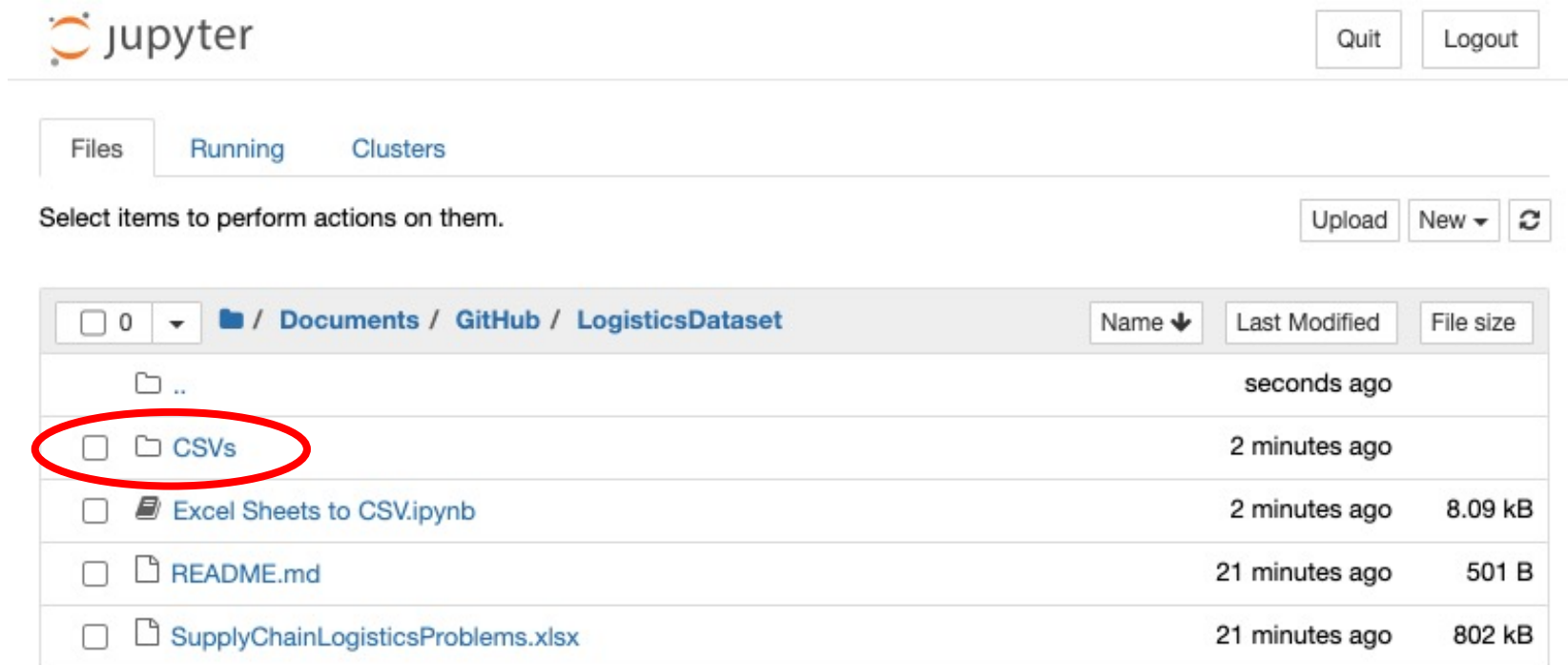


The image shows the JupyterLab interface. At the top, there's a 'jupyter' logo and buttons for 'Quit' and 'Logout'. Below that, there are tabs for 'Files', 'Running', and 'Clusters'. A message says 'Select items to perform actions on them.' with buttons for 'Upload', 'New', and a refresh icon. The main area shows a file browser for the path '/ Documents / GitHub / LogisticsDataset'. It lists several files and folders: '..' (parent directory), 'CSVs' (folder), 'Excel Sheets to CSV.ipynb' (Jupyter Notebook file, highlighted with a red circle), 'README.md' (text file), and 'SupplyChainLogisticsProblems.xlsx' (Excel file). The table also shows the 'Last Modified' time and 'File size' for each item.

	Name	Last Modified	File size
<input type="checkbox"/>	..	seconds ago	
<input type="checkbox"/>	CSVs	2 minutes ago	
<input type="checkbox"/>	Excel Sheets to CSV.ipynb	2 minutes ago	8.09 kB
<input type="checkbox"/>	README.md	21 minutes ago	501 B
<input type="checkbox"/>	SupplyChainLogisticsProblems.xlsx	21 minutes ago	802 kB

The Jupyter Notebook file that will be run to split-up the worksheets into separate CSVs

Navigate to the LogisticsDataset Directory



The image shows the JupyterLab file browser interface. At the top, there's a Jupyter logo and navigation buttons for 'Quit' and 'Logout'. Below that, there are tabs for 'Files', 'Running', and 'Clusters'. A message says 'Select items to perform actions on them.' with buttons for 'Upload', 'New', and a refresh icon. The main area shows a file tree with the path '/ Documents / GitHub / LogisticsDataset'. The tree contains a '..' directory, a 'CSVs' directory (highlighted with a red circle), an 'Excel Sheets to CSV.ipynb' file, a 'README.md' file, and a 'SupplyChainLogisticsProblems.xlsx' file. A table at the bottom lists the files with columns for 'Name', 'Last Modified', and 'File size'.

	Name ↓	Last Modified	File size
<input type="checkbox"/>	..	seconds ago	
<input type="checkbox"/>	CSVs	2 minutes ago	
<input type="checkbox"/>	Excel Sheets to CSV.ipynb	2 minutes ago	8.09 kB
<input type="checkbox"/>	README.md	21 minutes ago	501 B
<input type="checkbox"/>	SupplyChainLogisticsProblems.xlsx	21 minutes ago	802 kB

Where the output CSV files
will be stored

Click on the “Excel Sheets to CSV.ipynb” File, Run the Code



```
# Import Packages
import pandas as pd import os


# Define the Excel File Variable
Excel_WB = 'SupplyChainLogisticsProblems.xlsx'

# Create a Data Frame from the Excel File
Excel_DF = pd.ExcelFile(Excel_WB)

# Set Index
Temp_Index = 0

# Export the Sheets as CSVs
for sheet in Excel_DF.sheet_names:
    Temp_DF = Excel_DF.parse(Temp_Index, index=False) # The Temporary Holding Place of a Sheet as it Goes Through the Loop
    Temp_DF = Temp_DF.filter(regex='^(?!Unnamed)').columns # Drop NoName Columns
    CSV_File = sheet+'.csv' # Name of CSV File That We Will Export (Same as Sheet Name)
    os.chdir('/Users/jibach/Documents/GitHub/LogisticsDataset/CSVs') # Define Path Where I Want CSVs Stored
    Temp_DF.to_csv(CSV_File, index=False) # Export the DF to CSV
    Temp_Index += 1 # Reset the Index, Adding a '1' Moves Us to the Next Sheet
```

CSV Files Placed in CSVs Folder

 jupyter

QuitLogout

FilesRunningClusters

Select items to perform actions on them.

UploadNew ↕

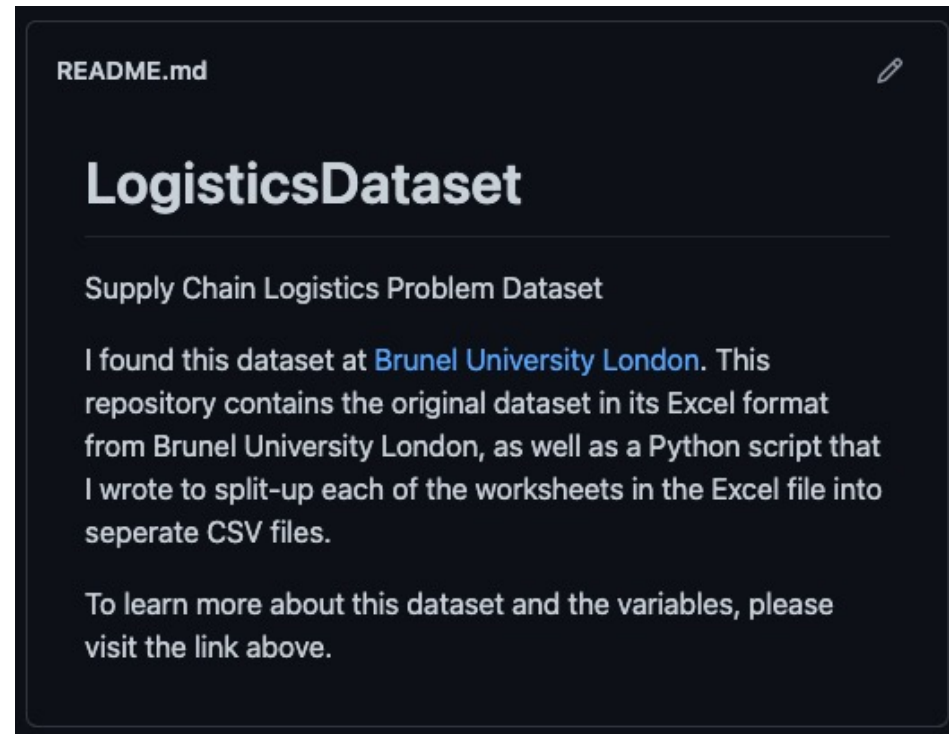
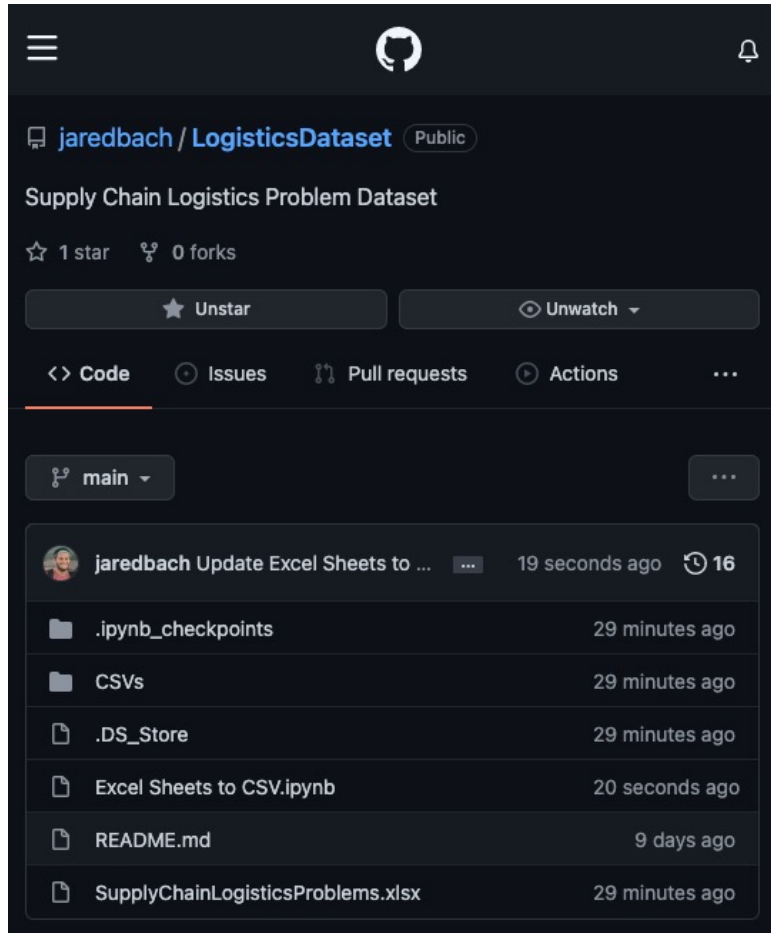
☐ 0 ▾

📁 / Documents / GitHub / LogisticsDataset / CSVs

Name ↓Last ModifiedFile size

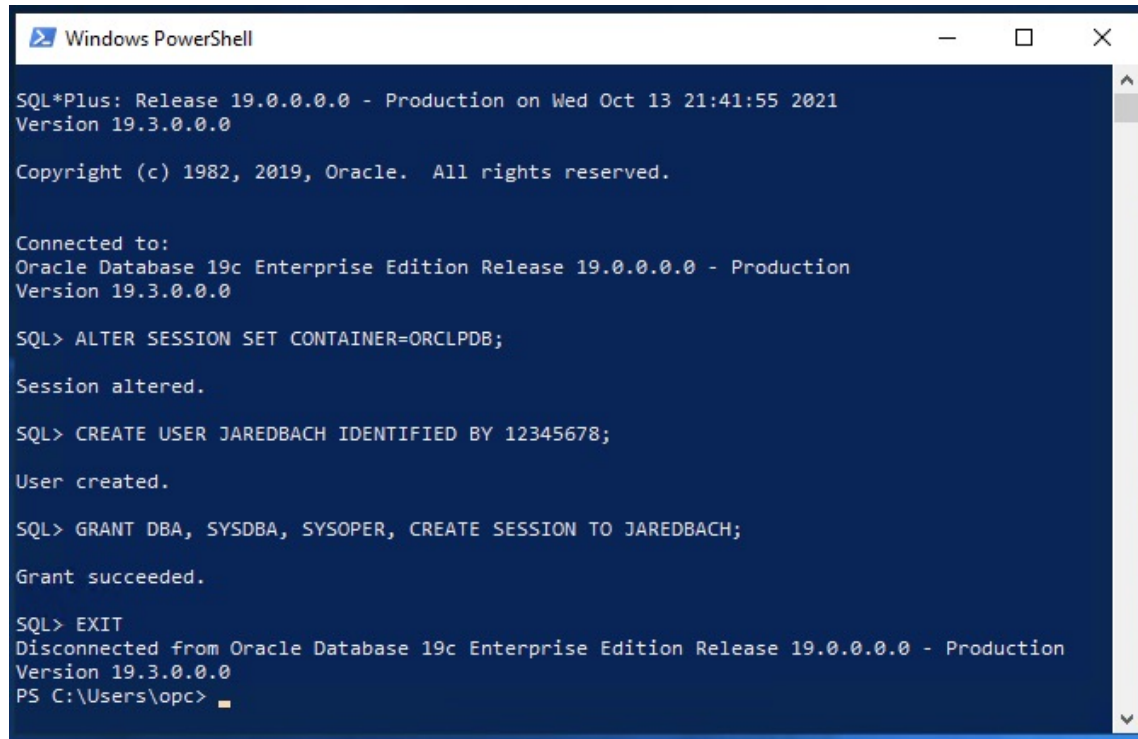
📁 ..	seconds ago	
<input type="checkbox"/> 📄 FreightRates.csv	19 minutes ago	126 kB
<input type="checkbox"/> 📄 OrderList.csv	19 minutes ago	959 kB
<input type="checkbox"/> 📄 PlantPorts.csv	19 minutes ago	346 B
<input type="checkbox"/> 📄 ProductsPerPlant.csv	19 minutes ago	32.6 kB
<input type="checkbox"/> 📄 VmiCustomers.csv	19 minutes ago	355 B
<input type="checkbox"/> 📄 WhCapacities.csv	19 minutes ago	248 B
<input type="checkbox"/> 📄 WhCosts.csv	19 minutes ago	542 B

Also in GitHub Repo



Load CSV Files Into Oracle Database 19c

Log-in to SQL*PLUS as SYSDBA on the Windows VM, Create New User

A screenshot of a Windows PowerShell terminal window. The title bar reads "Windows PowerShell". The terminal output shows the SQL*PLUS version (19.3.0.0.0) and release date (Wed Oct 13 21:41:55 2021). It indicates the user is connected to an Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production. The user enters the command "ALTER SESSION SET CONTAINER=ORCLPDB;" and receives the response "Session altered.". Then, the user enters "CREATE USER JAREDBACH IDENTIFIED BY 12345678;" and receives "User created.". Next, the user enters "GRANT DBA, SYSDBA, SYSOPER, CREATE SESSION TO JAREDBACH;" and receives "Grant succeeded.". Finally, the user enters "EXIT" and receives "Disconnected from Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production Version 19.3.0.0.0" and the prompt "PS C:\Users\opc>".

```
Windows PowerShell

SQL*Plus: Release 19.0.0.0.0 - Production on Wed Oct 13 21:41:55 2021
Version 19.3.0.0.0

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Connected to:
Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production
Version 19.3.0.0.0

SQL> ALTER SESSION SET CONTAINER=ORCLPDB;

Session altered.

SQL> CREATE USER JAREDBACH IDENTIFIED BY 12345678;

User created.

SQL> GRANT DBA, SYSDBA, SYSOPER, CREATE SESSION TO JAREDBACH;

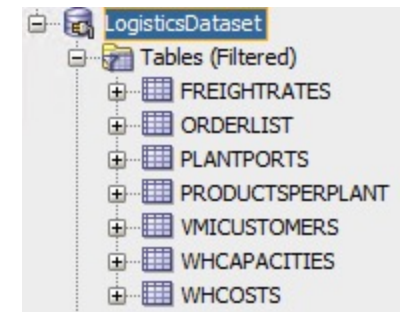
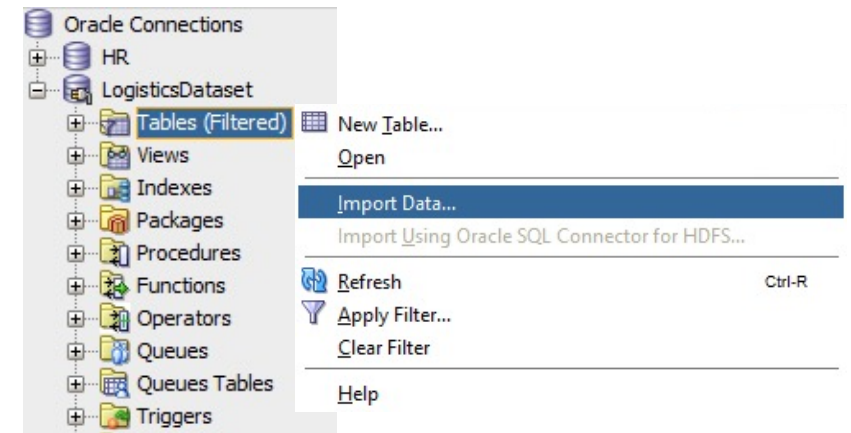
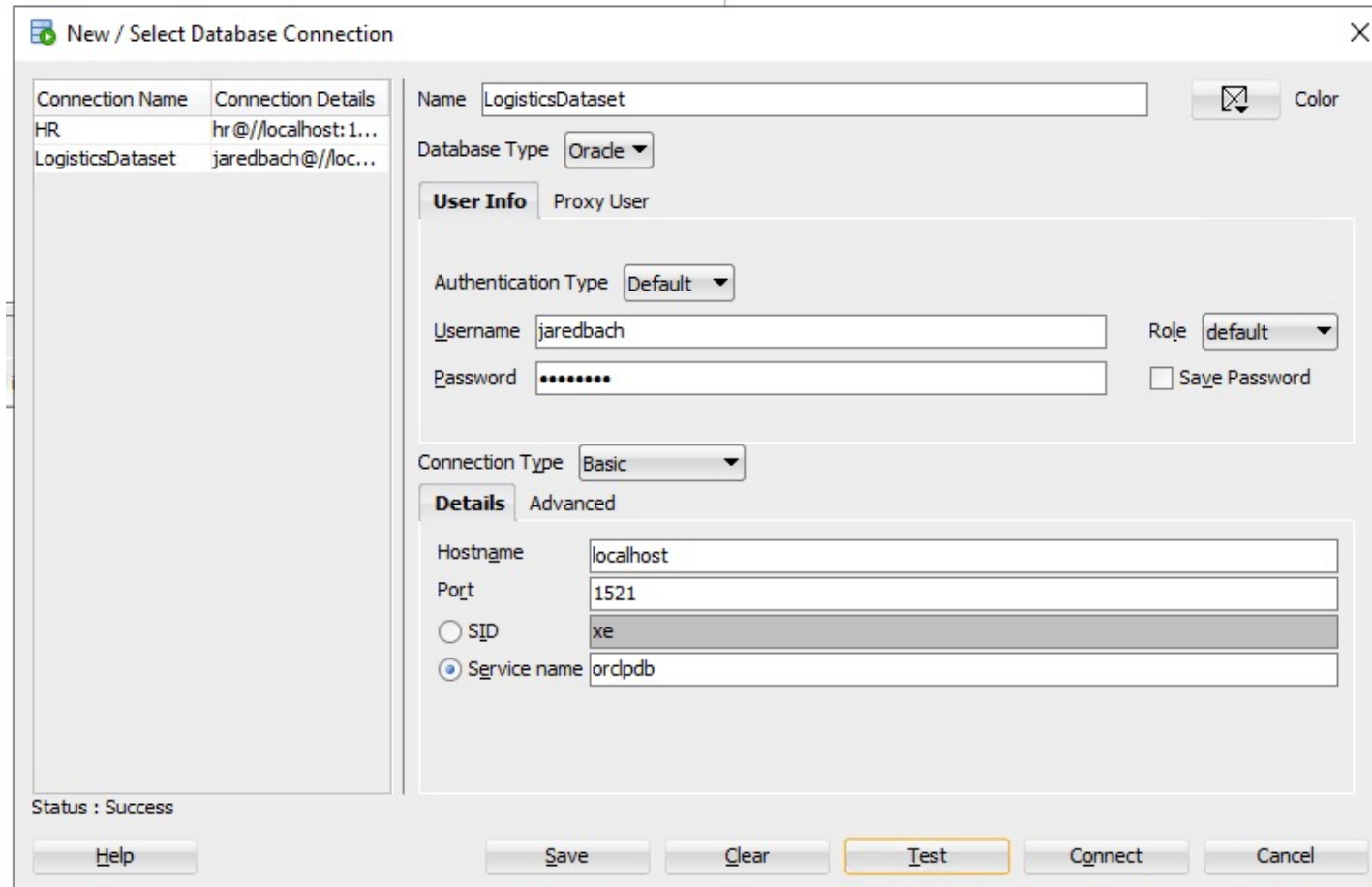
Grant succeeded.

SQL> EXIT
Disconnected from Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production
Version 19.3.0.0.0
PS C:\Users\opc>
```

SQL Code

```
-- Connect to Pluggable Database
ALTER SESSION SET CONTAINER=ORCLPDB;
-- Create New User JaredBach
CREATE USER JAREDBACH IDENTIFIED BY 12345678;
-- Grant JaredBach Privileges
GRANT DBA, SYSDBA, SYSOPER, CREATE SESSION TO
JAREDBACH;
```

Open SQL Developer, Create a New Connection Under the New User, Import Data



Creating The Star-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

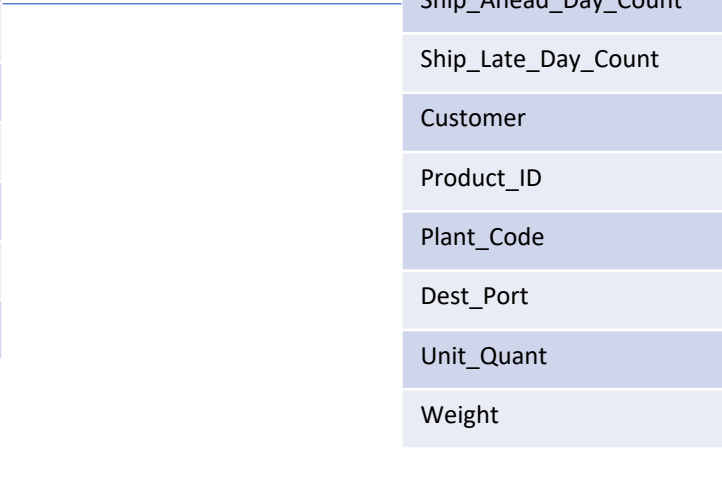
WhCosts
Plant_Code
Cost_Per_Unit

WhCapacities
Plant_Code
Daily_Capacity

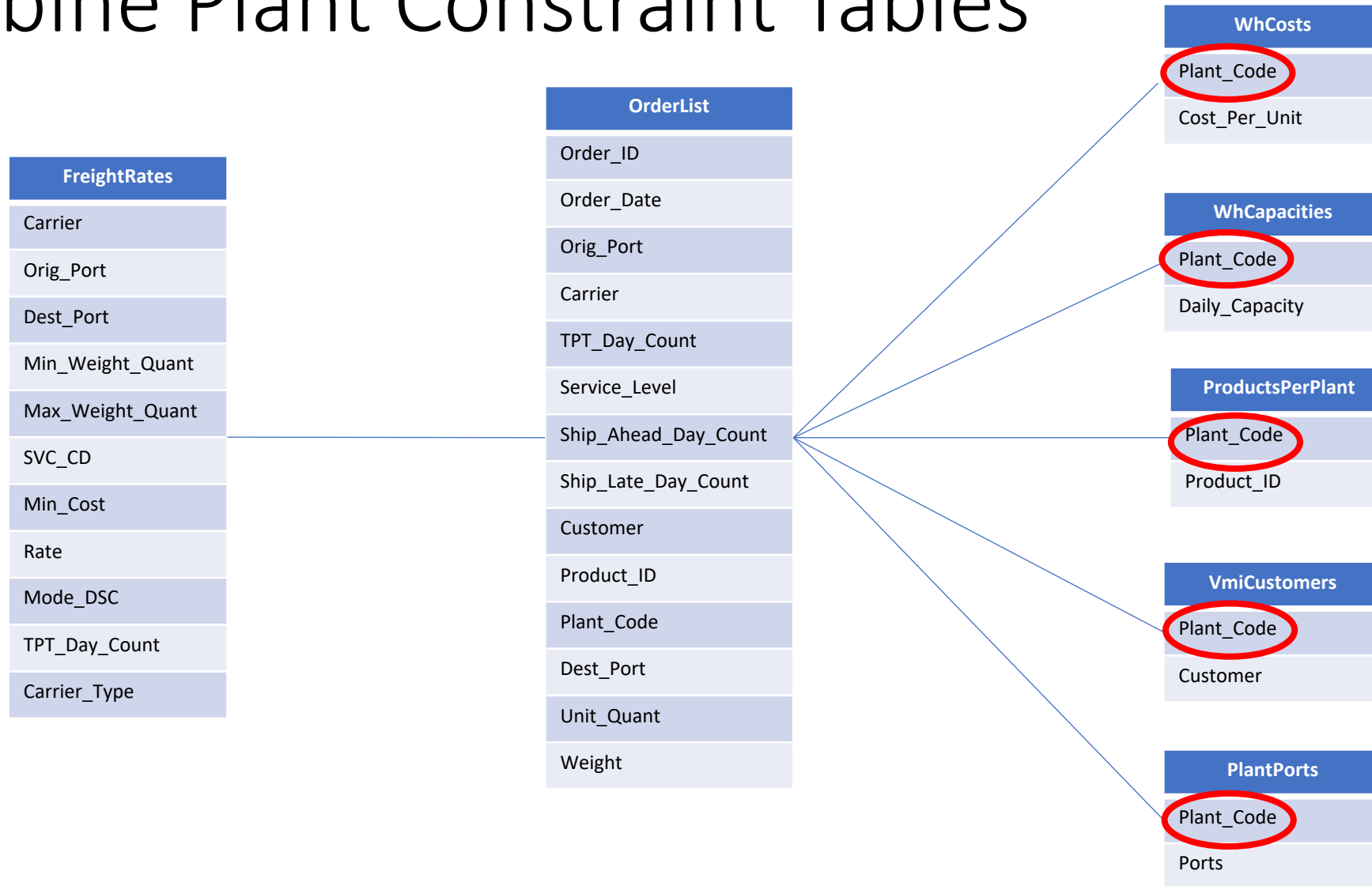
ProductsPerPlant
Plant_Code
Product_ID

VmiCustomers
Plant_Code
Customer

PlantPorts
Plant_Code
Ports

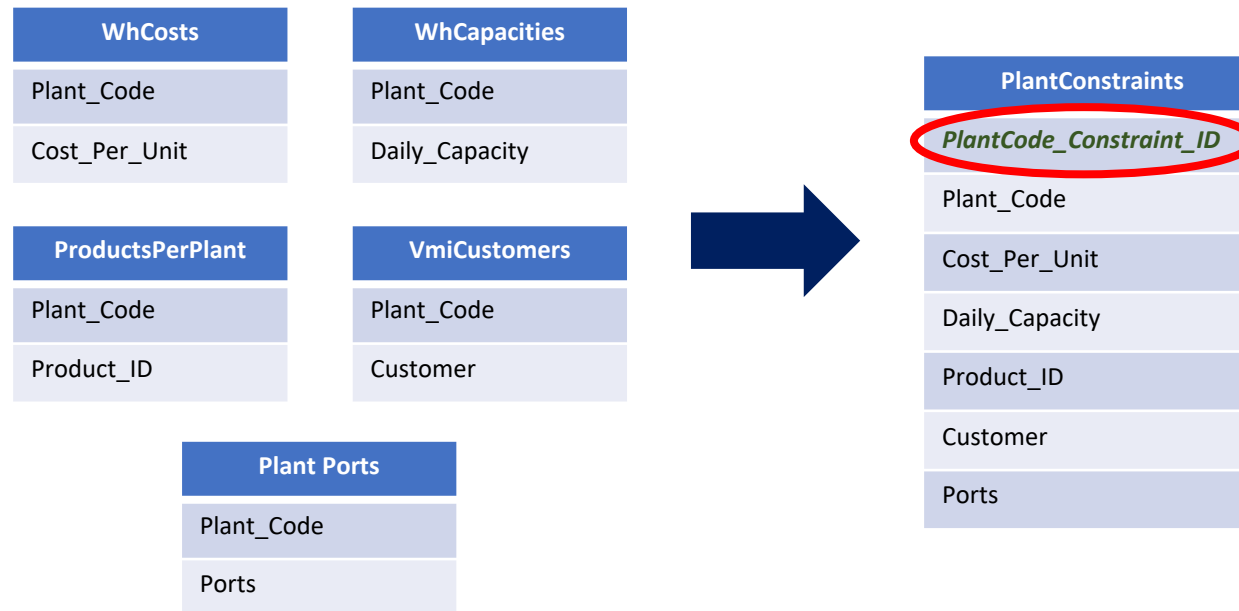


Combine Plant Constraint Tables



Step 1

Create PlantConstraints Table, Add Primary Key Column to Table



SQL Code (1/4)

```
-- Create New Table PlantConstraints
CREATE TABLE PlantConstraints (
    Plant_Code      VARCHAR2(26),
    Cost_Per_Unit   NUMBER(38),
    Daily_Capacity  NUMBER(38),
    Product_ID      NUMBER(38),
    Customer        VARCHAR(26),
    Ports           VARCHAR(26)
);

-- Insert Into PlantConstraints Table Data From WhCosts
INSERT INTO PlantConstraints (PlantConstraints.Plant_Code,
PlantConstraints.Cost_Per_Unit)
SELECT WhCosts.Plant_Code, WhCosts.Cost_Per_Unit
FROM WhCosts;
```


SQL Code (2/4)

```
-- Insert Into PlantConstraints Table Data From WhCapacities
INSERT INTO PlantConstraints(PlantConstraints.Plant_Code,
PlantConstraints.Daily_Capacity)
SELECT WhCapacities.Plant_Code, WhCapacities.Daily_Capacity
FROM WhCapacities;
```

```
-- Insert Into PlantConstraints Table Data From VmiCustomers
INSERT INTO PlantConstraints (PlantConstraints.Plant_Code,
PlantConstraints.Customer)
SELECT VmiCustomers.Plant_Code, VmiCustomers.Customer
FROM VmiCustomers;
```

```
-- Insert Into PlantConstraints Table Data From ProductsPerPlant
INSERT INTO PlantConstraints (PlantConstraints.Plant_Code,
PlantConstraints.Product_ID)
SELECT ProductsPerPlant.Plant_Code, ProductsPerPlant.Product_ID
FROM ProductsPerPlant;
```

SQL Code (3/4)

```
-- Insert Into PlantConstraints Table Data From PlantPorts
INSERT INTO PlantConstraints (PlantConstraints.Plant_Code,
PlantConstraints.Ports)
SELECT PlantPorts.Plant_Code, PlantPorts.Ports
FROM PlantPorts;

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

-- 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;
```

SQL Code (4/4)

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

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
Ports

Add Primary Key Column to FreightRates

FreightRates
<i>Freight_Rates_ID</i>
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
Ports

SQL Code

```
-- 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;
```

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
Ports

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

FreightRates	OrderList	PlantProdCust	PlantConstraints
Freight_Rates_ID	Order_ID	PlantProdCust_ID	PlantCode_Constraint_ID
PortCarrier_ID	PlantProdCust_ID	Plant_Code	PlantProdCust_ID
Carrier	PortCarrier_ID	Product_ID	Plant_Code
Orig_Port	Order_Date	Customer	Cost_Per_Unit
Dest_Port	Orig_Port		Daily_Capacity
Min_Weight_Quant	Carrier		Product_ID
Max_Weight_Quant	TPT_Day_Count		Customer
Service_Level	Service_Level		Ports
Min_Cost	Ship_Ahead_Day_Count		
Rate	Ship_Late_Day_Count		
Mode_DSC	Customer		
TPT_Day_Count	Product_ID		
Carrier_Type	Plant_Code		
	Dest_Port		
	Unit_Quant		
	Weight		

SQL Code 1/8 (PlantProdCost)

```
-- Create PlantProdCust Table
CREATE TABLE PlantProdCust (
    PlantProdCust_ID          NUMBER(38),
    Plant_Code                VARCHAR2(26),
    Product_ID                NUMBER(38),
    Customer                  VARCHAR2(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;
```

SQL Code 2/8 (PlantProdCost)

```
-- Replace NULL Values 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;  
  
-- Remove Duplicate Rows in PlantProdCust  
DELETE FROM PlantProdCust A WHERE ROWID NOT IN (  
    SELECT MAX(ROWID)  
    FROM PlantProdCust B  
    WHERE A.Plant_Code = B.Plant_Code  
    AND A.Product_ID = B.Product_ID  
    AND A.Customer = B.Customer  
);  
  
-- Populate The Primary Key Column  
UPDATE PlantProdCust SET PlantProdCust_ID = Seq_X.NEXTVAL;
```

SQL Code 3/8 (PlantProdCost)

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

-- Populate Foreign Key in OrderList Correctly
UPDATE OrderList A
SET A.PlantProdCust_ID = (
    SELECT PlantProdCust_ID
    FROM PlantProdCust 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 OrderList
ALTER TABLE OrderList DROP COLUMN Plant_Code;
ALTER TABLE OrderList DROP COLUMN Product_ID;
ALTER TABLE OrderList DROP COLUMN Customer;
```

SQL Code 4/8 (PlantProdCost)

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

-- Populate Foreign Key in PlantConstraints Correctly
UPDATE PlantConstraints A
SET A.PlantProdCust_ID = (
    SELECT PlantProdCust_ID
    FROM PlantProdCust 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;
```

SQL Code 5/8 (PortCarrier)

```
-- Create PortCarrier Table
CREATE TABLE PortCarrier (
    PortCarrier_ID    NUMBER(38),
    Carrier            VARCHAR2(26),
    Orig_Port          VARCHAR2(26),
    Dest_Port          VARCHAR2(26),
    Service_Level      VARCHAR2(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;
```

SQL Code 6/8 (PortCarrier)

```
-- Remove Duplicate Rows in PortCarrier
DELETE FROM PortCarrier A WHERE ROWID NOT IN (
    SELECT MAX(ROWID)
    FROM PortCarrier 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
);

-- Populate The Primary Key Column
UPDATE PortCarrier SET PortCarrier_ID = Seq_X.NEXTVAL;
```

SQL Code 7/8 (PortCarrier)

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

-- Populate Foreign Key in OrderList Correctly
UPDATE OrderList A
SET A.PortCarrier_ID = (
    SELECT PortCarrier_ID
    FROM PortCarrier 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;
```

SQL Code 8/8 (PortCarrier)

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

-- Populate Foreign Key in FreightRates Correctly
UPDATE FreightRates A
SET A.PortCarrier_ID = (
    SELECT PortCarrier_ID
    FROM PortCarrier 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;
```


Updated Tables

FreightRates
Freight_Rates_ID
PortCarrier_ID
Min_Weight_Quant
Max_Weight_Quant
Min_Cost
Rate
Mode_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
Ports

Create Fact Table With Facts & Foreign Keys

FactTable	OrderList	PlantProdCust	PlantConstraints	FreightRates
<i>PlantCode_Constraint_ID</i>	Order_ID	PlantProdCust_ID	PlantCode_Constraint_ID	Freight_Rates_ID
<i>Order_ID</i>	PlantProdCust_ID	Plant_Code	PlantProdCust_ID	PortCarrier_ID
<i>Freight_Rates_ID</i>	PortCarrier_ID	Product_ID	Cost_Per_Unit	Min_Weight_Quant
<i>Min_Weight_Quant</i>	Order_Date	Customer	Daily_Capacity	Max_Weight_Quant
<i>Max_Weight_Quant</i>	TPT_Day_Count		Ports	Min_Cost
<i>Min_Cost</i>	Ship_Ahead_Day_Count			Rate
<i>Rate</i>	Ship_Late_Day_Count			Mode_DSC
<i>TPT_Day_Count</i>	Unit_Quant			TPT_Day_Count
<i>Cost_Per_Unit</i>	Weight			Carrier_Type
<i>Daily_Capacity</i>				
<i>Ship_Ahead_Day_Count</i>				
<i>Ship_Late_Day_Count</i>				
<i>Unit_Quant</i>				
<i>Weight</i>				

PortCarrier
PortCarrier_ID
Carrier
Orig_Port
Dest_Port
Service_Level

SQL Code 1/3

```
-- Create Fact Table
CREATE TABLE FactTable (
    PlantCode_Constraint_ID    NUMBER(38),
    Order_ID                   NUMBER(38),
    Freight_Rates_ID           NUMBER(38),
    Min_Weight_Quant           NUMBER(38),
    Max_Weight_Quant           NUMBER(38),
    Min_Cost                    NUMBER(38),
    Rate                        NUMBER(38),
    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)
);
```

SQL Code 2/3

```
-- 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;

-- 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;
```

SQL Code 3/3

```
-- 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);
```

Updated Tables



FreightRates
Freight_Rates_ID
PortCarrier_ID
Mode_DSC
Carrier_Type

PlantConstraints
PlantCode_Constraint_ID
PlantProdCust_ID
Ports
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

Set Primary Keys and Foreign Keys

 = Foreign Key
 = Primary Key

FreightRates
<i>Freight_Rates_ID</i>
<i>PortCarrier_ID</i>
Mode_DSC
Carrier_Type

PlantConstraints
<i>PlantCode_Constraint_ID</i>
<i>PlantProdCust_ID</i>
Ports

PortCarrier
<i>PortCarrier_ID</i>
Carrier
Orig_Port
Dest_Port
Service_Level

FactTable
<i>PlantCode_Constraint_ID</i>
<i>Order_ID</i>
<i>Freight_Rates_ID</i>
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
<i>Order_ID</i>
<i>PortCarrier_ID</i>
<i>PlantProdCust_ID</i>
Order_Date

PlantProdCust
<i>PlantProdCust_ID</i>
Plant_Code
Product_ID
Customer

SQL Code 1/3

```
-- 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);
```


SQL Code 2/3

```
-- 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);
```

SQL Code 3/3

```
-- 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);
```

Going Back to Excel

Create 5 New Tables: Dates, Locations, Customers_SH (Customer “Short-Hand”), Orig_Port_Locations, Dest_Port_Locations, Plant_Locations

Dates

ORDER_DATE	MONTH_NUM	MONTH_NAME	QUARTER	YEAR
6/10/18	6	Jun	2	2018
4/24/18	4	Apr	2	2018
9/20/18	9	Sep	3	2018
5/25/18	5	May	2	2018
6/30/18	6	Jun	2	2018
12/21/18	12	Dec	4	2018
8/9/18	8	Aug	3	2018
7/26/18	7	Jul	3	2018
9/21/18	9	Sep	3	2018
6/16/18	6	Jun	2	2018
1/19/18	1	Jan	1	2018
6/15/18	6	Jun	2	2018
12/7/18	12	Dec	4	2018
4/22/18	4	Apr	2	2018
2/5/18	2	Feb	1	2018
12/20/18	12	Dec	4	2018
11/5/18	11	Nov	4	2018
11/28/18	11	Nov	4	2018
7/25/18	7	Jul	3	2018
9/15/18	9	Sep	3	2018
6/21/18	6	Jun	2	2018
1/7/18	1	Jan	1	2018
5/18/18	5	May	2	2018
11/22/18	11	Nov	4	2018
11/13/18	11	Nov	4	2018
10/20/18	10	Oct	4	2018
7/9/18	7	Jul	3	2018
11/2/18	11	Nov	4	2018
1/29/18	1	Jan	1	2018

Locations

LOCATION_ID	CITY	STATE_NAME	STATE	LONGITUDE	LATITUDE
1	Camden	New Jersey	NJ	-75.12338257	39.93738174
2	Philadelphia	Pennsylvania	PA	-75.09488	39.979031
3	Boston	Massachusetts	MA	-71.0389415	42.3481664
4	Miami	Florida	FL	-80.1779964	25.778567
5	Wilmington	North Carolina	NC	-77.9479854	34.196556
6	Baltimore	Maryland	MD	-76.6096734	39.2860811
7	Bayonne	New Jersey	NJ	-74.547283	40.287226
8	Charleston	South Carolina	SC	-79.9257181	32.7808424
9	San Pedro	California	CA	-118.2813644	33.73823547
10	Savannah	Georgia	GA	-81.150809	32.123742
11	New York	New York	NY	-74.0056639	40.6830965
12	Pottsville	Pennsylvania	PA	-76.182344	40.690894
13	Raymond	New Hampshire	NH	-71.1661286	43.0274128
14	Fort Pierce	Florida	FL	-80.3827964	27.4118942
15	Henderson	North Carolina	NC	-78.39128113	36.28921127
16	Smyrna	Delaware	DE	-75.626646	39.2888684
17	Williamsport	Maryland	MD	-77.807916	39.619286
18	Bethlehem	Pennsylvania	PA	-75.3227189	40.6112545
19	Arcadia	Florida	FL	-81.851939	27.239609
20	Mebane	North Carolina	NC	-79.262621	36.102563
21	Pedricktown	New Jersey	NJ	-75.408412	39.733769
22	Winter Haven	Florida	FL	-81.7556018	28.0462827
23	Davenport	Florida	FL	-81.74889	27.995134
24	Brooksville	Florida	FL	-82.2200794	28.5186767
25	Harrison	New Jersey	NJ	-74.161783	40.742177
26	Ridgeville	South Carolina	SC	-80.311951	33.102683
27	Mira Loma	California	CA	-117.558152	34.012427
28	Port Wentworth	Georgia	GA	-81.163168	32.149092
29	Johnsontown	New York	NY	-74.4067541	42.9868881
30	Alachua	Florida	FL	-82.468558	29.760911

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

Plant_Locations

PLANT_LOCATION_ID	LOCATION_ID	PLANT_CODE
12	12	PLANT01
13	13	PLANT02
14	14	PLANT03
15	15	PLANT04
16	16	PLANT05
17	17	PLANT06
18	18	PLANT07
19	19	PLANT08
20	20	PLANT09
21	21	PLANT10
22	22	PLANT11
23	23	PLANT12
24	24	PLANT13
25	25	PLANT14
26	26	PLANT15
27	27	PLANT16
28	28	PLANT17
29	29	PLANT18
30	30	PLANT19

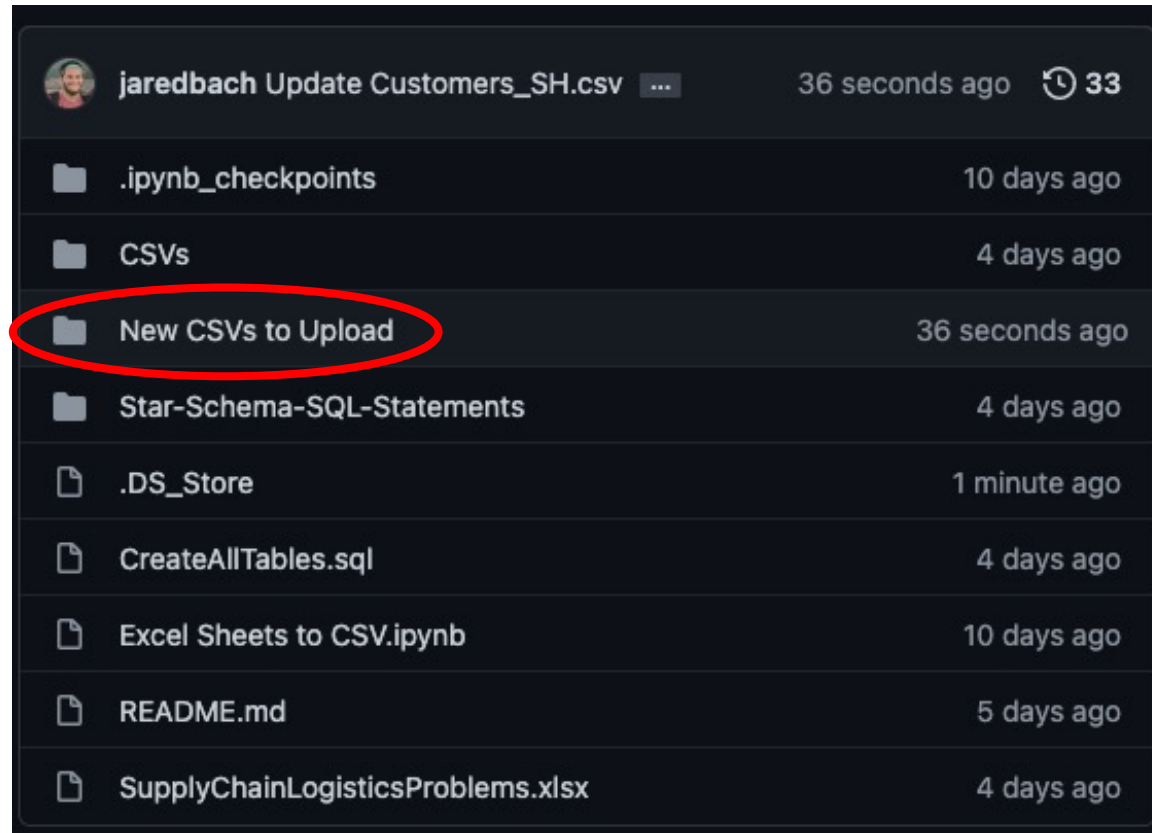
Orig_Port_Locations

ORIG_PORT_LOCATION_ID	LOCATION_ID	ORIG_PORT
1	1	PORT01
2	2	PORT02
3	3	PORT03
4	4	PORT04
5	5	PORT05
6	6	PORT06
7	7	PORT07
8	8	PORT08
9	9	PORT09
10	10	PORT10
11	11	PORT11

Dest_Port_Locations

DEST_PORT_LOCATION_ID	LOCATION_ID	DEST_PORT
9	9	PORT09

New CSVs in GitHub Repo



Back to SQL Developer

Drop Order_Date Column

FreightRates
Freight_Rates_ID
PortCarrier_ID
Mode_DSC
Carrier_Type

PlantConstraints
PlantCode_Constraint_ID
PlantProdCust_ID
Ports

PortCarrier
PortCarrier_ID
Carrier
Orig_Port
Dest_Port
Service_Level

FactTable
PlantProdCust_ID
PortCarrier_ID
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

Make Order_Date
Column NULL in SQL

PlantProdCust
PlantProdCust_ID
Plant_Code
Product_ID
Customer

Drop Order_Date Column

FreightRates
Freight_Rates_ID
PortCarrier_ID
Mode_DSC
Carrier_Type

PlantConstraints
PlantCode_Constraint_ID
PlantProdCust_ID
Ports

PortCarrier
PortCarrier_ID
Carrier
Orig_Port
Dest_Port
Service_Level

FactTable
PlantProdCust_ID
PortCarrier_ID
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

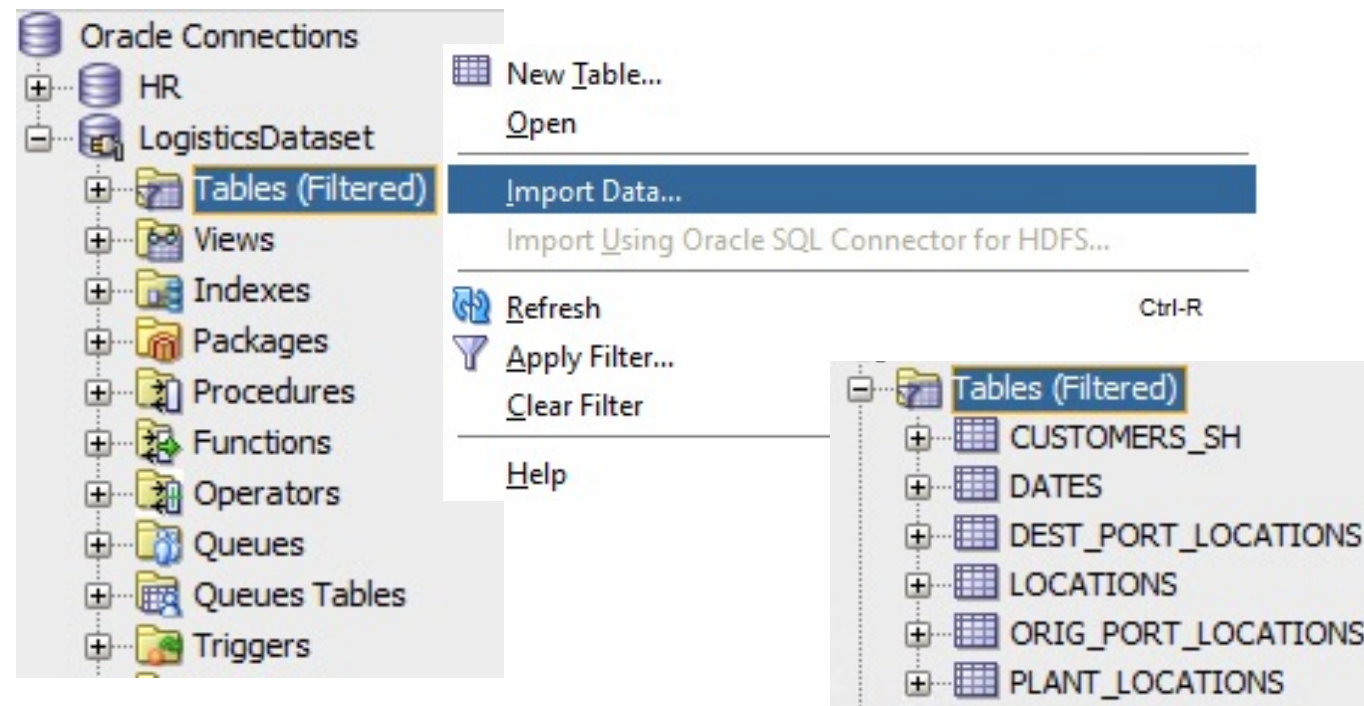
Going to randomly populate dates—
All of the dates are the same for
each Order_ID, this is simply going
to make the data more interesting

PlantProdCust
PlantProdCust_ID
Plant_Code
Product_ID
Customer

SQL Code

```
-- Drop Order_Date from OrderList  
ALTER TABLE OrderList DROP COLUMN Order_Date;
```

Import New Data (Dates, Locations, Customers_SH, Dest_Port_Locations, Orig_Port_Locations, Plant_Locations)



Updated Tables

Customers_SH
Customers
Customers_SH

Plant_Locations
Plant_Location_ID
Location_ID
Plant_Code

Locations
Location_ID
City
State_Name
State
Longitude
Latitude

PlantConstraints
PlantCode_Constraint_ID
PlantProdCust_ID
Ports

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_Date
Month_Num
Month_Name
Quarter
Year

Dest_Port_Locations
Dest_Port_Location_ID
Location_ID
Dest_Port

Orig_Port_Locations
Orig_Port_Location_ID
Location_ID
Orig_Port

Add Correct Location Columns to PlantConstraints, PortCarrier, & PlantProdCust, Populate Correctly

Customers_SH
Customers
Customers_SH

Plant_Locations
Plant_Location_ID
Location_ID
Plant_Code

Locations
Location_ID
City
State_Name
State
Longitude
Latitude

PlantConstraints
PlantCode_Constraint_ID
PlantProdCust_ID
Port_Location_ID
Ports

PortCarrier
PortCarrier_ID
Orig_Port_Location_ID
Dest_Port_Location_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

PlantProdCust
PlantProdCust_ID
Plant_Location_ID
Plant_Code
Product_ID
Customer

Dates
Order_Date
Month_Num
Month_Name
Quarter
Year

Dest_Port_Locations
Dest_Port_Location_ID
Location_ID
Dest_Port

Orig_Port_Locations
Orig_Port_Location_ID
Location_ID
Orig_Port

FreightRates
Freight_Rates_ID
PortCarrier_ID
Mode_DSC
Carrier_Type

SQL Code (PlantConstraints)

```
-- 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
UPDATE PlantConstraints A
SET A.Port_Location_ID = (
    SELECT Orig_Port_Location_ID
    FROM Orig_Port_Locations B
    WHERE A.Ports=B.Orig_Port
);
```

SQL Code (PortCarrier)

```
-- 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
UPDATE PortCarrier A
SET A.Orig_Port_Location_ID = (
    SELECT Orig_Port_Location_ID
    FROM Orig_Port_Locations B
    WHERE A.Orig_Port=B.Orig_Port
);

-- Populate The Dest_Port_Location_ID in PortCarrier Correctly
UPDATE PortCarrier A
SET A.Dest_Port_Location_ID = (
    SELECT Dest_Port_Location_ID
    FROM Dest_Port_Locations B
    WHERE A.Dest_Port=B.Dest_Port
);
```

SQL Code (PlantProdCust)

```
-- 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
UPDATE PlantProdCust A
SET A.Plant_Location_ID = (
    SELECT Plant_Location_ID
    FROM Plant_Locations B
    WHERE A.Plant_Code=B.Plant_Code
);
```


Updated Tables

Customers_SH
Customers
Customers_SH

Plant_Locations
Plant_Location_ID
Location_ID
Plant_Code

Locations
Location_ID
City
State_Name
State
Longitude
Latitude

PlantConstraints
PlantCode_Constraint_ID
PlantProdCust_ID
Port_Location_ID
Ports

PortCarrier
PortCarrier_ID
Orig_Port_Location_ID
Dest_Port_Location_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

PlantProdCust
PlantProdCust_ID
Plant_Location_ID
Plant_Code
Product_ID
Customer

Dates
Order_Date
Month_Num
Month_Name
Quarter
Year

Dest_Port_Locations
Dest_Port_Location_ID
Location_ID
Dest_Port

Orig_Port_Locations
Orig_Port_Location_ID
Location_ID
Orig_Port

FreightRates
Freight_Rates_ID
PortCarrier_ID
Mode_DSC
Carrier_Type

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

Customers_SH
Customers
Customers_SH

Plant_Locations
Plant_Location_ID
Location_ID
Plant_Code

Locations
Location_ID
City
State_Name
State
Longitude
Latitude

PlantConstraints
PlantCode_Constraint_ID
PlantProdCust_ID
Port_Location_ID
Ports

PortCarrier
PortCarrier_ID
Orig_Port_Location_ID
Dest_Port_Location_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

PlantProdCust
PlantProdCust_ID
Plant_Location_ID
Plant_Code
Product_ID
Customer

Dates
Order_Date
Month_Num
Month_Name
Quarter
Year

Dest_Port_Locations
Dest_Port_Location_ID
Location_ID
Dest_Port

Orig_Port_Locations
Orig_Port_Location_ID
Location_ID
Orig_Port

FreightRates
Freight_Rates_ID
PortCarrier_ID
Mode_DSC
Carrier_Type

SQL Code

```
-- Drop Ports From PlantConstraints
ALTER TABLE PlantConstraints DROP COLUMN Ports;

-- 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;
```

Updated Tables

Customers_SH
Customers
Customers_SH

Plant_Locations
Plant_Location_ID
Location_ID
Plant_Code

Locations
Location_ID
City
State_Name
State
Longitude
Latitude

PlantConstraints
PlantCode_Constraint_ID
PlantProdCust_ID
Port_Location_ID

PortCarrier
PortCarrier_ID
Orig_Port_Location_ID
Dest_Port_Location_ID
Carrier
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

PlantProdCust
PlantProdCust_ID
Plant_Location_ID
Product_ID
Customer

Dates
Order_Date
Month_Num
Month_Name
Quarter
Year

Dest_Port_Locations
Dest_Port_Location_ID
Location_ID
Dest_Port

Orig_Port_Locations
Orig_Port_Location_ID
Location_ID
Orig_Port

FreightRates
Freight_Rates_ID
PortCarrier_ID
Mode_DSC
Carrier_Type

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

Customers_SH	PlantConstraints	FactTable	OrderList	Dest_Port_Locations	Dates
Customers	PlantCode_Constraint_ID	PlantCode_Constraint_ID	Order_ID	Dest_Port_Location_ID	Order_Date
Customers_SH	PlantProdCust_ID	Order_ID	PortCarrier_ID	Location_ID	Month_Num
	Port_Location_ID	Freight_Rates_ID	PlantProdCust_ID	Dest_Port	Month_Name
		Min_Weight_Quant	Month_Num		Quarter
		Max_Weight_Quant	Month_Name		Year
		Min_Cost	Quarter		
		Rate	Year		
		TPT_Day_Count			
		Cost_Per_Unit			
		Daily_Capacity			
		Ship_Ahead_Day_Count			
		Ship_Late_Day_Count			
		Unit_Quant			
		Weight			

Plant_Locations	PortCarrier	PlantProdCust	FreightRates
Plant_Location_ID	PortCarrier_ID	PlantProdCust_ID	Freight_Rates_ID
Location_ID	Orig_Port_Location_ID	Plant_Location_ID	PortCarrier_ID
Plant_Code	Dest_Port_Location_ID	Product_ID	Mode_DSC
	Carrier	Customer	Carrier_Type
	Service_Level		

Locations
Location_ID
City
State_Name
State
Longitude
Latitude

SQL Code (1/3)

```
-- 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);
```

SQL Code (2/3)

```
-- Insert Order_Date, Month_Num, Month_Name, Quarter, & Year Data From Table Dates Into Table OrderList
```

```
UPDATE OrderList A  
SET A.Order_Date = (SELECT Order_Date FROM Dates B WHERE A.Order_ID=B.Order_ID);
```

```
UPDATE OrderList A  
SET A.Month_Num = (SELECT Month_Num FROM Dates B WHERE A.Order_ID=B.Order_ID);
```

```
UPDATE OrderList A  
SET A.Month_Name = (SELECT Month_Name FROM Dates B WHERE A.Order_ID=B.Order_ID);
```

```
UPDATE OrderList A  
SET A.Quarter= (SELECT Quarter FROM Dates B WHERE A.Order_ID=B.Order_ID);
```

```
UPDATE OrderList A  
SET A.Year_ = (SELECT Year_ FROM Dates B WHERE A.Order_ID=B.Order_ID);
```

SQL Code (3/3)

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


Updated Tables

Customers_SH
Customers
Customers_SH

Plant_Locations
Plant_Location_ID
Location_ID
Plant_Code

Locations
Location_ID
City
State_Name
State
Longitude
Latitude

PlantConstraints
PlantCode_Constraint_ID
PlantProdCust_ID
Port_Location_ID

PortCarrier
PortCarrier_ID
Orig_Port_Location_ID
Dest_Port_Location_ID
Carrier
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
Month_Num
Month_Name
Quarter
Year

PlantProdCust
PlantProdCust_ID
Plant_Location_ID
Product_ID
Customer

Dest_Port_Locations
Dest_Port_Location_ID
Location_ID
Dest_Port

Orig_Port_Locations
Orig_Port_Location_ID
Location_ID
Orig_Port

FreightRates
Freight_Rates_ID
PortCarrier_ID
Mode_DSC
Carrier_Type

Add Customers_SH to PlantProdCust, Drop Customers_SH Table

Customers_SH
Customers
Customers_SH

Plant_Locations
Plant_Location_ID
Location_ID
Plant_Code

Locations
Location_ID
City
State_Name
State
Longitude
Latitude

PlantConstraints
PlantCode_Constraint_ID
PlantProdCust_ID
Port_Location_ID

PortCarrier
PortCarrier_ID
Orig_Port_Location_ID
Dest_Port_Location_ID
Carrier
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
Month_Num
Month_Name
Quarter
Year

PlantProdCust
PlantProdCust_ID
Plant_Location_ID
Product_ID
Customer
<u>Customers_SH</u>

Dest_Port_Locations
Dest_Port_Location_ID
Location_ID
Dest_Port

Orig_Port_Locations
Orig_Port_Location_ID
Location_ID
Orig_Port

FreightRates
Freight_Rates_ID
PortCarrier_ID
Mode_DSC
Carrier_Type

SQL Code

```
-- Add New Column to PlantProdCust, Customers_SH (Short-Hand)
ALTER TABLE PlantProdCust ADD Customers_SH VARCHAR2(26);

-- Populate the Customers_SH Column
UPDATE PlantProdCust A SET A.Customers_SH = (SELECT Customers_SH FROM Customers_SH B WHERE
A.Customer=B.Customers);

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

Updated Tables

Plant_Locations
Plant_Location_ID
Location_ID
Plant_Code

Locations
Location_ID
City
State_Name
State
Longitude
Latitude

PlantConstraints
PlantCode_Constraint_ID
PlantProdCust_ID
Port_Location_ID

PortCarrier
PortCarrier_ID
Orig_Port_Location_ID
Dest_Port_Location_ID
Carrier
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
Month_Num
Month_Name
Quarter
Year

PlantProdCust
PlantProdCust_ID
Plant_Location_ID
Product_ID
Customer
Customers_SH

Dest_Port_Locations
Dest_Port_Location_ID
Location_ID
Dest_Port

Orig_Port_Locations
Orig_Port_Location_ID
Location_ID
Orig_Port

FreightRates
Freight_Rates_ID
PortCarrier_ID
Mode_DSC
Carrier_Type

Drop Customer Column, Change Name of Customers_SH to Customer

Plant_Locations
Plant_Location_ID
Location_ID
Plant_Code

PlantConstraints
PlantCode_Constraint_ID
PlantProdCust_ID
Port_Location_ID

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
Month_Num
Month_Name
Quarter
Year

Dest_Port_Locations
Dest_Port_Location_ID
Location_ID
Dest_Port

Locations
Location_ID
City
State_Name
State
Longitude
Latitude

PortCarrier
PortCarrier_ID
Orig_Port_Location_ID
Dest_Port_Location_ID
Carrier
Service_Level

Orig_Port_Locations
Orig_Port_Location_ID
Location_ID
Orig_Port

PlantProdCust
PlantProdCust_ID
Plant_Location_ID
Product_ID
Customer
Customers_SH

FreightRates
Freight_Rates_ID
PortCarrier_ID
Mode_DSC
Carrier_Type



Change Name
to "Customer"

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;
```

Updated Tables

Plant_Locations
Plant_Location_ID
Location_ID
Plant_Code

Locations
Location_ID
City
State_Name
State
Longitude
Latitude

PlantConstraints
PlantCode_Constraint_ID
PlantProdCust_ID
Port_Location_ID

PortCarrier
PortCarrier_ID
Orig_Port_Location_ID
Dest_Port_Location_ID
Carrier
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
Month_Num
Month_Name
Quarter
Year



PlantProdCust
PlantProdCust_ID
Plant_Location_ID
Product_ID
Customer



Dest_Port_Locations
Dest_Port_Location_ID
Location_ID
Dest_Port


Orig_Port_Locations
Orig_Port_Location_ID
Location_ID
Orig_Port

FreightRates
Freight_Rates_ID
PortCarrier_ID
Mode_DSC
Carrier_Type

Set Primary & Foreign Keys



 = Foreign Key
 = Primary Key


Plant_Locations
 <i>Plant_Location_ID</i>
 <i>Location_ID</i>
Plant_Code

PlantConstraints
PlantCode_Constraint_ID
PlantProdCust_ID
 <i>Port_Location_ID</i>



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
Month_Num
Month_Name
Quarter
Year

Dest_Port_Locations
 <i>Dest_Port_Location_ID</i>
 <i>Location_ID</i>
Dest_Port

Locations
 <i>Location_ID</i>
City
State_Name
State
Longitude
Latitude

PortCarrier
PortCarrier_ID
 <i>Orig_Port_Location_ID</i>
 <i>Dest_Port_Location_ID</i>
Carrier
Service_Level

Orig_Port_Locations
 <i>Orig_Port_Location_ID</i>
 <i>Location_ID</i>
Orig_Port

PlantProdCust
PlantProdCust_ID
 <i>Plant_Location_ID</i>
Product_ID
Customer

FreightRates
Freight_Rates_ID
PortCarrier_ID
Mode_DSC
Carrier_Type

SQL Code

```
-- Set Primary Key for Locations, Plant_Locations, Dest_Port_Locations, Orig_Port_Locations
ALTER TABLE Locations ADD PRIMARY KEY (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);

-- Set Foreign Key in Dest_Port_Locations
ALTER TABLE Dest_Port_Locations ADD FOREIGN KEY (Location_ID)
REFERENCES Locations(Location_ID);

-- Set Foreign Key in Plant_Locations
ALTER TABLE Plant_Locations ADD FOREIGN KEY (Location_ID)
REFERENCES Locations(Location_ID);
```

SQL Code

```
-- Set Foreign Key in Orig_Port_Locations
ALTER TABLE Orig_Port_Locations ADD FOREIGN KEY (Location_ID)
REFERENCES Locations(Location_ID);



-- 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 Orig_Port_Locations(Orig_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);
```

Final Tables

 = Foreign Key
 = Primary Key

Plant_Locations
Plant_Location_ID
Location_ID
Plant_Code

PlantConstraints
PlantCode_Constraint_ID
PlantProdCust_ID
Port_Location_ID

FactTable
PlantCode_Constraint_ID
Order_ID
Freight_Rates_ID

OrderList
Order_ID
PortCarrier_ID
PlantProdCust_ID

Dest_Port_Locations
Dest_Port_Location_ID
Location_ID
Dest_Port

Locations
Location_ID
City
State_Name
State
Longitude
Latitude

PortCarrier
PortCarrier_ID
Orig_Port_Location_ID
Dest_Port_Location_ID
Carrier
Service_Level

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

Month_Num
Month_Name
Quarter
Year

Orig_Port_Locations
Orig_Port_Location_ID
Location_ID
Orig_Port

PlantProdCust
PlantProdCust_ID
Plant_Location_ID
Product_ID
Customer

FreightRates
Freight_Rates_ID
PortCarrier_ID
Mode_DSC
Carrier_Type

Final Tables

