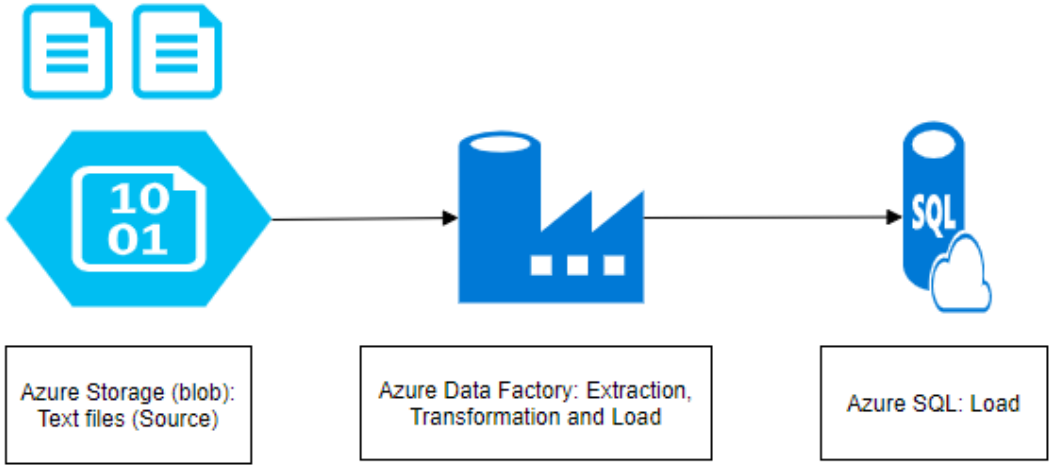
Azure-Data-Factory
Azure Data Factory

Problem Statement:
XYZ Company has requested to get a file that lists all the products the company sells (source). They also requested the model description which is in a different table (source & transform – we will use lookup & select). XYZ requested shipping weight needs to be calculated by padding the actual weight plus 10% to account for packing (transformation – we will use calculation & derive column). Finally, they want to load the data to Azure SQL by list price descending (sort and sink)

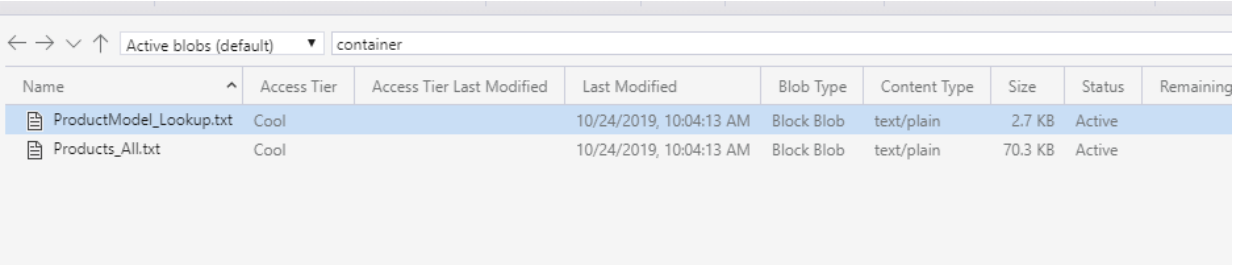
Introduction:
To solve this, we need to use Azure Data Factory (ADF) that will extract text files from azure storage, transform it in ADF and load it to azure SQL Database.



Getting Started:
For this project to work, we need
   a) Azure blob storage
   b) Azure Data Factory
   c) Azure SQL

Source:

In Azure Blob, there are couple of text files which we will process them using ADF.



Active blobs (default) | container

Name	Access Tier	Access Tier Last Modified	Last Modified	Blob Type	Content Type	Size	Status	Remaining
ProductModel_Lookup.txt	Cool		10/24/2019, 10:04:13 AM	Block Blob	text/plain	2.7 KB	Active	
Products_All.txt	Cool		10/24/2019, 10:04:13 AM	Block Blob	text/plain	70.3 KB	Active	

I created source for Product_All txt file below.

Set properties

Name

DS_Blob_ProductAll

Linked service *

AZ_Blob_DataFactory

Edit connection

File path

container / Directory / Products_All.txt Browse

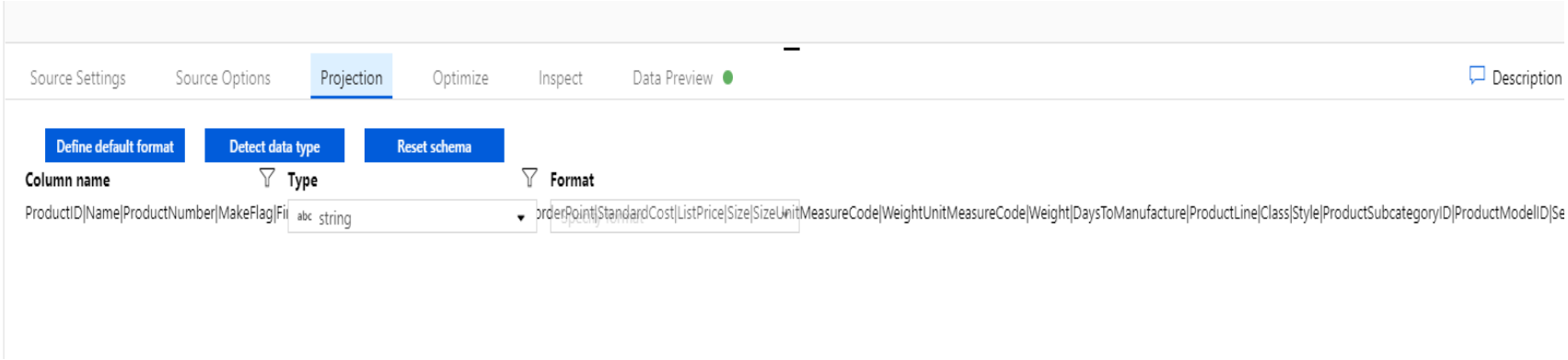
First row as header ☑

Import schema

◉ From connection/store ○ From sample file ○ None

▸ Advanced

Now if we look at the data, they are not parsed correctly



I will go to the data source to change the column comma delimiter to pipe delimiter.

DelimitedText

DS_Products_All

General | Connection | Schema | Parameters

Linked service * AZ_Blob_DataFactory Test connection Edit + New

File path * container / Directory / Products_All.txt Browse Preview data

Compression type none

Column delimiter Pipe (|)
Edit

Row delimiter Auto detect (\r,\n, or \r\n)
Edit

Encoding Default(UTF-8)

Escape character Backslash (\)
Edit

Quote character Double quote (")
Edit

First row as header ✓

We have to select import schema to refresh source data schema.

DelimitedText

ds_Blob_ProductsAll

General | Connection | Schema | Parameters

Import schema | Clear

Column name	Type
ProductID	String
Name	String
ProductNumber	String
MakeFlag	String
FinishedGoodsFlag	String
Color	String
SafetyStockLevel	String
ReorderPoint	String
StandardCost	String
ListPrice	String
Size	String
SizeUnitMeasureCode	String
WeightUnitMeasureCode	String
Weight	String
DaysToManufacture	String

Now, if we preview the data, it is parsed correctly.

Data Preview

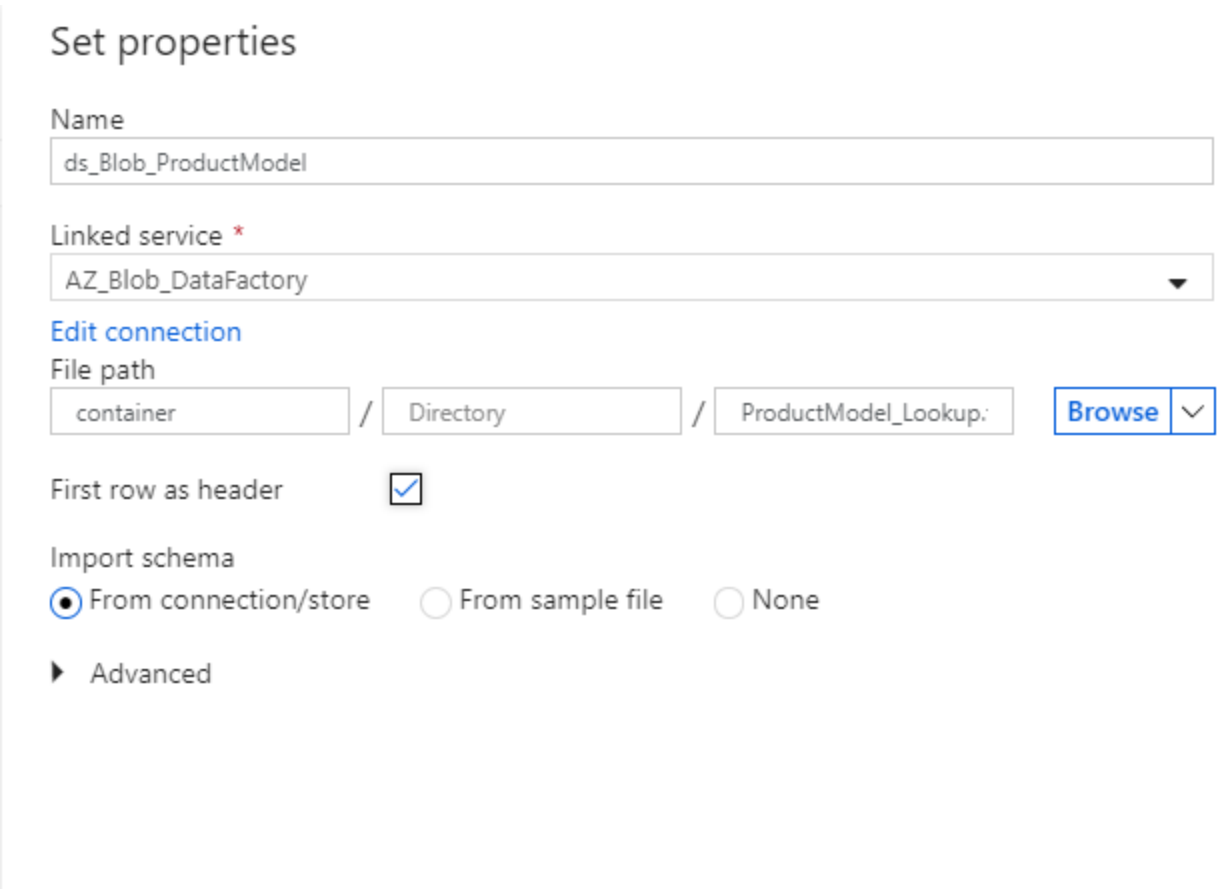
Linked service: AZ_Blob_DataFactory
Object: Products_All.txt

ProductID	Name	ProductNumber	MakeFlag	FinishedGoodsFlag	Color	SafetyStockLevel	ReorderPoint	Sta
1	Adjustable Race	AR-5381	False	False	\N	1000	750	0.0
2	Bearing Ball	BA-8327	False	False	\N	1000	750	0.0
3	BB Ball Bearing	BE-2349	True	False	\N	800	600	0.0
4	Headset Ball Bearings	BE-2908	False	False	\N	800	600	0.0
316	Blade	BL-2036	True	False	\N	800	600	0.0
317	LL Crankarm	CA-5965	False	False	Black	500	375	0.0
318	ML Crankarm	CA-6738	False	False	Black	500	375	0.0
319	HL Crankarm	CA-7457	False	False	Black	500	375	0.0

We will modify the data types for ProductsAll.text file

Weight	1.2 double	Specify format
DaysToManufacture	123 integer	Specify format
ProductLine	abc string	Specify format
Class	abc string	Specify format
Style	abc string	Specify format
ProductSubcategoryID	12s short	Specify format
ProductModelID	12s short	Specify format
SellStartDate	timestamp	Specify format
SellEndDate	timestamp	Specify format
DiscontinuedDate	timestamp	Specify format

Now we will create second data source for Product Model table.



Columns are separated by commas, so they are parsed correctly for second data source.

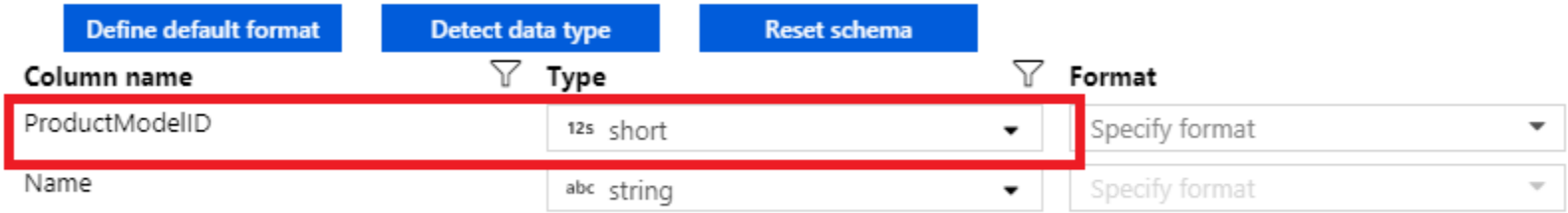
Data Preview

Linked service: AZ_Blob_DataFactory
Object: ProductModel_Lookup.txt

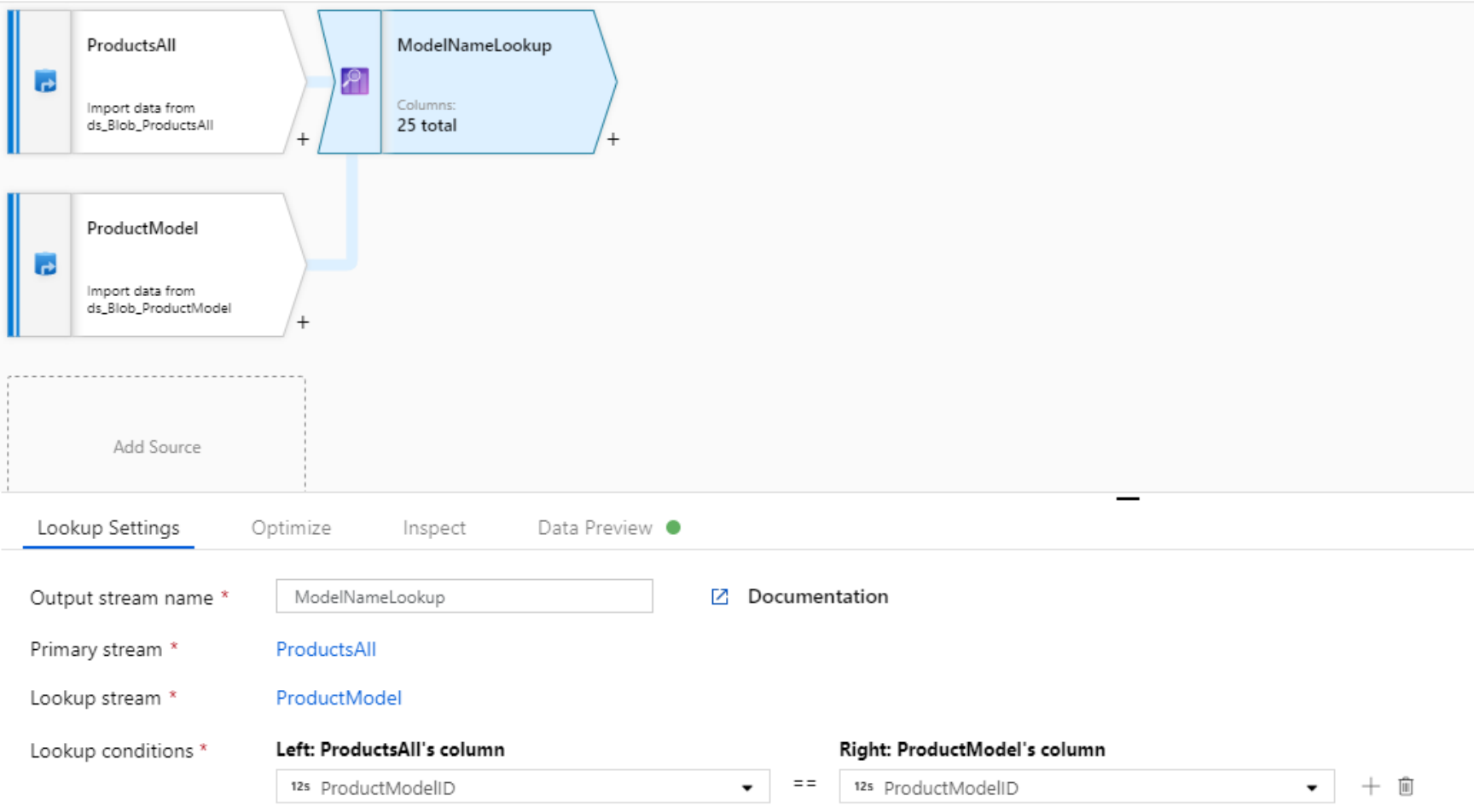
ProductModelID	Name
122	All-Purpose Bike Stand
119	Bike Wash
115	Cable Lock
98	Chain
1	Classic Vest
2	Cycling Cap
121	Fender Set - Mountain
102	Front Brakes
103	Front Derailleur

Transformation:

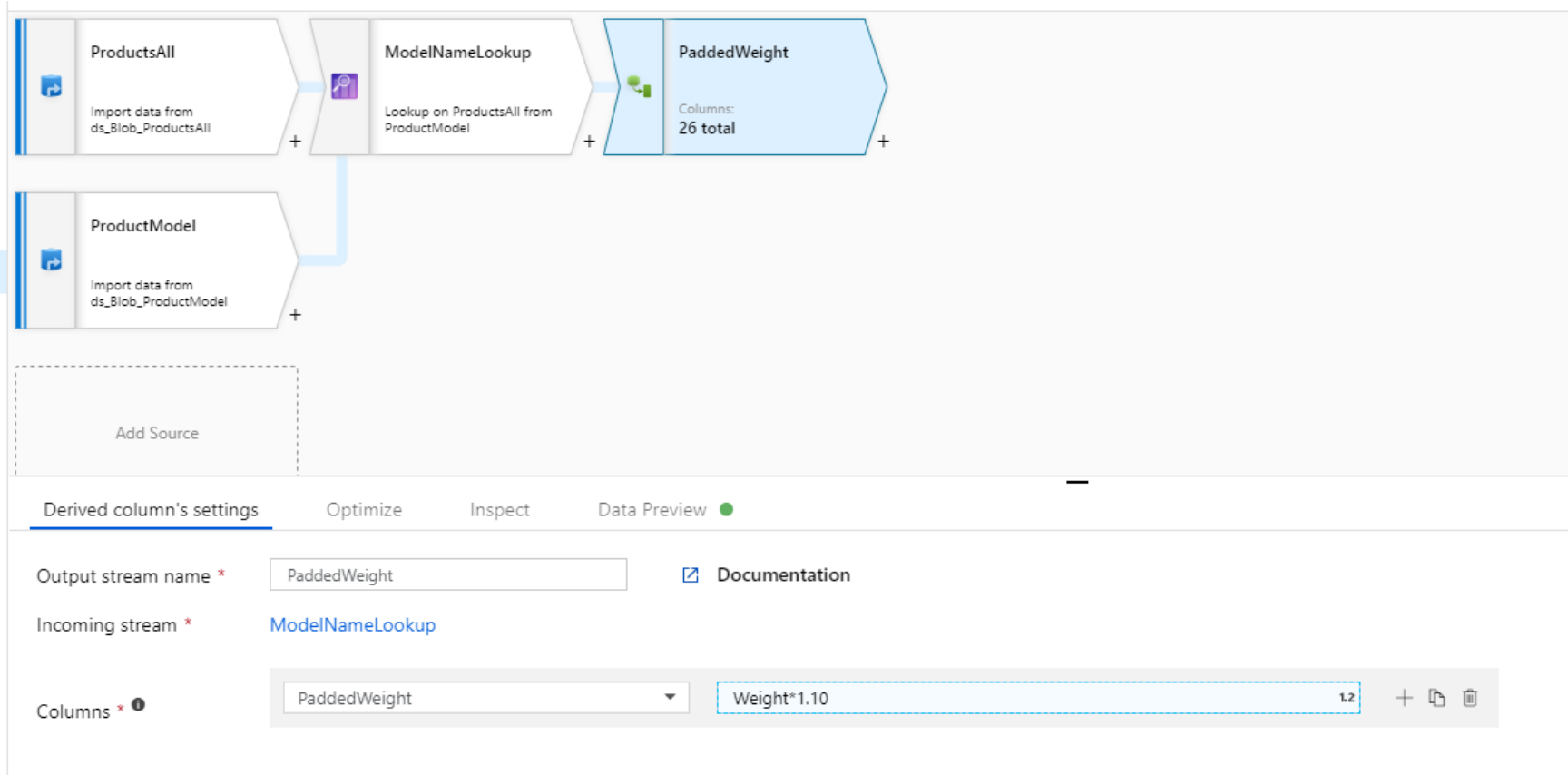
I will change the ProductModelID to short data type, so we can compare them with the first source file ProductsAll.text file.



Now I will do a lookup comparison based on our two sources with comparing ProductModelIds.



As, one of our requirements is to add actual weight plus 10% of weight so we can add packaging weight for the whole package.

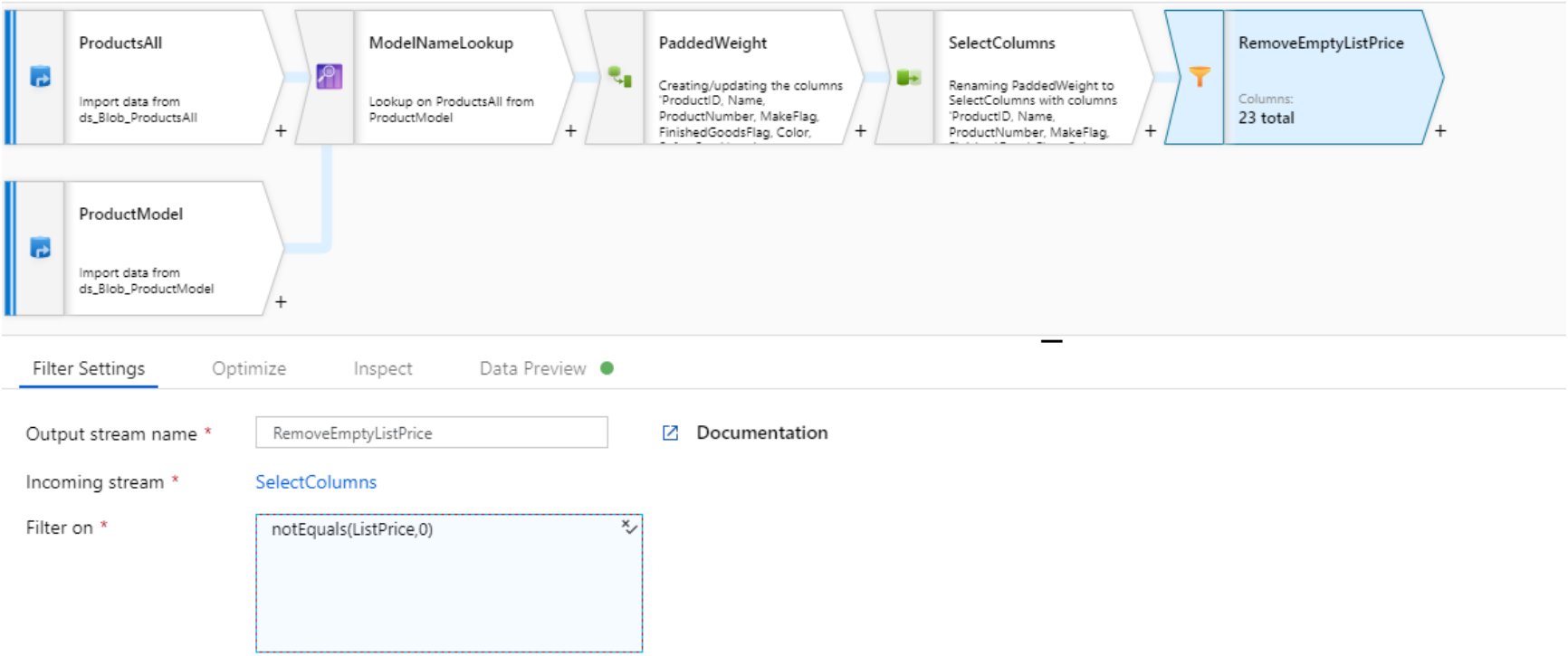


As we have 26 columns in our data flows, we will remove few columns which are needed by the business.

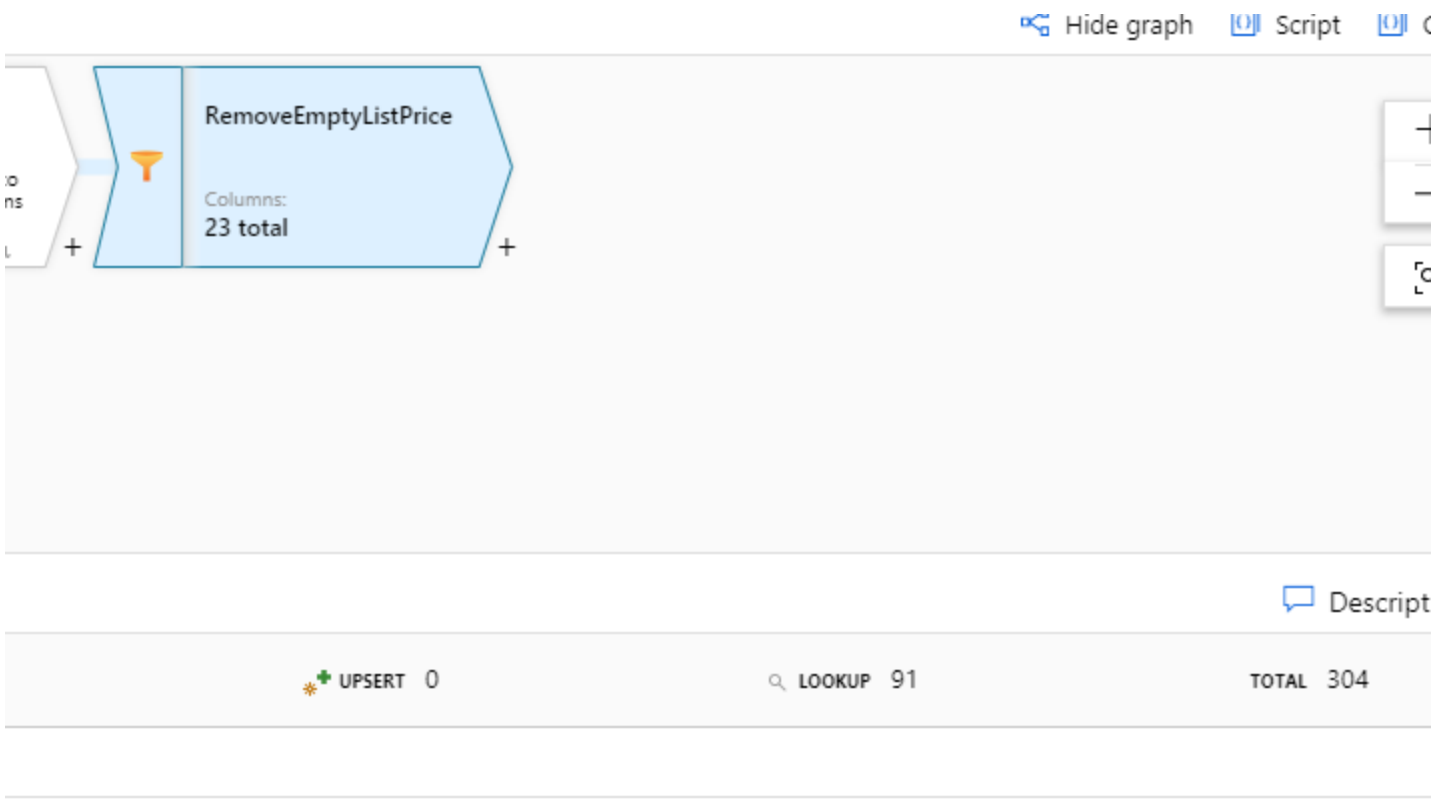
Select Settings | Optimize | Inspect | Data Preview

StandardCost	StandardCost
ListPrice	ListPrice
Size	Size
SizeUnitMeasureCode	SizeUnitMeasureCode
WeightUnitMeasureCode	WeightUnitMeasureCode
DaysToManufacture	DaysToManufacture
ProductLine	ProductLine
Class	Class
Style	Style
ProductSubcategoryID	ProductSubcategoryID
ProductsAll@ProductModelID	ProductModelID
SellStartDate	SellStartDate
SellEndDate	SellEndDate
DiscontinuedDate	DiscontinuedDate
ProductModel@Name	ModelName
PaddedWeight	PaddedWeight

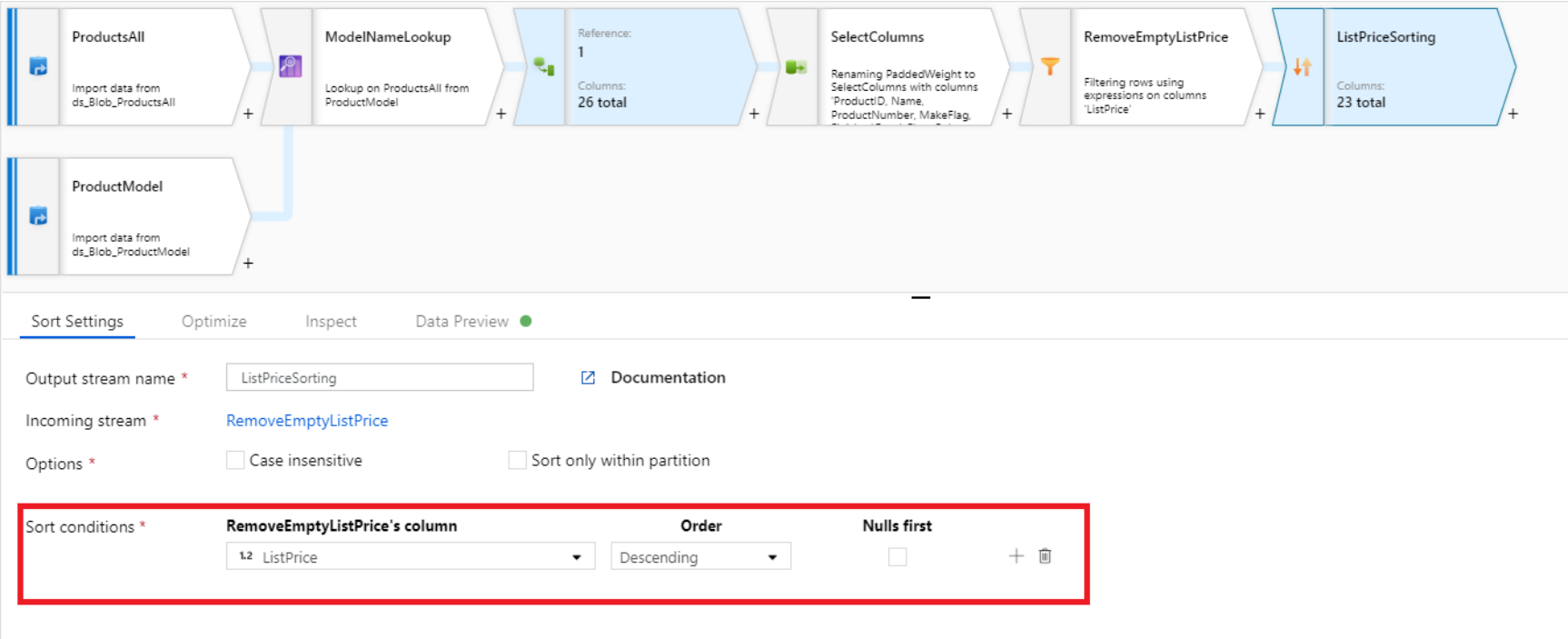
We will also remove empty list price using filter.



After using the filter, our number of rows are reduced to 304 rows.

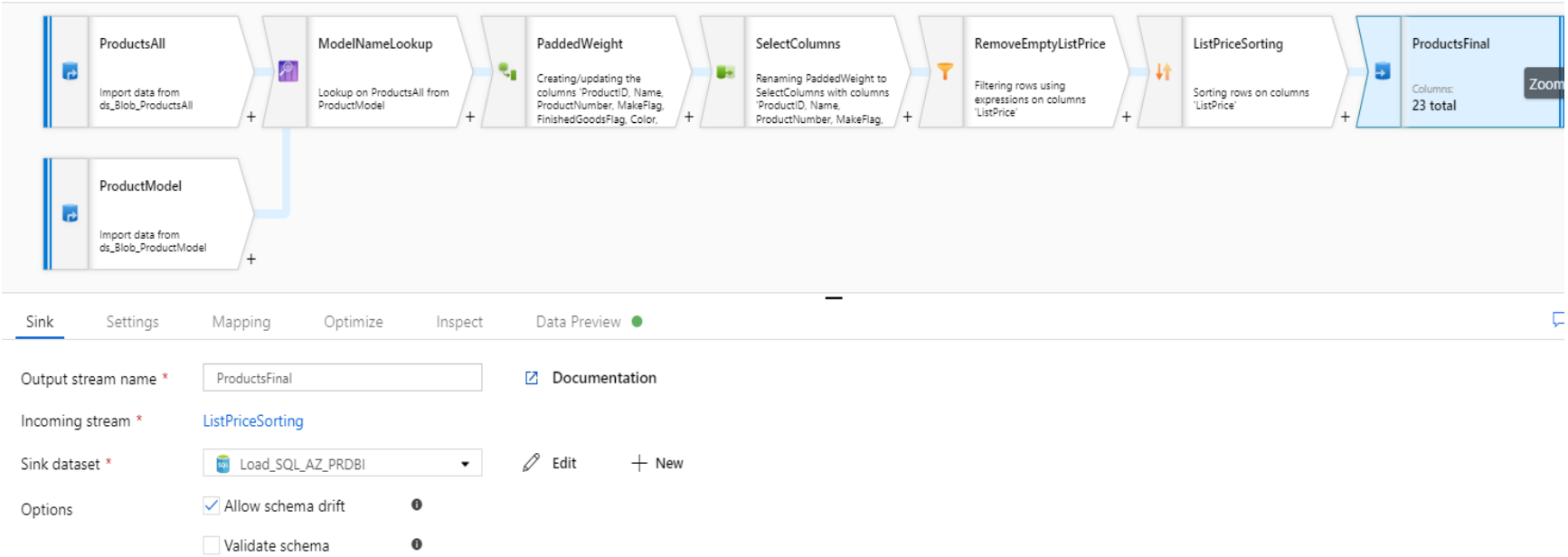

Hide graph
Script
RemoveEmptyListPrice
Columns:
23 total
Descript
UPSERT 0
LOOKUP 91
TOTAL 304

Now our last requirement is to sort list price in descending order.



Destination:

Now I will create a destination table and load the data in Azure SQL.



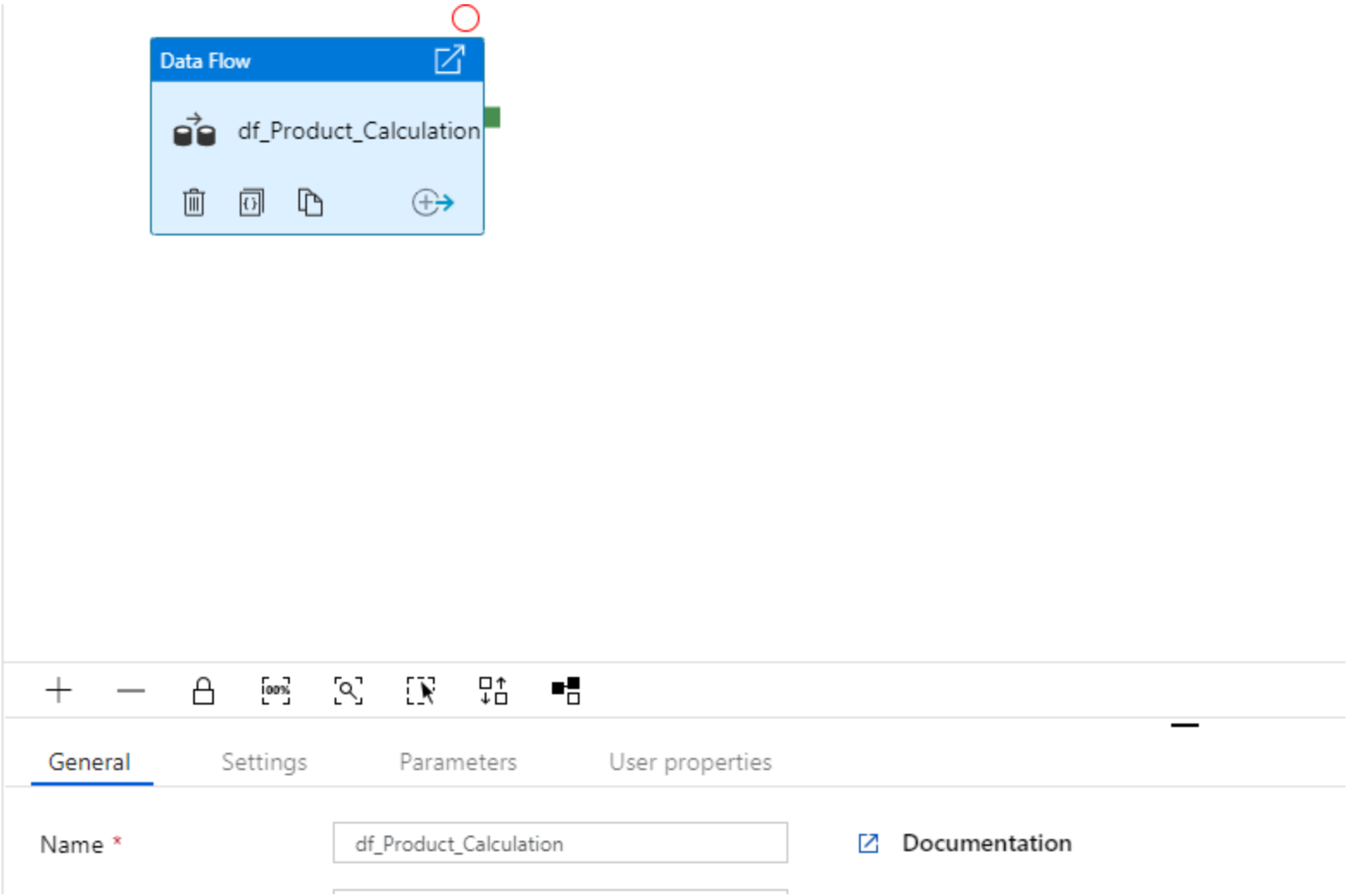
Now we will create a new pipeline to run this data flow.

Adding Data Flow

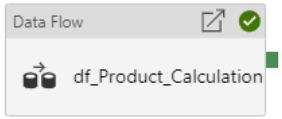
(•) Use existing Data Flow ( ) Create new Data Flow

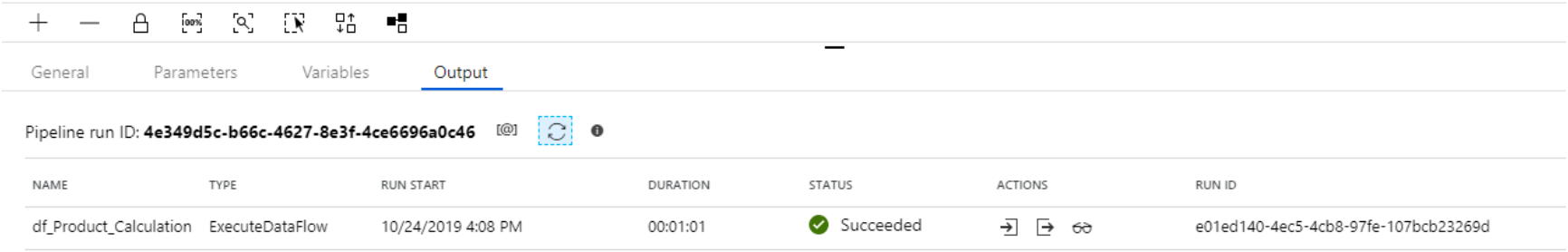
Existing Data Flow *

df_Product_Calculation



From above graph, we can see successful execution of pipeline is completed.





Data is uploaded to the table below.

```sql
SELECT TOP (1000) [ProductID]
      ,[Name]
      ,[ProductNumber]
      ,[MakeFlag]
      ,[FinishedGoodsFlag]
      ,[Color]
      ,[SafetyStockLevel]
      ,[ReorderPoint]
      ,[StandardCost]
      ,[ListPrice]
      ,[Size]
      ,[SizeUnitMeasureCode]
      ,[WeightUnitMeasureCode]
      ,[DaysToManufacture]
      ,[ProductLine]
      ,[Class]
      ,[Style]
      ,[ProductSubcategoryID]
      ,[ProductModelID]
      ,[SellStartDate]
      ,[SellEndDate]
      ,[DiscontinuedDate]
      ,[ModelName]
      ,[PaddedWeight]
  FROM [Products].[ModelProductsLoad]
```

100 %

Results | Messages

	ProductID	Name	ProductNumber	MakeFlag	FinishedGoodsFlag	Color	SafetyStockLevel	ReorderPoint	StandardCost	ListPrice	Size	SizeUnitMeasureCode	WeightUnitMeasureCode	DaysToManufacture	ProductL
1	771	Mountain-100 Silver, 38	BK-M82S-38	True	True	Silver	100	75	1912.1544	3399.99	38	CM	LB	4	M
2	772	Mountain-100 Silver, 42	BK-M82S-42	True	True	Silver	100	75	1912.1544	3399.99	42	CM	LB	4	M
3	773	Mountain-100 Silver, 44	BK-M82S-44	True	True	Silver	100	75	1912.1544	3399.99	44	CM	LB	4	M
4	774	Mountain-100 Silver, 48	BK-M82S-48	True	True	Silver	100	75	1912.1544	3399.99	48	CM	LB	4	M
5	749	Road-150 Red, 62	BK-R93R-62	True	True	Red	100	75	2171.2942	3578.27	62	CM	LB	4	R
6	750	Road-150 Red, 44	BK-R93R-44	True	True	Red	100	75	2171.2942	3578.27	44	CM	LB	4	R
7	751	Road-150 Red, 48	BK-R93R-48	True	True	Red	100	75	2171.2942	3578.27	48	CM	LB	4	R
8	752	Road-150 Red, 52	BK-R93R-52	True	True	Red	100	75	2171.2942	3578.27	52	CM	LB	4	R
9	753	Road-150 Red, 56	BK-R93R-56	True	True	Red	100	75	2171.2942	3578.27	56	CM	LB	4	R
10	775	Mountain-100 Black, 38	BK-M82B-38	True	True	Black	100	75	1898.0944	3374.99	38	CM	LB	4	M
11	776	Mountain-100 Black, 42	BK-M82B-42	True	True	Black	100	75	1898.0944	3374.99	42	CM	LB	4	M
12	777	Mountain-100 Black, 44	BK-M82B-44	True	True	Black	100	75	1898.0944	3374.99	44	CM	LB	4	M
13	778	Mountain-100 Black, 48	BK-M82B-48	True	True	Black	100	75	1898.0944	3374.99	48	CM	LB	4	M
14	954	Touring-1000 Yellow, 46	BK-T79Y-46	True	True	Yellow	100	75	1481.9379	2384.07	46	CM	LB	4	T
15	955	Touring-1000 Yellow, 50	BK-T79Y-50	True	True	Yellow	100	75	1481.9379	2384.07	50	CM	LB	4	T