databricks **Data To Action Module 8 Assignment**

(https://databricks.com)

Assignment: Data To Action

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05.06.2023

- Ability to work with S&P Global data platform
- Transform data using some of the following: R, Python, SQL or Alteryx
- Synthesize big data into insight and action

1 COLLECT COMPANY DATA

Automive Industry

- Market Industry of Interest: Automobiles.
- US Based & Publicly Traded
- General Motors vs Ford Motor Company

```sql
%sql
SELECT
  c.simpleindustrydescription as Industry_Description,
  c.companyId as Company_Id,
  m.ISOCODE as Country_Code,
  --c.TICKERSYMBOL as Ticker_Symbol,
  m.COMPANYNAME as Company_Name,
  m.PRICECLOSE as Closing_Price,
  to_date(m.PRICINGDATE) as Price_Date
FROM
  marketintelligence.company c
  join marketintelligence.marketdata m on m.companyid = c.companyid
WHERE m.ISOCODE='USD' and c.SIMPLEINDUSTRYDESCRIPTION='Automobiles' and m.PRICINGDATE >='2022-01-01' and m.PRICINGDATE <
'2023-01-01' and
(m.COMPANYNAME='Ford Motor Company' or m.COMPANYNAME='General Motors Company')
```

Table	GM vs Ford Closing Prices					
	Industry_Description ▲	Company_Id ▲	Country_Code ▲	Company_Name ▲	Closing_Price ▲	Price_Date ▲
1	Automobiles	106335	USD	Ford Motor Company	11.630000	2022-12-30
2	Automobiles	106335	USD	Ford Motor Company	11.540000	2022-12-29
3	Automobiles	106335	USD	Ford Motor Company	10.950000	2022-12-28
4	Automobiles	106335	USD	Ford Motor Company	11.200000	2022-12-27
5	Automobiles	106335	USD	Ford Motor Company	11.360000	2022-12-23
6	Automobiles	106335	USD	Ford Motor Company	11.310000	2022-12-22
7	Automobiles	106335	USD	Ford Motor Company	11.780000	2022-12-21

502 rows

Performance Metrics

> Select 5 key financial metrics on which to compare these 2 companies' overtime

- Total Revenue, Gross Profit, EBIT, Net Debt, FTE
- Optional: Inventory (how much inventory of cars do these companies hold?)

```sql
%sql

SELECT
 companyId,
 companyName,
 dataItemName,
 round(sum(dataItemValue),2) as totalValue,
 round(avg(dataItemValue),2) as avgValue,
 fiscalYear
FROM
marketintelligence.financials
WHERE
 dataItemId IN (
   28,
   10,
   400,
   4364,
   3085,
   1043,
   100
 ) -- Financial Metrics 5 + 1

 AND (companyId = 106335 or companyId = 61206100) -- Ford Motor & GM respectively
 AND periodTypeName = 'Annual'
 --AND fiscalYear = 2021
 GROUP BY fiscalYear, companyName, dataItemName, companyId
 ORDER BY companyName, dataItemName, fiscalYear
```

Table   Average Historical Performance of Ford & General Motors --2021 and 2022

	companyId	companyName	dataItemName	totalValue	avgValue	fiscalYear
1	106335	Ford Motor Company	EBIT	10520.00	10520.00	2021
2	106335	Ford Motor Company	EBIT	7663.00	7663.00	2022
3	106335	Ford Motor Company	Full Time Employees	183000.00	183000.00	2021
4	106335	Ford Motor Company	Full Time Employees	173000.00	173000.00	2022
5	106335	Ford Motor Company	Gross Profit	16438.00	16438.00	2021
6	106335	Ford Motor Company	Gross Profit	17215.00	17215.00	2022
7	106335	Ford Motor Company	Inventory	12065.00	12065.00	2021
8	106335	Ford Motor Company	Inventory	14080.00	14080.00	2022
9	106335	Ford Motor Company	Net Debt	103028.00	103028.00	2021
10	106335	Ford Motor Company	Net Debt	108290.00	108290.00	2022
11	106335	Ford Motor Company	Total Revenues	136341.00	136341.00	2021
12	106335	Ford Motor Company	Total Revenues	158057.00	158057.00	2022
13	61206100	General Motors Company	EBIT	11434.00	11434.00	2021
14	61206100	General Motors Company	EBIT	11999.00	11999.00	2022
15	61206100	General Motors Company	Full Time Employees	157000.00	157000.00	2021
16	61206100	General Motors Company	Full Time Employees	167000.00	167000.00	2022
17	61206100	General Motors Company	Gross Profit	18079.00	18079.00	2021
18	61206100	General Motors Company	Gross Profit	21154.00	21154.00	2022
19	61206100	General Motors Company	Inventory	12988.00	12988.00	2021
20	61206100	General Motors Company	Inventory	15366.00	15366.00	2022
21	61206100	General Motors Company	Net Debt	85919.00	85919.00	2021
22	61206100	General Motors Company	Net Debt	88610.00	88610.00	2022

24 rows

Total Revenue Over Time

```sql
%sql
SELECT
  companyName,
  dataItemName,
  dataItemId,
  round(sum(dataItemValue),2) as totalValue,
  --round(avg(dataItemValue),2) as avgValue,
  fiscalYear
FROM
marketintelligence.financials
WHERE (companyId = 106335 or companyId = 61206100) and DATAITEMID=28 -- Total Revenue
AND periodTypeName = 'Annual'
GROUP BY
  fiscalYear, companyName, dataItemName, dataItemId
ORDER BY
  companyName, fiscalYear
```

Table	Historical Total Revenue Performance for Ford & General Motors: 2021 - 2022				
	companyName	**dataItemName**	**dataItemId**	**totalValue**	**fiscalYear**
1	Ford Motor Company	Total Revenues	28	136341.00	2021
2	Ford Motor Company	Total Revenues	28	158057.00	2022
3	General Motors Company	Total Revenues	28	127004.00	2021
4	General Motors Company	Total Revenues	28	156735.00	2022

4 rows

Total Gross Profit Over Time

```sql
%sql
SELECT
  companyName,
  dataItemName,
  dataItemId,
  round(sum(dataItemValue),2) as totalValue,
  --round(avg(dataItemValue),2) as avgValue,
  fiscalYear
FROM
marketintelligence.financials
WHERE (companyId = 106335 or companyId = 61206100) and DATAITEMID=10 --Gross Profit
AND periodTypeName = 'Annual'
GROUP BY
  fiscalYear, companyName, dataItemName, dataItemId
ORDER BY
  companyName, fiscalYear
```

Table	Historical Total Gross Profit for Ford Motor & General Motors: 2021 - 2022				
	companyName	**dataItemName**	**dataItemId**	**totalValue**	**fiscalYear**
1	Ford Motor Company	Gross Profit	10	16438.00	2021
2	Ford Motor Company	Gross Profit	10	17215.00	2022
3	General Motors Company	Gross Profit	10	18079.00	2021
4	General Motors Company	Gross Profit	10	21154.00	2022

4 rows

EBIT Over Time

```
%sql
SELECT
  companyName,
  dataItemName,
  dataItemId,
  round(sum(dataItemValue),2) as totalValue,
  --round(avg(dataItemValue),2) as avgValue,
  fiscalYear
FROM
marketintelligence.financials
WHERE (companyId = 106335 or companyId = 61206100) and DATAITEMID=400 --EBIT
AND periodTypeName = 'Annual'
GROUP BY
  fiscalYear, companyName, dataItemName, dataItemId
ORDER BY
  companyName, fiscalYear
```

Table	Historical EBIT Performance for Ford & General Motors: 2021 - 2022					
	companyName	**dataItemName**	**dataItemId**	**totalValue**	**fiscalYear**	
1	Ford Motor Company	EBIT	400	10520.00	2021	
2	Ford Motor Company	EBIT	400	7663.00	2022	
3	General Motors Company	EBIT	400	11434.00	2021	
4	General Motors Company	EBIT	400	11999.00	2022	

4 rows

Net Debt Over Time

```
%sql
SELECT
  companyName,
  dataItemName,
  dataItemId,
  round(sum(dataItemValue),2) as totalValue,
  --round(avg(dataItemValue),2) as avgValue,
  fiscalYear
FROM
marketintelligence.financials
WHERE (companyId = 106335 or companyId = 61206100) and DATAITEMID=4364 -- Net Debt
AND periodTypeName = 'Annual'
GROUP BY
  fiscalYear, companyName, dataItemName, dataItemId
ORDER BY
  companyName, fiscalYear
```

Table	Historical Net Debt Performance for Ford & General Motors: 2021 - 2022					
	companyName	**dataItemName**	**dataItemId**	**totalValue**	**fiscalYear**	
1	Ford Motor Company	Net Debt	4364	103028.00	2021	
2	Ford Motor Company	Net Debt	4364	108290.00	2022	
3	General Motors Company	Net Debt	4364	85919.00	2021	
4	General Motors Company	Net Debt	4364	88610.00	2022	

4 rows

FTE Over Time

```
%sql
SELECT
  companyName,
  dataItemName,
  dataItemId,
  round(sum(dataItemValue),2) as totalValue,
  --round(avg(dataItemValue),2) as avgValue,
  fiscalYear
FROM
marketintelligence.financials
WHERE (companyId = 106335 or companyId = 61206100) and DATAITEMID=3085 -- Full Time Employees
AND periodTypeName = 'Annual'
GROUP BY
  fiscalYear, companyName, dataItemName, dataItemId
ORDER BY
  companyName, fiscalYear
```

Table	Historical Number of Full Time Employees at Ford & General Motors: 2021 - 2022				
	companyName	dataItemName	dataItemId	totalValue	fiscalYear
1	Ford Motor Company	Full Time Employees	3085	183000.00	2021
2	Ford Motor Company	Full Time Employees	3085	173000.00	2022
3	General Motors Company	Full Time Employees	3085	157000.00	2021
4	General Motors Company	Full Time Employees	3085	167000.00	2022

4 rows

Inventory

```
%sql
SELECT
  companyName,
  dataItemName,
  dataItemId,
  round(sum(dataItemValue),2) as totalValue,
  TO_DATE(periodEndDate) periodEndDate
FROM
marketintelligence.financials
WHERE (companyId = 106335 or companyId = 61206100) and DATAITEMID=1043 -- Inventory
--AND periodTypeName = 'quarterly'
GROUP BY
  companyName, dataItemName, dataItemId,PERIODENDDATE
ORDER BY
  companyName, PERIODENDDATE
```

Table	Visualization 1				
	companyName	dataItemName	dataItemId	totalValue	periodEndDate
1	Ford Motor Company	Inventory	1043	12742.00	2021-03-31
2	Ford Motor Company	Inventory	1043	13593.00	2021-06-30
3	Ford Motor Company	Inventory	1043	13508.00	2021-09-30
4	Ford Motor Company	Inventory	1043	24130.00	2021-12-31
5	Ford Motor Company	Inventory	1043	14647.00	2022-03-31
6	Ford Motor Company	Inventory	1043	13976.00	2022-06-30
7	Ford Motor Company	Inventory	1043	15213.00	2022-09-30

16 rows

```
%sql

SELECT
 companyId,
 companyName,
 dataItemName,
 round(sum(dataItemValue),2) as totalValue,
 --round(avg(dataItemValue),2) as avgValue,
 fiscalYear
FROM
 marketintelligence.financials
WHERE
 dataItemId IN (
   1043,
   34
 ) -- Financial Metrics

 AND (companyId = 106335 or companyId = 61206100) -- Ford Motor & GM respectively
 AND periodTypeName = 'Annual'
 --AND fiscalYear = 2021
 GROUP BY fiscalYear, companyName, dataItemName, companyId
 ORDER BY companyName, dataItemName, fiscalYear
```

Table

	companyId	companyName	dataItemName	totalValue	fiscalYear
1	106335	Ford Motor Company	Cost of Goods Sold, Total	114651.00	2021
2	106335	Ford Motor Company	Cost of Goods Sold, Total	134346.00	2022
3	106335	Ford Motor Company	Inventory	12065.00	2021
4	106335	Ford Motor Company	Inventory	14080.00	2022
5	61206100	General Motors Company	Cost of Goods Sold, Total	100544.00	2021
6	61206100	General Motors Company	Cost of Goods Sold, Total	126892.00	2022
7	61206100	General Motors Company	Inventory	12988.00	2021

8 rows

Ownership Data

- Determine the top 15 organizations that hold the most ownership in the 2 companies chosen

```
%sql
--- Ford Motor Company --- leveraging sql code from S&P Global

WITH year_totals AS (
  SELECT companyname,
         own.ownername,
         own.ownedcompanyid,
         YEAR(own.holdingDate) as holdingYear,
         SUM(own.sharesHeld) AS Common_Stock_Equivalent_Held,
         SUM(own.percentOfSharesOutstanding) AS Percent_of_Shares_Outstanding
  FROM marketintelligence.ownership own
  WHERE own.ownedcompanyid = 106335 -- Ford Motor Company
  GROUP BY companyname, own.ownername, holdingYear, own.ownedcompanyid
),
top_10_yearly AS (
  SELECT companyname, ownername, holdingYear, Common_Stock_Equivalent_Held, Percent_of_Shares_Outstanding,
         ROW_NUMBER() OVER (PARTITION BY holdingYear ORDER BY Common_Stock_Equivalent_Held DESC) as rn
  FROM year_totals
)
SELECT companyname, ownername, holdingYear, Common_Stock_Equivalent_Held, Percent_of_Shares_Outstanding
FROM top_10_yearly
WHERE rn <= 15
ORDER BY holdingYear, Common_Stock_Equivalent_Held DESC;
```

Table   Institutional Ownership of Ford Motor Company

	companyname	ownername	holdingYear	Common_Stock_Equivalent_Held
1	Ford Motor Company	The Vanguard Group, Inc.	2022	335643986
2	Ford Motor Company	State Street Global Advisors, Inc.	2022	305567986
3	Ford Motor Company	BlackRock, Inc.	2022	260680686
4	Ford Motor Company	Newport Trust Company, Asset Management Arm	2022	147546419
5	Ford Motor Company	Geode Capital Management, LLC	2022	69911885
6	Ford Motor Company	Fisher Asset Management, LLC	2022	47659333
7	Ford Motor Company	Northern Trust Global Investments	2022	38788349
8	Ford Motor Company	Norges Bank Investment Management	2022	36047929
9	Ford Motor Company	Morgan Stanley, Investment Banking and Brokerage Investments	2022	31944852
10	Ford Motor Company	BNY Mellon Asset Management	2022	31486231
11	Ford Motor Company	Dimensional Fund Advisors LP	2022	25928311
12	Ford Motor Company	Legal & General Investment Management Limited	2022	25685262
13	Ford Motor Company	UBS Asset Management	2022	24455152
14	Ford Motor Company	Charles Schwab Investment Management, Inc.	2022	23717464
15	Ford Motor Company	LSV Asset Management	2022	20119177

15 rows

```sql
%sql
--- General Motors Company --- leveraging sql code from S&P Global

WITH year_totals AS (
  SELECT companyname,
         own.ownername,
         own.ownedcompanyid,
         YEAR(own.holdingDate) as holdingYear,
         SUM(own.sharesHeld) AS Common_Stock_Equivalent_Held,
         SUM(own.percentOfSharesOutstanding) AS Percent_of_Total_Shares_Outstanding
  FROM marketintelligence.ownership own
  WHERE own.ownedcompanyid = 61206100 -- General Motors
  GROUP BY companyname, own.ownername, holdingYear, own.ownedcompanyid
),
top_10_yearly AS (
  SELECT companyname, ownername, holdingYear, Common_Stock_Equivalent_Held, Percent_of_Total_Shares_Outstanding,
         ROW_NUMBER() OVER (PARTITION BY holdingYear ORDER BY Common_Stock_Equivalent_Held DESC) as rn
  FROM year_totals
)
SELECT companyname, ownername, holdingYear, Common_Stock_Equivalent_Held, Percent_of_Total_Shares_Outstanding
FROM top_10_yearly
WHERE rn <= 15
ORDER BY holdingYear, Common_Stock_Equivalent_Held DESC;
```

Table   Institutional Ownership of General Motors Company

	companyname	ownername	holdingYear	Common_Stock_Equivalent_Held	Percent_
1	General Motors Company	Capital Research and Management Company	2022	169128690	12.12707
2	General Motors Company	BlackRock, Inc.	2022	125709882	9.01381
3	General Motors Company	The Vanguard Group, Inc.	2022	110305628	7.90927
4	General Motors Company	State Street Global Advisors, Inc.	2022	56597075	4.05819
5	General Motors Company	Berkshire Hathaway Inc.	2022	50000000	3.58516
6	General Motors Company	Harris Associates L.P.	2022	39376366	2.82341
7	General Motors Company	Invesco Ltd.	2022	25297273	1.81390
8	General Motors Company	Geode Capital Management, LLC	2022	25133861	1.80218
9	General Motors Company	Hotchkis and Wiley Capital Management, LLC	2022	16605466	1.19067

	General Motors Company	Hotchkis and Wiley Capital Management, LLC	2022		
10	General Motors Company	Greenhaven Associates Inc	2022	15319003	1.09842
11	General Motors Company	Arrowstreet Capital, Limited Partnership	2022	14763488	1.05859
12	General Motors Company	Norges Bank Investment Management	2022	14662536	1.05135
13	General Motors Company	BNY Mellon Asset Management	2022	13872063	0.99467
14	General Motors Company	Northern Trust Global Investments	2022	13720376	0.98380
15	General Motors Company	Putnam LLC	2022	12884970	0.92389

15 rows

Market Data

Trade Volume & Stock Price

```sql
%sql
SELECT
  companyName,
  volume as tradeVolume,
  priceClose as stockPrice,
  to_date(pricingDate) as priceDate
FROM marketintelligence.marketdata
WHERE companyId = 106335 -- Ford
GROUP BY companyName,priceDate, volume,priceClose
ORDER BY priceDate
```

Table

	companyName	tradeVolume	stockPrice	priceDate	
1	Ford Motor Company	62183010	11.700000	2021-02-22	
2	Ford Motor Company	72904530	11.620000	2021-02-23	
3	Ford Motor Company	95152780	12.270000	2021-02-24	
4	Ford Motor Company	75249410	11.760000	2021-02-25	
5	Ford Motor Company	69614530	11.700000	2021-02-26	
6	Ford Motor Company	43172810	11.980000	2021-03-01	
7	Ford Motor Company	104789000	12.550000	2021-03-02	

503 rows

Table

	companyName	tradeVolume	stockPrice	priceDate	
1	General Motors Company	14501270	51.980000	2021-02-22	
2	General Motors Company	21202690	51.110000	2021-02-23	
3	General Motors Company	18374960	52.900000	2021-02-24	
4	General Motors Company	20628940	50.600000	2021-02-25	
5	General Motors Company	17125140	51.330000	2021-02-26	
6	General Motors Company	15385260	52.540000	2021-03-01	
7	General Motors Company	36267190	54.110000	2021-03-02	

503 rows

file:///C:/Users/jennb/Downloads/drive-download-20230512T172437Z-001/Preliminary_Analysis_Auto/Data To Action Databricks Export.html

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