

Data Science

Data Analytics

in

Business Processes

Task 1:

Refer the dataset: 'dabp_salesdata.xlsx'

Data Analysis

- Open the "SalesData.xlsx" dataset.
- Calculate the following using Excel functions:
 - i) Total revenue for each product.
 - ii) Total cost for each product.
 - iii) Gross profit for each product (Total revenue - Total cost).
 - iv) Total revenue for each month.
 - v) Average monthly gross profit.
- Create a bar chart to visualize the monthly revenue.

What-If Analysis

- Imagine the company wants to offer a discount of 10% on one of the products to boost sales. Calculate the new gross profit for each product after applying the discount.

So, shall I apply the 10% for all the products or shall I apply randomly for one of the products and apply some random discounts for all the other products?

I would recommend applying the 10% discount to the product that you think would have the biggest impact on sales. You can also use what-if analysis to experiment with different discount percentages and products to see which scenario would be most profitable for your business.

- Create a data table to show how the overall gross profit changes as the discount is applied to different products.

Decision Analysis

Based on your analysis:

- Identify which product would benefit the most from a 10% discount in terms of gross profit increase.
- Provide a brief recommendation on whether the company should proceed with the discount strategy.

i) Total revenue for each product.

1. Calculating the total revenue for each product line item (column H).

H2	:	X	✓	<i>fx</i>	=[@[Price Per Unit]]*[@[Units Sold]]			
	A	B	C	D	E	F	G	H
1	Transaction ID	Date	Month	Product	Units Sold	Price Per Unit	Cost Per Unit	Revenue
2	12	1/6/2023	Jan	Adilette	80	\$40	\$24	\$3,200

2. Using UNIQUE function to get the product names from column D to column P.

P2 : =UNIQUE(Table1[Product])

	A	B	C	D	E	F	G	H	I	J	K	O	P
													Using Unique Function to find product names from the column D
1	Transaction ID	Date	Month	Product	Units Sold	Price Per Unit	Cost Per Unit	Revenue	Cost	Gross Profit			
2	12	1/6/2023	Jan	Adilette	80	\$40	\$24	\$3,200	\$1,920	\$1,280			Adilette
3	24	1/12/2023	Jan	Adilette	85	\$40	\$24	\$3,400	\$2,040	\$1,360			Gazelle
4	33	2/18/2023	Feb	Adilette	90	\$40	\$24	\$3,600	\$2,160	\$1,440			NMD
5	43	3/15/2023	Mar	Adilette	88	\$40	\$24	\$3,520	\$2,112	\$1,408			Predator
6	53	4/4/2023	Apr	Adilette	87	\$40	\$24	\$3,480	\$2,088	\$1,392			Samba
7	61	4/20/2023	Apr	Adilette	85	\$40	\$24	\$3,400	\$2,040	\$1,360			Stan Smith
8	71	5/15/2023	May	Adilette	80	\$40	\$24	\$3,200	\$1,920	\$1,280			Superstar
9	81	6/16/2023	Jun	Adilette	78	\$40	\$24	\$3,120	\$1,872	\$1,248			Terrex
10	91	7/18/2023	Jul	Adilette	82	\$40	\$24	\$3,280	\$1,968	\$1,312			UltraBoost
11	10	1/5/2023	Jan	Gazelle	40	\$140	\$84	\$5,600	\$3,360	\$2,240			Yeezy Boost 350

3. Using SUMIF function to get the Total Revenue for each product.

Q2 : =SUMIF(\$D:\$D,P2,H:H)

	A	B	C	D	E	F	G	H	I	J	K	O	P	Q
													Using Unique Function to find product names from the column D	Total Revenue for Each Product
1	Transaction ID	Date	Month	Product	Units Sold	Price Per Unit	Cost Per Unit	Revenue	Cost	Gross Profit				
2	12	1/6/2023	Jan	Adilette	80	\$40	\$24	\$3,200	\$1,920	\$1,280			Adilette	\$ 30,200
3	24	1/12/2023	Jan	Adilette	85	\$40	\$24	\$3,400	\$2,040	\$1,360			Gazelle	\$ 45,640
4	33	2/18/2023	Feb	Adilette	90	\$40	\$24	\$3,600	\$2,160	\$1,440			NMD	\$ 82,800
5	43	3/15/2023	Mar	Adilette	88	\$40	\$24	\$3,520	\$2,112	\$1,408			Predator	\$ 107,520
6	53	4/4/2023	Apr	Adilette	87	\$40	\$24	\$3,480	\$2,088	\$1,392			Samba	\$ 39,000
7	61	4/20/2023	Apr	Adilette	85	\$40	\$24	\$3,400	\$2,040	\$1,360			Stan Smith	\$ 51,870
8	71	5/15/2023	May	Adilette	80	\$40	\$24	\$3,200	\$1,920	\$1,280			Superstar	\$ 90,900
9	81	6/16/2023	Jun	Adilette	78	\$40	\$24	\$3,120	\$1,872	\$1,248			Terrex	\$ 76,380
10	91	7/18/2023	Jul	Adilette	82	\$40	\$24	\$3,280	\$1,968	\$1,312			UltraBoost	\$ 112,600
11	10	1/5/2023	Jan	Gazelle	40	\$140	\$84	\$5,600	\$3,360	\$2,240			Yeezy Boost 350	\$ 102,000

The above same results can be obtained by using a Pivot Table as shown below.

The screenshot displays an Excel spreadsheet with a PivotTable and the PivotTable Fields task pane. The PivotTable is located in the range A1:K12, with 'Row Labels' in column A and 'Sum of Revenue' in column B. The data is summarized by product, with a grand total of \$738,910.00. The PivotTable Fields task pane on the right shows the configuration for the PivotTable, with 'Product' selected for the Rows area and 'Sum of Revenue' selected for the Values area. The task pane also lists various fields that can be added to the report, including Transaction ID, Date, Product, Units Sold, Price Per Unit, Cost Per Unit, Revenue, Cost, Gross Profit, Days (Date), and Months (Date).

Row Labels	Sum of Revenue
Adilette	\$ 30,200.00
Gazelle	\$ 45,640.00
NMD	\$ 82,800.00
Predator	\$ 107,520.00
Samba	\$ 39,000.00
Stan Smith	\$ 51,870.00
Superstar	\$ 90,900.00
Terrex	\$ 76,380.00
UltraBoost	\$ 112,600.00
Yeezy Boost 350	\$ 102,000.00
Grand Total	\$ 738,910.00

PivotTable Fields

Choose fields to add to report:

- ☐ Transaction ID
- ☐ Date
- ☒ **Product**
- ☐ Units Sold
- ☐ Price Per Unit
- ☐ Cost Per Unit
- ☒ **Revenue**
- ☐ Cost
- ☐ Gross Profit
- ☐ Days (Date)
- ☐ Months (Date)

Drag fields between areas below:

Filters	Columns

Rows	Values
Product	Sum of Revenue

☐ Defer Layout Update Update

ii) Total cost for each product.

1. Calculating the total cost for each product line item (column I)

Formula bar: $\text{=[@[Cost Per Unit]]*[@[Units Sold]]}$

	A	B	C	D	E	F	G	H	I
1	Transaction ID	Date	Month	Product	Units Sold	Price Per Unit	Cost Per Unit	Revenue	Cost
2	12	1/6/2023	Jan	Adilette	80	\$40	\$24	\$3,200	\$1,920
3	24	1/12/2023	Jan	Adilette	85	\$40	\$24	\$3,400	\$2,040
4	33	2/18/2023	Feb	Adilette	90	\$40	\$24	\$3,600	\$2,160
5	43	3/15/2023	Mar	Adilette	88	\$40	\$24	\$3,520	\$2,112
6	53	4/4/2023	Apr	Adilette	87	\$40	\$24	\$3,480	\$2,088

2. Using SUMIF function to get the Total Cost for each product.

Formula bar: $\text{=SUMIF(\$D:\$D,P2,I:I)}$

	A	B	C	D	E	F	G	H	I	J	K	O	P	Q	R
1	Transaction ID	Date	Month	Product	Units Sold	Price Per Unit	Cost Per Unit	Revenue	Cost	Gross Profit			Using Unique Function to find product names from the column D	Total Revenue for Each Product	Total Cost for Each Product
2	12	1/6/2023	Jan	Adilette	80	\$40	\$24	\$3,200	\$1,920	\$1,280			Adilette	\$ 30,200	\$ 18,120
3	24	1/12/2023	Jan	Adilette	85	\$40	\$24	\$3,400	\$2,040	\$1,360			Gazelle	\$ 45,640	\$ 27,384
4	33	2/18/2023	Feb	Adilette	90	\$40	\$24	\$3,600	\$2,160	\$1,440			NMD	\$ 82,800	\$ 49,680
5	43	3/15/2023	Mar	Adilette	88	\$40	\$24	\$3,520	\$2,112	\$1,408			Predator	\$ 107,520	\$ 64,512
6	53	4/4/2023	Apr	Adilette	87	\$40	\$24	\$3,480	\$2,088	\$1,392			Samba	\$ 39,000	\$ 23,400
7	61	4/20/2023	Apr	Adilette	85	\$40	\$24	\$3,400	\$2,040	\$1,360			Stan Smith	\$ 51,870	\$ 31,122
8	71	5/15/2023	May	Adilette	80	\$40	\$24	\$3,200	\$1,920	\$1,280			Superstar	\$ 90,900	\$ 54,540
9	81	6/16/2023	Jun	Adilette	78	\$40	\$24	\$3,120	\$1,872	\$1,248			Terrex	\$ 76,380	\$ 45,828
10	91	7/18/2023	Jul	Adilette	82	\$40	\$24	\$3,280	\$1,968	\$1,312			UltraBoost	\$ 112,600	\$ 67,560
11	10	1/5/2023	Jan	Gazelle	40	\$140	\$84	\$5,600	\$3,360	\$2,240			Yeezy Boost 350	\$ 102,000	\$ 61,200
12	22	1/11/2023	Jan	Gazelle	41	\$140	\$84	\$5,740	\$3,444	\$2,296					

The above same results can be obtained by using a Pivot Table as shown below.

The screenshot displays an Excel spreadsheet with a PivotTable and the PivotTable Fields task pane. The PivotTable is located in the range A1:B12, with 'Row Labels' in column A and 'Sum of Cost' in column B. The data is as follows:

Row Labels	Sum of Cost
Adilette	\$ 18,120.00
Gazelle	\$ 27,384.00
NMD	\$ 49,680.00
Predator	\$ 64,512.00
Samba	\$ 23,400.00
Stan Smith	\$ 31,122.00
Superstar	\$ 54,540.00
Terrex	\$ 45,828.00
UltraBoost	\$ 67,560.00
Yeezy Boost 350	\$ 61,200.00
Grand Total	\$443,346.00

The PivotTable Fields task pane on the right shows the following configuration:

- Choose fields to add to report:**
 - ☐ Transaction ID
 - ☐ Date
 - ☒ **Product**
 - ☐ Units Sold
 - ☐ Price Per Unit
 - ☐ Cost Per Unit
 - ☐ Revenue
 - ☒ **Cost**
 - ☐ Gross Profit
 - ☐ Days (Date)
 - ☐ Months (Date)
- Drag fields between areas below:**
 - Filters:** (Empty)
 - Columns:** (Empty)
 - Rows:** Product
 - Values:** Sum of Cost
- ☐ Defer Layout Update
- Update** button

iii)Gross profit for each product (Total revenue - Total cost).

- Calculating the total gross profit for each product line item (column J)

J2 $\text{=[@Revenue]-[@Cost]}$

	A	B	C	D	E	F	G	H	I	J
	ction ID	Date	Month	Product	Units Sold	Price Per Unit	Cost Per Unit	Revenue	Cost	Gross Profit
2	2	1/6/2023	Jan	Adilette	80	\$40	\$24	\$3,200	\$1,920	\$1,280
3	4	1/12/2023	Jan	Adilette	85	\$40	\$24	\$3,400	\$2,040	\$1,360
4	3	2/18/2023	Feb	Adilette	90	\$40	\$24	\$3,600	\$2,160	\$1,440
5	3	3/15/2023	Mar	Adilette	88	\$40	\$24	\$3,520	\$2,112	\$1,408
5	3	4/4/2023	Apr	Adilette	87	\$40	\$24	\$3,480	\$2,088	\$1,392
7	1	4/20/2023	Apr	Adilette	85	\$40	\$24	\$3,400	\$2,040	\$1,360

- Using SUMIF function to get the Total Gross Profit of each product.

S2 $\text{=SUMIF(SD:$D,P2,J:I)}$

	A	B	C	D	E	F	G	H	I	J	K	O	P	Q	R	S
	ction ID	Date	Month	Product	Units Sold	Price Per Unit	Cost Per Unit	Revenue	Cost	Gross Profit			Using Unique Function to find product names from the column D	Total Revenue for Each Product	Total Cost for Each Product	Gross Profit for Each Product
2	2	1/6/2023	Jan	Adilette	80	\$40	\$24	\$3,200	\$1,920	\$1,280			Adilette	\$ 30,200	\$ 18,120	\$ 12,080
3	4	1/12/2023	Jan	Adilette	85	\$40	\$24	\$3,400	\$2,040	\$1,360			Gazelle	\$ 45,640	\$ 27,384	\$ 18,256
4	3	2/18/2023	Feb	Adilette	90	\$40	\$24	\$3,600	\$2,160	\$1,440			NMD	\$ 82,800	\$ 49,680	\$ 33,120
5	3	3/15/2023	Mar	Adilette	88	\$40	\$24	\$3,520	\$2,112	\$1,408			Predator	\$ 107,520	\$ 64,512	\$ 43,008
5	3	4/4/2023	Apr	Adilette	87	\$40	\$24	\$3,480	\$2,088	\$1,392			Samba	\$ 39,000	\$ 23,400	\$ 15,600
7	1	4/20/2023	Apr	Adilette	85	\$40	\$24	\$3,400	\$2,040	\$1,360			Stan Smith	\$ 51,870	\$ 31,122	\$ 20,748
8	1	5/15/2023	May	Adilette	80	\$40	\$24	\$3,200	\$1,920	\$1,280			Superstar	\$ 90,900	\$ 54,540	\$ 36,360
9	1	6/16/2023	Jun	Adilette	78	\$40	\$24	\$3,120	\$1,872	\$1,248			Terrex	\$ 76,380	\$ 45,828	\$ 30,552
10	1	7/18/2023	Jul	Adilette	82	\$40	\$24	\$3,280	\$1,968	\$1,312			UltraBoost	\$ 112,600	\$ 67,560	\$ 45,040
11	0	1/5/2023	Jan	Gazelle	40	\$140	\$84	\$5,600	\$3,360	\$2,240			Yeezy Boost 350	\$ 102,000	\$ 61,200	\$ 40,800
12	3	1/11/2023	Jan	Gazelle	41	\$140	\$84	\$5,740	\$3,444	\$2,296						

The above same results can be obtained by using a Pivot Table as shown below.

The screenshot displays an Excel spreadsheet with a PivotTable and the PivotTable Fields task pane. The PivotTable is located in the range A1:B12, with 'Row Labels' in column A and 'Sum of Gross Profit' in column B. The data is as follows:

Row Labels	Sum of Gross Profit
Adilette	\$ 12,080.00
Gazelle	\$ 18,256.00
NMD	\$ 33,120.00
Predator	\$ 43,008.00
Samba	\$ 15,600.00
Stan Smith	\$ 20,748.00
Superstar	\$ 36,360.00
Terrex	\$ 30,552.00
UltraBoost	\$ 45,040.00
Yeezy Boost 350	\$ 40,800.00
Grand Total	\$ 295,564.00

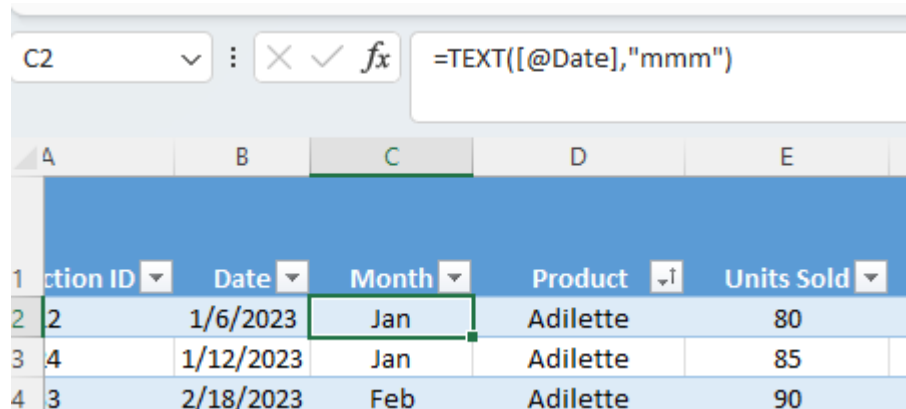
The PivotTable Fields task pane on the right shows the following configuration:

- Choose fields to add to report:**
 - ☐ Transaction ID
 - ☐ Date
 - ☒ **Product**
 - ☐ Units Sold
 - ☐ Price Per Unit
 - ☐ Cost Per Unit
 - ☐ Revenue
 - ☐ Cost
 - ☒ **Gross Profit**
 - ☐ Days (Date)
 - ☐ Months (Date)
- Drag fields between areas below:**
 - Filters:** (Empty)
 - Columns:** (Empty)
 - Rows:** Product
 - Values:** Sum of Gross Profit
- ☐ Defer Layout Update
- Update

A tooltip is visible over the 'Yeezy Boost 350' row, showing: 'Series "Aug" Point "Yeezy Boost 350" Value: \$3,700.00'.

iv) Total revenue for each month.

1. Using the TEXT function, get the name of the month for each line item into column C.



The screenshot shows an Excel interface. The formula bar at the top displays the formula `=TEXT([@Date], "mmm")` for cell C2. Below the formula bar, a table is visible with columns A through E. The table has a header row with dropdown arrows and three data rows. The 'Month' column (C) contains the values 'Jan', 'Jan', and 'Feb'.

	A	B	C	D	E
1	ction ID ▼	Date ▼	Month ▼	Product ▼↑	Units Sold ▼
2	2	1/6/2023	Jan	Adilette	80
3	4	1/12/2023	Jan	Adilette	85
4	3	2/18/2023	Feb	Adilette	90

2. Using UNIQUE function to get the month names to column L.

The above same results can be obtained by using a Pivot Table as shown below.

The screenshot displays an Excel spreadsheet with a PivotTable and the PivotTable Fields task pane. The PivotTable is located in the range B2:B10, with 'Row Labels' in column A and 'Sum of Revenue' in column B. The data shows monthly revenue from January to August, with a Grand Total of \$738,910.00. The PivotTable Fields task pane is open on the right, showing the available fields and their placement in the PivotTable layout.

Row Labels	Sum of Revenue
Jan	\$ 196,500.00
Feb	\$ 74,280.00
Mar	\$ 123,120.00
Apr	\$ 96,970.00
May	\$ 72,620.00
Jun	\$ 70,690.00
Jul	\$ 68,010.00
Aug	\$ 36,720.00
Grand Total	\$ 738,910.00

PivotTable Fields

Choose fields to add to report:

- ☐ Transaction ID
- ☐ Date
- ☐ Product
- ☐ Units Sold
- ☐ Price Per Unit
- ☐ Cost Per Unit
- ☒ **Revenue**
- ☐ Cost
- ☐ Gross Profit
- ☐ Days (Date)
- ☒ **Months (Date)**

Drag fields between areas below:

Filters	Columns

Rows	Values
Months (Date)	Sum of Revenue

☐ Defer Layout Update Update

v) Average monthly gross profit.

Using AVERAGEIF function to get the average gross profit for each month.

N2															:	✕	✓	fx	=AVERAGEIF(\$C:\$C,L2,J:J)														
A		B		C		D		E		F		G		H		I		J		K		L		M		N							
												Using Unique Function to find month names from the column C												Total Revenue for Each Month		Average Gross Profit for Each Month							
1	ction ID	Date	Month	Product	Units Sold	Price Per Unit	Cost Per Unit	Revenue	Cost	Gross Profit		Jan	\$	196,500.00	\$	3,144.00																	
2	2	1/6/2023	Jan	Adilette	80	\$40	\$24	\$3,200	\$1,920	\$1,280		Feb	\$	74,280.00	\$	2,971.20																	
3	4	1/12/2023	Jan	Adilette	85	\$40	\$24	\$3,400	\$2,040	\$1,360		Mar	\$	123,120.00	\$	3,078.00																	
4	3	2/18/2023	Feb	Adilette	90	\$40	\$24	\$3,600	\$2,160	\$1,440		Apr	\$	96,970.00	\$	2,770.57																	
5	3	3/15/2023	Mar	Adilette	88	\$40	\$24	\$3,520	\$2,112	\$1,408		May	\$	72,620.00	\$	2,904.80																	
6	3	4/4/2023	Apr	Adilette	87	\$40	\$24	\$3,480	\$2,088	\$1,392		Jun	\$	70,690.00	\$	2,827.60																	
7	1	4/20/2023	Apr	Adilette	85	\$40	\$24	\$3,400	\$2,040	\$1,360		Jul	\$	68,010.00	\$	2,720.40																	
8	1	5/15/2023	May	Adilette	80	\$40	\$24	\$3,200	\$1,920	\$1,280		Aug	\$	36,720.00	\$	2,937.60																	
9	1	6/16/2023	Jun	Adilette	78	\$40	\$24	\$3,120	\$1,872	\$1,248																							
10	2	7/12/2023	Jul	Adilette	82	\$40	\$24	\$3,280	\$1,968	\$1,312																							

The above same results can be obtained by using a Pivot Table as shown below.

B2 3144

Row Labels	Average of Gross Profit
Jan	\$ 3,144.00
Feb	\$ 2,971.20
Mar	\$ 3,078.00
Apr	\$ 2,770.57
May	\$ 2,904.80
Jun	\$ 2,827.60
Jul	\$ 2,720.40
Aug	\$ 2,937.60
Grand Total	\$ 2,955.64

PivotTable Fields

Choose fields to add to report:

Search

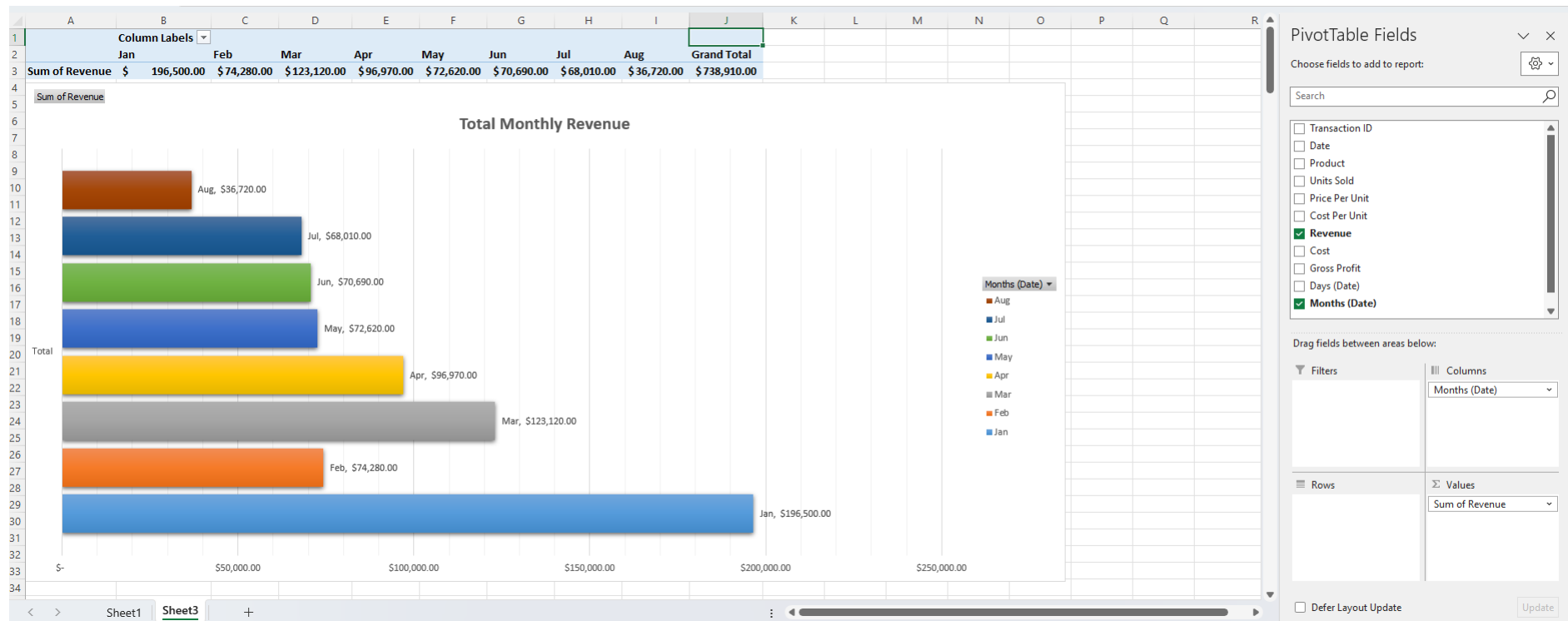
- ☐ Transaction ID
- ☐ Date
- ☐ Product
- ☐ Units Sold
- ☐ Price Per Unit
- ☐ Cost Per Unit
- ☐ Revenue
- ☐ Cost
- ☒ Gross Profit
- ☐ Days (Date)
- ☒ Months (Date)

Drag fields between areas below:

Filters	Columns

Rows	Values
Months (Date)	Average of Gross Profit

The below screenshot displays a Bar chart to visualize the monthly revenue.



The month of January had the most monthly income generation, and the month of August witnessed the lowest monthly revenue generation, as shown in the above bar chart.

References

- Abby Jenkins . (2022, 08 09). *oracle netsuite*. Retrieved from netsuite: <https://www.netsuite.com/portal/resource/articles/inventory-management/inventory-turnover-ratio.shtml>
- Abby Jenkins . (2022, 05 06). *oracle netsuite*. Retrieved from netsuite: <https://www.netsuite.com/portal/resource/articles/inventory-management/days-in-inventory.shtml>
- datacamp*. (2022, 05). Retrieved from datacamp: <https://www.datacamp.com/tutorial/power-bi-dashboard-tutorial>
- Dock Treece. (2023, 02 21). *busines news daily*. Retrieved from busines news daily: <https://www.businessnewsdaily.com/16199-how-to-calculate-cogs.html>
- microsoft. (n.d.). *Create dashboards in Power BI*. Retrieved from learn.microsoft: <https://learn.microsoft.com/en-us/training/modules/create-dashboards-power-bi/>
- Ronny Henry. (2020, 02 07). *extensive*. Retrieved from extensive: <https://www.extensiv.com/blog/good-inventory-turnover-ratio>
- sba U.S. small business administration*. (n.d.). Retrieved from sba: <https://www.sba.gov/breakevenpointcalculator>