

**Individual assignment -Transformation, M coding and DAX (20 Marks)****Part 1: Power BI Transformation and M-Code**

1. Captured the current datetime in Power Query using Power BI M-Code.

The screenshot shows the Microsoft Power Query Editor interface. A query named "Current Datetime" is selected. The formula bar at the top contains the M code: `= Table.TransformColumnTypes(#"Renamed Columns",{{"Current Datetime", type datetime}})`. The preview pane below shows a single row with the value `2023-05-26 11:30:02 PM`. The right side of the screen displays the "Query Settings" pane, which includes fields for "Name" (set to "Q1_CurrentDate") and "All Properties". Below it, the "APPLIED STEPS" pane lists the steps taken: "currentDateTime", "Converted to Table", "Renamed Columns", and "Changed Type". The bottom of the screen shows the Windows taskbar with various pinned icons and the system tray.

BDAT 1010

Business Intelligence

2. Created ID1, ID2, and ID3 columns against Full Name as shown in the table below and populate the required value in Power Query using M-Code.

- ID1: Value starts from 0 and increments by 1.
- ID2: Value starts from 1 and increments by 1.
- ID3: Value starts from 0 and increments by 5.

Created a column using “Enter Data” option and populate the values mentioned in the table.

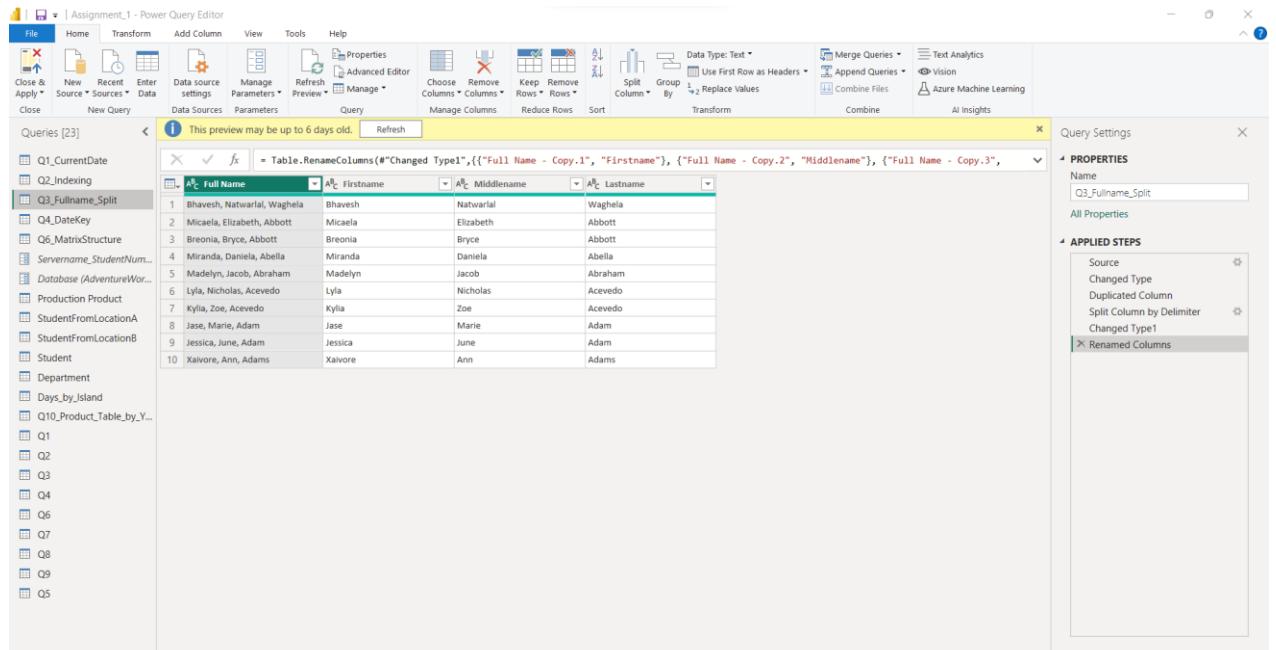
The screenshot shows the Microsoft Power Query Editor interface. On the left, the 'Queries [23]' pane lists various queries, with 'Q2_Indexing' selected. The main area displays a table with four columns: ID1, ID2, ID3, and Full Name. The table has 10 rows of data. The 'Query Settings' pane on the right shows the properties of the selected query, including the applied steps taken during the transformation process.

	ID1	ID2	ID3	Full Name
1	0	1	0	Bhavesh, Natwarlal, Waghela
2	1	2	5	Micaela, Elizabeth, Abbott
3	2	3	10	Breonia, Bryce, Abbott
4	3	4	15	Miranda, Daniela, Abella
5	4	5	20	Madelyn, Jacob, Abraham
6	5	6	25	Lyla, Nicholas, Acevedo
7	6	7	30	Kyila, Zoë, Acevedo
8	7	8	35	Jase, Marie, Adam
9	8	9	40	Jessica, June, Adam
10	9	10	45	Xaivore, Ann, Adams

BDAT 1010

Business Intelligence

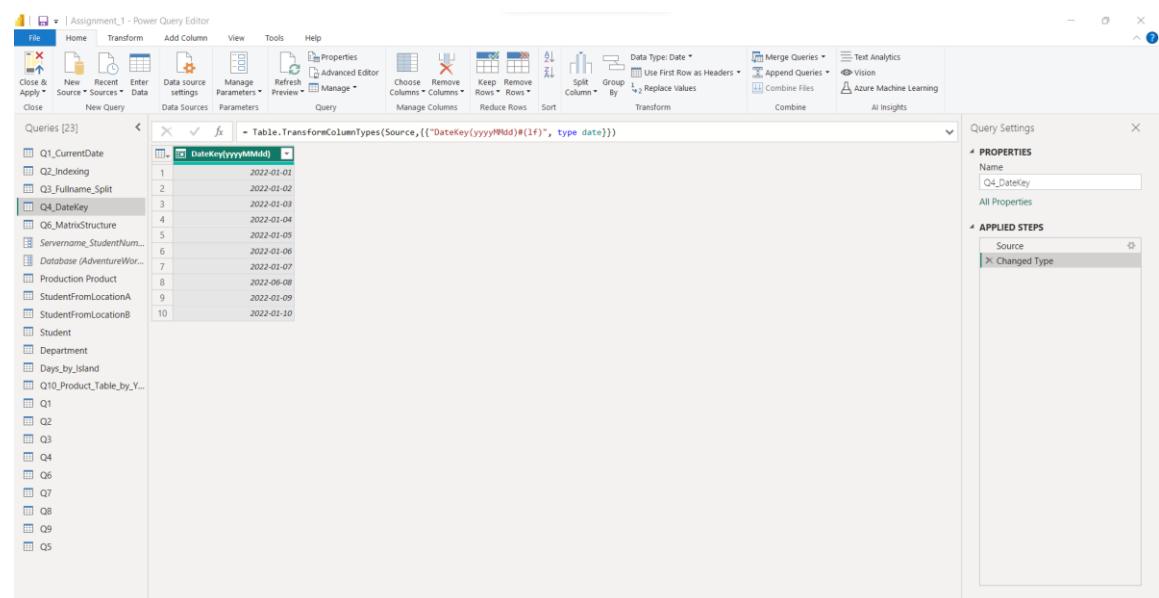
3. Extracted First Name, Middle Name, and Last Name from the “Full Name” column as mentioned below using Power Query. [Used Enter data to create the below table with a “FullName” column].



The screenshot shows the Microsoft Power Query Editor interface. The 'Q3_Fullname_Split' query is selected. The table preview shows four columns: 'Full Name', 'Firstname', 'Middlename', and 'Lastname'. The data consists of 10 rows of names, each split into its constituent parts. The 'Applied Steps' pane on the right shows the 'Renamed Columns' step.

Full Name	Firstname	Middlename	Lastname
Bhavesh, Natwarlal, Waghela	Bhavesh	Natwarlal	Waghela
Micaela, Elizabeth, Abbott	Micaela	Elizabeth	Abbott
Breonia, Bryce, Abbott	Breonia	Bryce	Abbott
Miranda, Daniela, Abella	Miranda	Daniela	Abella
Madelyn, Jacob, Abraham	Madelyn	Jacob	Abraham
Lyla, Nicholas, Acevedo	Lyla	Nicholas	Acevedo
Kylla, Zoe, Acevedo	Kylla	Zoe	Acevedo
Jase, Mario, Adam	Jase	Mario	Adam
Jessica, June, Adam	Jessica	June	Adam
Xaviore, Ann, Adams	Xaviore	Ann	Adams

4. Extracted Date from DateKey column present in the table below using Power Query.



The screenshot shows the Microsoft Power Query Editor interface. The 'Q4_DateKey' query is selected. The table preview shows a single column 'DateKey'. The data consists of 10 rows of dates from January 1, 2022, to January 10, 2022. The 'Applied Steps' pane on the right shows the 'Changed Type' step.

DateKey
2022-01-01
2022-01-02
2022-01-03
2022-01-04
2022-01-05
2022-01-06
2022-01-07
2022-01-08
2022-01-09
2022-01-10

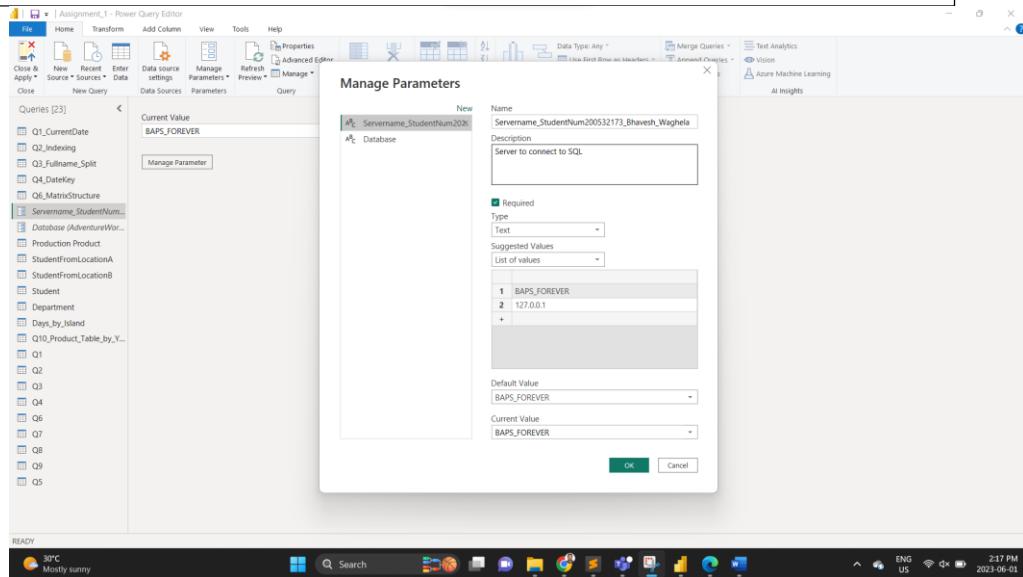
5. Created two parameters to input the Server and Database name and import the ‘Product’ table using Power Query.

Use the following configuration for the parameters-

- Parameter1: Servername_StudentNum#####_fName_lName
Local server as Localhost & 127.0.0.1

BDAT 1010

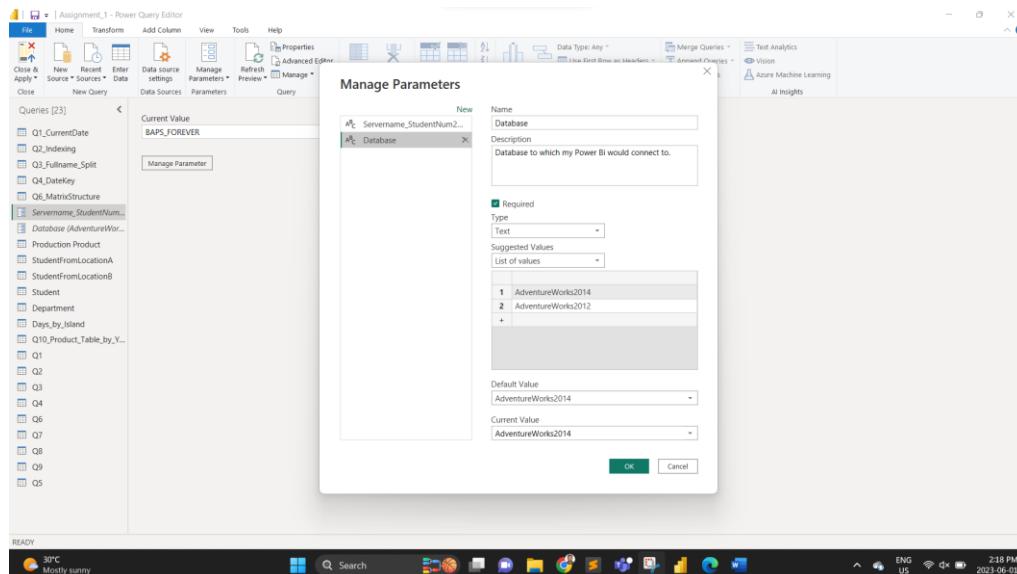
Business Intelligence



Parameter2: Database

Database as “AdventureWorks2014” & “AdventureWorks2012”

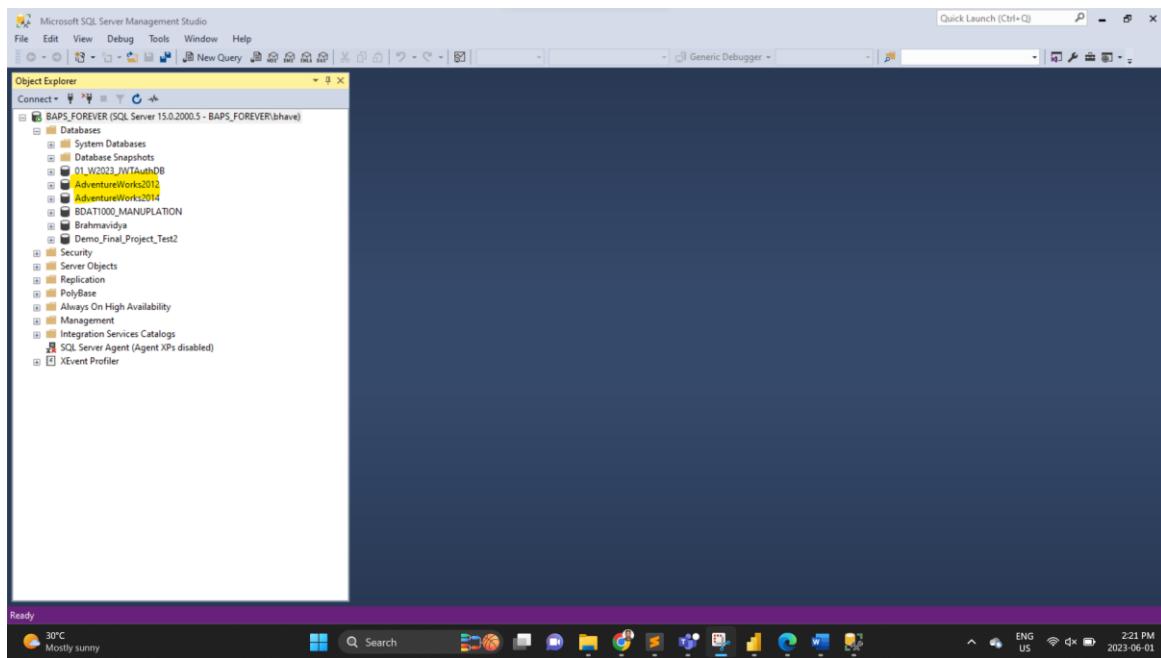
Once the parameter is created, I imported the mentioned table using MS SQL Server connector.



BDAT 1010

Business Intelligence

- Restored the mentioned database.



Referred to the below URL to download the database backup file,

After downloading the .bakfile - restored to the local SQL Server database.

- ✓ AdventureWorks2014: <https://github.com/Microsoft/sql-server-samples/releases/download/adventureworks/AdventureWorks2014.bak>
- ✓ AdventureWorks2012: <https://github.com/Microsoft/sql-server-samples/releases/download/adventureworks/AdventureWorks2012.bak>

6. Converted the below table to matrix structure (Expected output) using Power Query.Input Dataset: Expected Output:

Year	Month	Sales
2021	Jan	520
2021	Feb	360
2021	Mar	210
2021	Apr	320
2020	May	160
2020	Jun	963
2020	Jul	201
2020	Jan	302
2020	Feb	500
2020	Mar	450

Year	Jan	Feb	Mar	Apr	May	Jun	Jul
2020	302	500	450	null	160	963	201
2021	520	360	210	320	null	null	null

BDAT 1010

Business Intelligence

The screenshot shows the Power Query Editor interface. The main area displays a table with two rows and eight columns. The first column is 'Year' (containing 2020 and 2021), and the subsequent seven columns represent months from Jan to Jun. The second column is 'Month' (containing Jan through Jun). The third column is 'Sales' (containing values like 302, 500, etc.). The fourth column is 'Sales' (containing null values). The 'APPLIED STEPS' pane on the right shows the steps taken: 'Source', 'Changed Type', 'Split Column by Delimiter', 'Changed Type1', 'Promoted Headers', and 'Pivoted Column'. The status bar at the bottom indicates it was previewed on Saturday.

7. Combined all the records to “StudentFromLocationA” table with “StudentFromLocationB” table using Power Query.

I used Append Query to combine these two tables.

StudentFromLocationA and **StudentFromLocationB**

The screenshot shows the Power Query Editor interface. The main area displays a table with 10 rows and 5 columns. The columns are labeled ID, First Name, Last Name, DOB, and Department. The rows contain various student records. The 'APPLIED STEPS' pane on the right shows the 'Append Query' step. The status bar at the bottom indicates it was previewed on Saturday.

The screenshot shows the Power Query Editor interface. The main area displays a table with 5 rows and 5 columns. The columns are labeled ID, First Name, Last Name, DOB, and Department. The rows contain student records. The 'APPLIED STEPS' pane on the right shows the 'Changed Type' step. The status bar at the bottom indicates it was previewed on Saturday.

BDAT 1010

Business Intelligence

8. Merge all the records from the “Student” table with “Department” using Power Query. You can use Merge Query to combine these two tables. Here DepartmentID is a key column in both the tables.

I Used “Enter Data” option to create the below tables in Power BI.

The screenshot displays two separate Power Query Editor windows side-by-side. Both windows have a toolbar at the top with various options like File, Home, Transform, Add Column, View, Tools, and Help. The left window shows a 'Queries [23]' pane on the left with items like Q1_CurrentDate, Q2_Indexing, Q3_Fullname_Split, Q4_DateKey, Q5_MatchStructure, Servername_StudentNumber, Database_AdventureWorks, Production_Product, StudentFromLocationA, StudentFromLocationB, and Student. The main area shows a table with columns: First Name, Last Name, DOB, DepartmentID, Department.DepartmentID, and Department.Department Code. The right window also shows a 'Queries [23]' pane with similar items. Its main area shows a table with columns: DepartmentID, Department Code, and Department Name. A 'Query Settings' pane is open on the right of each window, showing properties like 'Name' and 'Applied Steps'.

9. Downloaded “2020-monthly-visitor-statistics.xlsx” file from the link given below. Load the “Days by Island” sheet in Power BI Desktop and apply PowerQuery transformation to extract a part of the data (highlighted in the dataset snapshot).

Note: Downloaded “2020-monthly-visitor-statistics.xlsx” file from the below URL:

<https://www.hawaiitourismauthority.org/media/7901/2020-monthly-visitor-statistics.xlsx>

BDAT 1010

Business Intelligence

The screenshot shows the Microsoft Power Query Editor interface. The ribbon at the top includes File, Home, Transform, Add Column, View, Tools, and Help. The main area displays a table titled "Table.RenameColumns(#"Removed Columns2", {"Count.Island Name", "Island Name"})". The table has three columns: Island Name, Count.Month, and Count.Number of Visitors. The data shows monthly visitor counts for various islands. The bottom right corner of the window shows "PREVIEW DOWNLOADED ON SATURDAY 24 PM 2023-06-01". The taskbar at the bottom shows the date as 2023-06-01 and the time as 24 PM.

Island Name	Count.Month	Count.Number of Visitors
O'ahu	JAN	3647907.708
O'ahu	FEB	3106258.146
O'ahu	MAR	1719456.871
O'ahu	APR	92973.58937
O'ahu	MAY	151462.3304
O'ahu	JUN	311721.242
O'ahu	JUL	356087.8897
O'ahu	AUG	455805.0307
O'ahu	SEP	3181215.1595
O'ahu	OCT	522326.8496
O'ahu	NOV	863617.8143
O'ahu	DEC	1243871.161
Maui	JAN	2197986.599
Maui	FEB	1962659.826
Maui	MAR	1057111.384
Maui	APR	13195.16138
Maui	MAY	31899.70806
Maui	JUN	54141.07623
Maui	JUL	62432.21006
Maui	AUG	66380.91736
Maui	SEP	87807.10345
Maui	OCT	313045.6564
Maui	NOV	712026.972
Maui	DEC	594709.7796
Moloka'i	JAN	35918.9785
Moloka'i	FEB	28029.3134
Moloka'i	MAR	14134.69645

10. Transformed the dataset using Power Query transformation.

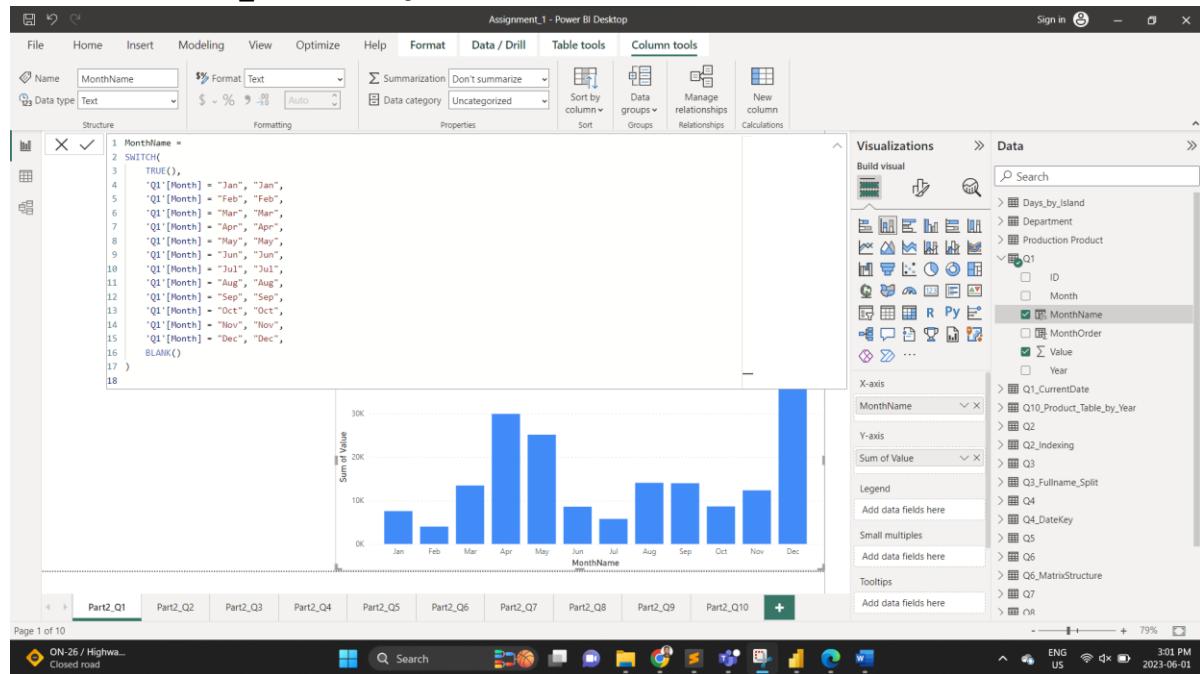
Used “Enter Data” option to create the table in Power BI.

The screenshot shows the Microsoft Power Query Editor interface. The ribbon at the top includes File, Home, Transform, Add Column, View, Tools, and Help. The main area displays a table titled "Table.ReorderColumns(#"Renamed Columns1", {"Year", "Product", "Month", "Sales"})". The table has four columns: Year, Product, Month, and Sales. The data shows monthly sales for different products across years. The bottom right corner of the window shows "PREVIEW DOWNLOADED AT 2:42 PM 2023-06-01". The taskbar at the bottom shows the date as 2023-06-01 and the time as 2:42 PM.

Year	Product	Month	Sales
2020	Technology	Jan	433.2
2020	Technology	Feb	435
2020	Technology	Mar	409.3
2020	Technology	Apr	377.6
2020	Technology	May	403.4
2020	Technology	Jun	471.8
2020	Technology	Jul	540.5
2020	Technology	Aug	485.5
2020	Technology	Sep	432.8
2020	Technology	Oct	442.7
2020	Technology	Nov	419.6
2020	Technology	Dec	532.8
2020	Office Supplies	Jan	255.4
2020	Office Supplies	Feb	229.1
2020	Office Supplies	Mar	230.7
2020	Office Supplies	Apr	209.2
2020	Office Supplies	May	226
2020	Office Supplies	Jun	260
2020	Office Supplies	Jul	272.1
2020	Office Supplies	Aug	243.6
2020	Office Supplies	Sep	183.4
2020	Office Supplies	Oct	234.1
2020	Office Supplies	Nov	197.8
2020	Office Supplies	Dec	260
2020	Furniture	Jan	2.6
2020	Furniture	Feb	2.1
2020	Furniture	Mar	1.9
2020	Furniture	Apr	2

Part 1: DAX

1. Sorted the month from Jan to Dec using Power BI DAX calculated column. [Used Q1 sheet from DAX_Data.xlsx file].



2. Captured the Values selected from the slicer, if nothing is selected then it displays "All".
Used cardvisuals to display the value. [Used Q2 sheet from DAX_Data.xlsx].

The screenshot shows the Power BI Desktop interface. On the left, there is a DAX formula editor with the following code:

```

1 Selected Values -
2 IF(ISFILTERED('Q2'[Category]),
3   CONCATENATEX(VALUES('Q2'[Category]), 'Q2'[Category], ", "),
4   "All"
5 )
6

```

In the center, there is a card visual with the text "Food, Electrical" and "Selected Values". On the right, the Data pane shows a hierarchy for the Q2 table, with "Selected Values" expanded to show "Value" and "Year". The status bar at the bottom indicates "Page 2 of 10" and "30°C Temps drop".

3. Used the DAX function to extract the Item name, Item ID, and Price from the "Item Description" column (which contains a combination of Item Name, Item ID, and price). [I Used Q3 sheet from DAX_Data.xlsx].

The screenshot shows the Power BI Desktop interface with two separate DAX formula editors.

Top Editor:

```

1 ItemName = LEFT(Q3[Items Description(Name.ID.Price)], FIND(".", Q3[Items Description(Name.ID.Price)])-1)

```

Bottom Editor:

```

1 ItemID = MID(Q3[Items Description(Name.ID.Price)], FIND(".", Q3[Items Description(Name.ID.Price)])+1, FIND(".", Q3[Items Description(Name.ID.Price)]+1) - FIND(".", Q3[Items Description(Name.ID.Price)])-1)

```

Both editors show a table view with columns: ID, ItemName, ItemID, and ItemPrice. The status bar at the bottom indicates "Page 3 of 10" and "CADUSD 0.9869".

BDAT 1010

Business Intelligence

The screenshot shows the Power BI Desktop interface with the title bar "Assignment_1 - Power BI Desktop". The ribbon menu includes File, Home, Insert, Modeling, View, Optimize, Help, Format, Data/Drill, Table tools, and Column tools. The Column tools tab is selected, showing a new column named "ItemPrice" with the formula: `=RIGHT('Q3'[Items Description(Name.ID.Price)], LEN('Q3'[Items Description(Name.ID.Price)]) - FIND(".", 'Q3'[Items Description(Name.ID.Price)]) + 1)`. Below the formula is a preview table with columns ID, ItemDescription, ItemName, ItemID, and ItemPrice, containing five rows of data. The Data pane on the right lists various tables and measures, including "Days_by_Island", "Department", "Production Product", "Q1", "Q1_CurrentDate", "Q10_Product_Table_by_Year", "Q2", "Q2_Indexing", "Q3", "Q3_Fullname_Split", "Q4", "Q4_DateKey", and "n1".

4. Added a DAX function to calculate sum of Budget cost where [Type] = Capex and [Period] =Total. [Used Q4 sheet from DAX_Data.xlsx].

The screenshot shows the Power BI Desktop interface with the title bar "Assignment_1 - Power BI Desktop". The ribbon menu includes File, Home, Insert, Modeling, View, Optimize, Help, Format, Data/Drill, Table tools, and Column tools. The Column tools tab is selected, showing a new column named "TotalCapexBudget" with the formula: `=CALCULATE(SUM('Q4'[Budgeted Cost]), 'Q4'[Type] = "Capex", 'Q4'[Period] = "Total")`. Below the formula is a visual element displaying the value "1747" with the text "Sum of TotalCapexBudget". The Data pane on the right lists various tables and measures, including "Days_by_Island", "Department", "Production Product", "Q1", "Q1_CurrentDate", "Q10_Product_Table_by_Year", "Q2", "Q2_Indexing", "Q3", "Q3_Fullname_Split", "Q4", "Q4_Budgeted_Cost", "Q4_DateKey", "Q5", "Q6", "Q7", "Q8", "Q9", and "Q10".

5. Calculated the MAX of the number after multiplying with a constant value then calculate the MAX of those columns using MAX inside MAX to get MaxVal.

Note: S, M, W, and V are the column name. And M_Cal, W_Cal, and V_Cal are the calculated columns [Used Q5 sheet from DAX_Data.xlsx and made some transformation to get proper input].

S	M_Cal	W_Cal	V_Cal	MaxVal
1	26,250.00	500	19800	26,250.00
2	17,500.00	60000	660	60,000.00
3	21,875.00	284000	99000	284,000.00
4	8,750.00	4200	118800	118,800.00
5	17,500.00	40250	79200	79,200.00

6. The table is having item name column, add two columns based on the following value, 1st column contains a value based on the distinct item and 2nd column contains a value based on the item by skipping the row if there is a tie as shown in the screenshot below. [Use Q6 sheet from DAX_Data.xlsx].

See documentation on RankX function -

ties

(Optional) An enumeration that defines how to determine ranking when there are ties.

enumeration	Description
Skip	The next rank value, after a tie, is the rank value of the tie plus the count of tied values. For example if five (5) values are tied with a rank of 11 then the next value will receive a rank of 16 (11 + 5). This is the default value when <i>ties</i> parameter is omitted.
Dense	The next rank value, after a tie, is the next rank value. For example if five (5) values are tied with a rank of 11 then the next value will receive a rank of 12.

BDAT 1010

Business Intelligence

The screenshot shows two separate Power BI Desktop windows side-by-side. Both windows have the same layout: a ribbon at the top with 'Assignment_1 - Power BI Desktop' selected, followed by 'File', 'Home', 'Insert', 'Modeling', 'View', 'Optimize', 'Help', 'Format', 'Data / Drill', and 'Table tools'. Below the ribbon is a toolbar with various icons for data manipulation. The main area contains a data grid table.

Top Window:

- Calculated Column:** `1 ID1 = RANKX(ALL(Q6[Item Name]), Q6[Item Name], ASC, Dense)`
- Data Grid:** Shows a table with columns 'Item ID', 'Item Name', 'ID1', and 'ID2'. The data is:

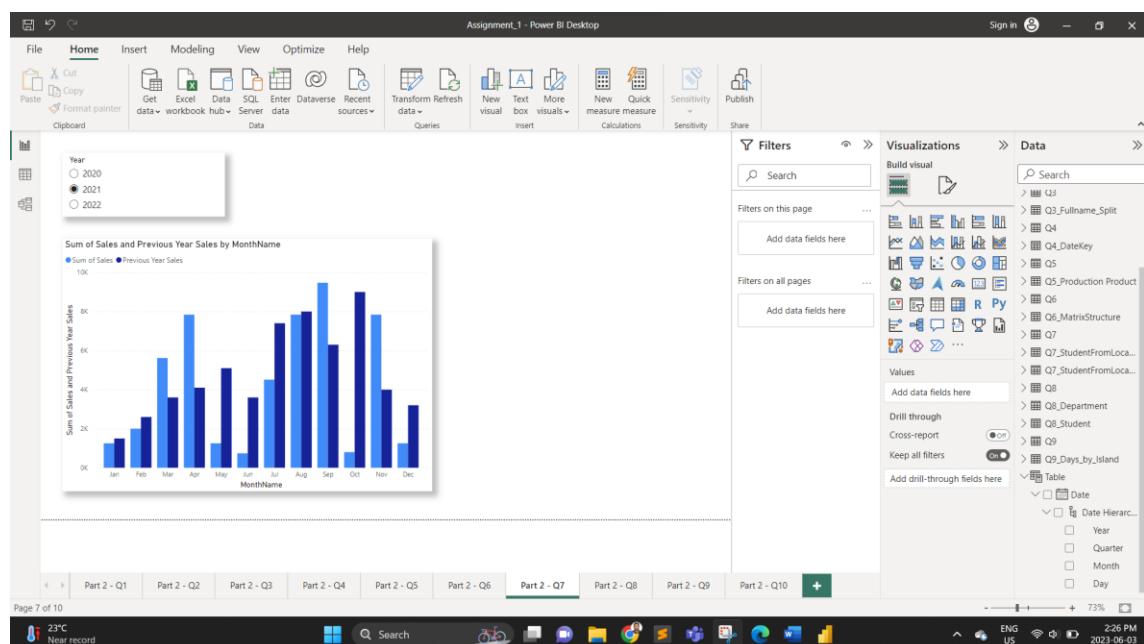
Item ID	Item Name	ID1	ID2
1	Apple	1	1
2	Apple	1	1
3	Banana	2	3
4	Banana	2	3
5	Candy	3	5
6	Candy	3	5
7	Candy	3	5

Bottom Window:

- Calculated Column:** `1 ID2 = RANKX(Q6, COUNTROWS(FILTER(Q6, [Item Name] >= EARLIER([Item Name]))))`
- Data Grid:** Shows a table with columns 'Item ID', 'Item Name', 'ID1', and 'ID2'. The data is:

Item ID	Item Name	ID1	ID2
1	Apple	1	1
2	Apple	1	1
3	Banana	2	3
4	Banana	2	3
5	Candy	3	5
6	Candy	3	5
7	Candy	3	5

7. Created a bar graph to shown previous year and present year sales month onmonth basis. [Use Q7 sheet from DAX_Data.xlsx].



BDAT 1010

Business Intelligence

8. Added a DAX function to create a filter (Region= "South") set of rows from an existing table to a new table as shown in the snapshot below.

Did some transformation to remove the empty columns. [Used Q8 sheet from DAX_Data.xlsx].

The screenshot shows the Power BI Desktop interface. In the top ribbon, the 'Table tools' tab is selected. A new table named 'Q8_FilteredRegion' has been created, indicated by the checkmark icon. The table contains 14 rows of data with columns: ID, State, Region, and Sales. The formula bar at the top shows the DAX formula: `1 Q8_FilteredRegion = FILTER(Q8, Q8[Region] = "South")`. The Data pane on the right lists various tables and their fields, including Q8_FilteredRegion, which is currently selected.

The screenshot shows the Power BI Desktop interface with a report page open. A table visual is displayed with the following data:

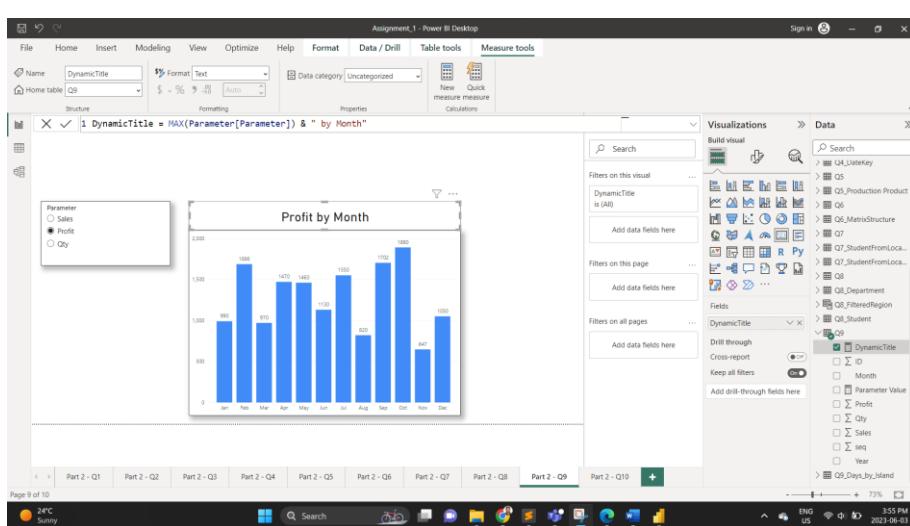
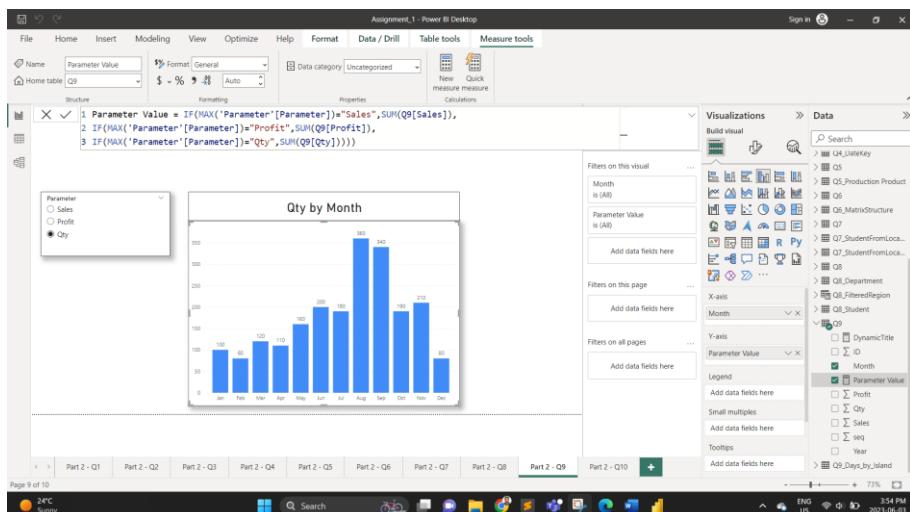
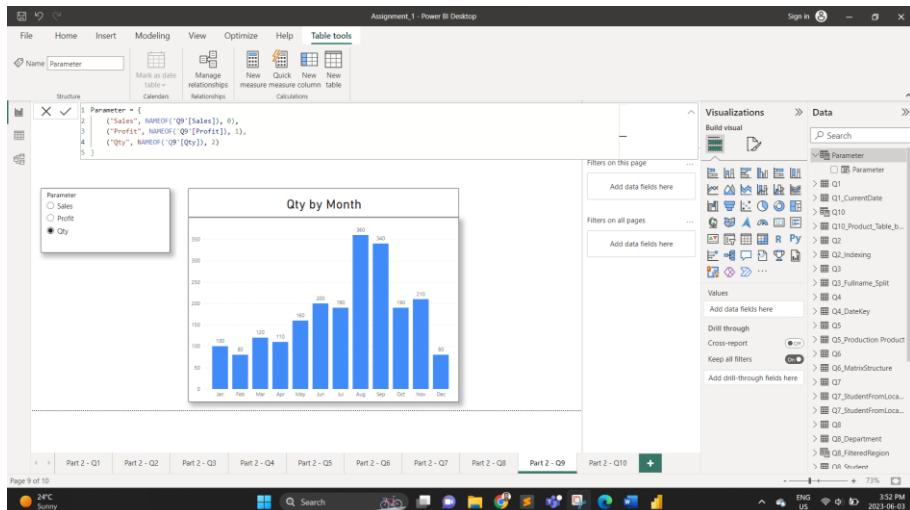
ID	Region	State	Sales
1	South	Brighton and Hove	1,500.00
2	South	Milton Keynes	2,600.00
3	South	Southampton	3,600.00
4	South	Portsmouth	4,100.00
5	South	Slough	5,100.00
6	South	Reading	3,600.00
7	South	Oxford	7,400.00
8	South	High Wycombe	8,000.00
9	South	Basingstoke	6,300.00
10	South	Maidstone	9,000.00
11	South	Crawley	4,000.00
12	South	Worthing	3,200.00
13	South	Gillingham	1,253.00
14	South	Eastbourne	2,000.00
Total			61,653.00

The 'Filters' pane on the right shows filters applied to the table: ID is (All), Region is (All), Sales is (All), and State is (All). The 'Visualizations' pane shows various chart and report options available for this table.

BDAT 1010

Business Intelligence

9. Created a bar graph as shown below with swapping axis as profit, sales, or quantity on a parameter(slicer). [Used Q9 sheet from DAX_Data.xlsx].



BDAT 1010

Business Intelligence

10. Generated a calendar table that has the following

columns using DAX function.

Date: containing a date value

DateKey: containing a date in integer format, ex- 26-05-2022 → 20220626

Year: containing a year value from date

MonthNo: containing a month number from date

MonthName: containing month name from date

Day: containing day from date

Quarter: containing quarter from date

WeekNo: containing week no from date

WeekDay: containing week day from day

The screenshot shows the Power BI Desktop interface with the 'Table tools' ribbon selected. A code editor window displays the DAX formula for generating the calendar table:

```
Q10 = ADDCOLUMNS (
    CALENDAR (DATE(2022, 1, 1), DATE(2022, 12, 31)),
    "DateKey", FORMAT ([Date], "YYYYMMDD"),
    "Year", YEAR ([Date]),
    "MonthNo", MONTH ([Date]),
    "MonthName", FORMAT ([Date], "MMM"),
    "Day", DAY ([Date]),
    "Quarter", CEILING (MONTH ([Date]) / 3, 1),
    "WeekNo", WEEKNUM ([Date], 1),
    "WeekDay", WEEKDAY ([Date], 1)
)
```

The main area shows a preview of the 'Q10' table with 365 rows, displaying columns: Date, DateKey, Year, MonthNo, MonthName, Day, Quarter, WeekNo, WeekDay. The data spans from 01-07-2022 to 31-12-2022. The Power BI Data pane on the right shows the structure of the Q10 table, including relationships to other datasets like Q1, Q2, Q3, Q4, Q5, and Q6.

The screenshot shows the Power BI Desktop interface with the 'Home' ribbon selected. The 'Q10' table is visible in the data view. The 'Visualizations' pane on the right shows various chart and report options. The 'Data' pane on the far right lists all tables and measures in the model, including Q1, Q2, Q3, Q4, Q5, Q6, and Q10.

BDAT 1010

Business Intelligence