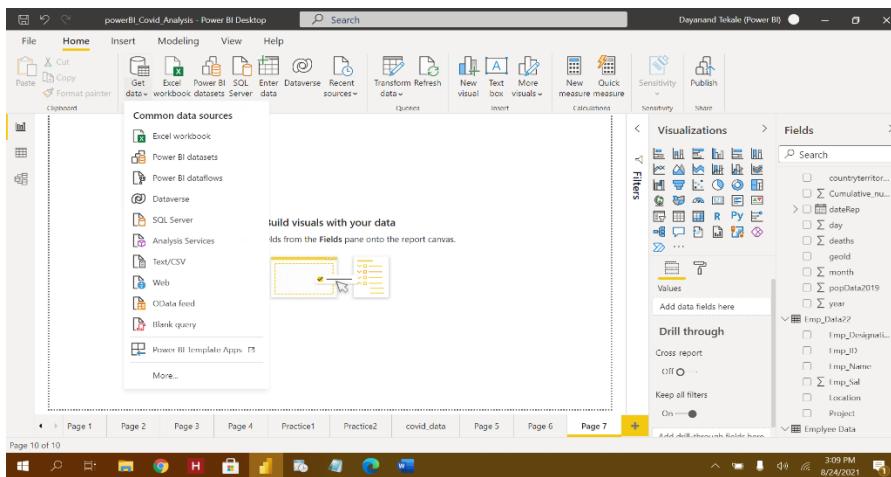
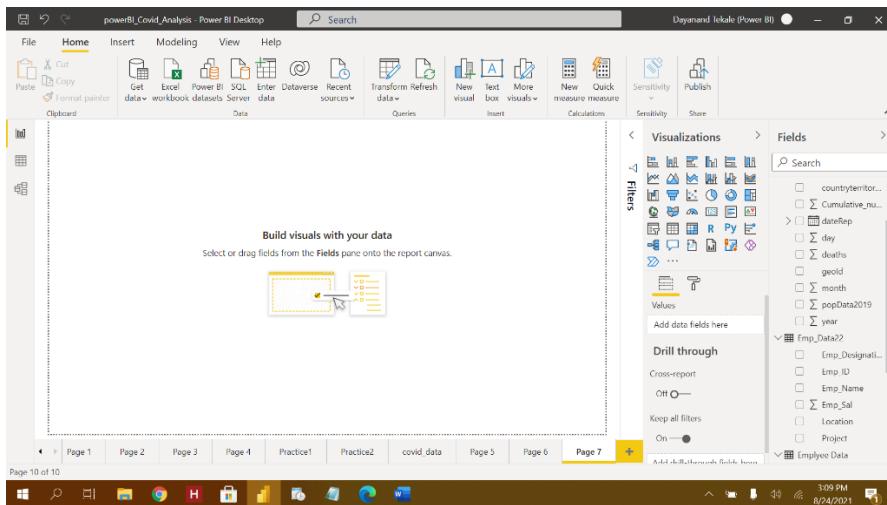


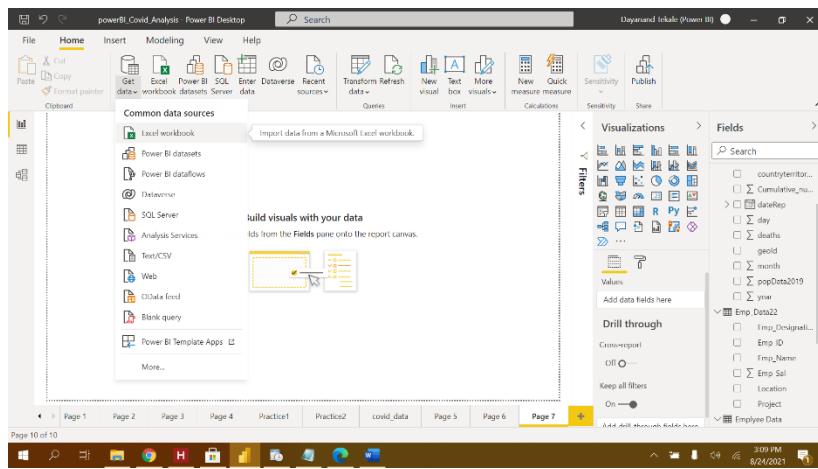
**Dayanand Shivraj Tekale**

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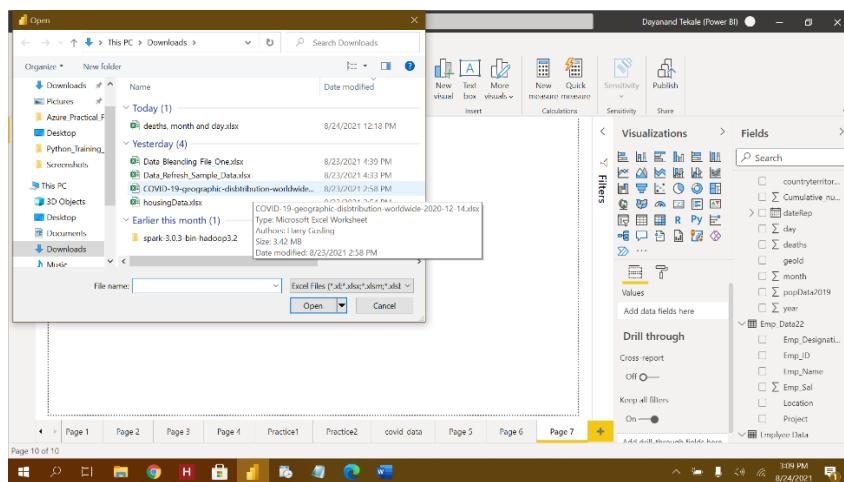
**Que1. Create Dashboard (create various visualizations) By using Covid Data and publish, attach all the screenshots****Answer:**

- Go to Azure Portal
- Log in
- And Go to Home
- Click on Get Data

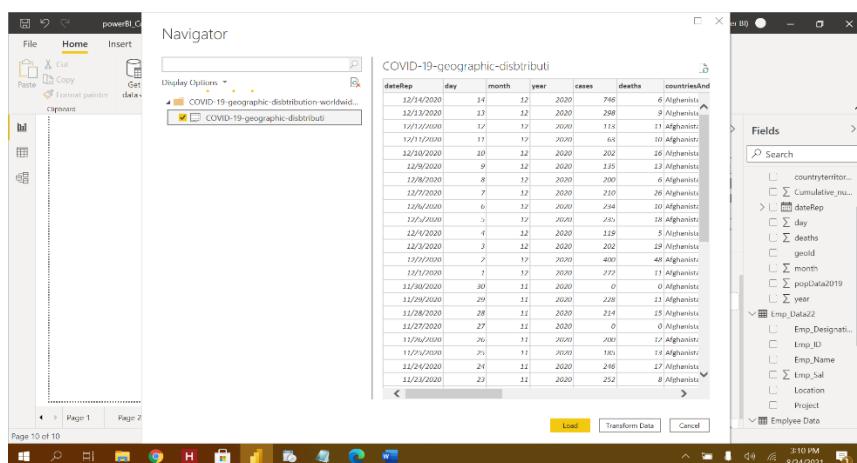




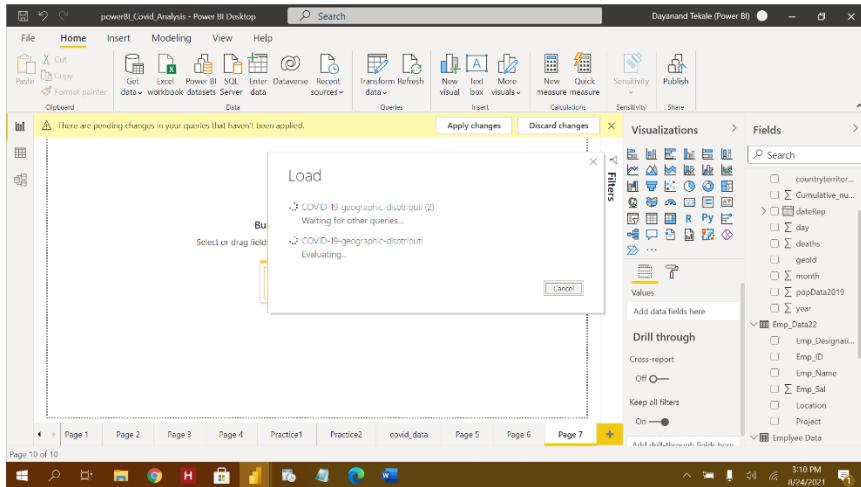
## -Upload Data Sheet



## -Load Data

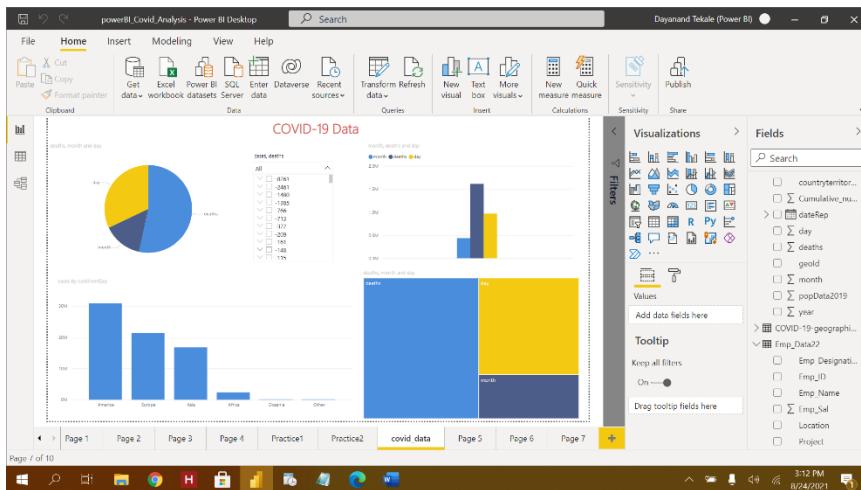


-Right Side We can See Data



-Visualization Tool

-With the Help of Visualization Drag and Drop the required tables on Visualization Sheet.

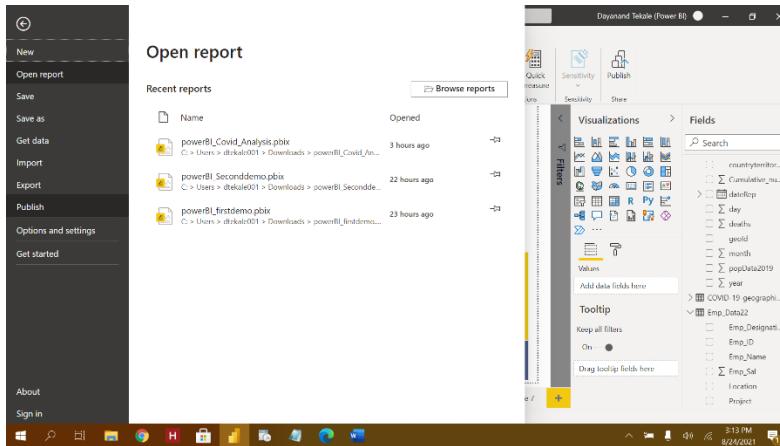


-This is The Dashboard For Covid Data Set

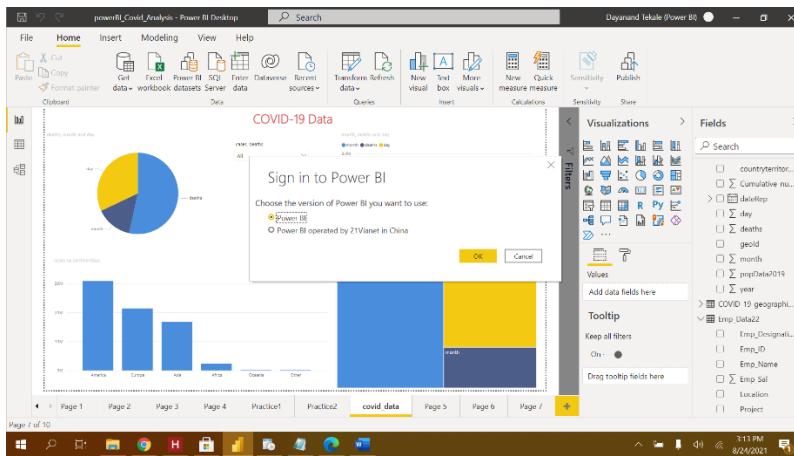
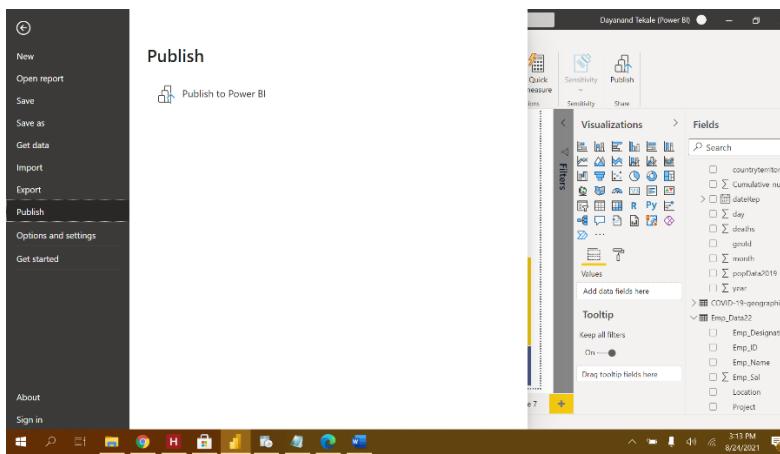
-Here Visualize properly And It is the Visualization Part

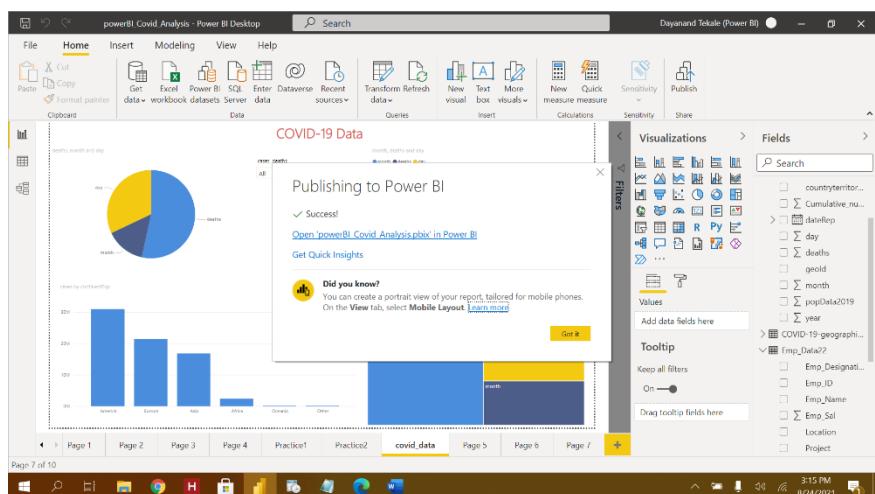
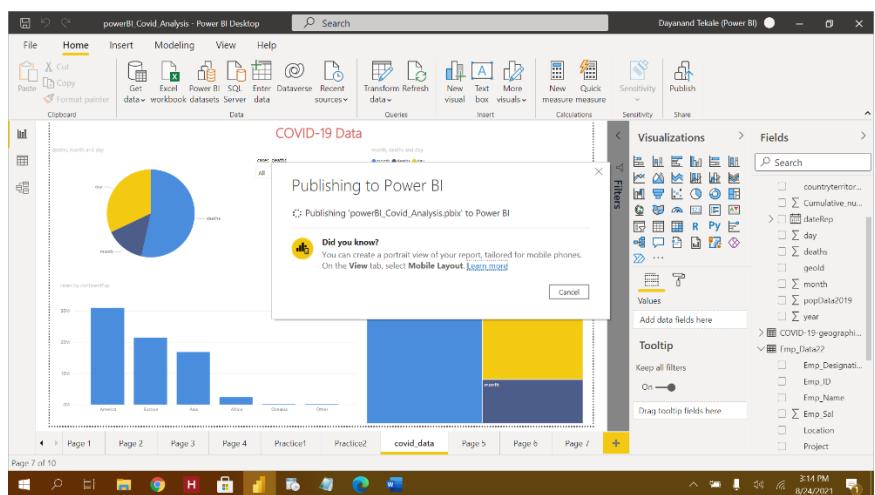
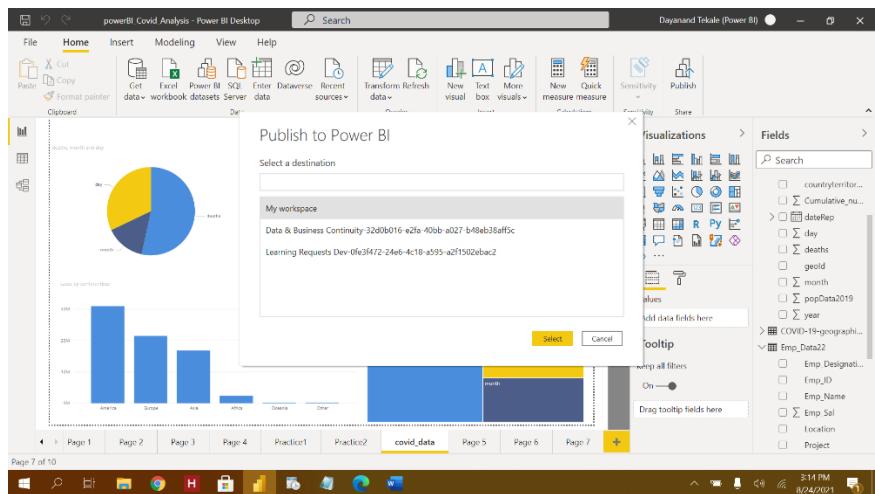
-For Publish:

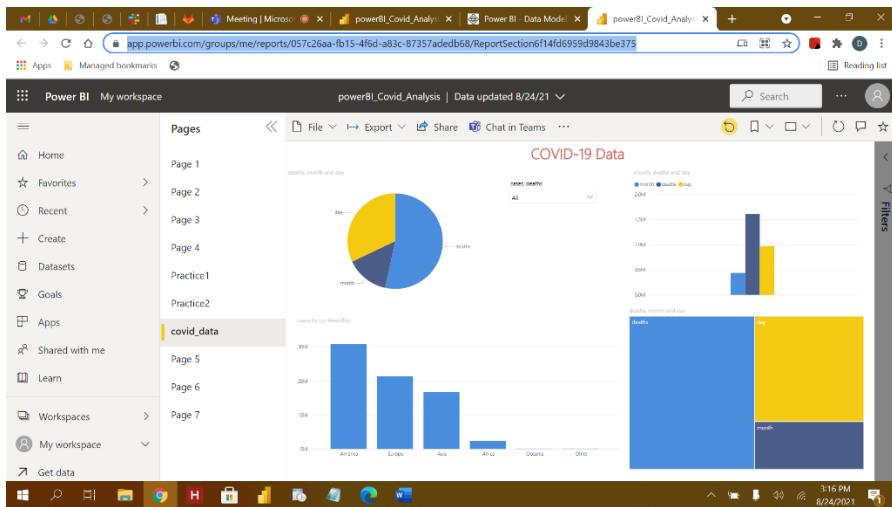
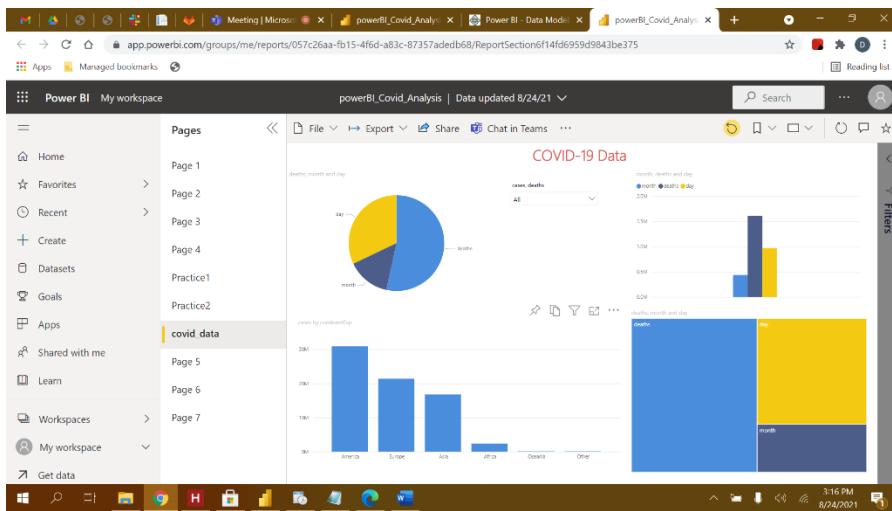
-Go to File



## -Select Publish







-This file is in Online Power BI Desktop

-We can open With the help of URL

**Que2. Explain the Data modelling and show how to establish the relationship between one to many and one to one , attach all the screenshots**

**Answer:**

-Data modeling is the process of creating a visual representation of either a whole information system or parts of it to communicate connections between data points and structures. The goal is to illustrate the types of data used and stored within the system, the relationships among these data types, the ways the data can be grouped and organized and its formats and attributes.

-Data models are built around business needs. Rules and requirements are defined upfront through feedback from business stakeholders so they can be incorporated into the design of a new system or adapted in the iteration of an existing one.

-Data can be modeled at various levels of abstraction. The process begins by collecting information about business requirements from stakeholders and end users. These business rules are then translated into data structures to formulate a concrete database design. A data model can be compared to a roadmap, an architect's blueprint or any formal diagram that facilitates a deeper understanding of what is being designed.

-Data modeling employs standardized schemas and formal techniques. This provides a common, consistent, and predictable way of defining and managing data resources across an organization, or even beyond.

-Ideally, data models are living documents that evolve along with changing business needs. They play an important role in supporting business processes and planning IT architecture and strategy. Data models can be shared with vendors, partners, and/or industry peers.

**- Established the relationship between one to many and one to one**

-With The help Of Data We can perform Some operation

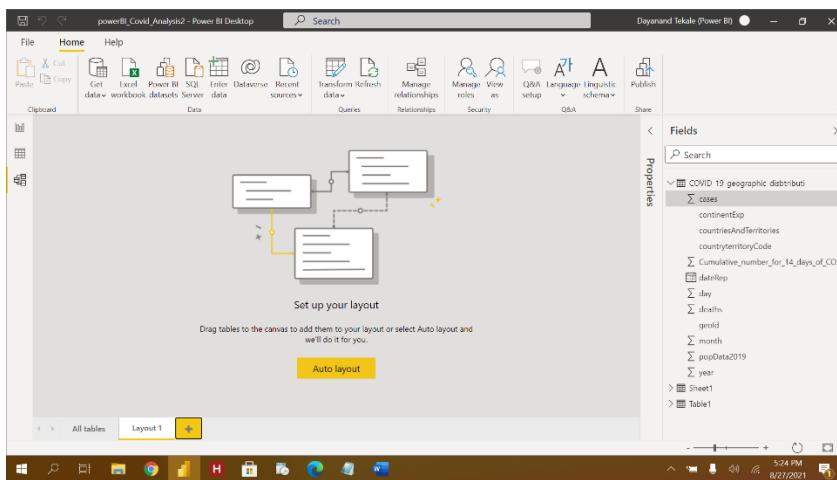
-Go to Home

-Select Get Data

-Upload Data

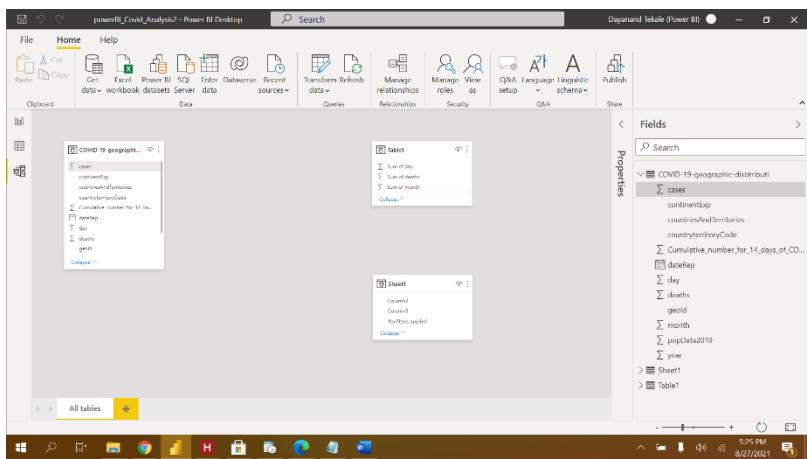
-Go to Data (Right side having 3rd Option)

-And from here we can perform some operations with the help of Data sheet



-Right Side we can able to see the Data Uploaded Successfully

-Then Drag And Drop Tables/Sheet

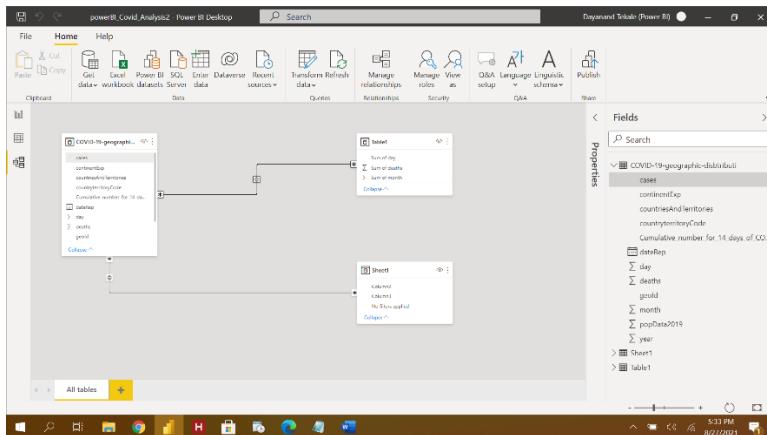
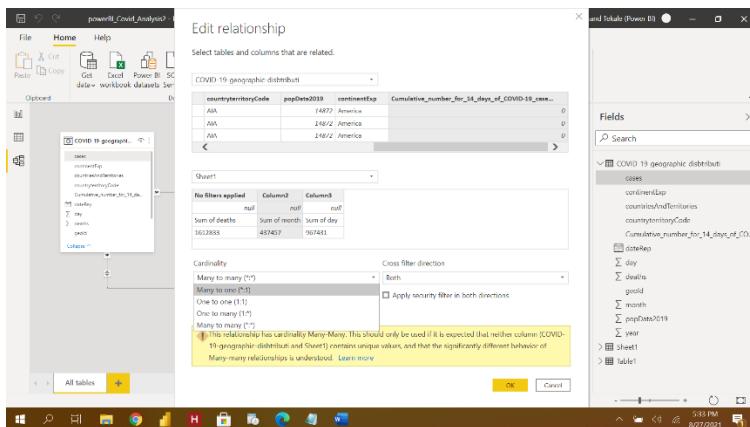


-After That Just Drag and Drop the Columns from one table to Another Table

-We can see the properties From Here we can Select

--One to One

--Many to Many



**Que3. Explain DAX with an example and calculate minimum 5 diffrent calculations and attach the screenshots**

**Answer:**

-Data Analysis Expressions (DAX) is a formula expression language used in Analysis Services, Power BI, and Power Pivot in Excel. DAX formulas include functions, operators, and values to perform advanced calculations and queries on data in related tables and columns in tabular data models.

-Important concepts in DAX. It describes DAX as it applies to all the products that use it. Some functionality may not apply to certain products or use cases.

-The sample model does not contain any DAX formulas. It does however support hundreds or even thousands of potential calculation formulas and queries. Some function examples, like those in CALCULATE, DATESBETWEEN, DATESIN PERIOD, IF, and LOOKUPVALUE can be added to the sample model without modification

-Measures are dynamic calculation formulas where the results change depending on context. Measures are used in reporting that support combining and filtering model data by using multiple attributes such as a Power BI report or Excel PivotTable or PivotChart.

-Measures are created by using the DAX formula bar in the model designer.

-A formula in a measure can use standard aggregation functions automatically created by using the Auto sum feature, such as COUNT or SUM, or you can define your own formula by using the DAX formula bar. Named measures can be passed as an argument to other measures.

-When we define a formula for a measure in the formula bar, a Tooltip feature shows a preview of what the results would be for the total in the current context, but otherwise the results are not immediately output anywhere.

-The reason we cannot see the (filtered) results of the calculation immediately is because the result of a measure cannot be determined without context.

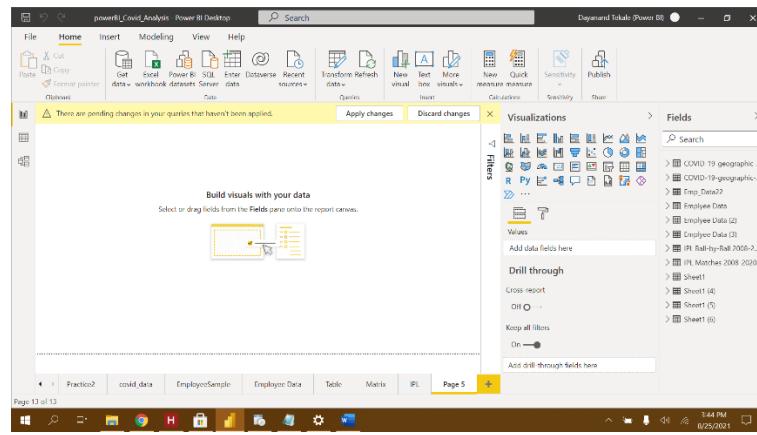
-To evaluate a measure requires a reporting client application that can provide the context needed to retrieve the data relevant to each cell and then evaluate the expression for each cell. That client might be an Excel PivotTable or PivotChart, a Power

BI report, or a table expression in a DAX query in SQL Server Management Studio (SSMS).

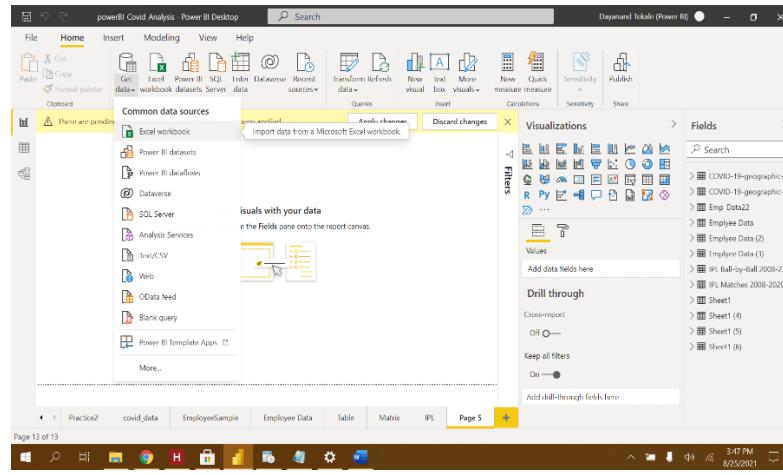
-Regardless of the client, a separate query is run for each cell in the results. That is to say, each combination of row and column headers in a PivotTable, or each selection of slicers and filters in a Power BI report, generates a different subset of data over which the measure is calculated.

## -5 diffrent calculations

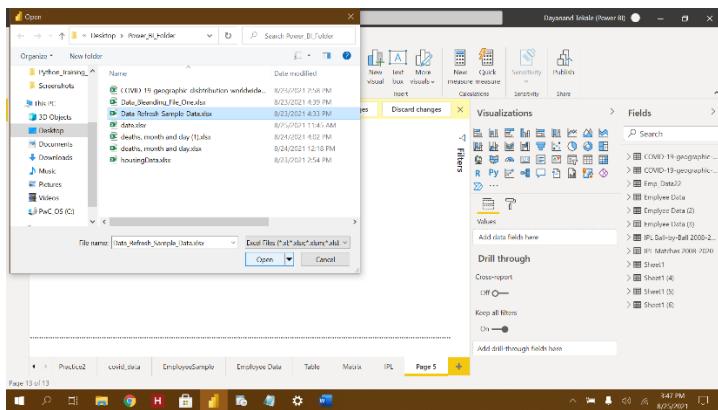
-Go to portal



-Get Data



-Select Data From The File



## -Load Data

Ship Mode	Profit	Unit Price	Shipping Cost	Customer Name
Delivery Truck	517.61	209.31	68.00	Kathy French
Regular Air	46.20%	8.67	2.00	Kathy French
Regular Air	1138.91	130.99	2.99	Wayne E. Holt
Regular Air	4.71%	5.38	2.00	Claudia Miers
Regular Air	26.40%	14.80	1.00	Lucio Butina
Regular Air	21.5	12.74	2.00	Patricia Reichert
Delivery Truck	440.77	101.98	56.22	Sylvia Fonsiero
Regular Air	-102.01%	101.99	6.00	Sylvia Fonsiero
Regular Air	11.02%	55.20	5.20	Jim Padberg
Regular Air	313.62	130.99	8.99	Jim Padberg
Regular Air	20.80%	130.99	8.99	Carsten Hoffmeyer
Regular Air	5.57	4.71	0.75	Patricia Sauer
Regular Air	-17.80%	15.99	1.13	Factoring
Regular Air	144.35	4.85	4.05	Factoring
Regular Air	5.2	2.00	0.75	Five Miles
Regular Air	272.06	63.26	2.00	Five Miles
Delivery Truck	1040.00	25.00	42.00	Jakob Juhani Wihuri
Regular Air	-28.21%	1.89	0.05	Lauren Bernice
Delivery Truck	80.44	121.99	26.00	Lauren Bernice
Regular Air	118.50	503.98	5.20	Regina Bechtel
Delivery Truck	3104.22	503.99	26.00	Regina Bechtel

## -Drag and Drop the calculated File on dashboard

-Go to Modelling

-Quick Measure

1. For Minimum Column Price

-See On Data Sheet Column Is Added Now Successfully

-With The Help Of Formulae We can Calculate the Fields

-Here We can able to see the all calculated Fields

The screenshot shows the Power BI Desktop interface. The ribbon at the top includes File, Home, Insert, Modeling, View, Help, Format, Data / Drill, and Table tools. A search bar is located at the top center. The main area displays a table with columns: Customer Name, Profit, Flt Shpg Mode, Shipping Cost, Unit Price, and Unit Cost. The table contains several rows of flight data. On the right side, there are several toolbars: Column tools, Visualizations, Fields, and Filters. The Fields toolbar lists various data types and relationships. The Filters toolbar includes a search field and sliders for text size and image height. The status bar at the bottom shows the page number (Page 5) and the time (1:51 PM).

The screenshot shows the Power BI Desktop interface with the following details:

- File, Home, Help, Table tools, Column tools** are visible in the top ribbon.
- Search bar** at the top right.
- Column tools pane** on the right side, containing sections for Name, Data type (Whole number), Format (\$ %), Summarization (Sum), Data category (Uncategorized), Sort by column, Data groups, Manage relationships, New column, Pending changes, Apply changes, Discard changes, and Fields.
- Table structure pane** below the column tools, showing the schema of the table.
- Table content pane** displaying a large dataset with columns: r\_for\_14\_days\_of\_COVID-19\_cause\_d, min\_Column\_Price, min\_Column\_Price, MIN(Column\_Profit), Shaping, Max\_Column, Shipping\_Max, Column, Count\_Column, Sum\_Col1, min\_Column\_Price, and a value column.
- Message bar**: "Here are pending changes in your query that haven't been applied."
- Fields pane** on the right, listing various columns and their properties.

## 2. For Shipping Maximum Column

### 3. For Shipping Minimum Column

powerBI Covid Analysis Power BI desktop

Search

File Home Insert Modeling View Help Format Data / Drill Table tools Column tools

Name Shipping Max Col... Data type: Number

Summarization: Sum Data category: Unratepointed

Sort by column Sort by group Manage relationships New column

Properties

Formatting

There are pending changes in your queries that haven't been applied.

Apply changes Discard changes

Visualizations Fields

Filters

Search

Customer Name Profit Ship Mode Shipping Cost Unit Price

Customer Name	Profit	Ship Mode	Shipping Cost	Unit Price
Carlo Sotiro	0.75	4.71		
Carlo Sotiro	-4.71	Regular Air	2.45	
Carlo Sotiro	11.00	Regular Air	3.98	104.88
Don Miller	0.75	Regular Air	0.70	2.88
Edward Hoovers	3,624.27	Delivery Truck	26.00	500.98
Eugene Barchis	80.11	Delivery Truck	20.00	1203.08
Eugene Barchis	117.33	Regular Air	12.77	504.87
Jack Gorza	23.02	Regular Air	1.99	40.96
Jim Rosewood	301.95	Delivery Truck	42.50	231.98
Jake Karpowicz	-1,040.00	Delivery Truck	4.55	105.05
Mohammed MacIntyre	21.25	Regular Air	25.00	24.94
Nicola Schreider	72.07	Regular Air	3.04	18.89
Sylvia Foufoumane	440.72	Delivery Truck	26.22	100.98
Sylvia Foufoumane	-491.04	Regular Air	69.00	100.98
Total	4,207.27		392.01	2,232.53

Page 5

- For Maximum Shipping for Another Column Price

#### 4. For SUM Column

The screenshot shows the Power BI Desktop interface. The ribbon at the top has tabs for File, Home, Insert, Modeling, View, Help, Format, Data / Drill, Table tools, and Column tools. The Column tools tab is currently selected. A message box in the center says "There are pending changes in your queries that haven't been applied." Below it are buttons for "Apply changes" and "Discard changes". To the right, there's a "Visualizations" pane with icons for different chart types and a "Fields" pane showing a tree view of columns: Sheet1, SALARY, Employee Data (2), Employee Data (3), IPL.Ball by Bell 2000-2020, and IPL Matches 2000-2020. The main area displays a data grid with columns: Customer Name, Profile, Ship Mode, Shipping Cost, Unit Price. The data includes rows for various customers like Carlos Colomos, Claudia Minter, and Edward Hooks, with details such as shipping mode (Regular Air or Truck), shipping cost, and unit price.

### 5. For Sum of column Profit

powerBI.Covid.Analysis Power BI Desktop

File Home Help Table tools Column tools

Search

Name: For SUM\_Colum... Data type: Decimal numbers

Summarization: Sum Data category: Unaggregated Sort by column: Sort Data groups: Groups Management relationships: Relationships New column Calculations

There are pending changes in your query that haven't been applied.

Apply changes Discard changes Fields

MIN\_PROFIT

Shipping\_Max

Count\_Column

Sum\_Colulm

min\_Column\_Price

Shipping\_Max\_Column

For\_SUM\_Colum...

1 hr\_Sum\_Column

Shipping

Max\_Column

Shipping\_Max

Count\_Column

Sum\_Colulm

min\_Column\_Price

Shipping\_Max\_Column

For\_SUM\_Colum...

1 hr\_Sum\_Column

Shipping

Max\_Column

Shipping\_Max

Count\_Column

Sum\_Colulm

min\_Column\_Price

Shipping\_Max\_Column

For\_SUM\_Colum...

COVID-19-geographic-distribution (61,800 rows) Columns: For\_SUM\_Colum... [1 distinct values]

-This is All About we can calculate the fields

**Que4. Explain power BI Architecture in detail.**

## Answer:

-Power BI is a technology-driven Business Intelligence tool provided by Microsoft for analyzing and visualizing raw data to present actionable information. It combines business analytics, data visualization, and best practices that help an organization to make data-driven decisions.

-In February 2019, Gartner confirmed Microsoft as Leader in the "2019 Gartner Magic Quadrant for Analytics and Business Intelligence Platform" as a result of the capabilities of the Power BI platform.

- Power BI is a business analytics service provided by Microsoft that lets you visualize your data and share insights. It converts data from different sources to build interactive dashboards and Business Intelligence reports.

- Following are the reasons why Power BI is so popular and needed in the BI domain.

-Access to Volumes of Data from Multiple Sources

-Power BI can access vast volumes of data from multiple sources. It allows you to view, analyze, and visualize vast quantities of Data that cannot be opened in Excel. Some of the important data sources available for Power BI are Excel, CSV, XML, JSON, pdf, etc. Power BI uses powerful compression algorithms to import and cache the data within the.PBIX file.

-Interactive UI/UX Features

-Power BI makes things visually appealing. It has an easy drag and drops functionality, with features that allow you to copy all formatting across similar visualizations.

- Exceptional Excel Integration

-Power BI helps to gather, analyze, publish, and share Excel business data. Anyone familiar with Office 365 can easily connect Excel queries, data models, and reports to Power BI Dashboards.

-Accelerate Big Data Preparation with Azure

-Using Power BI with Azure allows you to analyze and share massive volumes of data. An azure data lake can reduce the time it takes to get insights and increase collaboration between business analysts, data engineers, and data scientists.

-Turn Insights into Action

-Power BI allows you to gain insights from data and turn those insights into actions to make data-driven business decisions.

-Real-time Stream Analytics

-Power BI will enable you to perform real-time stream analytics. It helps you fetch data from multiple sensors and social media sources to get access to real-time analytics, so you are always ready to make business decisions.

- Power BI architecture is a service built on top of Azure. There are multiple data sources that Power BI can connect to.

-Power BI Desktop allows you to create reports and data visualizations on the dataset. Power BI gateway is connected to on- premise data sources to get continuous data for reporting and analytics.

-Power BI services refer to the cloud services that are used to publish Power BI reports and data visualizations. Using Power BI mobile apps, we can stay connected to their data from anywhere. Power BI apps are available for Windows, iOS, and Android platforms.

## **Que5. What are the powerBI services**

### **Answer:**

-Power BI service is the Software as a Service (SaaS) part of Power BI. It is also known as Power BI Online. To access Power BI Service, you need to log in to Power BI Service.

-Power BI Dashboard is a single page visualization to tell a story. The visualizations on a dashboard are generated from reports, and each report is based on one dataset. A single page dashboard is known as a Canvas. Below is a Finance Dashboard published on Power BI Service.

-Power BI allows you to create different reports on Power BI Desktop. These reports can be published on the Power BI dashboard using the Power BI service. A Power BI report created on Power BI Desktop can be published on to Power BI Service by clicking on the Publish button.

#### **- Power Query**

-Power Query is the data transformation and mash up the engine. It enables you to discover, connect, combine, and refine data sources to meet your analysis need. It can be downloaded as an add-in for Excel or can be used as part of the Power BI Desktop.

#### **-Power Pivot**

-Power Pivot is a data modeling technique that lets you create data models, establish relationships, and create calculations. It uses Data Analysis Expression (DAX) language to model simple and complex data.

#### **-Power View**

-Power View is a technology that is available in Excel, Sharepoint, SQL Server, and Power BI. It lets you create interactive charts, graphs, maps, and other visuals that bring your data to life. It can connect to data sources and filter data for each data visualization element or the entire report.

#### **-Power Map**

-Microsoft's Power Map for Excel and Power BI is a 3-D data visualization tool that lets you map your data and plot more than a million rows of data visually on Bing maps in 3-D format from an Excel table or Data Model in Excel. Power Map works with Bing maps to get the best visualization based on latitude, longitude, or country, state, city, and street address information.

#### **-Power BI Desktop**

-Power BI Desktop is a development tool for Power Query, Power Pivot, and Power View. With Power BI Desktop, you have everything under the same solution, and it is easier to develop BI and data analysis experience.

### **-Power Q&A**

-The Q&A feature in Power BI lets you explore your data in your own words. It is the fastest way to get an answer from your data using natural language. An example could be what was the total sales last year? Once you've built your data model and deployed that into the Power BI website, then you can ask questions and get answers quickly.

## **Que6. Explain the Advantages and Disadvantages of PowerBI**

### **Answer:**

#### **-Advantages:**

##### **- Affordability**

A major advantage of using Power BI for data analysis and visualization is that it is affordable and relatively inexpensive. The Power BI version is free of cost. You can download and start using it to make reports and dashboards on your computer. However, if you want to use more Power BI services and publish your reports on the cloud, you can take the Power BI Cloud service solution for \$9.99 per user per month. Thus, Power BI is offered at a fair price as compared to other BI tools.

## **2. Custom Visualizations**

Power BI offers a wide range of custom visualizations i.e. visualizations made by developers for a specific use. Custom visuals are available on Microsoft marketplace. In addition to the general set of visualizations available you can use Power BI custom visualizations in your reports and dashboards. The range of custom visualizations includes KPIs, maps, charts, graphs, R script visuals, etc.

## **3. Excel Integration**

In Power BI, you also have the option to upload and view your data in Excel. You can select/filter/slice data in a Power BI report or dashboard and put it on Excel. You can then open Excel and view the same data in tabular form in an Excel spreadsheet. In other words, Power BI's capability of Excel integration helps users to view and work with the raw data behind a Power BI visualization.

## **4. Data Connectivity**

Another major advantage of using Power BI as your data analysis tool is that you can import data from a wide range of data sources. It offers data connectivity to data files (such as **XML**, **JSON**), Microsoft Excel, SQL Server databases, Azure sources, cloud-based sources, online services such as Google Analytics, Facebook, etc. In addition to all this, Power BI can also access

Big Data sources directly. Thus, you will get all sorts of data sources to connect to and get data for analysis and report making.

## **5. Prompt Updates**

Power BI gets upgrades from Microsoft every month. Microsoft has made a user community where users can upload their suggestions and tweaks about Power BI. The suggestions that get the most rating by other users have a good chance of getting included in the next update of Power BI. A Power BI user will get notified every time a new update comes which they can easily download. Due to the prompt and inclusive upgrading system, Power BI able to include better functionalities since its release.

### **-Dis-Advantages:**

#### **- Table Relationships**

Power BI is good with handling simple relationships between tables in a data model. But, if there are complex relationships between tables, that is, if they have more than one links between tables, Power BI might not handle them well. You need to create a Data Model carefully by having more unique fields so that Power BI does not confuse the relationships when it comes to complex relationships.

## **2. Configuration of Visuals**

In most cases, you might not feel the need to configure and optimize visualizations in Power BI. But even if you do, Power BI does not provide many options to configure your visualizations as per your requirements. Thus, users have limited options for what they can change in visuals.

## **3. Crowded User Interface**

The user interface of Power BI is often found crowded and bulky by the users. It is in the sense that there are many icons of options that block the view of dashboard or report. Most users wish that the user interface or the report canvas was clearer with fewer icons and options. Also, creating scrolling dashboards is a native feature.

## **4. Rigid Formulas**

As we know, the expression language used to deal with data in Power BI is DAX. However, you can perform a lot of actions using the, it is still not the easiest language to work with. Sometimes the formulas you create work well in Power BI, sometimes they don't. You can concatenate up to two elements but concatenating more than two elements needs nesting statements.

## **5. Handling Large Data Volumes**

Power BI has a limit of ingesting data at a time which is approximately 2 GBs of data. If you wish to import and use data of even greater volumes, you need to extend your free version to a paid

version of Power BI. Also, users have reported that Power BI takes a little more than usual time or even hangs while processing millions of rows and columns of data.

## 6. Complex to Understand and Master

Usually, Power BI is the easiest to use BI tool if you are using it simply to import data and create reports. But Power BI is an entire suite having a lot of other interrelated tools. When the purpose of your use is more than just creating reports in Power BI Desktop, you need to learn and master several.

### Que7. Explain Tables and Matrices with an example

#### Answer:

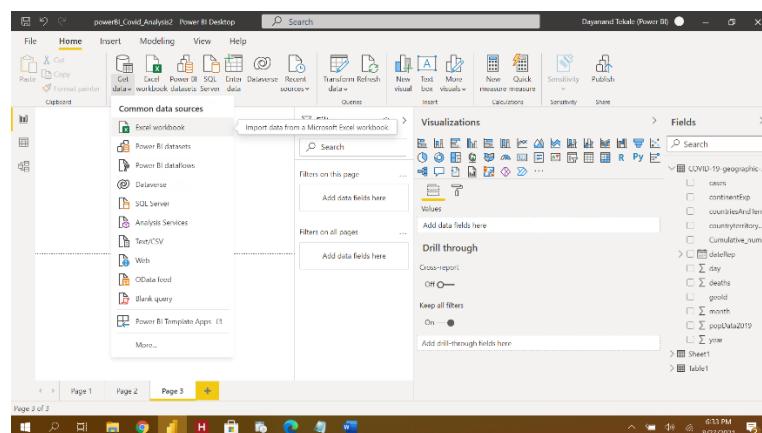
-Power BI has brilliant plotting capabilities, but it also provides lots of depth for tabular visualizations. This is especially important for a textual set of data or for analyzing a text category in your report. The table and matrix visualization charts in Power BI provide the option to display categorical variables with text labels in the report.

-The main difference between table and matrix visualizations is that tables are two-dimensional. This means they display data only in two dimensions. On the other hand, matrix visualization gives you the option to specify multiple variables in rows and columns. It also gives you the opportunity to take advantage of Power BI's drill-down functionality.

-Example:

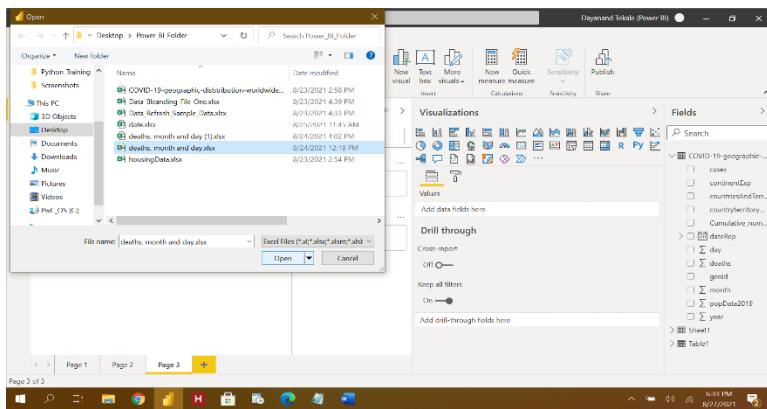
-Go to PowerBI

-Home



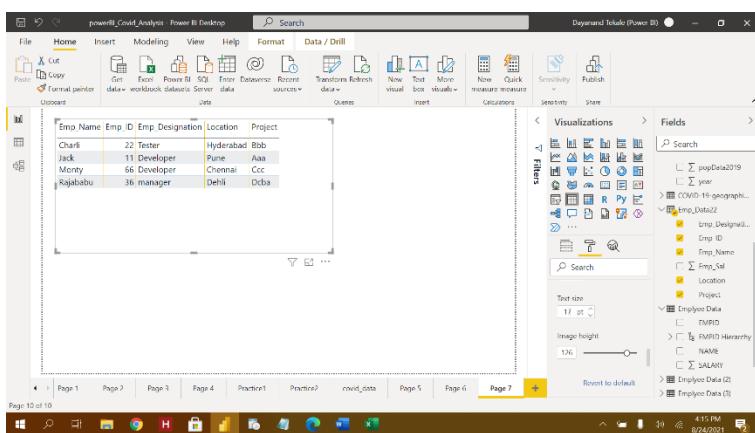
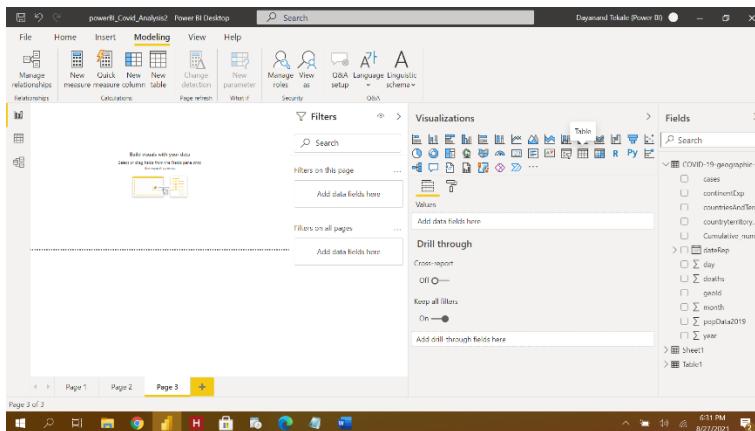
-Get Data

## -Load Data



-Right Side we can See the Data will be Loaded

-From Visualization Portion



-We can See the Tables Option

-With Help Of Table we Can Plot the Tables

The screenshot shows the Power BI Desktop interface. On the left, there is a table visualization with columns: Emp\_Name, Emp\_ID, Emp\_Designation, Location, and Project. The data includes rows for Charli, Jack, Monty, and Rajababu. On the right, the 'Fields' pane is open, displaying a hierarchy of fields from 'Employee Data' down to specific columns like Emp\_ID, Emp\_Name, Location, and Project.

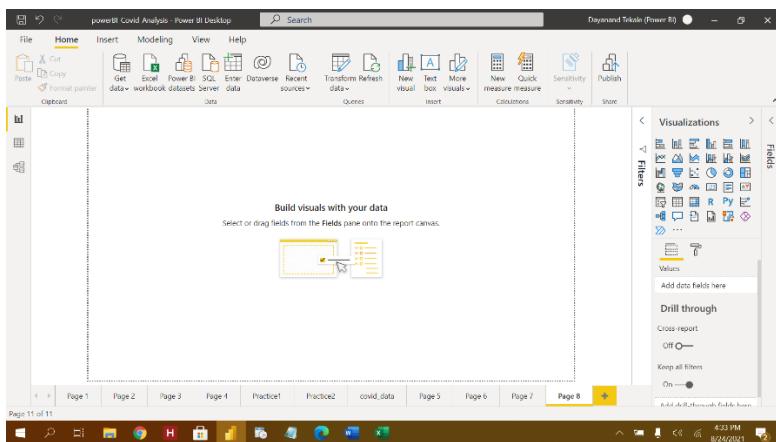
This screenshot is similar to the first one, but the 'Gridlines' option under 'Table' settings in the Fields pane is highlighted with a yellow box.

This screenshot is identical to the previous one, showing the 'Gridlines' setting selected in the Fields pane.

-We can Add the Columns/Tables from Data Sheet In Dashboard Here We Can see the Data Will Be added Successfully

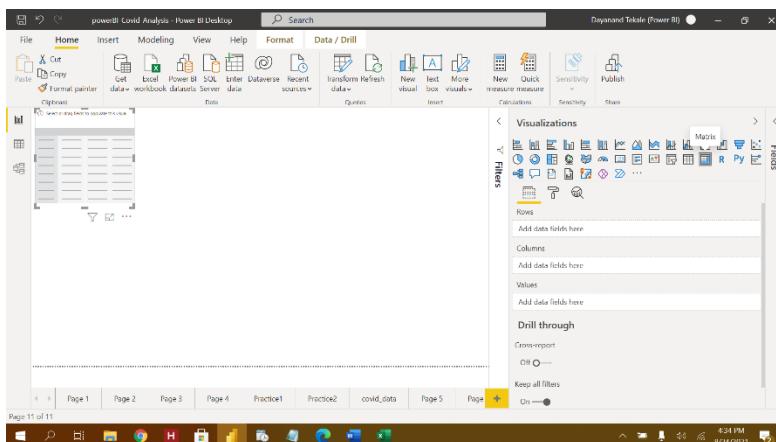
-We Can Create tables with Help Of Visualization Tool Table

=>Matrix:

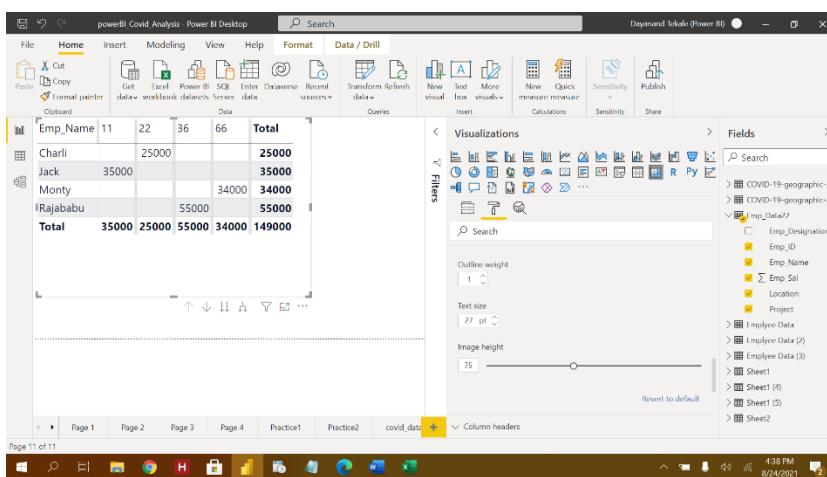


-Same Right Side we can see the Data

-In Visualization One option For Matrix



-With the help of Visualization We can Drag and Drop the Matrices



The screenshot shows the Power BI Desktop interface with a matrix visualization on the canvas. The matrix has 'Emp\_Name' as rows and categories 11, 22, 36, 66 as columns. The 'Total' row contains values 25000, 35000, 34000, 34000 respectively. The matrix is titled 'covid\_data'. The ribbon is at the top with tabs like File, Home, Insert, Modeling, View, Help, Format, Data / Drill. The Home tab is selected. The Fields pane on the right shows fields from 'Emp\_Data2' and 'Employee Data' tables.

This screenshot shows the same matrix visualization as above, but with conditional formatting applied. The 'Title' setting in the style pane is set to 'On' (radio button selected). The ribbon and Fields pane are identical to the first screenshot.

\_In Matrices we can See here the Visualization form will be Shown In Matrices

-This is best Way to create matrices on the basis of Data And With The Help of Power BI Tool.