

KONGU ENGINEERING COLLEGE (Autonomous) PERUNDURAI ERODE – 638 060
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DEPARTMENT OF COMPUTER APPLICATIONS

POWER BI LAB EXERCISES

TITLE:
“COMPETITIONS
TRACKER”

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ABSTRACT

The "Competitions Tracker" system is designed to manage and monitor various competitions held within and between departments or institutions, such as inter-college, intra-college, inter-department, and intra-department events. This system will track events like paper presentations, debugging, technical quizzes, and competitions involving Power BI. The tool helps maintain organized data, ensuring easy access to information about participants, judges, rankings, and results.

PROBLEM DESCRIPTION

Managing a large number of academic and technical competitions in an organized manner is a common challenge in colleges and universities. These competitions occur at various levels (intra-college, inter-department, etc.), and the manual handling of registrations, results, and rankings can become cumbersome. Without a structured system, it is difficult to track performance, winners, and participation across different competitions.

Challenges

- Handling multiple types of competitions (e.g., technical, paper presentations, debugging).
- Tracking participant data, scores, and rankings for different departments and institutions.
- Ensuring easy access to historical competition data for analysis and reporting.

Approach

Proposed Solution: The solution is a "Competitions Tracker" system that will:

- Store and manage data for various competition types at different levels (e.g., inter-college, intra-department).
- Keep track of participant names, competition details, scores, rankings, and winners.
- Allow administrators and users to analyse competition results using tools like Power BI for insights and reporting.

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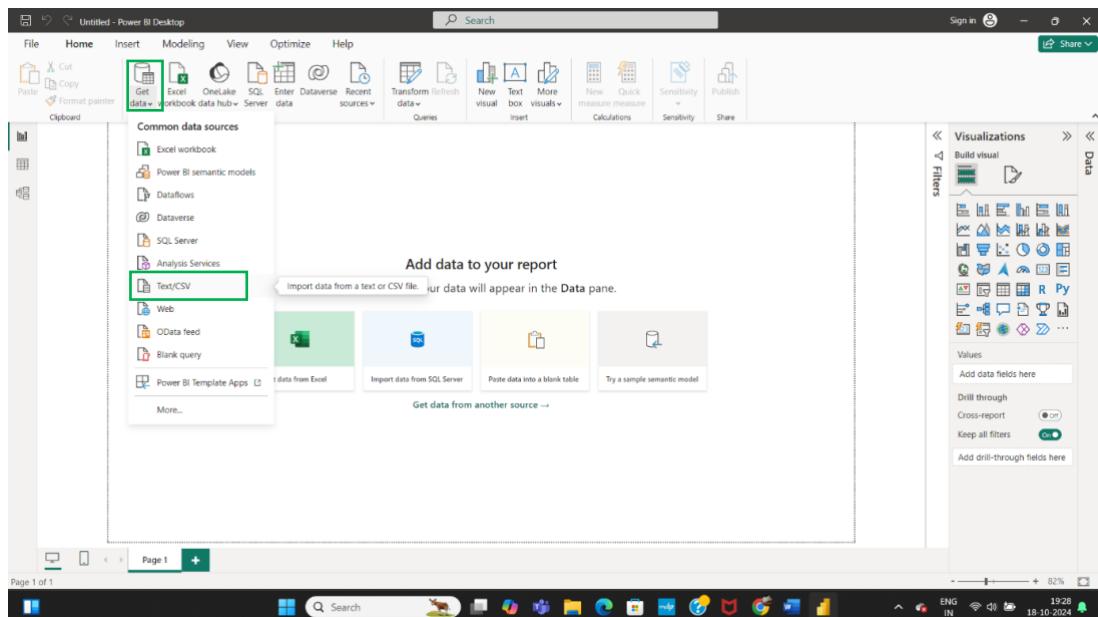
Competitions Tracker Data Analytics in Power BI

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Ex. No.:01	IMPORT DATA INTO POWER BI DESKTOP AND PERFORM BASIC OPERATIONS
Date:05.10.2024	

IMPORT DATA INTO POWERBI DESKTOP

- Open Power BI Desktop and click on "Get Data."



GET DATA as a Excel FILE

This screenshot shows the Power BI Desktop interface after selecting 'Text/CSV' from the ribbon. A 'Navigator' pane has appeared on the left side of the main workspace. It lists a single item: 'competition_tracker_updated.xlsx [4]'. Underneath this item, there are four categories: 'Colleges', 'Competitions', 'Participants', and 'Results', each with a small checkbox next to it. The 'Colleges' category is expanded, showing a table with 10 rows of data. The table has columns: 'CollegeID', 'College Name', 'Location', and 'Contact Person'. The data is as follows:

CollegeID	College Name	Location	Contact Person
1	College 1	City A	Contact 1
2	College 2	City B	Contact 2
3	College 3	City C	Contact 3
4	College 4	City D	Contact 4
5	College 5	City E	Contact 5
6	College 6	City F	Contact 6
7	College 7	City G	Contact 7
8	College 8	City H	Contact 8
9	College 9	City I	Contact 9
10	College 10	City J	Contact 10

At the bottom right of the Navigator pane, there are three buttons: 'Load' (highlighted with a red box), 'Transform Data', and 'Cancel'. The main workspace to the right of the Navigator pane shows the 'Visualizations' pane with various icons and the 'Filters' pane below it.

LOAD DATA(competition_tracker_updated.xlsx)

BASIC OPERATIONS

CREATE VISUALIZATION

1.Create a Chart

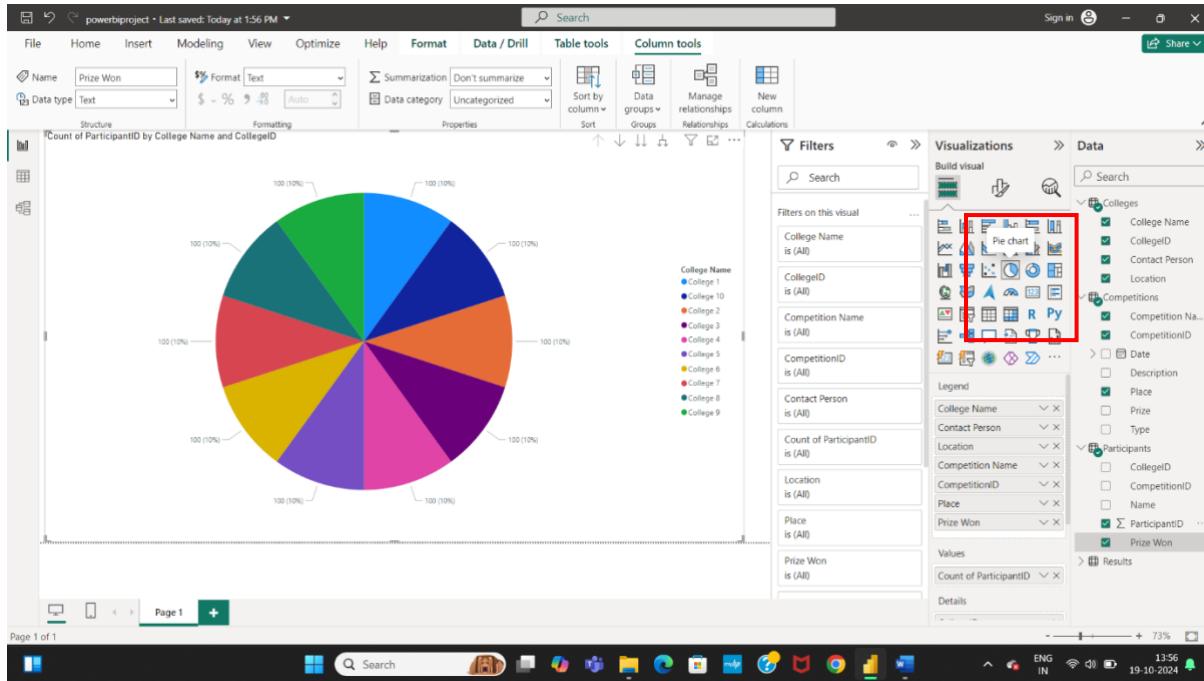


Chart View

2.Create a table

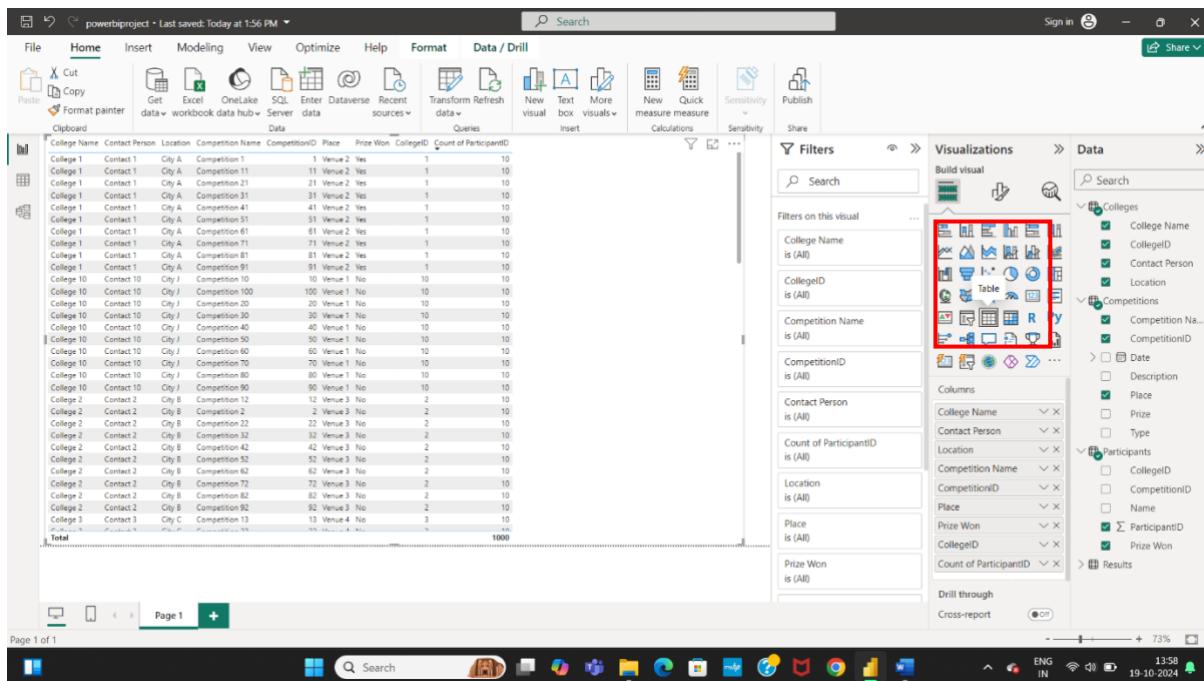


Table View

3.Transform Data

The screenshot shows the Power BI Data View interface. The top navigation bar includes 'Optimize', 'Help', 'Format', 'Data / Drill', and other options like 'Enter Data', 'Recent sources', and 'Server data'. Below the navigation is a toolbar with icons for Transform Refresh, New visual, Insert, More visuals, New measure, Quick measure, Calculators, and Sensitivity. A red box highlights the 'Transform data' icon and its dropdown menu, which contains 'Edit parameters' and 'Edit variables'.

Delete the column

REMOVE COLUMN

The screenshot shows the Power BI Data View interface with the 'Transform' ribbon tab selected. The main area displays a table with columns: CollegeID, College Name, Location, and Contact Person. The 'CollegeID' column is selected. A context menu is open over the 'CollegeID' column, with a red box highlighting the 'Remove Columns' option. The context menu also includes 'Copy', 'Add Column From Examples...', 'Remove Other Columns', 'Remove Duplicate Rows', 'Replace Values...', 'Change Type', 'Transform', and 'Merge Columns'.

Remove Column

The screenshot shows the Power BI Data View interface with the 'Transform' ribbon tab selected. The main area displays a table with columns: College Name, Location, and Contact Person. The 'CollegeID' column has been removed. The 'Applied Steps' pane on the right shows a step named 'Removed Other Columns' with a red box around it. The 'Properties' pane shows the query name is 'Colleges'.

After removing(Removed column: College ID)

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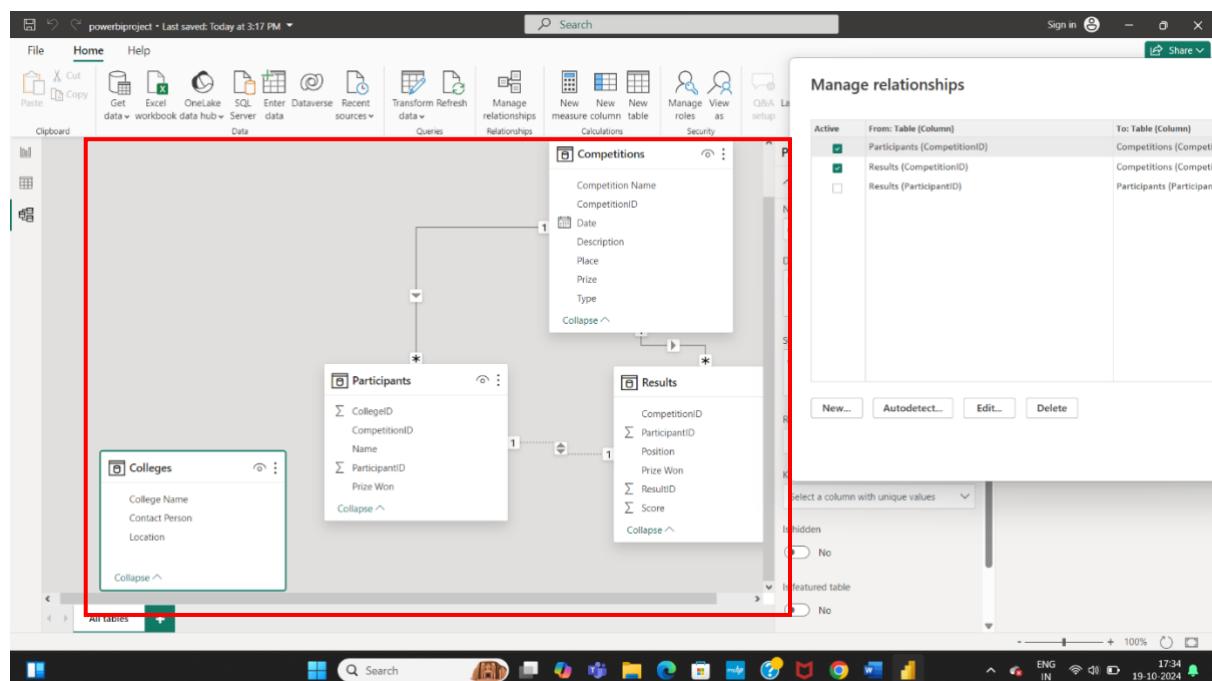
DEVELOP DATA MODEL FOR THE GIVEN PROBLEM

Identify Key Entities and Tables

The first step in developing a data model is identifying the key entities involved in the project. For this Competitions Tracker, there are four key entities:

1. Competitions
2. Participants
3. Results
4. Colleges

Each entity will have its own table, and there will be relationships between them.



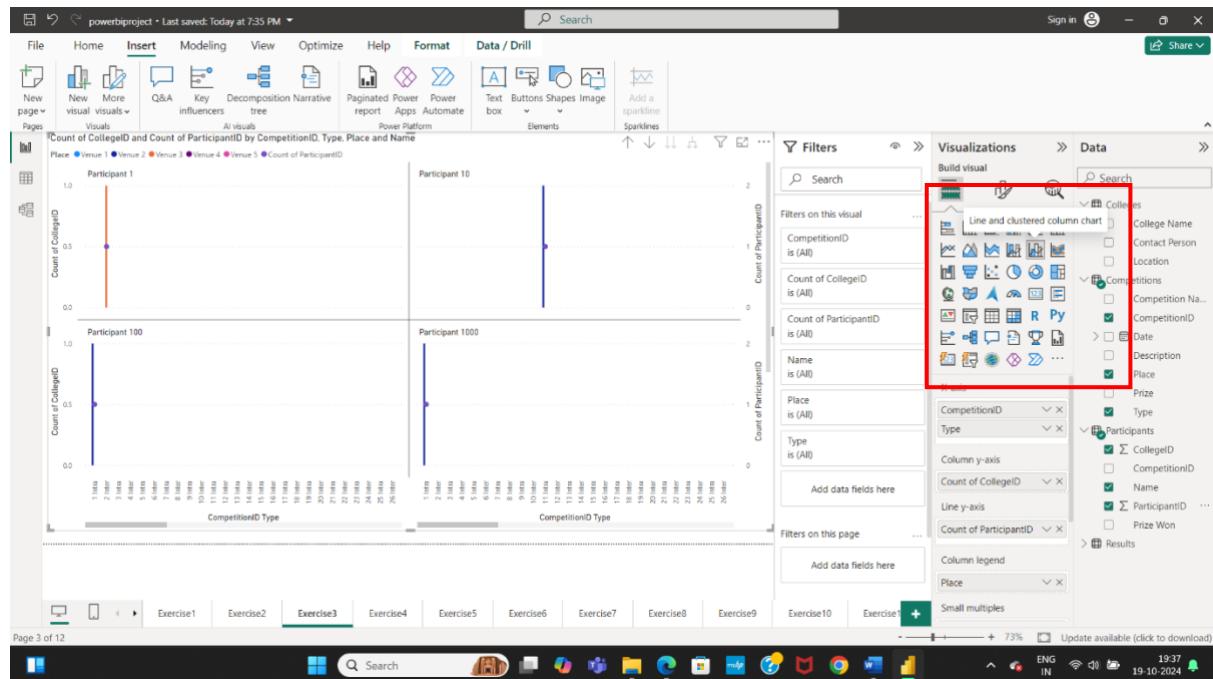
Model View

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CREATE SIMPLE CHARTS AND GRAPHS

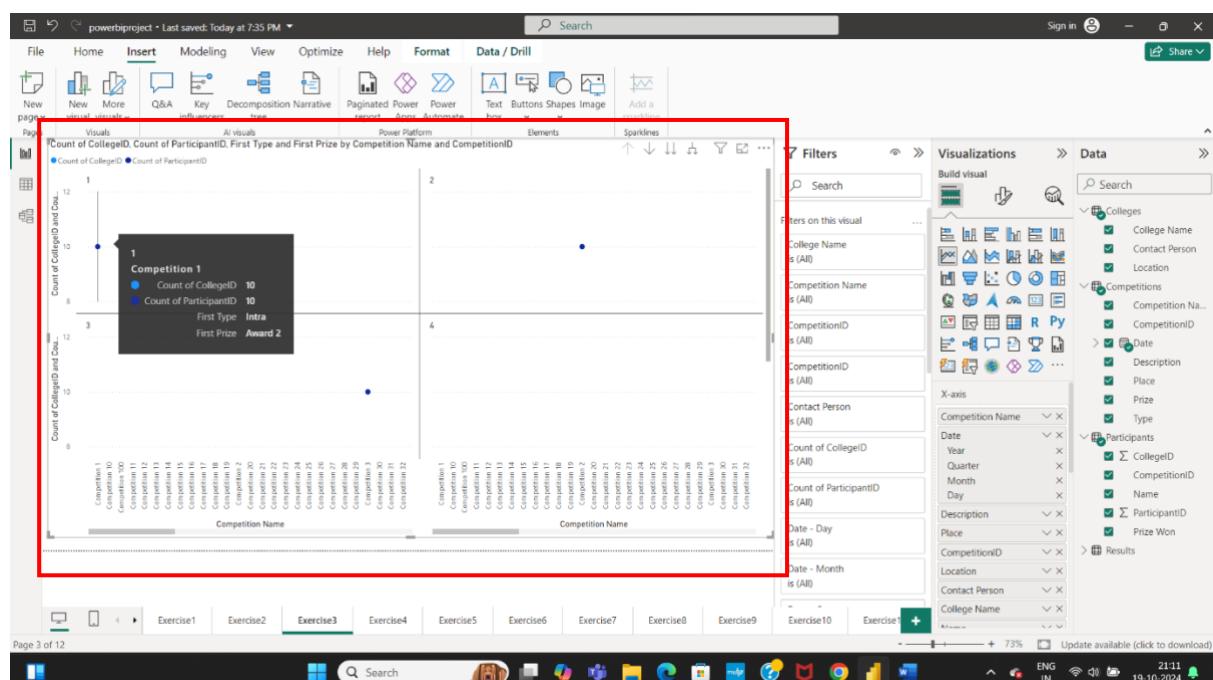
LINE AND CLUSTERED COLUMN CHART

Select the desired visualization type from the Visualizations pane, drag and drop your data fields into the visualization, and customize it as needed.



Line and Clustered Column Chart

LINE CHART



Line Chart

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CREATE AND PUBLISH POWER BI REPORTS

CREATING REPORT

Build visualizations using the fields pane, arrange them on the report canvas, and publish or export the report as needed.

The screenshot shows the Power BI Desktop interface. In the center, there is a visualization titled "Count of CollegeID by Location, Contact Person and College Name". The visualization consists of two stacked 3D bar charts. The top chart represents "Contact ..." and the bottom chart represents "College ...". The x-axis is labeled "Location" and the y-axis is labeled "Count". The Fields pane on the right side of the screen lists various fields from different tables: Colleges (College Name, Contact Person, Location), Competitions (Competition Name, Competition ID, Date, Description, Place, Prize, Type), Participants (College ID, Competition ID, Name, Participant ID, Prize Won), and Results.

Creating Report

PUBLISH REPORT

The screenshot shows the Power BI Desktop interface again. The visualization and Fields pane are identical to the previous screenshot. The main difference is the presence of a green box highlighting the "Publish" button in the ribbon menu. The ribbon also includes other tabs like Home, Insert, Modeling, View, Optimize, Help, and various data import and transformation options.

Publish Report

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CREATE POWER BI DASHBOARDS

Load Dataset:

Import competition data into Power BI and set up relationships between tables (e.g., Participants, Competitions).

Create Visuals:

Design charts, tables, and KPIs to display key metrics like participation, prizes, and competition types.

Customize Layout:

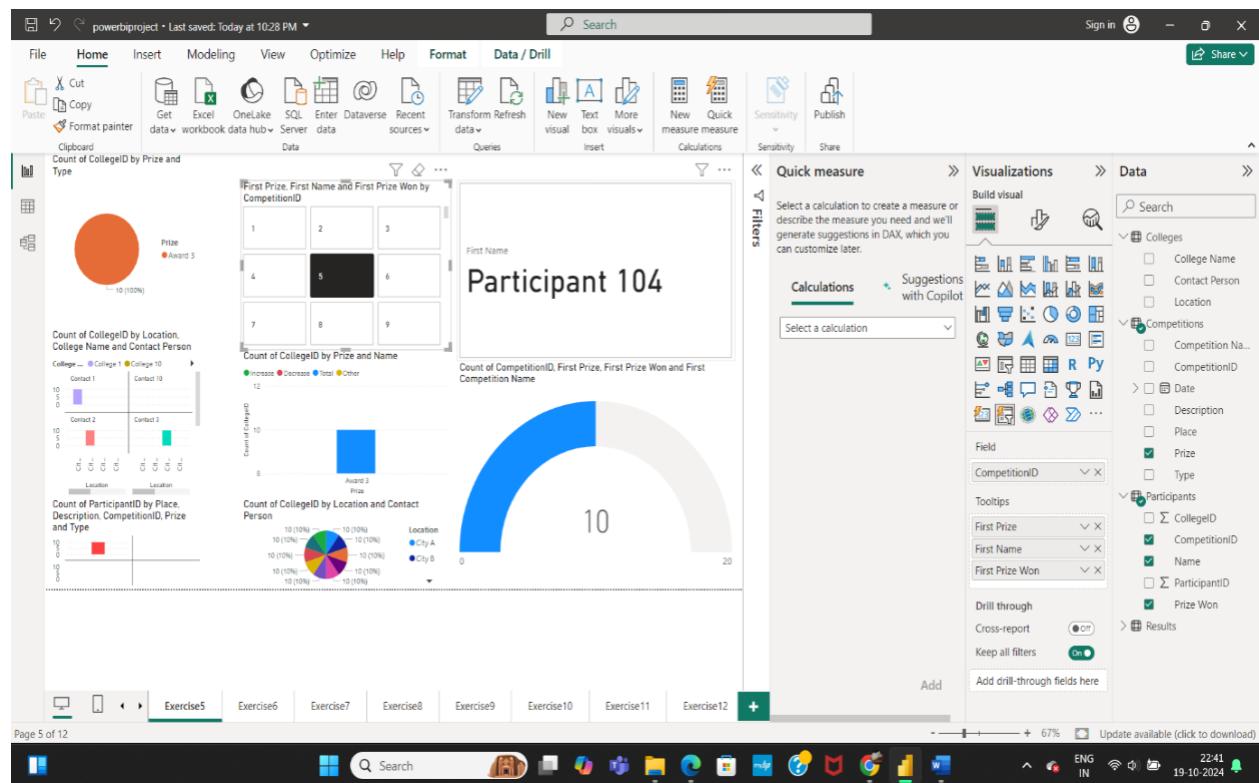
Format visuals with titles, data labels, and arrange them for a clear, organized view.

Publish and Share:

Publish the report to Power BI Service, pin key visuals to a dashboard, and share with stakeholders.

Review and Adjust:

Ensure interactivity with filters and drill-through features, allowing users to explore the data dynamically.



Dashboard

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CREATE A STACKED BARCHART

Select Visual:

In Power BI Desktop, go to the **Visualizations** pane and select the **Stacked Bar Chart** icon.

Add Axis:

Drag the field you want for categories (e.g., **Competition Type** or **Department**) to the **Axis** area.

Add Values:

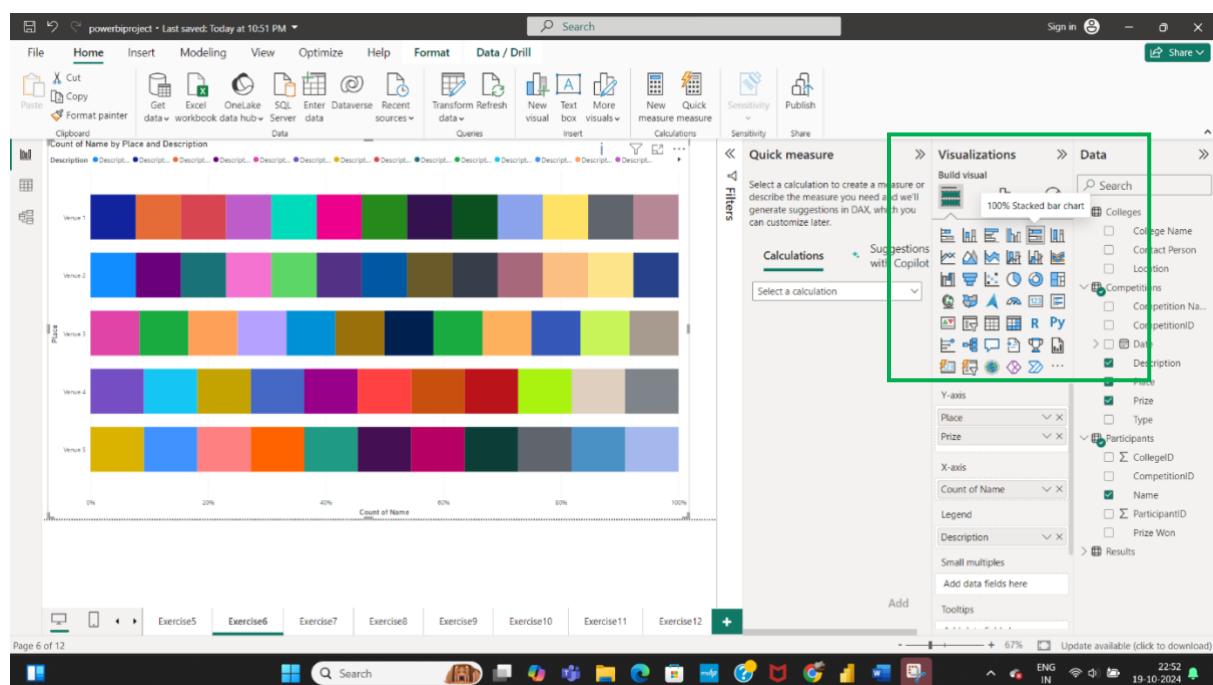
Drag the field for the value you want to measure (e.g., **Number of Participants**, **Scores**) to the **Values** area.

Add Legend:

Drag the field to split the bars by groups (e.g., **Prize Won**, **Competition Level**) into the **Legend** area.

Format:

Customize the chart with data labels, titles, and colors, and arrange it in your report.



Stacked Bar chart

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APPLY FILTERS IN THE REPORT

On the right side of the screen, you'll find the **Filters Pane** under the **Visualizations Pane**. This pane allows to apply filters at different levels: **visual**, **page**, or **report**.

This screenshot shows the Microsoft Power BI desktop application. The interface includes a ribbon bar with tabs like File, Home, Insert, Modeling, View, Optimize, Help, Format, and Data / Drill. On the left, there's a clipboard with data and a list of exercises (Exercise5, Exercise6, Exercise7, Exercise8, Exercise9, Exercise10, Exercise11, Exercise12). The main workspace is currently empty. On the right, the Visualizations pane is open, displaying various chart and report options. A red box highlights the 'Filters' section within the Visualizations pane, which contains settings for filtering 'Prize', 'Type', and 'Prize Won'. Below the filters, there are sections for 'Calculations', 'Suggestions with Copilot', and 'Columns'. The status bar at the bottom shows the page number as 'Page 7 of 12'.

Before filtering

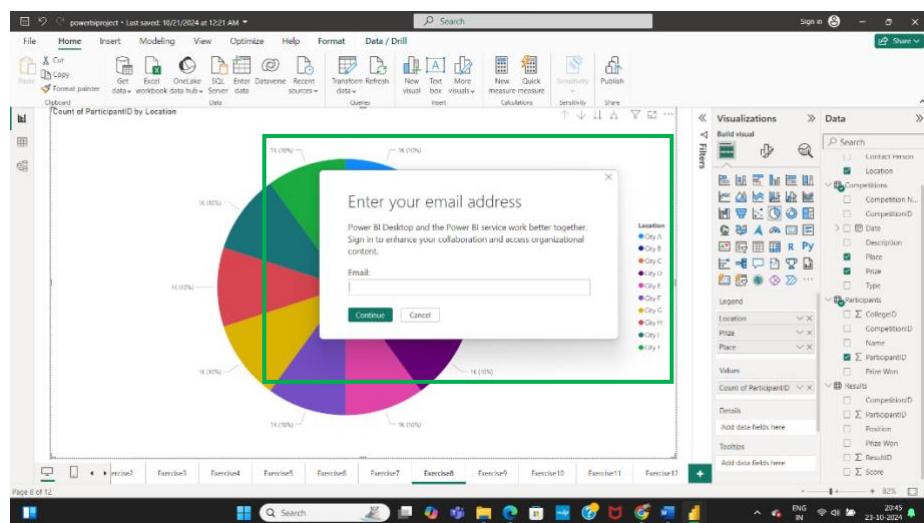
This screenshot shows the Microsoft Power BI desktop application again. The clipboard on the left now contains a single row of data: 'Prize Type Prize Won' followed by three rows of 'Award 1 Inter Yes', 'Award 2 Inter Yes', and 'Award 3 Inter Yes'. A green box highlights this clipboard area. The rest of the interface is identical to the previous screenshot, with the Visualizations pane showing the 'Filters' section and the status bar indicating 'Page 7 of 12'.

After Filtering

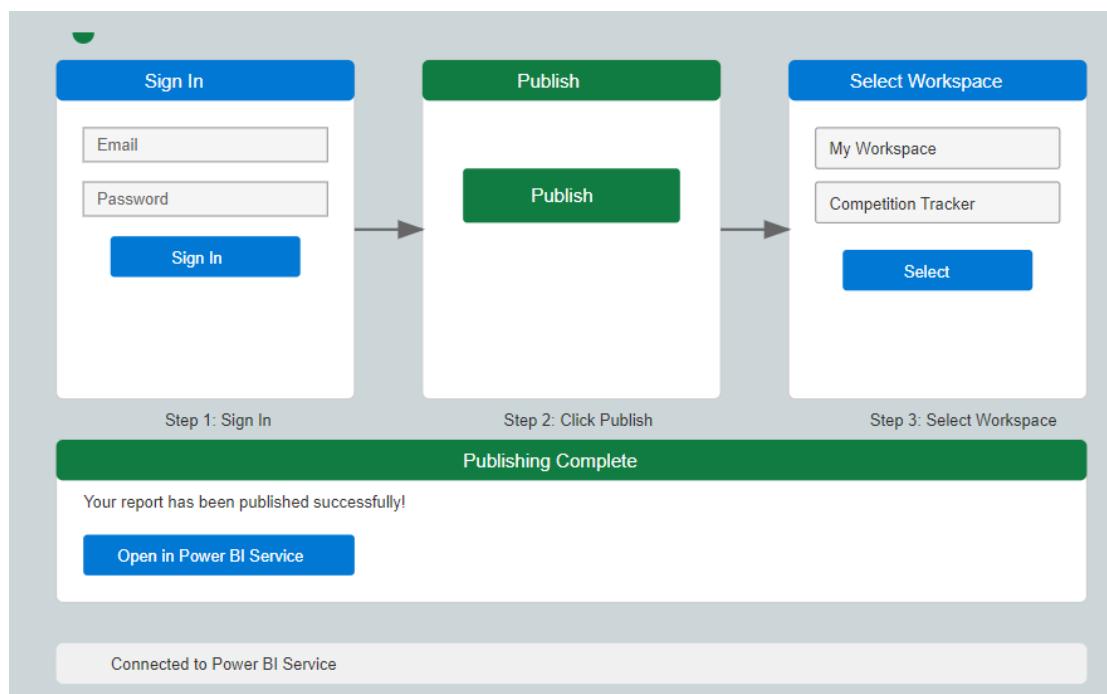
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CONNECT POWER BI DESKTOP WITH POWER BI SERVICES

1. **Sign in** to Power BI Desktop using your Power BI Service account.
2. **Publish the report** by clicking the **Publish** button in Power BI Desktop and selecting a Workspace.
3. After publishing, **view your report** on Power BI Service by logging in at app.powerbi.com.
4. Optionally, set up a **data refresh schedule** for automatic updates.
5. **Share the report** with others by using the Share button in Power BI Service.



Sign in



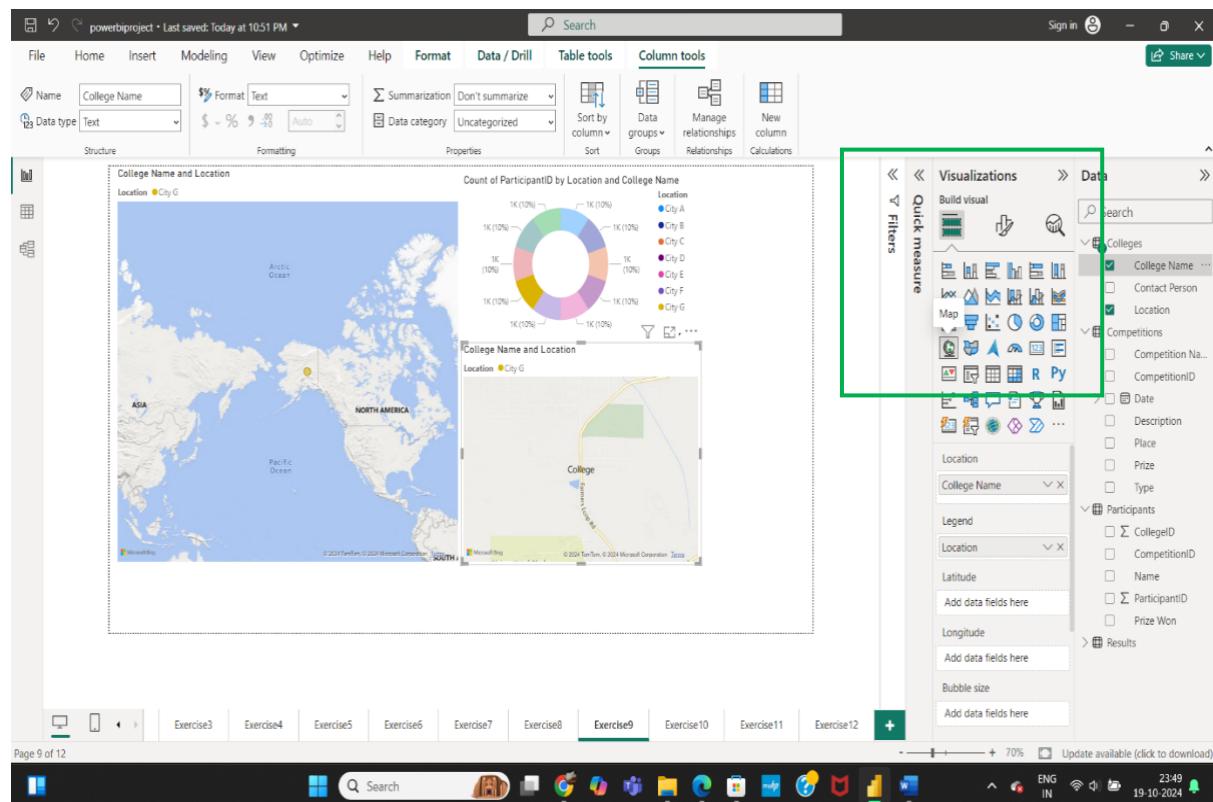
Connect to Power BI Services

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CREATE A MAP IN POWER BI

To create a map in Power BI, follow these steps:

1. **Open Power BI Desktop** and load your dataset that contains geographical data (e.g., country, state, city, or latitude/longitude).
2. **Select the Map visual** from the Visualizations pane.
3. **Drag the relevant geographical field** (e.g., location names) to the "Location" well in the visual.
4. **Add any numerical values** (e.g., sales figures, population) to the "Values" well to display size or color on the map.
5. **Customize the map settings** as needed (such as map style, color, or tooltips) from the Format pane to enhance your visual presentation.



Map View

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CREATE AND FORMAT A SLICER IN POWER BI

1. Open Power BI Desktop, load your dataset, and select the **Slicer** visual from the **Visualizations** pane.
2. Drag and drop the desired field (e.g., "Category") into the slicer visual.
3. Adjust the slicer settings in the **Visualizations** pane for single or multi-select options.
4. Use the **Format** pane to customize the title, font, colors, and layout of the slicer.
5. Test the slicer by clicking on items to filter other visuals, and then save your report.

The screenshot shows the Power BI Desktop interface with a report titled "powerbiproject". The report contains a table visual with columns for Prize, Competition Name, Name, Type, Contact Person, and Contact 10. Below the table are filters for Date (14-03-2024 to 30-03-2024) and Location (City). To the right, the Visualizations pane is open, showing various visualizations including a Slicer icon which is highlighted with a green box. The Fields pane shows "College Name" selected under the "College" category. The status bar at the bottom indicates "Page 10 of 12" and "00:09 20-10-2024".

Slicer

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DEMONSTRATE BASIC OPERATION USING POWER PIVOT IN EXCEL

Import Data: Use Power Pivot to import data from various sources (Excel tables, databases, online services) into a single data model.

Power Pivot Table

Create Relationships: Establish relationships between different tables by linking fields (e.g., Customer ID) to enable coherent data analysis.

Adding New Column

Calculated Columns and Measures: Create new data fields using DAX formulas for calculated columns and dynamic measures to perform calculations on existing data.

The screenshot shows the Power BI Desktop interface. On the left, a table view displays a column titled 'TotalWinners'. A tooltip for this column shows the DAX formula: `TotalWinners = CALCULATE(COUNTROWS(Results), Results[PrizeWon] = "Yes")`. Below the table, a ribbon bar has 'Results' selected. On the right, a context menu is open over the 'Competitions' table, with the 'New column' option highlighted. Other options in the menu include 'Create hierarchy', 'New measure', 'Delete from model', 'Hide in report view', 'Unhide all', 'Collapse all', 'Expand all', 'New group', 'Display folder', and 'Is hidden'.

Check results

New Column

The screenshot shows the Power BI Desktop interface. In the formula bar at the top, a DAX formula is being typed: `membersallowedColumn = TotalParticipants = SUM(Competitions[Participants])`. A green box highlights the formula, and a yellow box highlights the word 'DAX FORMULA'. Below the formula bar, a context menu is open over the 'Competitions' table, with the 'New column' option highlighted. The menu also includes other options like 'Create hierarchy', 'New measure', etc. The Power BI ribbon bar is visible at the top, and the Windows taskbar is at the bottom.

DAX FORMULA

New Column

Using DAX Formula

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PERFORM DATA ANALYTICS WITH PIVOT TABLE AND CHARTS

Load Data: Import your dataset into Power BI from various sources (Excel, SQL Server, etc.) using the **Get Data** feature.

Transform Data: Clean and prepare your data in the **Power Query Editor**, ensuring it is structured correctly for analysis.

Create Relationships: Set up relationships between tables in the **Model view** to enable coherent data analysis across different datasets.

Build Visuals: Use the **Report view** to add **Matrix visuals** for PivotTable-like summaries and various charts (e.g., bar, line) for data visualization.

The screenshot shows the Microsoft Power BI desktop application interface. The main area displays a matrix visual titled "Count of CollegeID, Count of ParticipantID and Count of ParticipantID by Year, Place and Prize". The matrix has "Place" and "Venue" as rows, and "Year" as a column. The data shows a count of 40 for each cell. The data pane on the right lists various data models and their fields, such as Competitions, Participants, and Results, with checkboxes indicating selected fields.

Place	Venue	Year	Total	Count of CollegeID	Count of ParticipantID
2024	Award 3	2024	Total	40	40
				40	40

Data Analytics with Pivot Table