

# Week 1

## Task 1

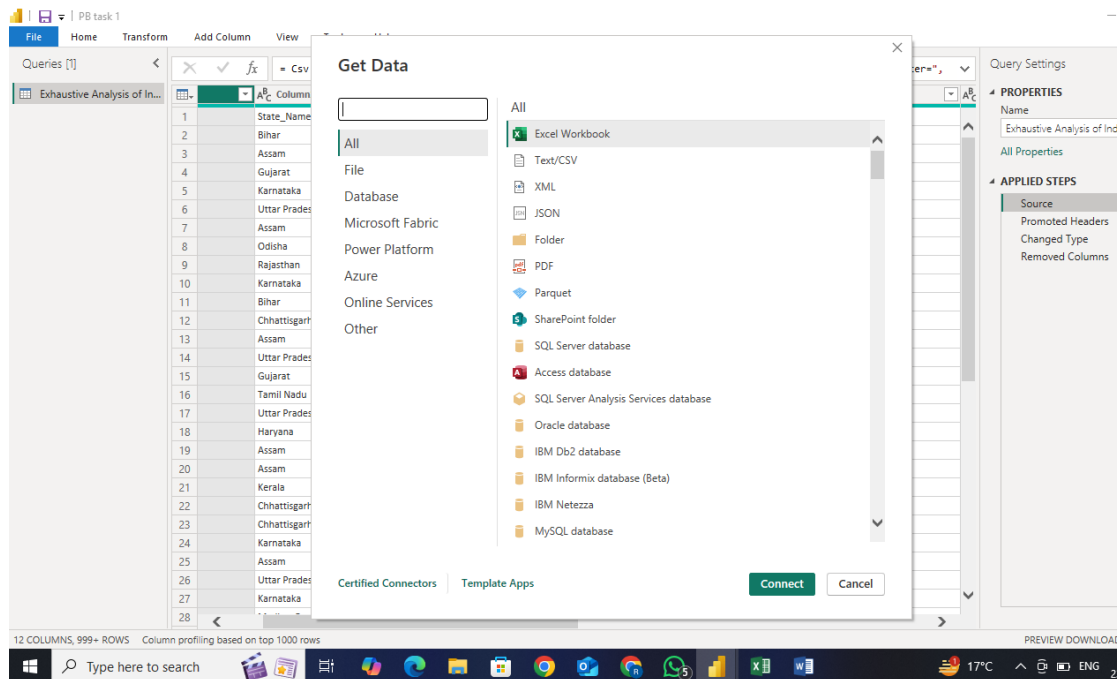
### Week 1 - Task 1: Overview of Power BI and Key Concepts

#### Step 1: Understanding BI Tools

1. **Power BI** is a **Microsoft Product** used for Business Intelligence (BI). It's a powerful tool for data visualization, analysis, and reporting.
2. BI tools are used to **Extract, Transform, and Load (ETL)** data to make informed decisions based on insights.

#### Step 2: Extract – Pull Data from Data Sources

1. **ETL (Extract, Transform, Load)** is the process of working with data from various sources.
  - **Extract:** Pull data from different sources such as:
    - **Excel**
    - **CSV/Text files**
    - **Databases (SQL, Oracle, etc.)**



- **Load:** Load the data into Power BI for analysis once it's cleaned.

### Step 3: Data Transformation – Clean and Prepare the Data

1. **Transform the Data:** This step involves processing and cleaning the data. Transformation operations could include:
  - Removing unnecessary columns.

Table: RemoveColumns(#"Changed Type",{"RowID"})

	State_Name	District_Name	Crop_Year	Season	Crop	Area
1	Bihar	NALANDA	2005	Rabi	Wheat	
2	Assam	KARBI ANGLONG	2019	Whole Year	Onion	
3	Gujarat	ANAND	2020	Summer	Maize	
4	Karnataka	UTTAR KANNAD	2013	Rabi	Groundnut	
5	Uttar Pradesh	JAUNPUR	2016	Rabi	Onion	
6	Assam	MARIGAON	2014	Rabi	Rapeseed & Mustard	
7	Odisha	SONEPUR	2006	Winter	Rapeseed & Mustard	
8	Rajasthan	DHOLPUR	2017	Whole Year	Garlic	
9	Karnataka	BELGAUM	2018	Whole Year	Coconut	
10	Bihar	MUNGER	2020	Summer	Moong(Green Gram)	
11	Chhattisgarh	JANIGIR-CHAMPA	2013	Kharif	Other Kharif pulses	
12	Assam	KARBI ANGLONG	2019	Rabi	Rapeseed & Mustard	
13	Uttar Pradesh	SHRAVASTI	2005	Kharif	Groundnut	
14	Gujarat	PATAN	2019	Kharif	Moong(Green Gram)	
15	Tamil Nadu	KARUR	2008	Whole Year	Sweet potato	
16	Uttar Pradesh	KASGANJ	2019	Rabi	Tobacco	
17	Haryana	MAHENDRAGARH	2006	Rabi	Wheat	
18	Assam	DHEMAJI	2017	Whole Year	Turmeric	
19	Assam	BAKSA	2015	Kharif	Small millets	
20	Kerala	PATHANAMTHITTA	2008	Whole Year	Sugarcane	
21	Chhattisgarh	JANIGIR-CHAMPA	2018	Rabi	Linseed	
22	Chhattisgarh	DHAMTARI	2020	Whole Year	Banana	

11 COLUMNS, 999+ ROWS Column profiling based on top 1000 rows

APPLIED STEPS: Source, Promoted Headers, Changed Type, Removed Columns

- Filtering out irrelevant or missing data.
- Changing data types (e.g., converting a column to Date, Number, or Text).
- Combining tables (merging data).
- Creating calculated columns or measures.

**In Power BI, this process is done in the Power Query Editor.**

### Step 4: Load Cleaned Data into Power BI

1. Once the data is cleaned and transformed, you **load the data** into Power BI.
  - You can either:
    - **Load data directly** from sources like Excel or databases.
    - **Import** the data into Power BI or create a **Direct Query** connection (depending on the data source).

### Step 5: Report View – Visualizations

1. **Report View** is where you create your **visualizations** in Power BI. Here, you can:
  - **Drag and drop fields** onto the report canvas to create charts, graphs, tables, etc.
  - Visualizations include bar charts, pie charts, line graphs, maps, etc.
  - You can use slicers and filters to make your report interactive.

**Goal:** Make your data easy to interpret with engaging visuals for stakeholders.

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## Step 6: Table View – See the Data

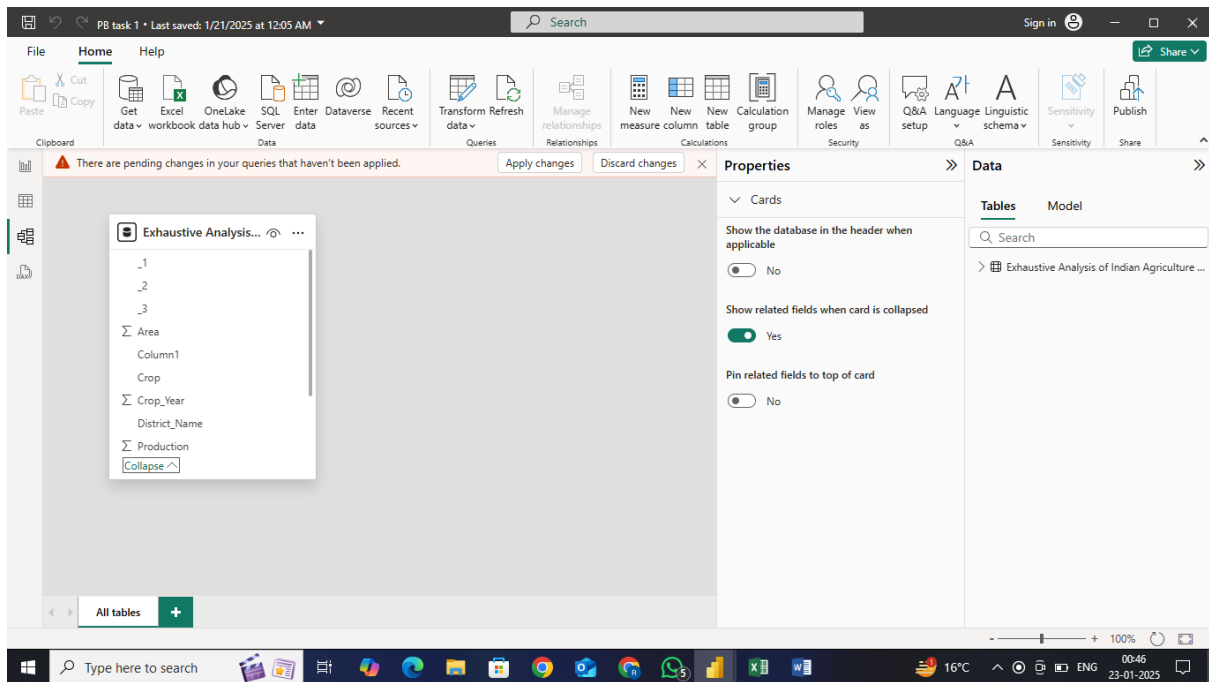
1. **Table View** allows you to see the raw data loaded into Power BI.
  - This view shows the **actual records** and values from your source data.
  - **Use Table View** to validate the data you have loaded and check for any anomalies or issues.

RowID	State_Name	District_Name	Crop_Year	Season	Crop	Area	Production	Column1	.1	.2	.3
48	Uttar Pradesh	PILIBHIT	2009	Kharif	Moong(Green Gram)	1	0.1				
657	Uttar Pradesh	AMBEDKAR NAGAR	2012	Kharif	Small millets	1	0				
959	Uttar Pradesh	MUZAFFARNAGAR	2012	Kharif	Sannhamp	1	0				
1469	Uttar Pradesh	VARANASI	2018	Kharif	Groundnut	1	1				
1477	Uttar Pradesh	GORAKHPUR	2020	Kharif	Dry chillies	1	1				
1864	Uttar Pradesh	BALRAMPUR	2010	Kharif	Moong(Green Gram)	1	0				
2081	Uttar Pradesh	AGRA	2010	Kharif	Sunflower	1	1				
3989	Uttar Pradesh	AURAIYA	2018	Kharif	Sannhamp	1	0				
4944	Uttar Pradesh	ETAH	2012	Kharif	Soyabean	1	1				
4963	Uttar Pradesh	SIDDHARTH NAGAR	2006	Kharif	Moong(Green Gram)	1	0				
6377	Uttar Pradesh	HATHRAS	2012	Kharif	Groundnut	1	1				
6498	Uttar Pradesh	MUZAFFARNAGAR	2022	Kharif	Sannhamp	1	1				
7358	Uttar Pradesh	MATHURA	2010	Kharif	Small millets	1	1				
8253	Uttar Pradesh	KAUSHAMBI	2011	Kharif	Sunflower	1	2				
8499	Uttar Pradesh	HAMIRPUR	2014	Kharif	Cotton(lint)	1	0				
8508	Uttar Pradesh	KANNAUJ	2009	Kharif	Moth	1	0.1				
9248	Uttar Pradesh	MAHARAJGANJ	2016	Kharif	Small millets	1	1				
9773	Uttar Pradesh	BALRAMPUR	2008	Kharif	Moong(Green Gram)	1	1				
9775	Uttar Pradesh	CHANDAULI	2014	Kharif	Small millets	1	1				
11191	Uttar Pradesh	GONDA	2015	Kharif	Sannhamp	1	0				
11891	Uttar Pradesh	CHANDAULI	2012	Kharif	Small millets	1	0				
12326	Uttar Pradesh	RAEPII N	2012	Kharif	Moong(Green Gram)	1	0				

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## Step 7: Model View – Create Relationships and Merge Data

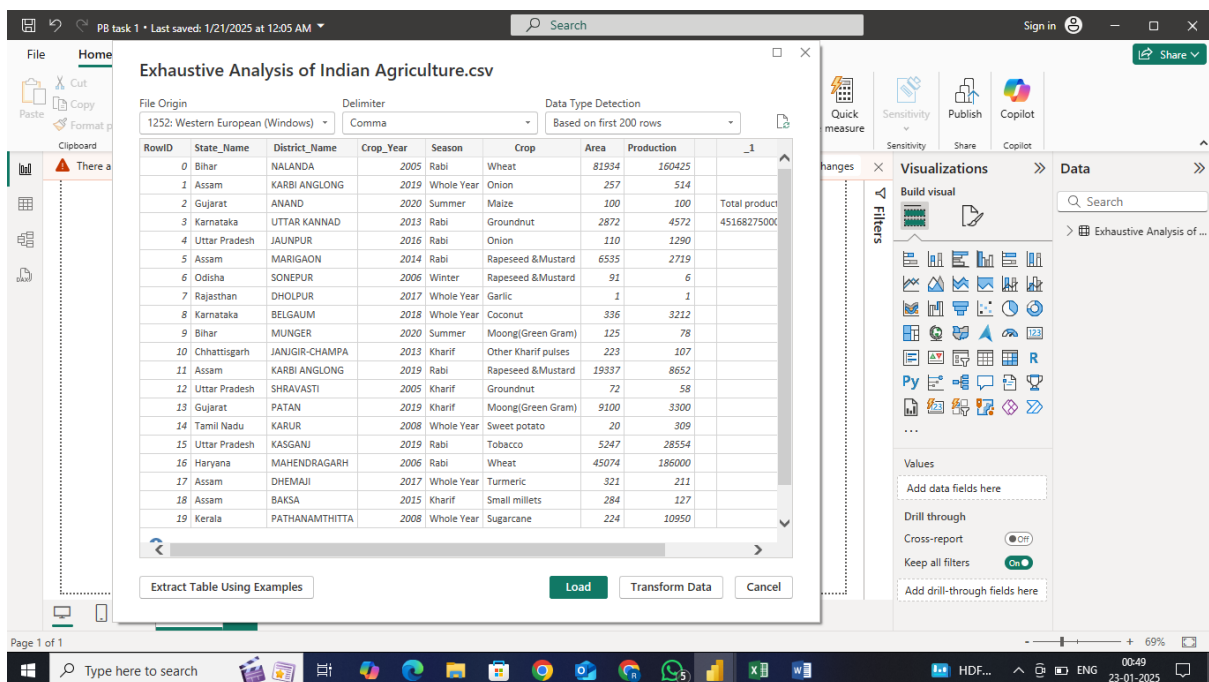
1. **Model View** is where you define relationships between your tables.
  - In the **Model View**, you can:
    - **Create relationships:** Link different tables together based on common fields (e.g., ProductID, CustomerID).
    - **Define relationships:** One-to-many, many-to-one, or many-to-many relationships.



- **Merge Operation:** You can perform merge operations to combine data from multiple tables (similar to SQL joins). For example, merging a "Sales" table with a "Product" table based on a common "ProductID".

## Step 8: Key Power BI Views

### 1. Report View: Create interactive reports with visualizations.



## 2. Table View: View raw data and perform data validation.

RowID	State_Name	District_Name	Crop_Year	Season	Crop	Area	Production	Column1	.1	.2	.3
48	Uttar Pradesh	PILIBHIT	2009	Kharif	Moong(Green Gram)	1	0.1				
657	Uttar Pradesh	AMBEDKAR NAGAR	2012	Kharif	Small millets	1	0				
959	Uttar Pradesh	MUZAFFARNAGAR	2012	Kharif	Sannhamp	1	0				
1469	Uttar Pradesh	VARANASI	2018	Kharif	Groundnut	1	1				
1477	Uttar Pradesh	GORAKHPUR	2020	Kharif	Dry chillies	1	1				
1864	Uttar Pradesh	BALRAMPUR	2010	Kharif	Moong(Green Gram)	1	0				
2081	Uttar Pradesh	AGRA	2010	Kharif	Sunflower	1	1				
3989	Uttar Pradesh	AURAIYA	2018	Kharif	Sannhamp	1	0				
4944	Uttar Pradesh	ETAH	2012	Kharif	Soyabean	1	1				
4963	Uttar Pradesh	SIDDHARTH NAGAR	2006	Kharif	Moong(Green Gram)	1	0				
6377	Uttar Pradesh	HATHRAS	2012	Kharif	Groundnut	1	1				
6498	Uttar Pradesh	MUZAFFARNAGAR	2022	Kharif	Sannhamp	1	1				
7358	Uttar Pradesh	MATHURA	2010	Kharif	Small millets	1	1				
8253	Uttar Pradesh	KAUSHAMBI	2011	Kharif	Sunflower	1	2				
8499	Uttar Pradesh	HAMIRPUR	2014	Kharif	Cotton(lint)	1	0				
8508	Uttar Pradesh	KANNAUJ	2009	Kharif	Moth	1	0.1				
9248	Uttar Pradesh	MAHARAJGANJ	2016	Kharif	Small millets	1	1				
9773	Uttar Pradesh	BALRAMPUR	2008	Kharif	Moong(Green Gram)	1	1				
9775	Uttar Pradesh	CHANDAULI	2014	Kharif	Small millets	1	1				
11191	Uttar Pradesh	GONDA	2015	Kharif	Sannhamp	1	0				
11891	Uttar Pradesh	CHANDAULI	2012	Kharif	Small millets	1	0				
12220	Uttar Pradesh	BABILU	2012	Kharif	Moong(Green Gram)	1	0				

## 3. Model View: Define relationships between tables and merge data for analysis.

### Step 9: Analysis and Dashboard Creation

1. Once your data is transformed and relationships are created, you can perform data analysis and derive **insights**.
2. Create **dashboards** by selecting key visuals from your report.
3. Dashboards are a way to consolidate and display important metrics for decision-makers in an easy-to-understand manner.

### Step 10: Final Remarks

- **Load:** When your data is cleaned and ready for analysis, you load it into Power BI.
- **Transform:** Data transformation involves cleaning and processing the data (done in Power Query).
- **Report View:** Visualize the data, create reports, and share insights through interactive dashboards.
- **Model View:** Define relationships and merge multiple data sources to create a cohesive dataset for analysis.

By following this workflow, you'll be able to leverage Power BI effectively for BI (Business Intelligence) tasks like data extraction, transformation, loading, and reporting.