



# University Institute of Engineering

## Department of Computer Science & Engineering

### Experiment:3

Date of Experiment: 29-07-2025

**1. Aim of the practical:** To demonstrate geospatial data visualization in Tableau using symbol maps and filled maps based on latitude and longitude fields.

**2. Objective:** To learn how to create location-based visualizations such as symbol maps and filled maps in Tableau and analyze geographic patterns using spatial fields like country, state, latitude, and longitude.

**3. Tool Used/ Apparatus Required:**

- Internet connectivity.
- A system with Tableau Desktop or Tableau Public installed.
- Sample geospatial dataset (e.g., GlobalStores.xls).
- Fields containing: Country, State, City, Latitude, Longitude.

**4. Theory:**

Geospatial data visualization involves displaying data with geographic components—such as country, state, latitude, and longitude—on a map. Tableau makes this process easy by recognizing geographic fields and allowing users to create interactive maps.

Two main types of maps in Tableau are:

- **Symbol Maps:** These use marks (usually circles) to represent data at specific locations. The size and color of symbols can represent different values or categories. They're ideal for showing point data like store locations or cities.
- **Filled Maps:** Also known as choropleth maps, these shade geographic areas (like countries or states) based on a measure. They are useful for comparing data across regions, such as sales by state or population density.

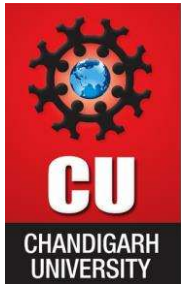
Tableau also supports custom mapping using latitude and longitude fields, which allows plotting precise points on the map—even when the location names are not recognized by default.

Geospatial visualization helps in identifying trends, patterns, and outliers across locations, making it a valuable tool

in fields like business, public health, and environmental studies.

**5. Procedure:**

- **Open Tableau and Load Dataset**
  - Launch Tableau and connect to the dataset containing location fields (e.g., GlobalStores.xls).
  - Ensure fields like **Country**, **State**, **City**, **Latitude**, and **Longitude** are available.
- **Create a Symbol Map**
  - Drag **Country** or **State** to *Detail* under *Marks*.
  - Drag **Latitude** and **Longitude** to Rows and Columns respectively (or Tableau auto-detects them).

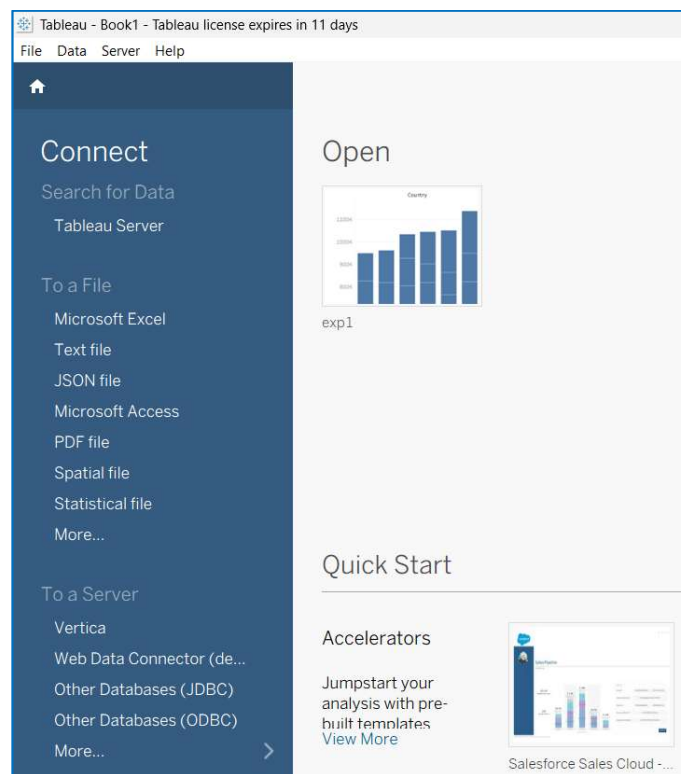


# University Institute of Engineering

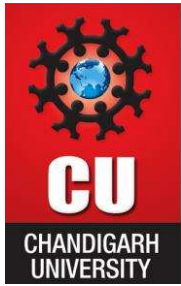
## Department of Computer Science & Engineering

- Set *Marks* type to **Map** → then change to **Circle** (Symbol).
- Add **Sales** or **Profit** to *Size* and/or *Color*.
- **Create a Filled Map**
  - Drag **Country** or **State** to the *View*.
  - Tableau automatically creates a filled map using geographic roles.
  - Drag **Sales** or **Profit** to *Color*.
  - Modify color gradient to reflect data intensity.
- **Customize the Map**
  - Add labels (e.g., **City**, **State**).
  - Use color palettes, borders, and tooltips.
  - Add filters (e.g., show data only for specific region or time).
- **Interpret the Visuals**
  - Analyze which regions perform better based on chosen metric.
  - Compare symbol map and filled map usage scenarios.

### 6. Result:



*Figure 3.1: Tableau Interface*

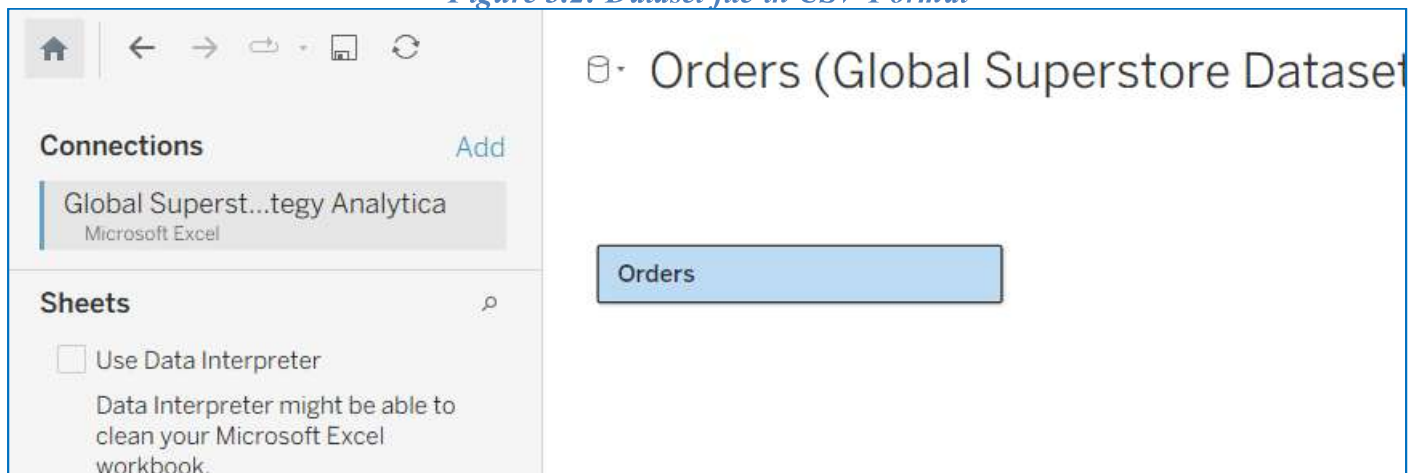


# University Institute of Engineering

## Department of Computer Science & Engineering

	A	B	C	D	E	F	G	H	I
1	Row ID	Order ID	Order Date	Ship Date	Ship Mode	Customer	Customer	Segment	City
2	32298	CA-2012-124	7/31/2012	7/31/2012	Same Day	RH-19495	Rick Hansen	Consumer	New York City
3	26341	IN-2013-778	2/5/2013	2/7/2013	Second Class	JR-16210	Justin Ritter	Corporate	Wollongong
4	25330	IN-2013-712	10/17/2013	10/18/2013	First Class	CR-12730	Craig Reiter	Consumer	Brisbane
5	13524	ES-2013-157	1/28/2013	1/30/2013	First Class	KM-16375	Katherine Mc	Home Office	Berlin
6	47221	SG-2013-432	11/5/2013	11/6/2013	Same Day	RH-9495	Rick Hansen	Consumer	Dakar
7	22732	IN-2013-423	6/28/2013	7/1/2013	Second Class	JM-15655	Jim Mitchum	Corporate	Sydney
8	30570	IN-2011-818	11/7/2011	11/9/2011	First Class	TS-21340	Toby Swindel	Consumer	Porirua
9	31192	IN-2012-863	4/14/2012	4/18/2012	Standard Cla	MB-18085	Mick Brown	Consumer	Hamilton
10	40155	CA-2014-135	10/14/2014	10/21/2014	Standard Cla	JW-15220	Jane Waco	Corporate	Sacramento
11	40936	CA-2012-116	1/28/2012	1/31/2012	Second Class	JH-15985	Joseph Holt	Consumer	Concord
12	34577	CA-2011-102	4/5/2011	4/9/2011	Second Class	GM-14695	Greg Maxwell	Corporate	Alexandria
13	28879	ID-2012-284	4/19/2012	4/22/2012	First Class	AJ-10780	Anthony Jacc	Corporate	Kabul
14	45794	SA-2011-183	12/27/2011	12/29/2011	Second Class	MM-7260	Magdelene M	Consumer	Jizan
15	4132	MX-2012-130	11/13/2012	11/13/2012	Same Day	VF-21715	Vicky Freyma	Home Office	Toledo
16	27704	IN-2013-739	6/6/2013	6/8/2013	Second Class	PF-19120	Peter Fuller	Consumer	Mudanjiang
17	13779	ES-2014-509	7/31/2014	8/3/2014	Second Class	BP-11185	Ben Peterma	Corporate	Paris
18	36178	CA-2014-143	11/3/2014	11/6/2014	Second Class	TB-21175	Thomas Bola	Corporate	Henderson
19	12069	ES-2014-165	9/8/2014	9/14/2014	Standard Cla	PJ-18835	Patrick Jones	Corporate	Prato
20	22096	IN-2014-117	1/31/2014	2/1/2014	First Class	JS-15685	Jim Sink	Corporate	Townsville
21	49463	TZ-2014-819	12/5/2014	12/7/2014	Second Class	RH-9555	Ritsa Hightov	Consumer	Uvinza
22	46630	PL-2012-782	8/8/2012	8/10/2012	First Class	AB-600	Ann Blume	Corporate	Bytom
23	31784	CA-2011-154	10/29/2011	10/31/2011	First Class	SA-20830	Sue Ann Reer	Consumer	Chicago
24	21586	IN-2011-448	5/2/2011	5/3/2011	First Class	JK-15325	Jason Klamcz	Corporate	Suzhou
25	13528	ES-2013-286	2/27/2013	3/1/2013	Second Class	LB-16795	Laurel Beltra	Home Office	Edinburgh
26	1570	US-2014-132	7/31/2014	8/1/2014	First Class	NP-18225	Naresi Patel	Consumer	Luárez

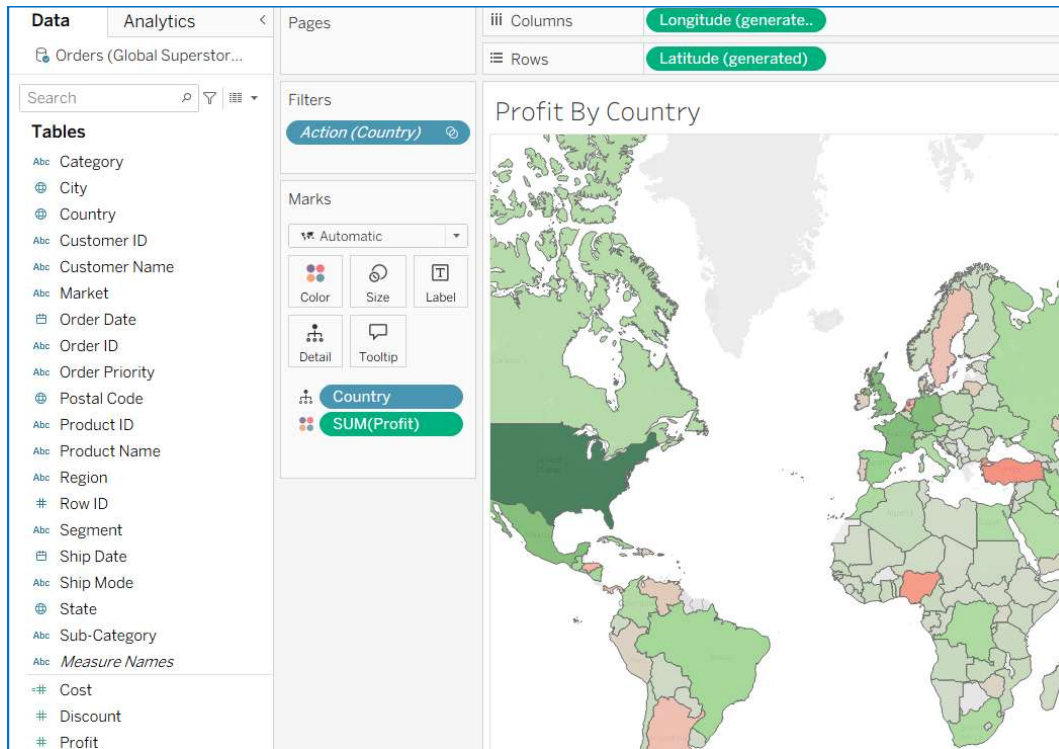
*Figure 3.2: Dataset file in CSV Format*



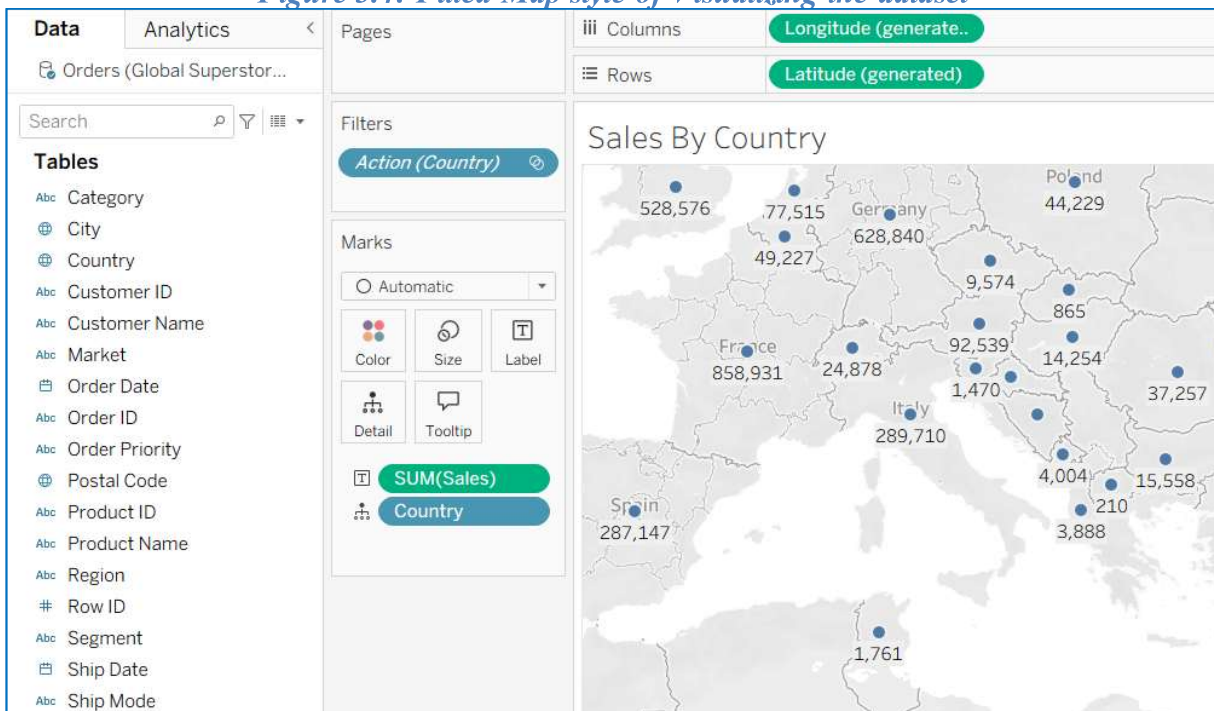
*Figure 3.3: Importing the data in Tableau*

# University Institute of Engineering

## Department of Computer Science & Engineering



*Figure 3.4: Filled Map style of Visualizing the dataset*



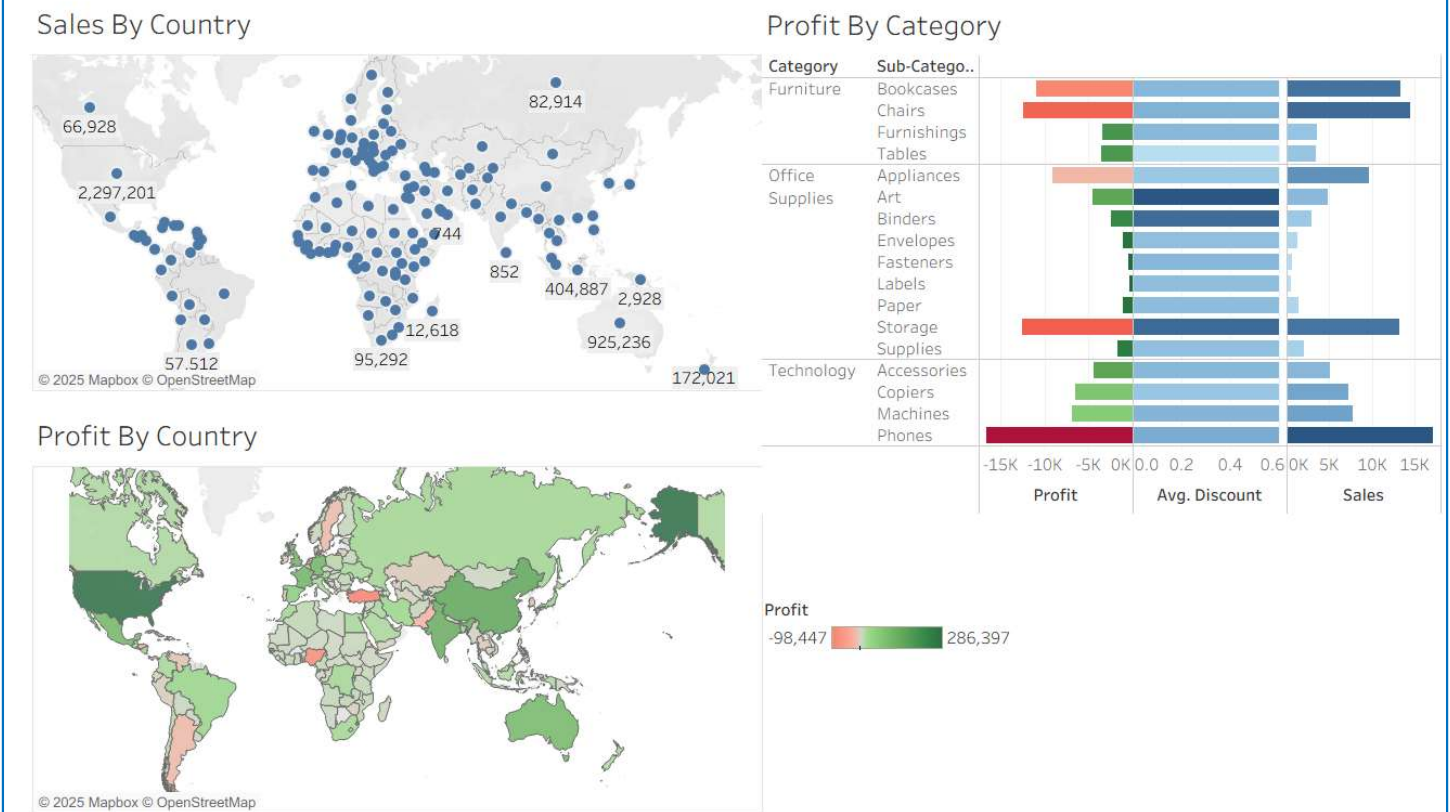
*Figure 3.5: Dot Mapping Style of visualizing the dataset*



# University Institute of Engineering

## Department of Computer Science & Engineering

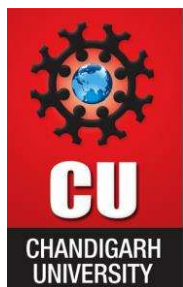
### Global Performance Dashboard



*Figure 3.6: Comparison between two parameters of the dataset.*

### Conclusion:

In this experiment, we successfully demonstrated how to create geospatial visualizations in Tableau using symbol maps and filled maps. By working with geographic fields such as country, state, latitude, and longitude, we learned how to plot data points and analyze spatial patterns effectively. The ability to switch between different visualization types and customize them made the analysis more interactive and insightful. Creating a dashboard further enhanced our understanding of how changes in visual components can dynamically reflect across a unified interface. Overall, this experiment highlighted the power and simplicity of Tableau in visualizing and interpreting geospatial data.



# University Institute of Engineering

## Department of Computer Science & Engineering

### Learning outcomes (What I have learnt):

1. **Understanding Geospatial Fields**, gained knowledge of how Tableau identifies and uses geographic fields like country, state, latitude, and longitude for map-based visualizations.
2. **Creating Symbol and Filled Maps**, learned how to create and customize symbol maps and filled (choropleth) maps to represent location-based data visually.
3. **Classifying Data Types**, developed the ability to distinguish between continuous and discrete data fields and apply them appropriately in visualizations.
4. **Using Interactive Dashboards**, learned how to build a dashboard by combining multiple worksheets and observed how changes in one view dynamically affect the overall dashboard.
5. **Hands-On Data Import and Visualization**, gained practical experience in importing a dataset, exploring different visualization options, applying filters, and interpreting spatial data trends using Tableau.

### Evaluation Grid:

Sr. No.	Parameters	Marks Obtained	Maximum Marks
1.	Student Performance (Conduct of experiment)		12
2.	Viva Voce		10
3.	Submission of Work Sheet (Record)		8
	Signature of Faculty (with Date):	Total Marks Obtained:	30