GIS Data Exploration

Prepared by

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Lecture Structure

- Data exploration: A theoretical background
- Data Query: Spatial & Attribute data query
- Demo sessions in QGIS 3.14
- Tasks for participants

Data Exploration

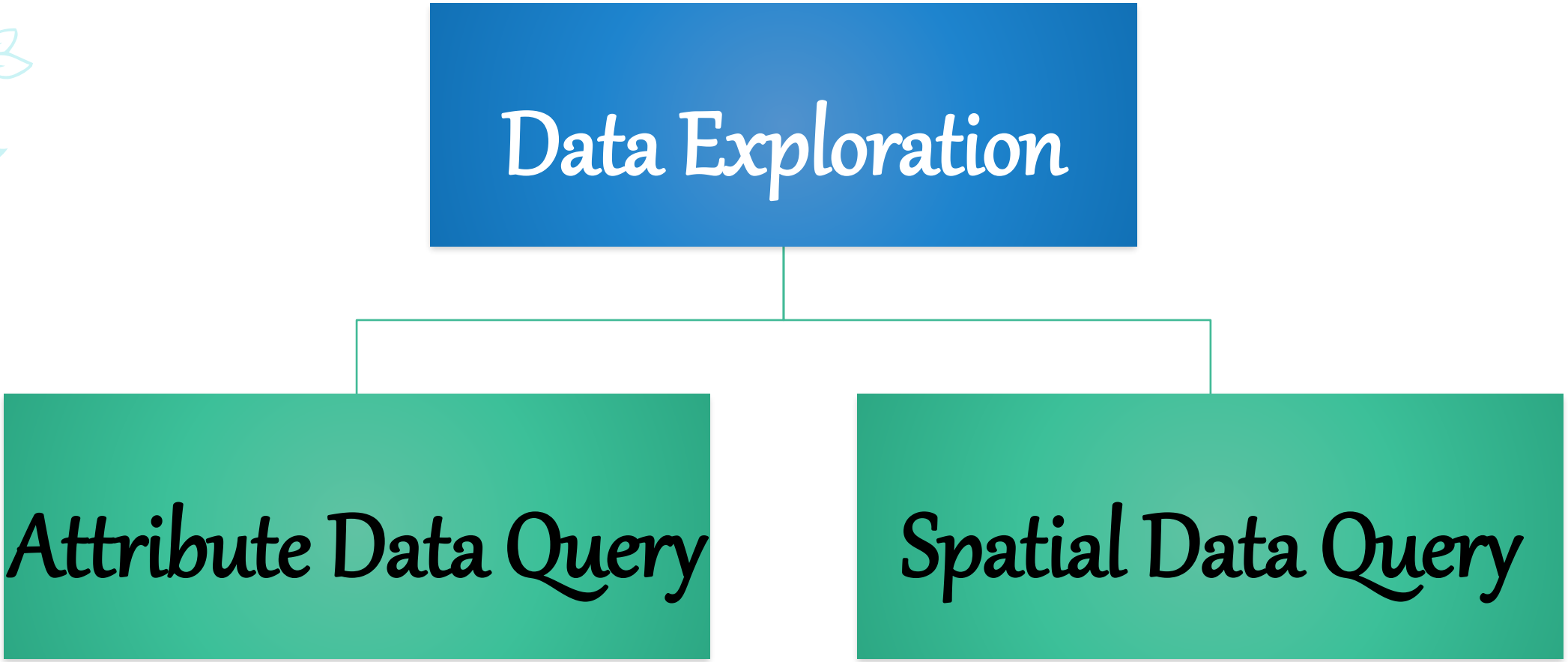
The GIS database has dozens of layers and hundreds of attributes

- **Where to start with?**
- **What to look for?**
- **Can we observe any kind of relationships?**

The act of finding answers to these questions/query is DATA EXPLORATION in GIS

Purpose:

- For **better understanding** of the data
- To provide a starting point in **formulating research questions** and **hypotheses**.


Data Exploration
Attribute Data Query
Spatial Data Query

Attribute Data Query

Attribute Data: describe the ***CHARACTERISTICS*** of the spatial feature

- ✓ Vector data can be in the form of points, lines or polygons.
- ✓ These vector data are accompanied with additional information stored in tabular form.
- ✓ This information can be in the form of ***text*** or ***numbers*** and acts as **attributes** of associated vector features.
- ✓ It is therefore called ‘attribute data’.

- **Retrieves data subset by working with Attribute Data**
- **This type of query requires the use of *EXPRESSIONS***

Ex 1: Exploring the attribute data

➢ *You can add/associate data to your attribute table by:*

- ✓ **Ordering : Ascending/ Descending/ Alphabetically**
- ✓ **Creating a new field**
- ✓ **Removing a field**
- ✓ **Calculating area**
- ✓ **Joining records (Joining Table)**

Tasks

Using the '***Places***' shape file identify the following:

1. Place with **HIGHEST sex ratio** (value) _____
2. Place with **LOWEST literacy rate** (value) _____

Lets see how many of you got it right...

1. Place with **HIGHEST sex ratio** (value) ***Hatod (974)***

2. Place with **LOWEST literacy rate** (value) ***Hatod (72.39%)***

Creating new field

- Add field '**VillageCo.**' to '**CD_Blocks2**' attribute data in the following way

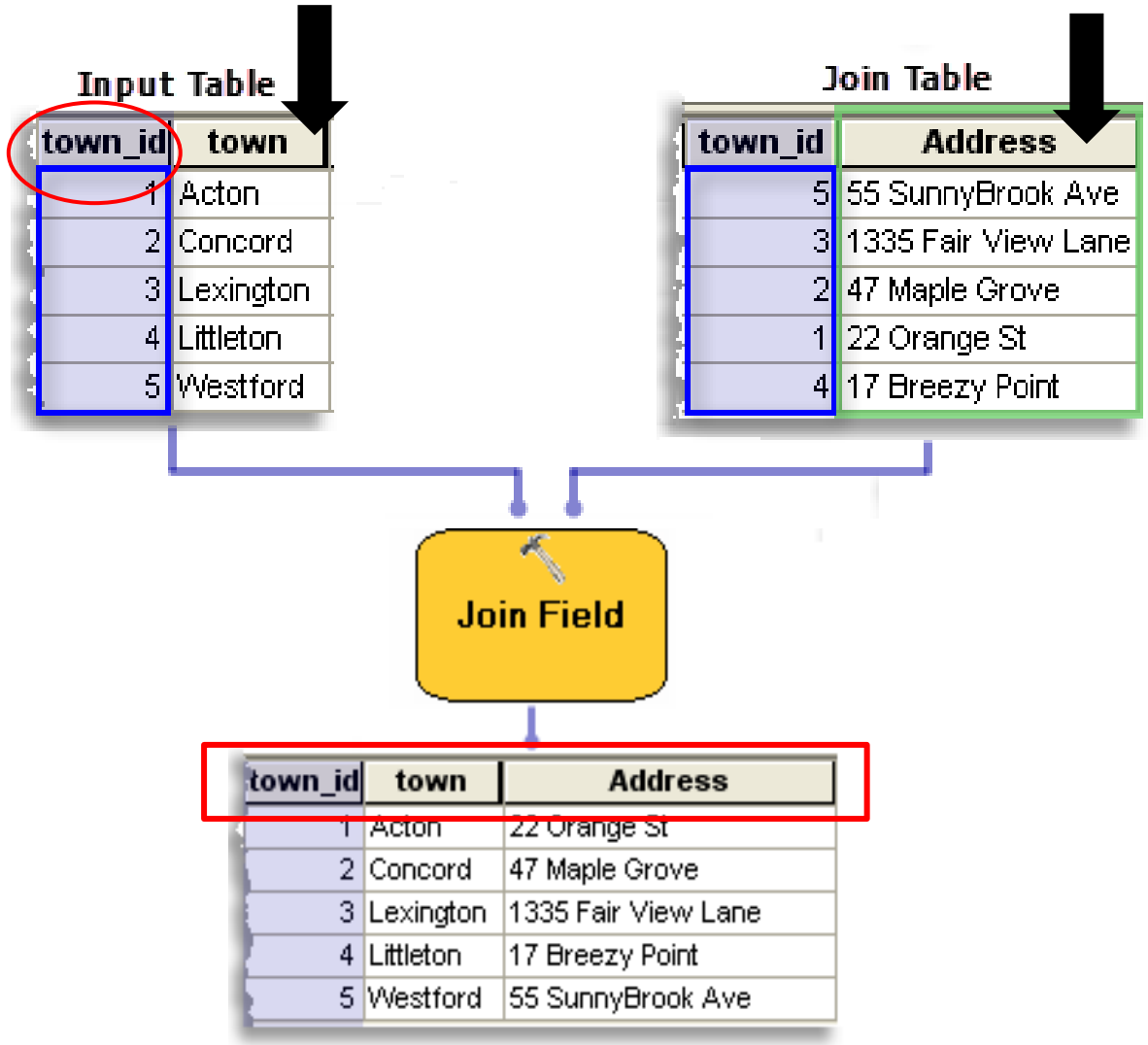
	FID	CD Block	VillageCo.
1	0	Sanwer	166
2	1	Indore	172
3	2	Mhow	146
4	3	Depalpur	130

Table Join

Joining **non-spatial data** to the **spatial data**

- ✓ Spatial Layer: shapefile, geodatabase
- ✓ Non-Spatial Layer: dbf, csv, txt
- ✓ ***Primary*** key (**Join field**): represents one or more attributes whose values can **uniquely identify a record** in a table
- ✓ ***Foreign*** key (**Target field**): counterpart of primary key in *another table* for the purpose of linkage

– ***Demo……***



Roll No.	Name of the Student	E-mail address
201	Ram	Xyz
202	Neena	abc
203	Honey	pqr

Roll No.	Math	English	Hindi	Physics	Chemistry
201	65	78	89	56	80
202	100	85	84	96	84
203	95	57	54	88	76

Roll No.	Name of the Student	E-mail address	Math	English	Hindi	Physics	Chemistry
201	Ram	Xyz	65	78	89	56	80
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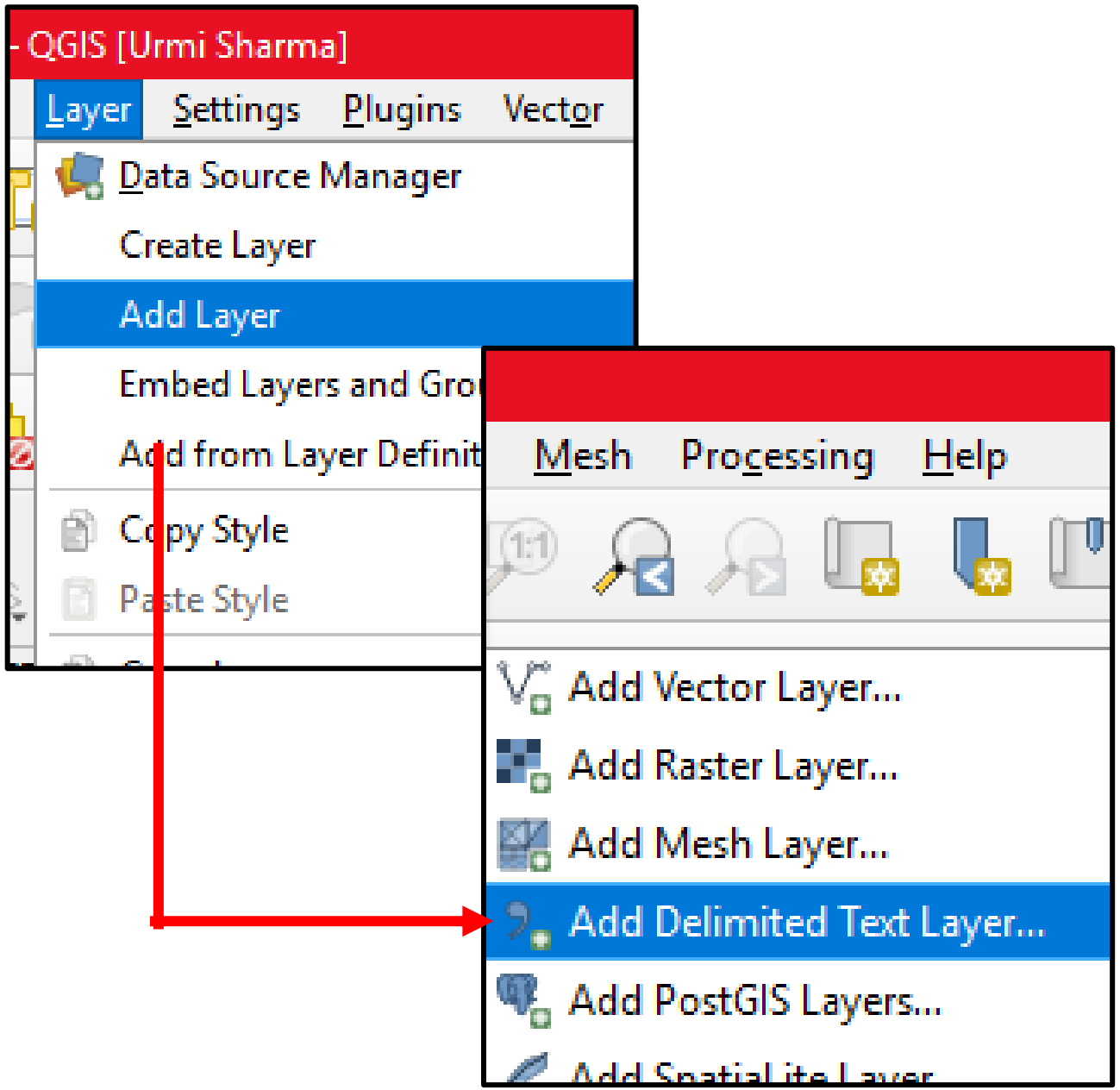
203	Honey	pqr	95	57	54	88	76

Ex 2: Joining a Table

1. Load vector file '**CD_Block_Indore**' in QGIS.
2. Load '**Table.csv**' file in QGIS (***remember to convert 'Table.xlsx' file into '.csv' format first***)
3. Join both the data sets using '**CD_Block**' as common field.
4. Join selected fields only: '***SC_Pop'***, ***'ST_Pop'***, ***'Lit_Rate'*** and '***Sex_Ratio***'
5. Change prefix of the column as '**Join_**'
6. Save your data as a new shapefile '**CD_Block_Indore_Joined**'.



Now lets explore more about the attribute table in QGIS

Advanced query operations

Ex 3: Advanced query operations

Filters

- Indore ATMS data:

1. How many number of **banks are having deposit facility**? ____18_____
2. How many **HDFC bank's** branches are there in the data_____6___
3. How many **Axis bank's** branches are there in the data _____
4. How many number of **banks are not having deposit facility**?

What if the questions are

1. **How many SBI banks are having deposit facility in Indore?**
2. Find out places with **literacy rate less than 80**
3. Find out places with **ST population above 3000**
4. Find out places with **sex ratio less than 930** and **literacy rate greater than equal to 80**
5. Find out **either Canara or HDFC banks having deposit facility**

Advanced Filter (Expression)

1. "bank_name" = 'State bank of India' AND "deposit_fa" = 1
2. "Literacy R" < 80
3. "ST_Pop" > 3000
4. "Sex Ratio" < 930 AND "Literacy R" >= 80
5. "bank_name" = 'Canara bank' AND "deposit_fa" = 1 OR
   "bank_name" = 'HDFC bank' AND "deposit_fa" = 1