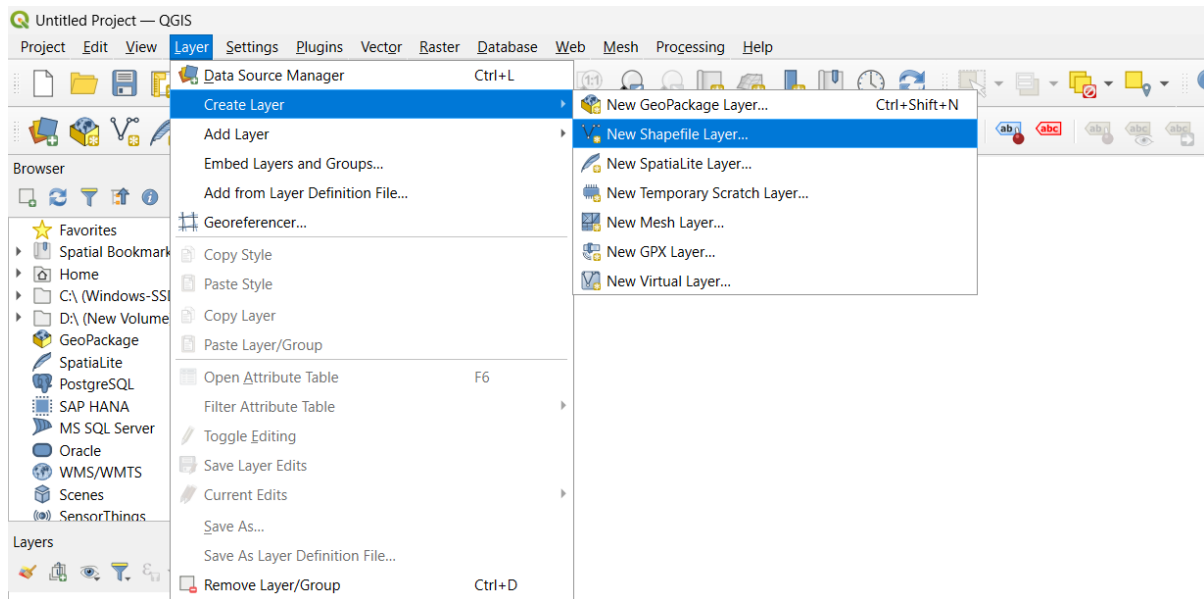
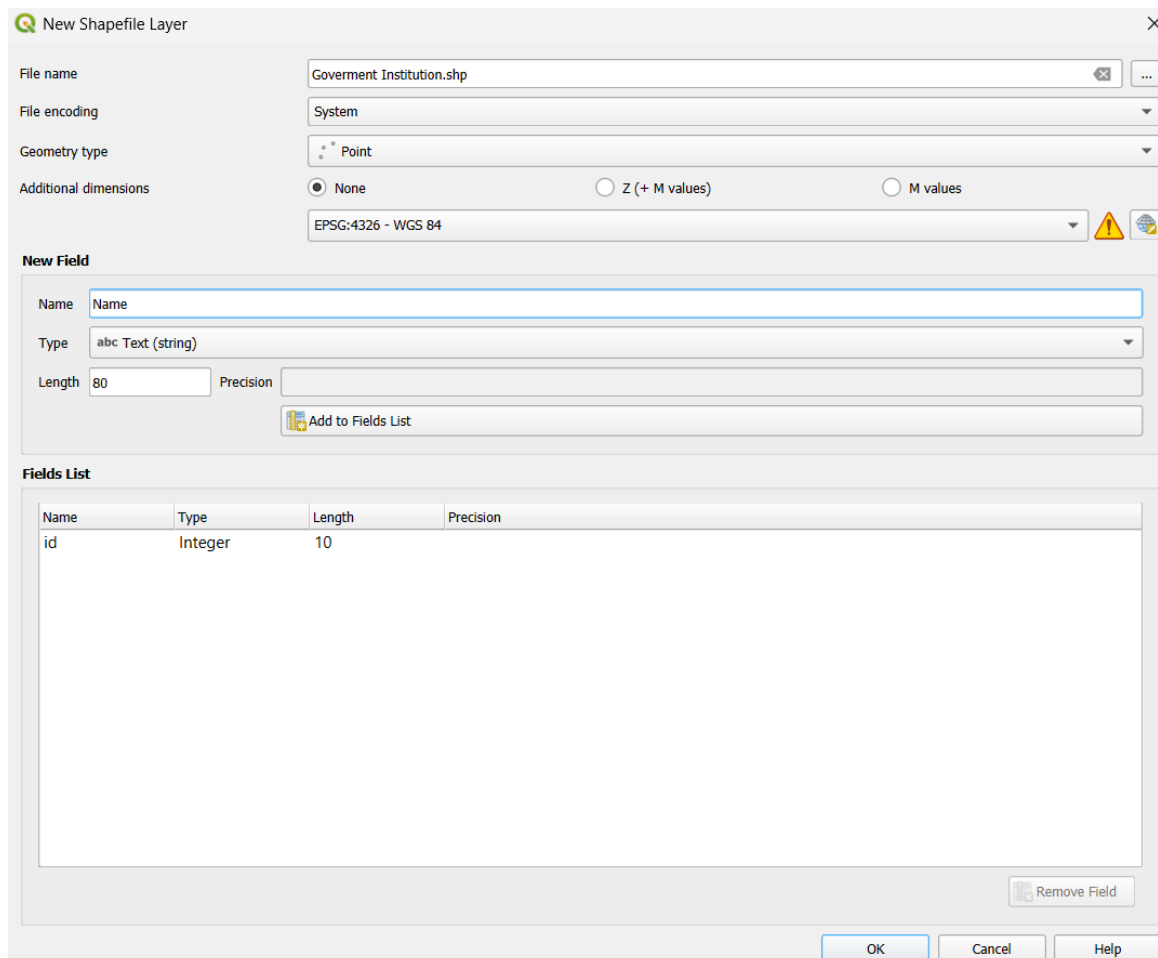


## Practical 2: Creating a Map Using Vector Data in QGIS

Go to Layer -> Create Layer -> New Shapefile Layer



Type the name of the layer and select the vector type and add the required fields



**New Shapefile Layer**

File name: Financial Institution.shp

File encoding: System

Geometry type: Point

Additional dimensions: ☒ None ☐ Z (+ M values) ☐ M values

EPSG:4326 - WGS 84

**New Field**

Name:

Type: abc Text (string)

Length: 80 Precision:

Add to Fields List

**Fields List**

Name	Type	Length	Precision
id	Integer	10	
Name	String	80	

Remove Field

OK Cancel Help

**New Shapefile Layer**

File name: Hospitals.shp

File encoding: System

Geometry type: Point

Additional dimensions: ☒ None ☐ Z (+ M values) ☐ M values

EPSG:4326 - WGS 84

**New Field**

Name:

Type: abc Text (string)

Length: 80 Precision:

Add to Fields List

**Fields List**

Name	Type	Length	Precision
id	Integer	10	
Name	String	80	

Remove Field

OK Cancel Help

Similarly add more point type of shapefile

**New Shapefile Layer**

File name: Roads.shp

File encoding: System

Geometry type: LineString

Additional dimensions: ☒ None ☐ Z (+ M values) ☐ M values

EPSG:4326 - WGS 84

**New Field**

Name:

Type: 123 Integer (32 bit)

Length: 10 Precision:

Add to Fields List

**Fields List**

Name	Type	Length	Precision
id	Integer	10	
Name	String	80	
Length	Integer	10	

Remove Field

OK Cancel Help

**New Shapefile Layer**

File name: Railway Track.shp

File encoding: System

Geometry type: LineString

Additional dimensions: ☒ None ☐ Z (+ M values) ☐ M values

EPSG:4326 - WGS 84

**New Field**

Name:

Type: 1.2 Decimal (double)

Length: 20 Precision: 6

Add to Fields List


**Fields List**

Name	Type	Length	Precision
id	Integer	10	
Name	String	80	
Length	Real	20	6

Remove Field

OK Cancel Help

Similarly add more line type of shapefile


New Shapefile Layer
✕

File name
✕
...

File encoding
System
▼

Geometry type
Polygon
▼

Additional dimensions
☒ None
☐ Z (+ M values)
☐ M values

⚠
🌐

**New Field**

Name

Type
abc Text (string)
▼

Length
Precision


➕ Add to Fields List

**Fields List**

Name	Type	Length	Precision
id	Integer	10	
Length	String	80	

➖ Remove Field

OK Cancel Help


New Shapefile Layer
✕

File name
✕
...

File encoding
System
▼

Geometry type
Polygon
▼

Additional dimensions
☒ None
☐ Z (+ M values)
☐ M values

⚠
🌐

**New Field**

Name

Type
abc Text (string)
▼

Length
Precision

➕ Add to Fields List

**Fields List**

Name	Type	Length	Precision
id	Integer	10	
Name	String	80	

➖ Remove Field

OK Cancel Help

**New Shapefile Layer**

File name: Lake.shp

File encoding: System

Geometry type: Polygon

Additional dimensions: ☒ None ☐ Z (+ M values) ☐ M values

EPSG:4326 - WGS 84

**New Field**

Name:

Type: abc Text (string)

Length: 80 Precision:

Add to Fields List

**Fields List**

Name	Type	Length	Precision
id	Integer	10	
Name	String	80	

Remove Field

OK Cancel Help

\*Untitled Project — QGIS

Project Edit View Layer Settings Plugins Vector Raster Database Web Mesh Processing Help

Browser

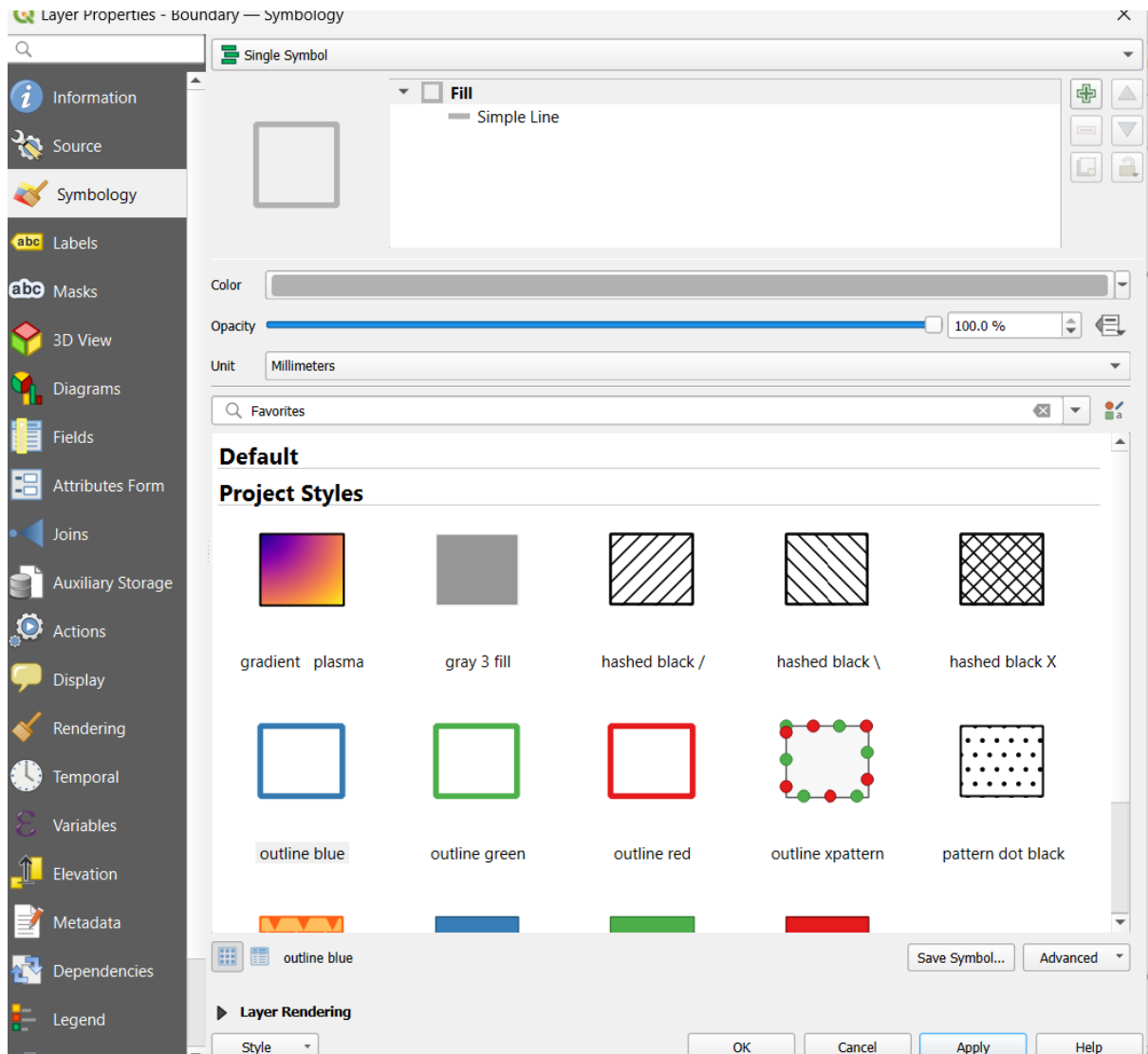
- Favorites
- Spatial Bookmarks
- Home
- C:\ (Windows-SSD)
- D:\ (New Volume)
- GeoPackage
- Spatialite
- PostgreSQL
- SAP HANA
- MS SQL Server
- Oracle
- WMS/WMTS
- Scenes
- SensorThings

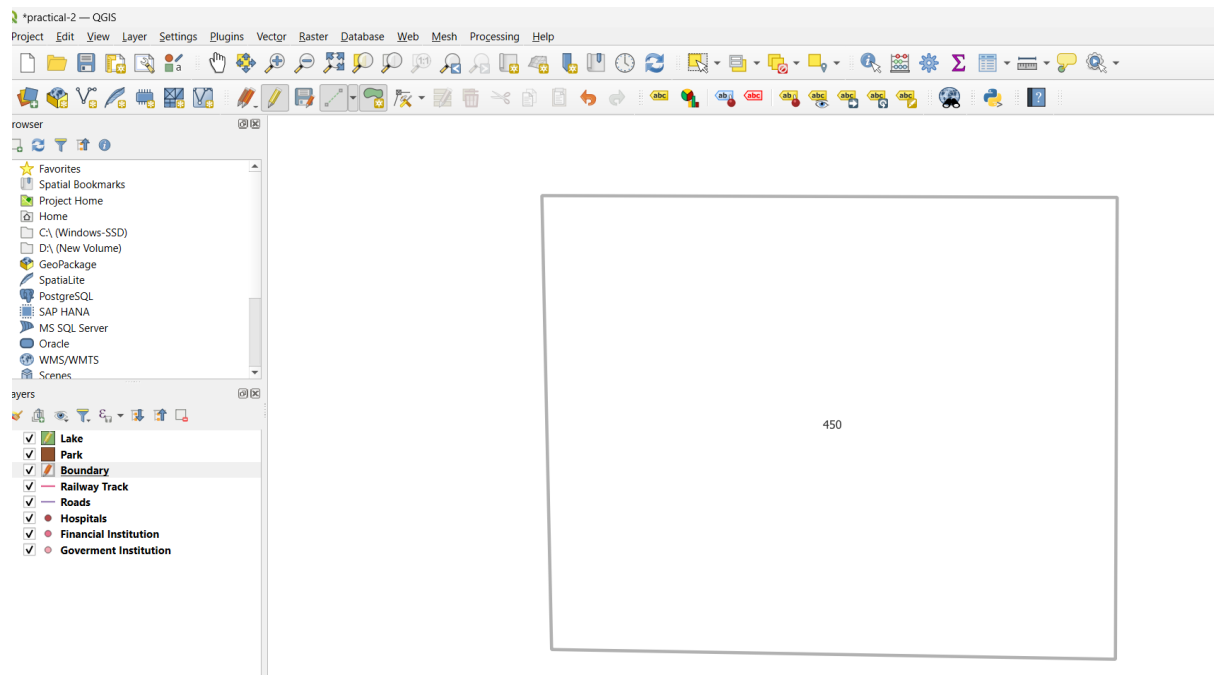
Layers

- ☒ Lake
- ☒ Park
- ☒ Boundary
- ☒ Railway Track
- ☒ Roads
- ☒ Hospitals
- ☒ Financial Institution
- ☒ Government Institution

Select the layer and then click on toggle editing then click on add polygon to create it

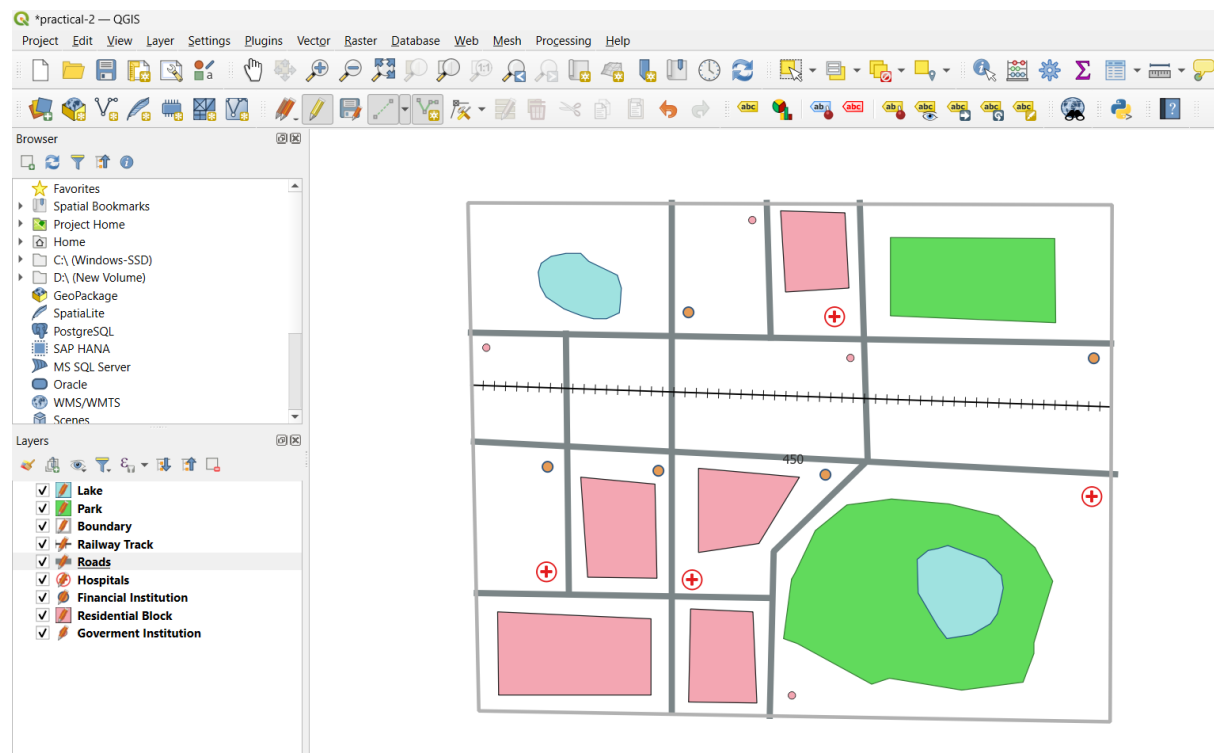
After adding the boundary polygon go to properties and change the style





Now add polygon, line and point into the canvas

And also change the styling of each layers



**QGIS (Quantum GIS)** is an open-source Geographic Information System software used for viewing, editing, analyzing, and visualizing spatial (geographic) data. It supports a wide range of data formats, enables advanced geoprocessing, and allows users to create custom maps.

## Vector Data in QGIS

Vector data represents geographic features using **geometric shapes**. These shapes correspond to real-world objects and are defined using coordinates.

### Components of Vector Data

Vector datasets contain two main components:

#### 1. Geometry

The spatial representation:

- Point, Line, or Polygon
- Stored as a set of X-Y (and optionally Z or M) coordinates

#### 2. Attributes

Tabular non-spatial information stored in the **attribute table**.

Each row corresponds to a feature; each column is a field.

Examples:

- *Landl*: owner\_name, area, land use
- *Road*: road\_name, type, length
- *River*: name, discharge, flow rate

## Where Vector Data Can Be Used

Vector data is widely used in GIS because it represents discrete objects accurately.

### Applications

- **Transportation**: network analysis, route planning
- **Environmental management**: protected areas, forest boundaries
- **Utilities**: water lines, electricity networks, telecom
- **Land administration**: cadastral mapping, property boundaries
- **Navigation apps**: points of interest, roads



## Creating Custom Maps Using Vector Data in QGIS

Creating custom maps involves combining vector layers, styling them, and organizing them to produce meaningful visualizations.

### Steps to Create Custom Maps

1. **Load vector data** (shapefile, GeoPackage, KML, etc.)
2. **Display layers on canvas**
3. **Add basemaps** (OpenStreetMap, satellite imagery)
4. **Symbolize and style layers**
5. **Label features** (e.g., names of roads, towns)
6. **Add map elements** (legend, scale bar, north arrow)
7. **Customize layout using Print Layout tool**
8. **Export the map** (PDF, image)

## Creating a Shapefile in QGIS

A **shapefile** is a common vector data format (.shp, .shx, .dbf, etc.). You can create a new shapefile to digitize custom features.

### Steps to Create a New Shapefile

1. Go to **Layer → Create Layer → New Shapefile Layer**
2. Choose **Geometry type** (Point / Line / Polygon)
3. Add fields to the **attribute table** (e.g., name, ID, area)
4. Save the file
5. Start **editing mode** to add new features
6. Digitize features on the map
7. Save edits and exit editing mode