Nagar Yuwak Shikshan Sanstha's
Yeshwantrao Chavan College of Engineering
(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)
Hingna Road, Wanadongri, Nagpur - 441 110
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Department of Computer Technology

Vision of the Department

To be a well-known centre for pursuing computer education through innovative pedagogy, value-based education and industry collaboration. **Mission of the Department**

To establish learning ambience for ushering in computer engineering professionals in core and multidisciplinary area by developing Problem-solving skills through emerging technologies.

Session 2025-2026

Vision: Dream of where you want.	**Mission:** Means to achieve Vision

Program Educational Objectives of the program (PEO): (broad statements that describe the professional and career accomplishments)

PEO1	**Preparation**	**P: Preparation**	**Pep-CL abbreviation pronounce as Pep-si-lL easy to recall**
PEO2	**Core Competence**	**E: Environment (Learning Environment)**	
PEO3	**Breadth**	**P: Professionalism**	
PEO4	**Professionalism**	**C: Core Competence**	
PEO5	**Learning Environment**	**L: Breadth (Learning in diverse areas)**	

Program Outcomes (PO): (statements that describe what a student should be able to do and know by the end of a program)

Keywords of POs:
Engineering knowledge, Problem analysis, Design/development of solutions, Conduct Investigations of Complex Problems, Engineering Tool Usage, The Engineer and The World, Ethics, Individual and Collaborative Team work, Communication, Project Management and Finance, Life-Long Learning

PSO Keywords: Cutting edge technologies, Research

"I am an engineer, and I know how to apply engineering knowledge to investigate, analyse and design solutions to complex problems using tools for entire world following all ethics in a collaborative way with proper management skills throughout my life." *to contribute to the development of cutting-edge technologies and Research*.

Integrity: I will adhere to the Laboratory Code of Conduct and ethics in its entirety.

Name and Signature of Student and Date
(Signature and Date in Handwritten)

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Session	**2025-26 (ODD)**	**Course Name**	**PE-I - Geo-Intelligence for Smart IoT Devices Lab**
Semester	**5**	**Course Code**	**23IOT1523**
Roll No	**37**	**Name of Student**	**Dhanashri Raut**

Practical Number	**02**
Course Outcome	Apply and demonstrate the use of proprietary and open-source GIS tools (e.g., QGIS) for creating, visualizing, and managing spatial datasets.
Aim	Download a shapefile, inspect metadata, and reproject it to a different CRS.
Problem Definition	The task involves downloading a shapefile, inspecting its metadata to analyze spatial reference and attribute information, and accurately reprojecting it to a different Coordinate Reference System (CRS).

Theory (100 words)	**1. Introduction to GIS Tools** Geographic Information Systems (GIS) are software platforms used for **capturing, storing, analyzing, and visualizing spatial data**. • **Proprietary GIS tools** (e.g., ArcGIS by ESRI) offer advanced functionalities, professional support, and integration with enterprise systems. • **Open-source GIS tools** (e.g., QGIS, GRASS GIS) provide free, community-driven platforms with extensibility through plugins. **2. Shapefile and Metadata** A **shapefile** is one of the most widely used spatial data formats. It usually consists of multiple files (.shp, .shx, .dbf, etc.) and stores **geometric features** (points, lines, polygons) along with associated attribute information. **Metadata** describes the dataset and includes details such as: • Coordinate Reference System (CRS) • Attribute descriptions • Data source and creator information • Date of creation and intended usage **Coordinate Reference Systems (CRS) and Reprojection** A **CRS** defines how spatial data relates to positions on Earth's surface. • **Geographic CRS**: uses latitude and longitude (e.g., WGS 84 – EPSG:4326). • **Projected CRS**: uses map projections for planar measurements (e.g., UTM zones).

Procedure and Execution (100 Words)	Implementation Steps: **Workflow Demonstration Using QGIS (Open-Source Tool)** 1. **Download a Shapefile** – from open data portals (e.g., Natural Earth, OpenStreetMap exports, government GIS repositories). 2. **Load into QGIS** – open the .shp file in the QGIS workspace. 3. **Inspect Metadata** – use the *Layer Properties* → *Metadata* tab to check CRS, attribute fields, extent, and source. 4. **Visualize Data** – apply symbology, labels, and thematic maps for better interpretation. 5. **Reproject Shapefile** – o Right-click the layer → *Export* → *Save Features As…* o Select desired CRS (e.g., convert from EPSG:4326 to UTM Zone 44N – EPSG:32644). 6. **Save and Manage** – export the reprojected layer and organize it into a project database. .

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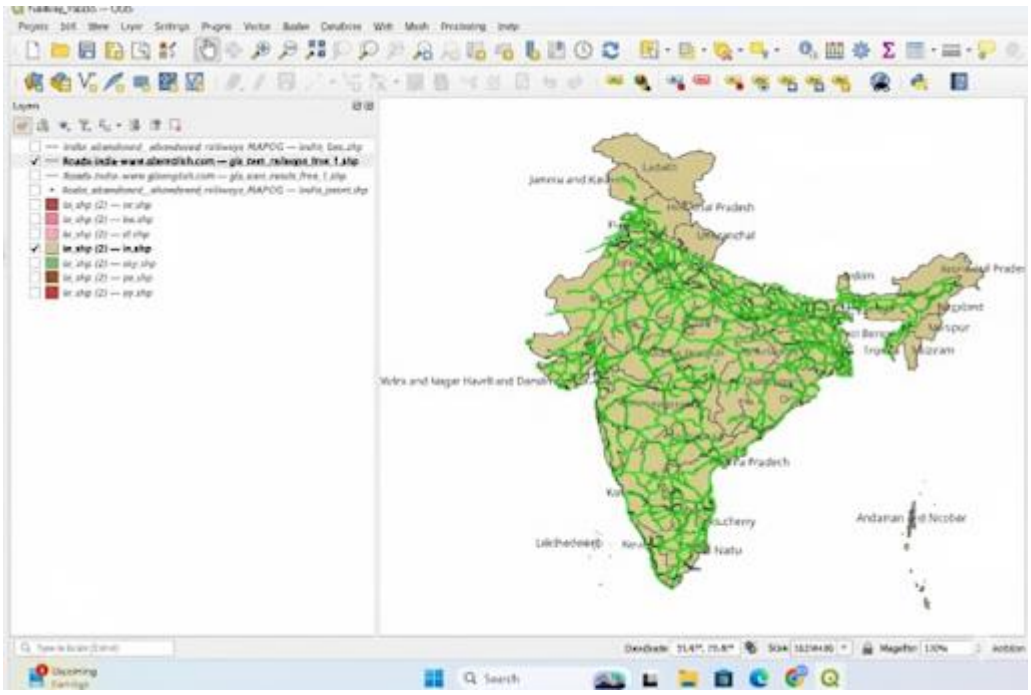
Stepwise Screenshots with steps:



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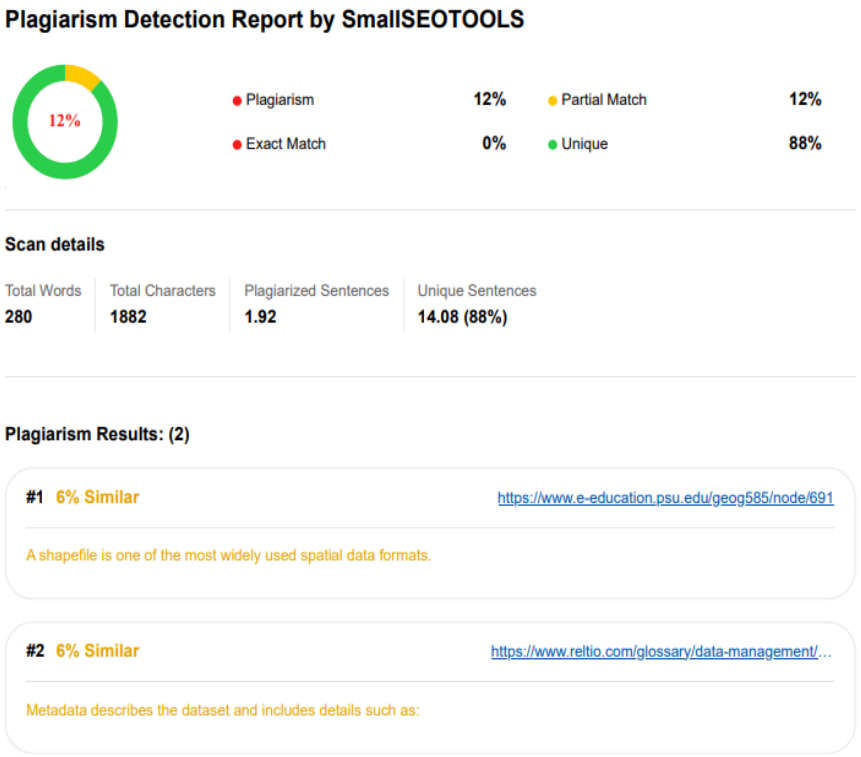
Output Analysis	The shapefile was successfully downloaded, loaded, and visualized in QGIS. Metadata inspection confirmed the dataset's structure, attribute fields, and initial CRS (EPSG:4326 – WGS 84). The layer was then reprojected into a different CRS (e.g., EPSG:32644 – UTM Zone 44N) and saved as a new file. The reprojected layer displayed correctly on the map, with noticeable changes in shape due to projection differences. This ensures accurate distance and area calculations in meters.
Link of student Github profile	**https://github.com/24030192-lab/PE-**

where lab assignment has been uploaded	
Conclusion	This practical demonstrated the use of GIS tools for handling spatial data. A shapefile was downloaded, its metadata inspected, and the dataset was reprojected into a different CRS. The process highlighted the importance of CRS in ensuring accuracy and compatibility of spatial datasets. Open-source software like QGIS provides an efficient platform for creating, visualizing, and managing geospatial data, making it a reliable alternative to proprietary GIS too.
Plag Report (Similarity index < 12%)	**12%**  **Plagiarism Detection Report by SmallSEOTOOLS** 12% Plagiarism 12% Partial Match 12% Exact Match 0% Unique 88% **Scan details** Total Words 280 | Total Characters 1882 | Plagiarized Sentences 1.92 | Unique Sentences 14.08 (88%) **Plagiarism Results: (2)** #1 6% Similar https://www.e-education.psu.edu/geog585/node/691 A shapefile is one of the most widely used spatial data formats. #2 6% Similar https://www.reltio.com/glossary/data-management/... Metadata describes the dataset and includes details such as:
Date	09/09/25

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