Project Title: Toposheet analysis: Extraction of geographical features using Arc GIS.

1. **Introduction**:

   Topographical maps are essential tools for spatial analysis and geographic visualization. In this project, a Survey of India topographical sheet was digitized using ArcGIS to convert physical map data into digital vector layers. The digitized features support better spatial analysis, map creation, and integration with other geospatial datasets.

2. **Objective:**

   The primary objective of this project was to georeference a scanned topographical map and digitize key features such as transportation networks, natural features, land use, and administrative boundaries using ArcGIS. The final output included a comprehensive layout map for visual and analytical purposes.

3. **Study area**:

   The study area for this project falls under Toposheet No. F45/10, published by the Survey of India. This sheet covers parts of eastern India, specifically intersecting two states: Jharkhand and West Bengal. Within this region, the primary districts represented are Purba Singhbhum in Jharkhand and Paschim Medinipur in West Bengal.

4. **Data source**:

   The base data for this project was a scanned topographical sheet obtained from the Survey of India.

5. **Methodology:**

   Georeferencing:

- The scanned toposheet was imported into ArcGIS.
- Control points were identified and matched with known geographic coordinates using the WGS 1984 datum.
- The map was rectified and saved as a georeferenced raster image.

   Digitization:

- Feature layers were created for each feature.
- The Editor tool was used to trace features directly from the georeferenced image.
- Symbology was applied to distinguish feature types (e.g., roads in red, rivers in blue, vegetation in green).

Map layout creation:

- A layout map was designed in ArcGIS Layout View.
- Map elements such as title, legend, scale bar, north arrow, and coordinate grid were added.
- The map was exported in high resolution for printing and presentation

6. **Output**:

A final layout map integrating all digitized elements, ready for analysis and presentation.

7. **Conclusion**:

The digitization of the Survey of India toposheet using ArcGIS successfully converted paper-based geographic information into a digital format suitable for further GIS analysis. The project provided hands-on experience with georeferencing and digitizing workflows, and the final output—a detailed layout map—demonstrates the potential of GIS tools in modern cartography and spatial planning.

Topographical Map