Extract Exchangeable Image File Format (EXIF) Data

Aim:

To extract **Exchangeable Image File Format (EXIF)** data from a digital image using **Exif Reader** and analyze metadata such as camera details, timestamps, and GPS information for forensic investigation.

Introduction:

Digital images often contain hidden metadata known as **EXIF data**, which stores critical information such as:

- Camera model and software used

- Date and time when the photo was taken

- GPS coordinates of the location (if enabled)

- Editing/processing software (if modified)

Forensic investigators use EXIF data to **verify authenticity**, **correlate evidence timelines**, and **establish location-based proofs**. This metadata can remain intact even if the photo is renamed or moved.

Procedure:

1. **Open Exif Reader Tool** ○   Launch the **ExifReader** software on Windows.

   ○   Load the target image file (WIN_20240810_14_40_14_Pro.jpg) via *File → Open*.

2. **Analyze Metadata Sections** ○   The software extracts metadata and displays it under categories:

     ▢   **Main Information**: Software, EXIF Offset, file structure details

- **Sub Information**: Original date/time, sub-second time

- **GPS Information**: Latitude, Longitude, Altitude

3. **Check Timestamps**
   - Locate the DateTimeOriginal field to verify when the image was actually captured.

   - Cross-check with system time and case timeline.

4. **Check GPS Coordinates** o Note the GPS Latitude & Longitude. o Convert coordinates into decimal format and map them (e.g., using Google Maps).

5. **Visual Verification**

   - Switch to the **Thumbnail Image/Preview** panel to confirm the actual image contents correspond with metadata.

6. **Document Findings** o Take a screenshot of the metadata screen and the photo preview.

   - Save extracted data in a forensic report file (TXT/HTML).

Output (Observation):

From the sample image (WIN_20240810_14_40_14_Pro.jpg), Exif Reader revealed the following key metadata:

- **Software**: Windows 11

- **Date/Time Original**: 2024:08:10 14:40:14

- **GPS Latitude**: 13°01′23.90148″ N

- **GPS Longitude**: 80°15′19.01749″ E

- **Image Preview**: Shows a classroom environment with multiple students, confirming consistency with metadata.

(Screenshots of both metadata details and actual photo preview attached as evidence.)
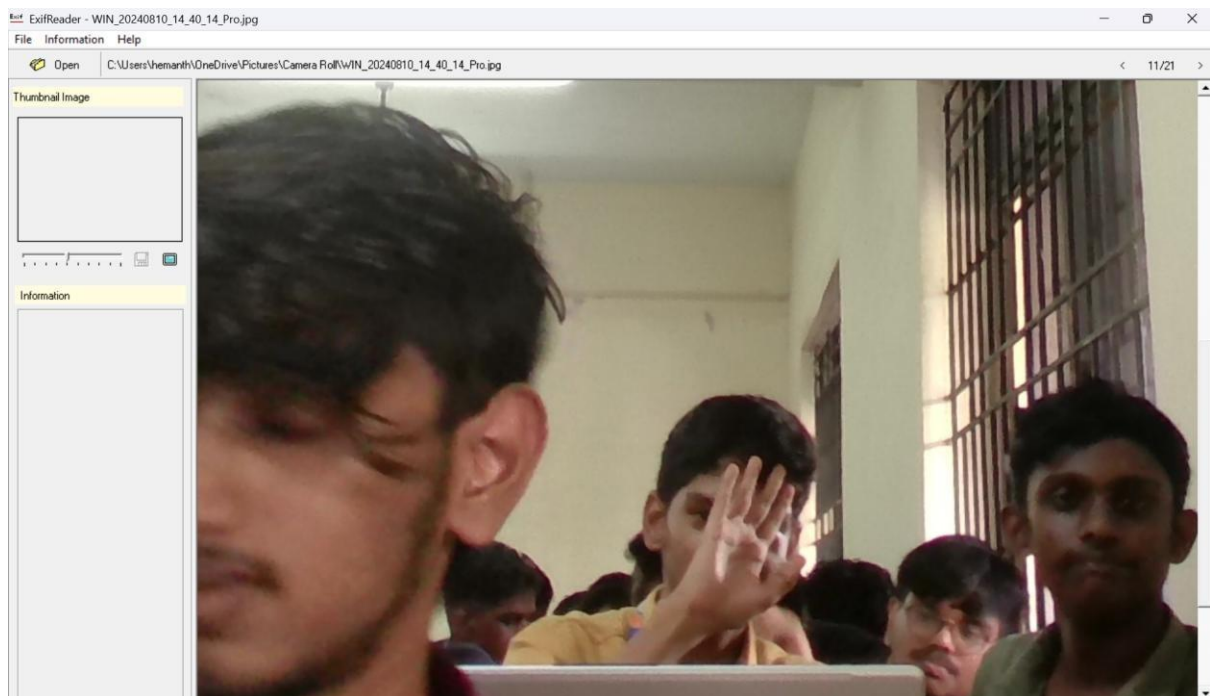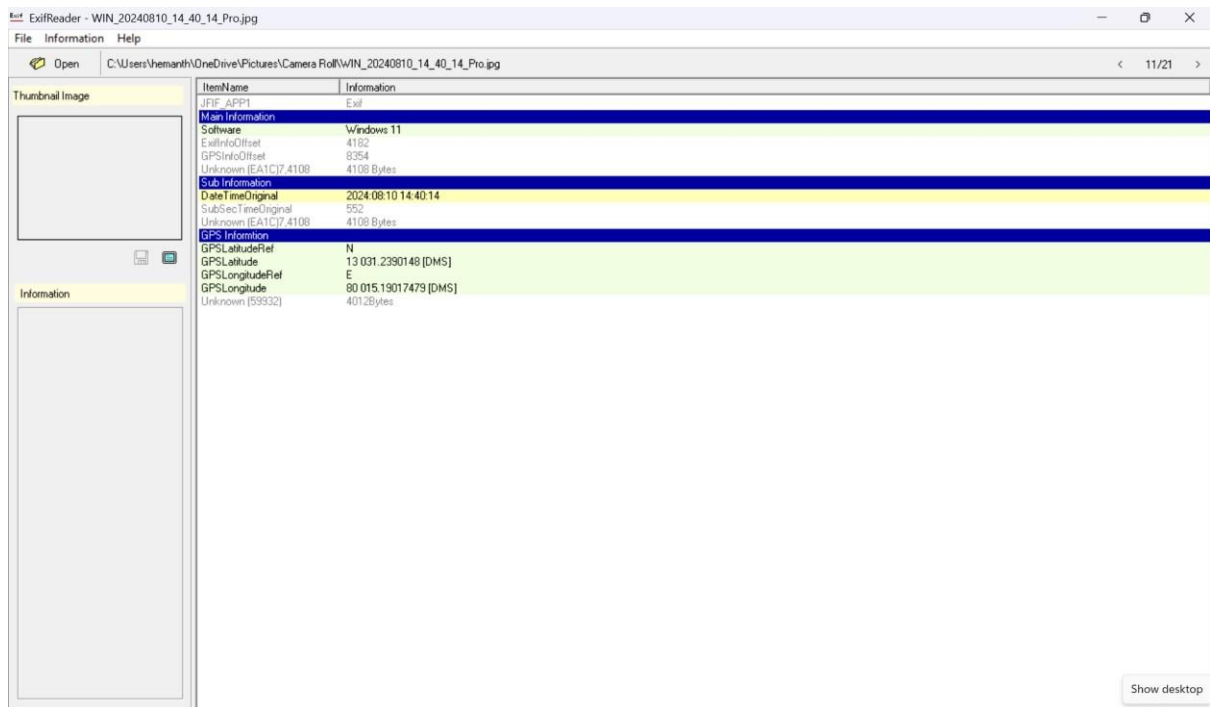
Result:

EXIF data was successfully extracted from the digital image using Exif Reader. Metadata analysis revealed the **capture date, software used, and GPS location**. The image and metadata matched, providing valuable forensic evidence of **when and where the photo was taken**.