

# Steganography Tool - Project Report

## Overview

This project is a simple **Steganography Tool** built in Python.

It allows users to hide (encode) secret text inside an image and later extract (decode) it back using a graphical user interface (GUI).

## Features

- Encode (hide) text inside PNG or BMP images using LSB (Least Significant Bit) technique.
- Decode hidden text from stego-images.
- Simple GUI built with Tkinter for ease of use.
- Error handling for missing files or empty messages.

## Tools & Libraries

- **Python 3**
- **Tkinter** - for GUI
- **Stegano** - for steganography (lsb module)
- **Pillow** - for image handling

## How It Works

1. **Encoding**: User selects an image, enters secret text, and saves the stego-image with hidden data.
2. **Decoding**: User selects the stego-image, and the tool reveals the hidden text.

## Installation

1. Make sure Python 3 is installed on your system.
2. Install required libraries:

```
```bash
pip install stegano pillow
```
```
3. Run the script in VS Code or any Python IDE.

## Usage

- **Encode**: Select an image, enter secret text, and save the modified image.
- **Decode**: Select the modified image to reveal the hidden message.

## Example

- Original Image → Encoded Image (with hidden message)
- Extract hidden text using the decode option.

## Limitations

- Only works with **PNG** and **BMP** images (not JPEG, since JPEG is lossy).
- Currently supports hiding text, not files.

## Future Improvements

- Add support for hiding files (e.g., PDF, DOCX).
- Add password protection with encryption.
- Improve GUI with drag-and-drop support.

## Author

Developed as a Python mini-project demonstration.