

# Steganography Tool for Image File Hiding

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**GitHub Link:** <https://github.com/jyotsnabalotiya/Steganography-Tool-for-Image-File-Hiding>

## Introduction

Steganography is the art of hiding secret information within another file or message to prevent detection. Unlike encryption, which conceals the content of a message, steganography hides the **existence** of the message itself. It is widely used in cybersecurity, secure communications, and digital forensics to ensure confidentiality and prevent unauthorized access to sensitive information.

## Abstract

This project demonstrates the implementation of a **Steganography Tool** that hides **text messages** or **files** inside an image using the **Least Significant Bit (LSB) technique** with **password-based encryption** for added security.

The tool was developed in **Python** and tested on **Kali Linux**, providing both **command-line** functionality and a simple GUI for ease of use.

## Tools Used

- **Programming Language:** Python 3
- **Libraries:** Pillow, Cryptography, Tkinter
- **Operating System:** Kali Linux
- **Version Control:** Git & GitHub

## Steps Involved in Building the Project

### 1. Environment Setup:

- Created virtual environment (venv) and installed required packages (pillow, cryptography).

### 2. Project Structure:

- Developed two main scripts:
  - stego.py – Core functionality for embedding and extracting data.
  - gui.py – Optional GUI interface for user interaction.

### 3. Image and File Handling:

- Generated a sample cover image and secret text file.

### 4. Embedding Process:

- Used LSB technique to hide text or file data inside an image with password protection.

### 5. Extraction Process:

- Retrieved hidden text or file using the correct password and saved it as an output file.

### 6. Testing:

- Verified embedding and extraction of both text and files using various test cases.

### 7. Version Control:

- Uploaded the entire project with screenshots to GitHub.

## Conclusion

Through this project, I learned how to implement **data hiding techniques** using Python and secure sensitive information using steganography. The combination of **image processing and encryption** ensures that the hidden data remains confidential and undetectable.

In the future, the tool can be extended to support **audio and video files** and include **advanced encryption algorithms** for even greater security.

## GitHub Repository:

<https://github.com/jyotsnabalotiya/Steganography-Tool-for-Image-File-Hiding>