AN

INTERNSHIP REPORT ON

"STEGANOGRAPHY WITH MULTIPLE DATA HIDING USING LSB TECHNIQUES"

SUBMITTED TO SAVITRIBAI PHULE PUNE UNIVERSITY FOR THE PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

BACHELOR OF ENGINEERING
IN
ELECTRONICS AND TELECOMMUNICATION

Submitted by

Sakshi Vispute(T190073153)

TE ENTC 2
Roll No : 9074

Under the Guidance of

Prof. Dr. Vikram M. Gadre Sir (IITB)

Department of Electronics and Telecommunication Engineering

Pune Vidyarthi Griha's College of Engineering and Technology & G. K. Pate (Wani) Institute of Management, Pune -411009

CERTIFICATE

This is to certify that Mr/Miss. **Sakshi Vispute** has completed Internship at the **Indian Institute Of Technology, Bombay** from **1st June 2021** to **31St DECEMBER 2021.** towards the partial fulfillment of the degree of **Bachelor of Engineering** in **Electronics and Telecommunication** Engineering at T.E. E & TC to be awarded by the **Savitribai Phule Pune University, Pune** at **Pune Vidyarthi Griha's College of Engineering and Technology, & G. K. Pate (Wani) Institute of Management,**

Pune -411009 during the academic year 2021-22.

(Prof. P.S. Deshpande)	(Prof. Dr. Y. B. Thakare)	(Dr. M. R.Tarambale)
Internship Coordinator	Head, Department of E&TC	I/C Principal

Place: Pune

Date:

INTERNSHIP COMPLETION CERTIFICATE FROM COMPANY

भारतीय प्रौद्योगिकी संस्थान, मुंबई
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IIT Bombay

Sr. No.: 2021_22_PVG_7

Date: 3rd Jan 2021 **Ref: GHRCoE + PVGCoET/ Students/ Internship/ 1 Jul – 31 Dec 2021**

CERTIFICATE

This is to certify that **Sakshi Vispute,**

a student of **Third Year of Electronics and Telecommunication Engineering** from **Pune Vidyarthi Griha's COET & GKPIM Pune,** has completed a six month- Industry Project Internship, successfully, from **1 July 2021 to 31 December 2021,** under my guidance.

S/he has worked for the development of two practical applications of Digital Signal Processing, aimed at applying the knowledge of Digital Signal Processing obtained in an academic course, in a practical problem.

S/he worked in a team of students from the Institutes: **G. H. Raisoni College of Engineering, Nagpur and PVG's College of Engineering & Technology and G. K. Pate (Wani) Institute of Management, Pune.**

This activity has also given this student, an opportunity to learn skills of teamwork and leadership, by association with students and faculty members of other Institutes of repute. We trust that the applications, that s/he has explored and developed, would be of value to professionals in the industry working in this space and also useful in an academic setting, to further understanding of digital signal processing principles through application platforms. Thus, s/he has contributed both to industry and to academia, in the process of this internship.

I wish this student, all the best for career and personal growth in future.

Digital Signature
Vikram M Gadre (i94038)
01-Dec-21 03:24:08 PM

Dr. V. M. Gadre, Professor, Department of Electrical Engineering, Indian Institute of Technology Bombay

(Pre-Authorized for award, along with counter-signature of Internship Faculty Coordinator(s) from Pune Vidyarthi Griha's COET & GKPIM Pune, after completion of internship)

Counter-signed:

Dr Minakshi P Atre | Prof Mahesh P Potadar | Prof Tanuja S Khatavkar

https://ams.iitb.ac.in/d/43546-JJLHGKMYU518UCQ0

Congratulations!

Sakshi Vispute (Group 5)
Winner 1

at

Atmanirbhar Bharat Project Presentation

held on 14th & 15th December 2021

DSP IITB Internship Program

at **Department of E & TC, PVG's COET & GKPIM** Pune during the period from 1st July 2021 to 31st December 2021

under the **Mentorship of Dr Vikram Gadre, Professor, EE Department, IIT Bombay**.

Dr Mrs M P Atre	Prof M P Potadar	Prof Mrs T S Khatavkar
Coordinator	Coordinator	Coordinator
Dr Y B Thakare	Dr M R Tarambale	Dr V M Gadre
Head E & TC Department	I/C Principal PVG's COET & GKPIM Pune	Professor, Dept. of Electrical Engineering Indian Institute of Technology, Bombay

ACKNOWLEDGEMENT

I would like to thank Prof. Dr. Vikram Gadre Sir for their guidance . I would like to thank Prof. Tanuja S Khatavkar ma'am, Prof. Dr. Minakshi P Atre ma'am &
Prof. Mahesh P Potdar Sir for giving me this opportunity.

I was able to develop Communication Skills, Teamwork Skills, Critical Thinking and Problem Solving Skills and learn about different steganography techniques, how steganography works, how to build a model and what is digital signal processing and image processing.

I would like to thank you again prof. Dr. Vikram Gadre sir and prof. Dr. Y.B. Thakare Sir Thanks to them we contributed to atma-nirbhar bharat. At last I would like to thank all my group members for their dedication as well as for reinforcing actions and behaviors that drive progress.

Sakshi Vispute.

INTERNSHIP PLACE DETAILS

Company background:

It is a well known institute i.e. Indian Institute of Technology Bombay (IITB). from this institute prof. Dr. Vikram Gadre sir guided us through the entire internship. They are well-known in the field of Digital Signal processing and its applications. Their mission is to contribute to the atma-nirbhar bharat through the internship opportunity.

Organization and activities:

They give this type of internship/opportunity through which students get a chance to explore new things,develop new skills and implement them via projects.

Scope and object of the study:

Our topic for internship is Video Steganography. It can be used in various applications where you want to hide your confidential data without anyone noticing the confidential data.

Description of internship :

Sr. no	Internship project title	Organization name	Internship start date	Internship end date	Duration of Internship
1	Steganography with multiple data hiding using LSB technique	Indian Institute Of Technology, Bombay	1st June 2021	31st December 2021	6 months

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ABSTRACT

Hiding a confidential data / message is very important now a days in government , military , research field because of the theft reason. For this purpose concept named ‘Steganography’ is being developed with the help of Artificial Intelligence. In the steganography concept we hide our confidential data into a text, image or in the video. For this there are many techniques. But here we have used LSB (Least Significant Bit) technique. In this technique message is hidden inside an image or video by replacing each pixels least significant bit with the bits of message to be hidden.

So here we have made a GUI (Graphical User Interface) so you can choose which setganography you want to perform i.e. text, image or video steganography. If the message is small you can choose text or image steganography or if the message is long you can perform video steganography. and this is the main advantage of video steganography that you can hide long message and the integrity will remain the same.

LIST OF ACRONYMS :

1. DSP - Digital Signal Processing
2. DIP - Digital Image Processing
3. LSB - Least Significant Bit
4. GUI - Graphical User Interface

LIST OF FIGURES

CHAPTER 1
INTRODUCTION

1.1 Introduction :

With the development of PCs and developing its utilization in various fields of life and work, the issue of data security has become dynamically significant. One reason considered in data security is the exchange of data through the cover media. Because of this, different techniques like cryptography, steganography, coding, and so on have been utilized. The technique for steganography is the strategy that has acquired consideration lately. The fundamental point of steganography is to conceal data in the other cover media with the goal that others won't notice the presence of the data. In steganography, the presence of the data in the sources won't be perceived by any means. Most steganography errands have been completed on pictures, video cuts ,texts, music and sounds .These days, utilizing steganography with different techniques, data security has improved impressively. As well as being utilized in the clandestine trading of data, steganography is utilized in different causes like copyright, forestalling e-record manufacturing. Steganography is gotten from the Greek for covered composition and essentially signifies "to hide by not really trying to hide". Steganography is the specialty of unnoticeably concealing information inside information. The significant point of steganography is to conceal data appropriately so the undesired beneficiaries don't associate the steganographic strategy with containing stowed away information Simple steganographic modes have been in need for many years, yet with the expanding utilization of documents in an electronic configuration new procedures for data stowing away have become conceivable. Numerous steganography assignments have been directed on various capacity cover media like text, picture, sound or video. Steganography and encryption are both used to check information privacy . Albeit the fundamental qualification between them is that with encryption anybody can see that the two collusions are associating stealthily. Steganography covers the presence of a mysterious message and in the most ideal circumstance nobody can see that the two players are communicating stealthily.

CHAPTER 2

OBJECTIVES

2.1 Title:

Steganography With Multiple Data Hiding Using LSB Techniques

2.2 Problem Statement:

Build a model to hide a confidential data into an image or video by using LSB (Least Significant Bit) technique.
Steganography conceals the actual presence of a message so that assuming effective it by and large draws in no doubt by any means.Using steganography, information can be covered in carriers like pictures, sound records, text reports, accounts and data transmissions.Inthis endeavor, we have proposed one more design of a steganography structure to disguise picture in picture , text in picture , picture and text in video . As the venture that was given over to us was of picture steganography as it were. So as a headway we made a model joining three steganographic for example Text Steganography ,ImageSteganography,VideoSteganography procedures utilizing LSB technique.

2.3 Objective:

The target of steganography is to conceal a mysterious message inside a cover-media so that others can't perceive the presence of the secret message.Truth be told in essential words "steganography infers covering one snippet of data inside another". Present day steganography uses the shot at disguising information into mechanized media records and moreover at the association pack level. Present day steganography utilizes the chance of concealing data into computerized media records and furthermore at the organization bundle level. Concealing data into a media requires following components We present a start to finish approach of picture, message and video steganography.Given info picture, text, video record will be changed over into cover edges and one of these edges would go about as cover picture to conceal private text and mystery picture.
To do different information stowing away, to build information security. To do information concealing utilizing MSB LSB strategy

2.4 Expected Outcomes:

Successfully hide a data into an image or a video without third party noticing it.

2.5 Social Relevance:

Now a days we are facing many cyber thefts while sending some confidential information in military, research and government field. So to avoid that steganography is the technique based on artificial Intelligence is implemented.
So in the steganography you can hide your information in the text, image or in the video without third party noticing the hidden data.
This technology can be used in sector like government , military , research where you want to share the confidential information without third party noticing it.

CHAPTER 3
MOTIVATION/SCOPE AND RATIONALE OF THE STUDY

There are some fields where they want to share some sensitive information or message to someone but while sending those messages there is integrity remain because of the theft in cyber crime. For example in military field they want to share some confidential information to someone but they don’t want enemies to know their message or in the research field researchers want to hide some new formula or there new discovery. So for these purpose our system has worked on.

CHAPTER 4

METHODOLOGICAL DETAILS OF ACTUAL WORK DONE

1. Utilizing the LSB method, which gives text stowing away in a picture likewise as coveringpicture records in a picture.
2. It works with JPEG plans for the cover picture and dependably makes JPEG Stegopictures because of its lossless pressure.
3. Least Significant Bit Embeddings (LSB) are a general steganographic method that is utilized to implant information into an assortment of state of the art sources; different applications are utilizing LSB acquainting with conceal one picture insideanother.
4. In this steganography programming, we can conceal the information utilizing LSB present strategies. The steganography thing is disconnects into three segments :

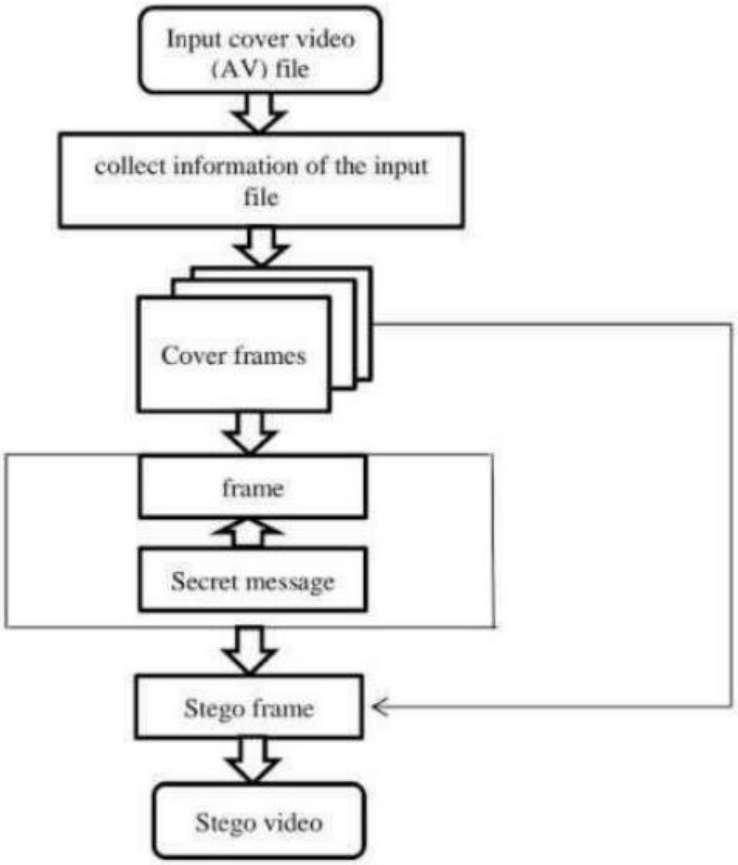
A] Text steganography : Text steganography is a cycle for camouflaging a confusing message inside one more message as a covering message for gen-erating a cover message related with the foremost mystery message

B] Image steganography : here we are hiding a image which is stego-image in another image which is cover image.

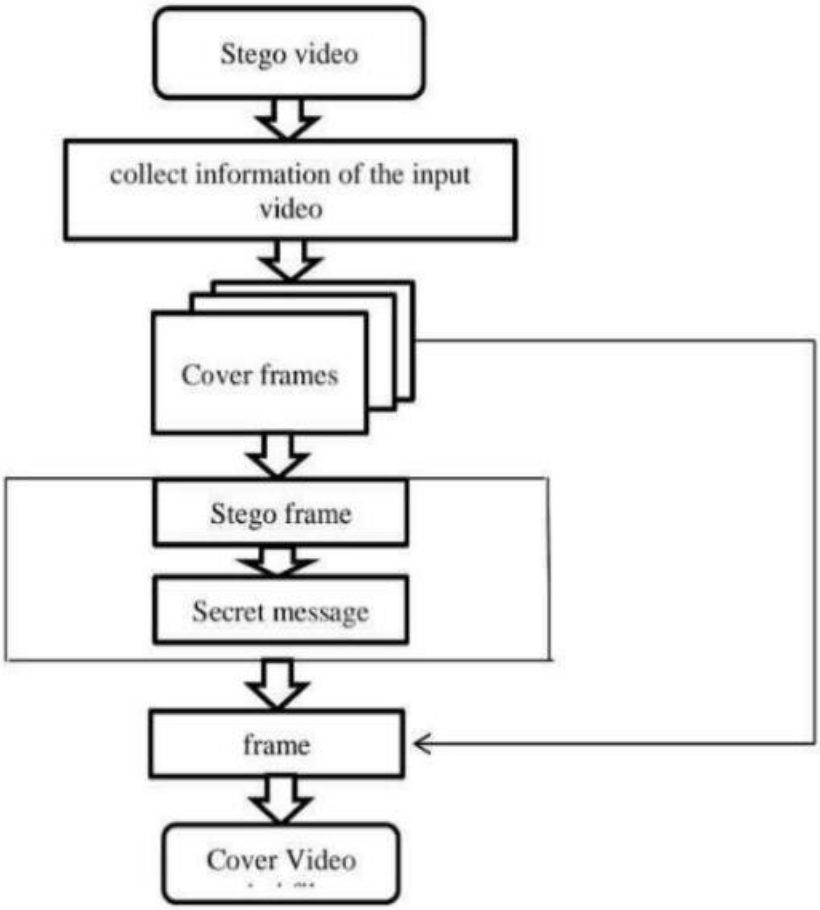
5. There are three rule groupings used to conceal message in-messages, that is, plan based, self confident and genuine generations, and semantic systems.

C] Video steganography : in this we are hiding our secret information in the video. So for doing this we have to break our video into frames to hide the data in it.

Encoding -


Input cover video (AV) file
collect information of the input file
Cover frames
frame
Secret message
Stego frame
Stego video

Decoding :



Tools used:

Jupyter Notebook

The Jupyter Notebook is an open-source web application that licenses you to make and share reports that contain live code, conditions, portrayals, and story message. Its uses fuse data cleaning and change, numerical reenactment, verifiable showing, data insight, AI, and essentiallymore.

Coding Technology used:

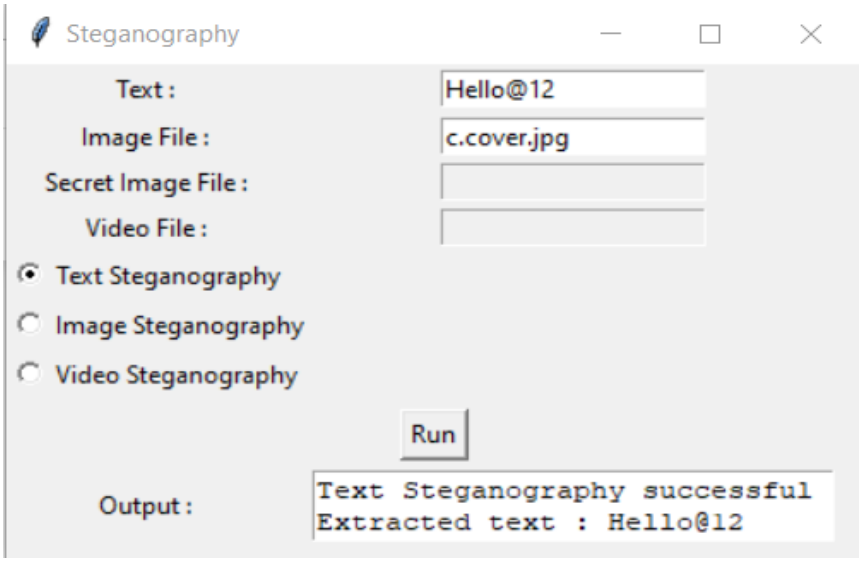
Python

CHAPTER 5
RESULT, ANALYSIS AND CONCLUSION

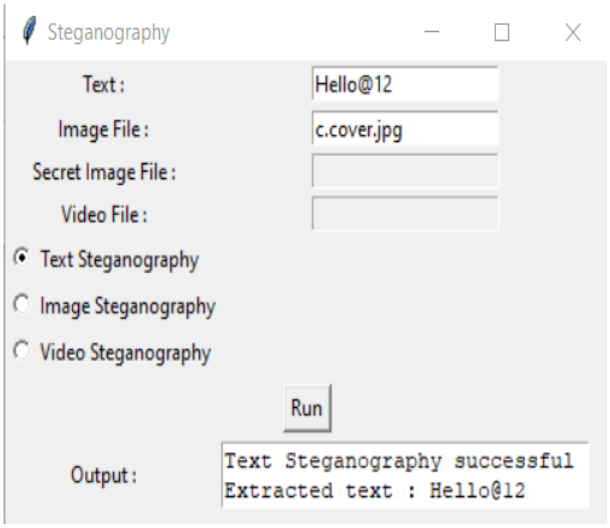
5.1 Result & Analysis :

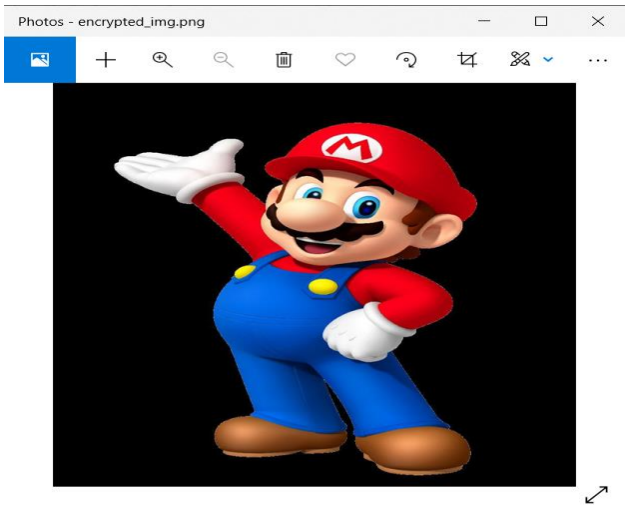
1. GUI window

This window shows three options of steganography you can choose the type from those three types



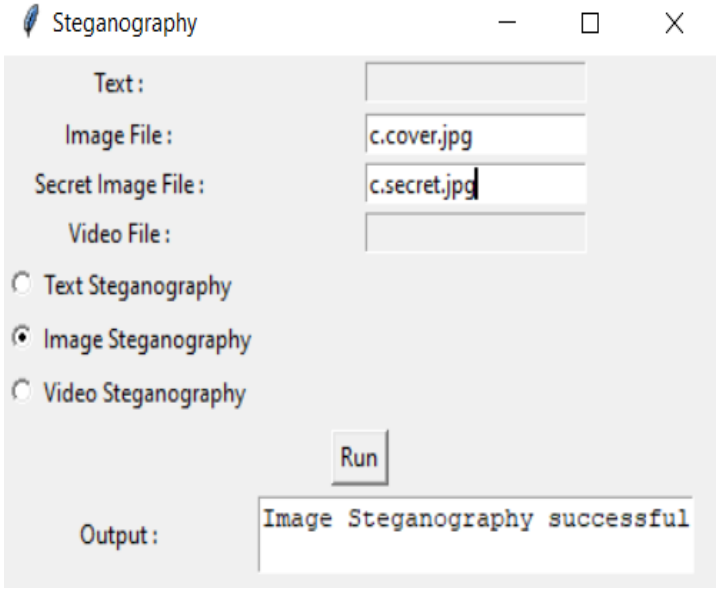
2. Text Steganography :

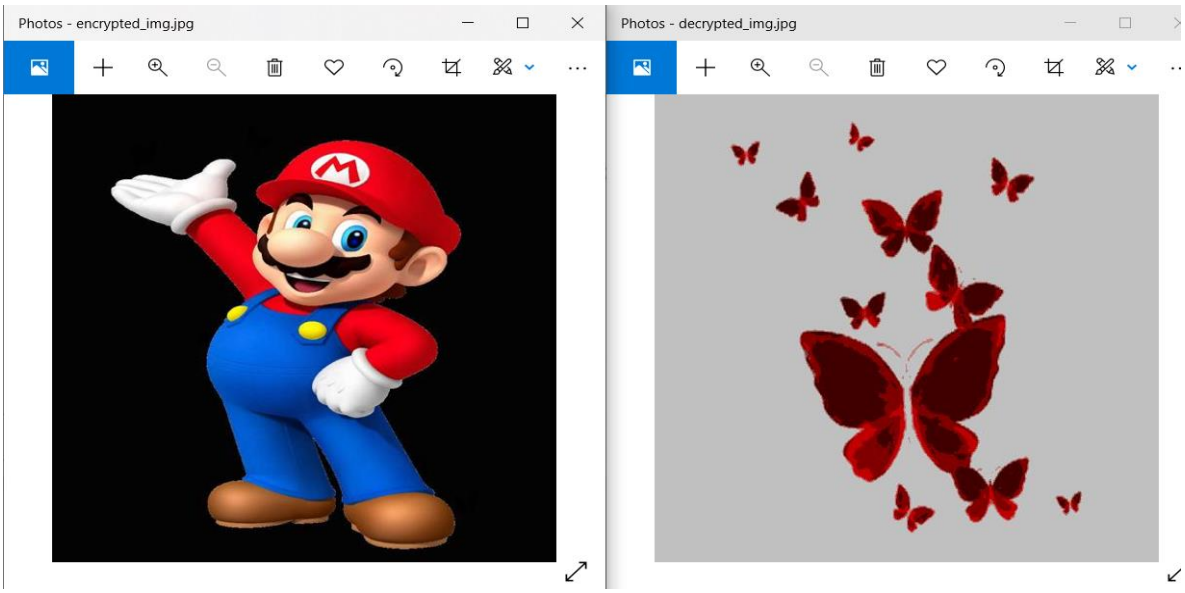




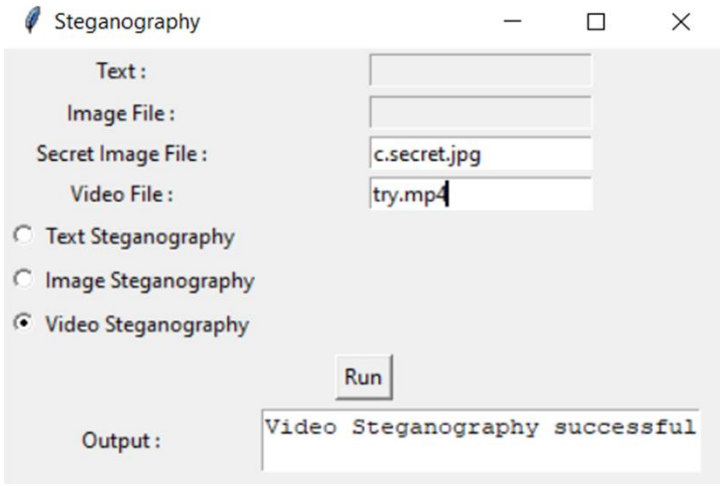
This is the image where text is hidden and the GUI window output column shows the message that text steganography is successful.

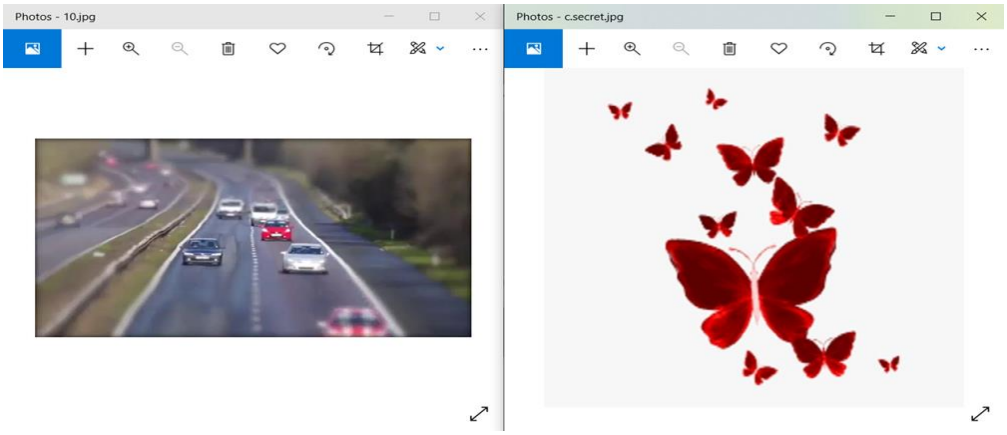
3. Image Steganography :

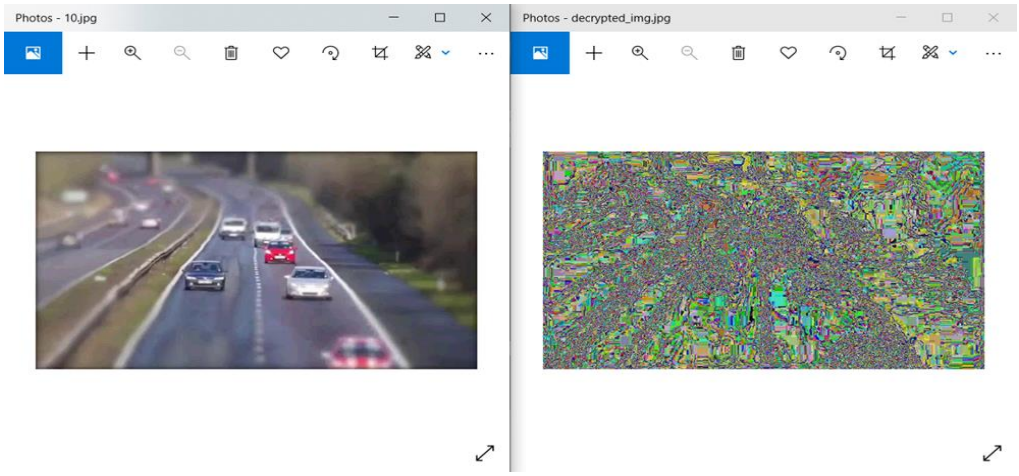




4. Video Steganography :







5.3 Conclusion:

This system has successfully hidden the information in text , image and video without anyone noticing the hidden information.
Successfully achieved the GUI window in which you can choose the steganography that you want to perform.
And text steganography , video steganography and image steganography has done successfully.

CHAPTER 6
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