LSB IMAGE STEGANOGRAPHY IN CYBER SECURITY

1BG18CS066

M S NAGAJYOTHI

7TH SEM, CSE A, BNMIT

GUIDED BY:

PROF. AASHITHA L SHARMA

ASSISTANT PROFESSOR

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INTRODUCTION

- An internship is a period of work experience offered by an organization for a limited period of time.
- They are typically undertaken by students and graduates looking to gain relevant skills and experience in a particular field.
- I worked as a cybersecurity and Ethical hacking intern.
- The internship was from 16th August 2021 to 14th September 2021

ABOUT THE COMPANY

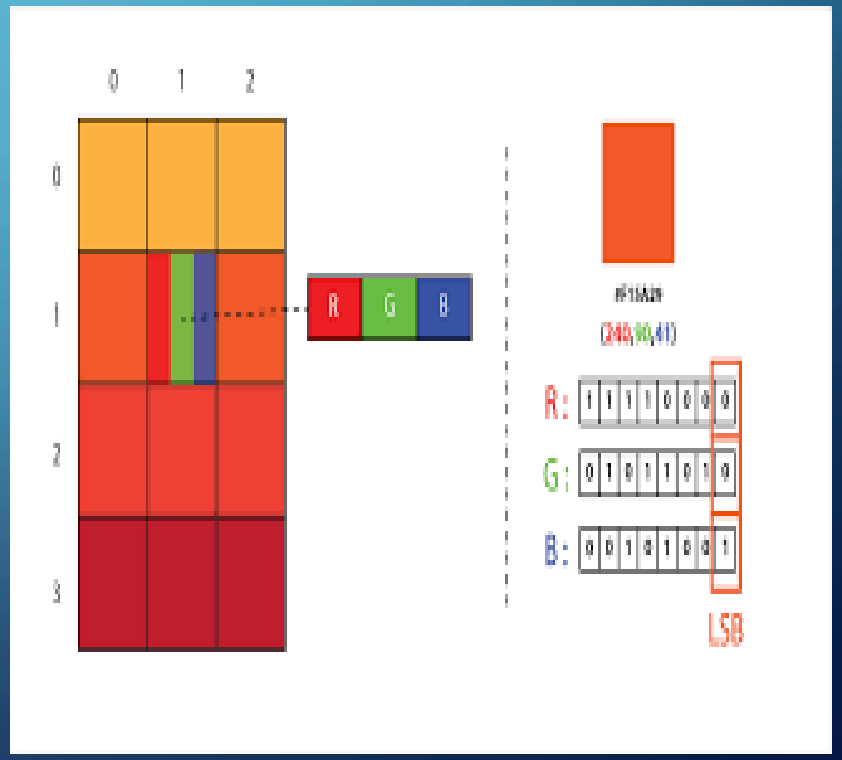
- Tequed labs is a research and development center and educational institute based in Bangalore founded by Mr. Aditya S k and Mr. Supreeth.
- They are focused on providing quality projects on latest technologies and develop products which are of great need to the society.
- Specialize in internet of things, research and development, machine leaning, artificial intelligence and cyber security.

ABOUT THE DEPARTMENT

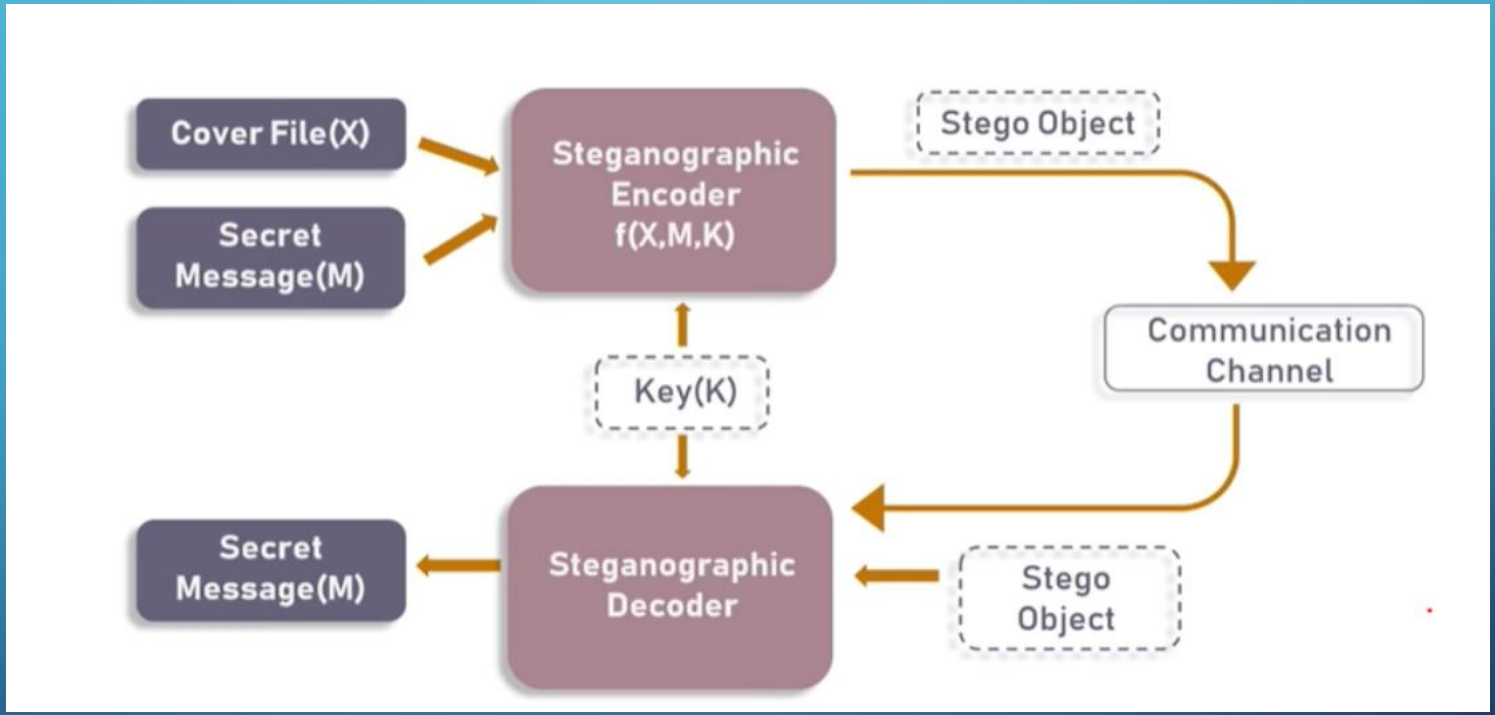
- Tequed labs provided a 5 week internship in the domain of cyber security and ethical hacking.
- The internship aimed at using LSB image steganography in which important and confidential images can be hidden through proper decoding techniques.
- LSB image steganography involves overwriting the bit with the lowest arithmetic value.
- The internship gave us a cooperate professionalism experience which will help us in future.

TASK PERFORMED

- Steganography is the study and practice of concealing information within objects in such a way that it deceives the viewer as if there is no information hidden within the object.
- LSB steganography is an image steganography technique in which messages are hidden inside an image by replacing each pixel's least significant bit with the bits of the message to be hidden.
- The advantage of lsb image steganography is that the output has a very slight difference to the input image.
- By embedding the last two lsb’s large messages can be hidden.



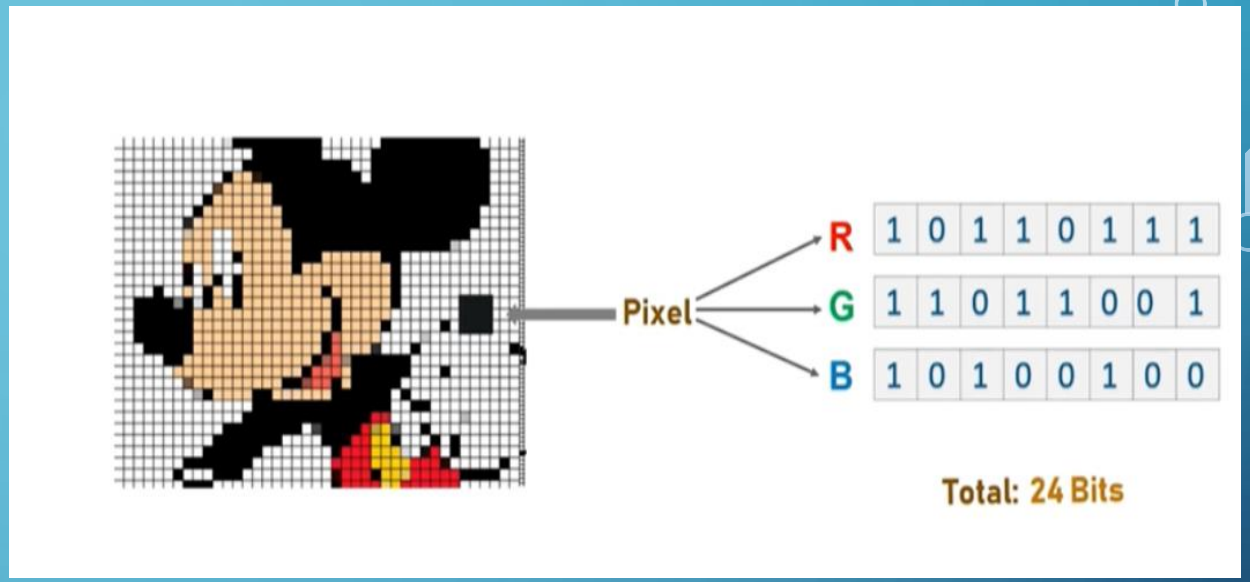
BASIC STEGANOGRAPHY MODEL



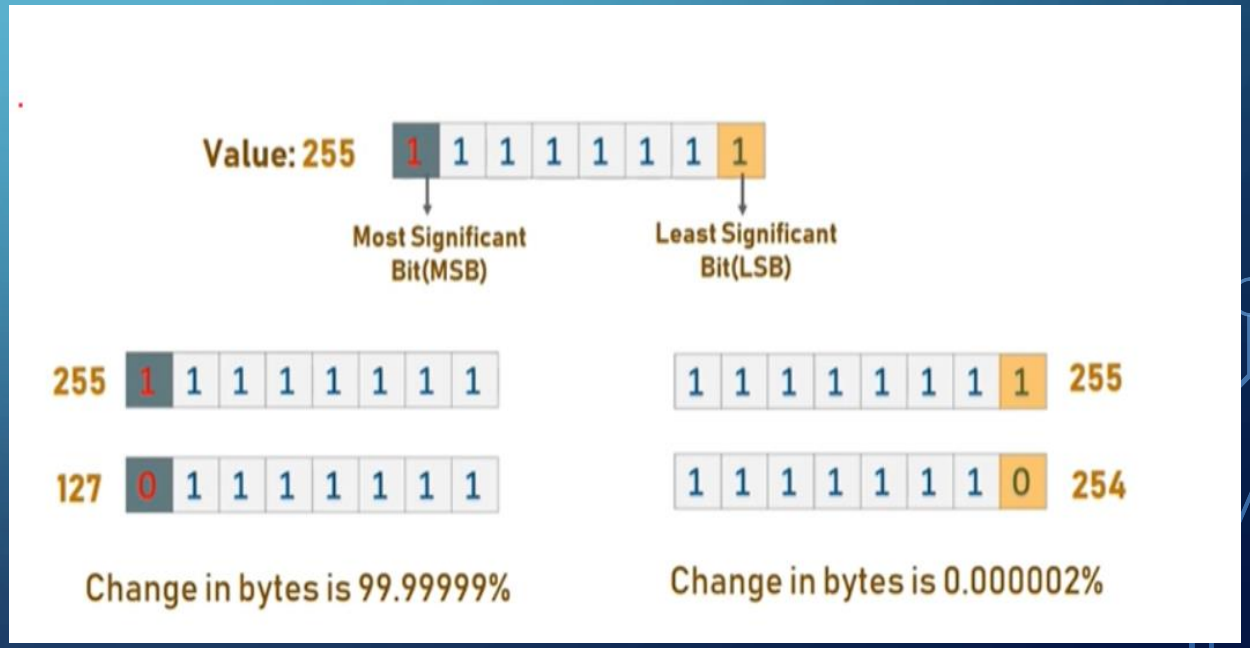
LEAST SIGNIFICANT BIT STEGANOGRAPHY

- A digital image as a finite set of digital values, called pixels.
- Pixels are the smallest individual element of an image.
- Least significant bit (lsb) is a technique in which the last bit of each pixel is modified and replaced with the secret message’s data bit.

- Pixel values of the image



- From the image, if we change MSB it will have a larger impact on the final value but if we change the LSB the impact on the final value is minimal, thus we use least significant bit steganography.



HOW LSB WORKS

1.Load an image and looks at the pixel in hexadecimal value

2.Covert secret text into bits and store them into LSB of pixel bits

3.A delimiter is added to the end of the edited pixel value

ENCRYPTION PROCESS

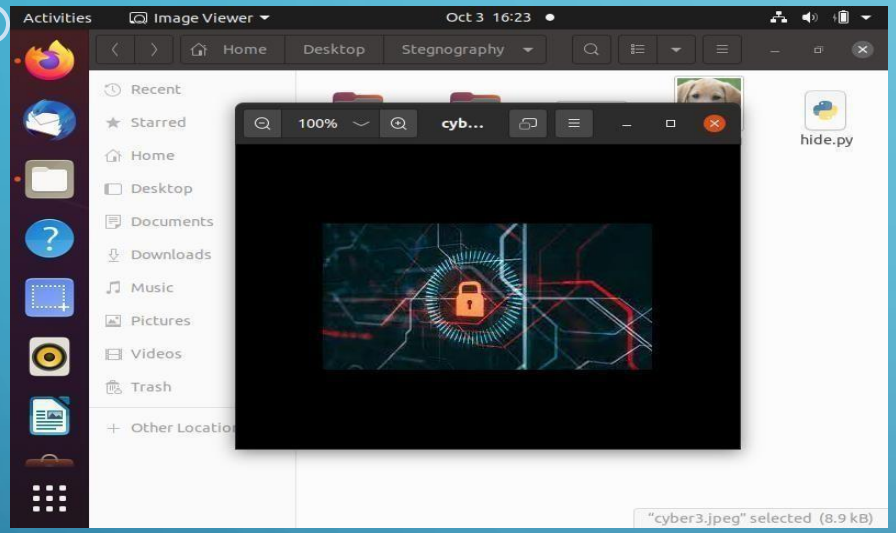
4.All the 0's and 1's are extracted until the delimiter is found .

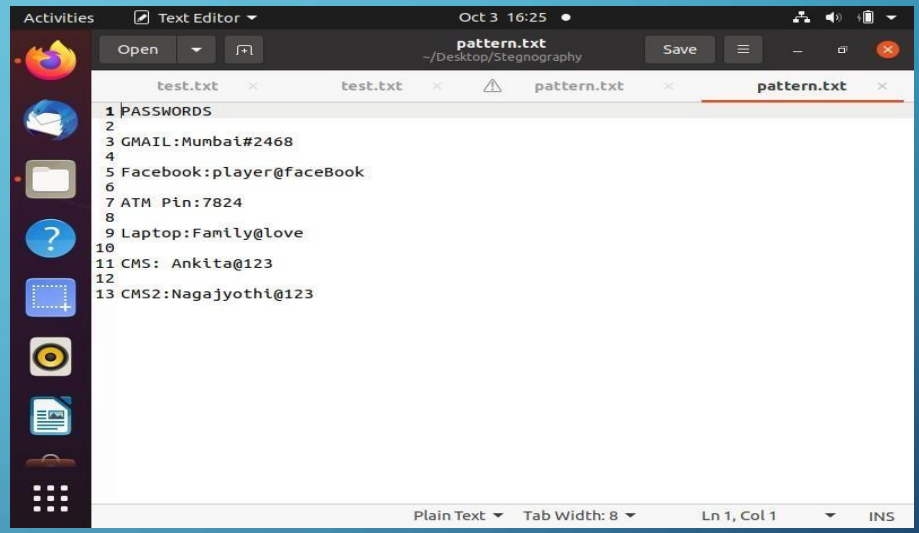
5.Extracted bits are converted into string that is the secret message

DECRYPTION PROCESS

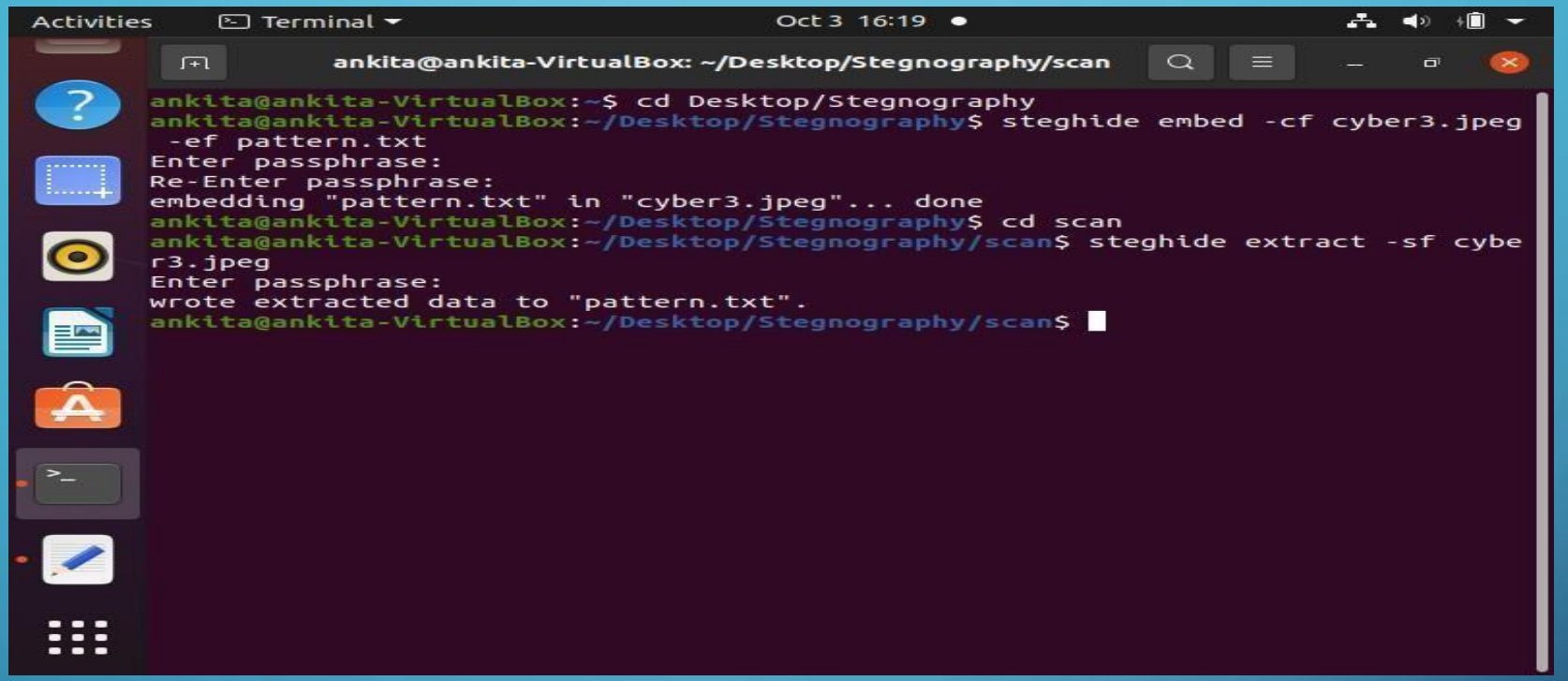
SNAPSHOTS

Before LBS Steganography



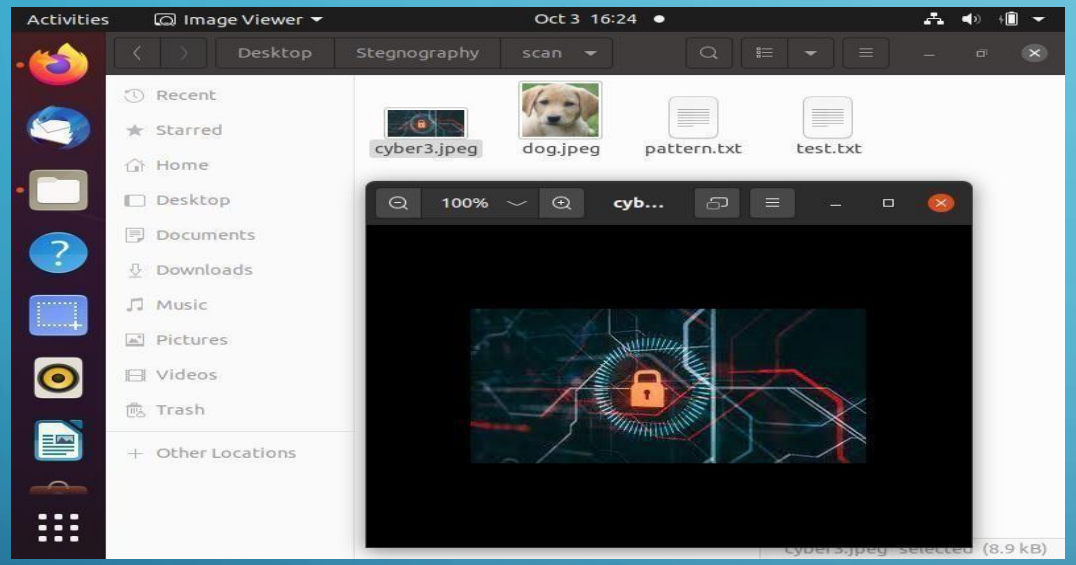


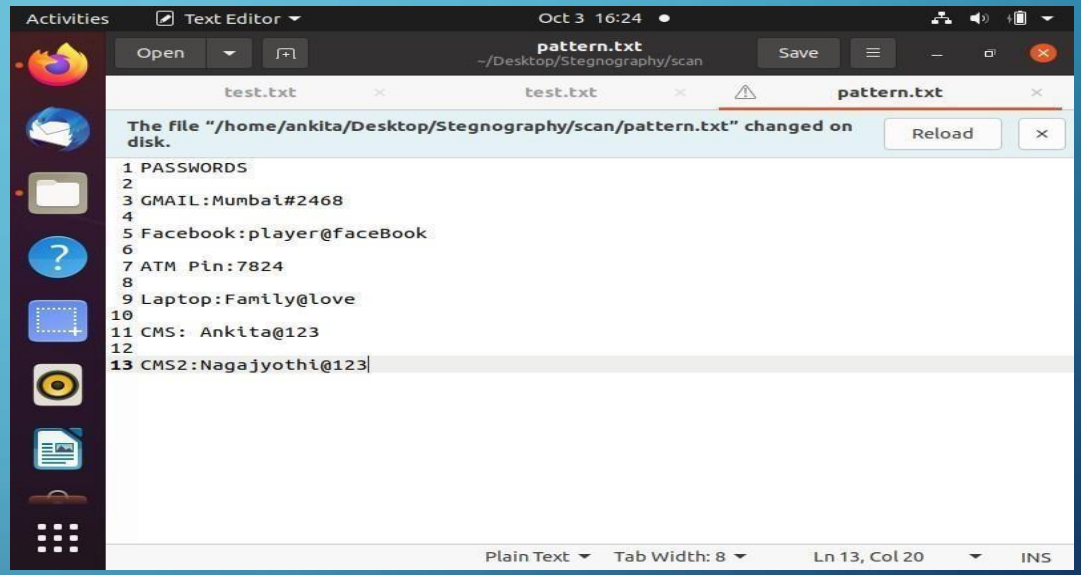
This is the initial picture with .jpeg extension in which a cover file is hidden the cyber3.jpeg image is stored in the folder steganography



After using the appropriate stighide command, the image is passed to another folder called scan where we find the secret message that was extracted from cyber3.jpeg image using lsb image steganography. the image looks the same as the original image but the lsb bits in the image have been varied.

AFTER LSB STEGANOGRAPHY





- After using the appropriate stighide command, the image is passed to another folder called Scan where we find the secret message that was extracted from dog.jpeg image using LSB Image Steganography. The image looks the same as the original image but the LSB bits in theimage have been varied.

REFLECTION NOTES

- At the first place, it was a great opportunity to be interning at Tequed Labs. The team introduced us to a lot of different technologies.
- The training provided us with sufficient understanding to the level that we could consume more information independently and hence acquire the skill.
- The work culture at Tequed Lab was excellent and we learnt and understood how cooperate professionalism work.
- Also learnt to be a keen and efficient team player working under Dinesh Pandurang who is a security consultant for cyber security and ethical hacking.

EXECUTIVE SUMMARY

- Working at tequed labs has been a good experience showing us how a professional world works.
- The project assigned was lsb image steganography, which is a security tool-based technique used for hiding a message inside an image and then decrypting it.
- With this we can hide any kind of secret information for example high security and high- level passwords without actually passing the message.
- One advantage of steganography is that it does not grab the attention of intruders or hackers easily.

CONCLUSION

- I would like to conclude that lsb image steganography is a powerful tool where it is almost impossible to extract the information until the correct password is obtained.
- LSB techniques implemented to 24 bit formats for the color image are difficult to detect contrary to 8 bit format
- Hence this provides us the benefit for securely storing sensitive data.

THANKYOU