# Digital Forensic Report

By: Trevor Hofmann

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## Summary of analysis

We were able to extract hidden messages for each image in the files given to us, that where encrypted into the images using the Steganography algorithm Least Significant Bit (LSB). Please see the relevant findings section for the exact messages.

## Objectives

Extract all hidden messages encrypted into the images using the Steganography algorithm Least Significant Bit (LSB)

## Chain of Custody

Using the SHA-265 checksum to generate a hash we have verified the file has not been changed while in custody.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table 1: Chain of Custody | | | | |
| File Name | Date of the file | Date Received | Original Hash | Post Hash |
| cornfield\_kuehler\_modified.png | 01-31-2024 | 01-31-2024 | 759a251393d598318187c7ec00eb743297d95bf179149d0e05bb5e64ea455576 | 759A251393D598318187C7EC00EB743297D95BF179149D0E05BB5E64EA455576 |
| correa.png | 01-31-2024 | 01-31-2024 | e2ab329a4a7c5fc5cd5078b80ac3afa3755d9c6ce83f6f5a58f79c4940ab39fd | E2AB329A4A7C5FC5CD5078B80AC3AFA3755D9C6CE83F6F5A58F79C4940AB39FD |
| f16\_modified\_Yang.png | 01-31-2024 | 01-31-2024 | 8a7c09523511e8983828d78e0d5f30442a367bb80a05afb1ccc78f63c0220860 | 8A7C09523511E8983828D78E0D5F30442A367BB80A05AFB1CCC78F63C0220860 |
| fox\_modified\_tanquerido.png | 01-31-2024 | 01-31-2024 | 1e5766f65d74a1ee27a1c9703216fc9b540b768807d82664e0e4866a4fad64fd | 1E5766F65D74A1EE27A1C9703216FC9B540B768807D82664E0E4866A4FAD64FD |
| iron\_FUDALA\_modified.png | 01-31-2024 | 01-31-2024 | 0aae5bcd7e0cd458b8ef9d15b70765bd4e462a5126e21143dd46008ce05c5de3 | 0AAE5BCD7E0CD458B8EF9D15B70765BD4E462A5126E21143DD46008CE05C5DE3 |
| Knight\_modified\_Tarrant.png | 01-31-2024 | 01-31-2024 | f146853c556071f7d618ed14c93f69d1fa14074099e93bc05b35c0465c8e4e7b | F146853C556071F7D618ED14C93F69D1FA14074099E93BC05B35C0465C8E4E7B |
| LanaBracken\_buffalo\_modified.png | 01-31-2024 | 01-31-2024 | d4a27e01a13468d7d18c8fbd8a8a78177dbc6df77b7f3058fb83a90182b89b00 | D4A27E01A13468D7D18C8FBD8A8A78177DBC6DF77B7F3058FB83A90182B89B00 |
| maroon\_bells\_modified\_by\_wang.png | 01-31-2024 | 01-31-2024 | 41b0996bb11bdb5d84c8cca2610f07a157fc7d4d19359830dabad64fafb17571 | 41B0996BB11BDB5D84C8CCA2610F07A157FC7D4D19359830DABAD64FAFB17571 |
| Palace\_Modified\_Collier.png | 01-31-2024 | 01-31-2024 | fc5b9f005c8e313acf1e168df1642854700d304132c09e2203023763c4ae28d9 | FC5B9F005C8E313ACF1E168DF1642854700D304132C09E2203023763C4AE28D9 |
| PointMuguBurkett\_modified.png | 01-31-2024 | 01-31-2024 | 565cfebbdca10c03214aec3a9ac787bdb8cecc00d924300c637dd1378d1f9bdf | 565CFEBBDCA10C03214AEC3A9AC787BDB8CECC00D924300C637DD1378D1F9BDF |
| sadcat\_modified.png | 01-31-2024 | 01-31-2024 | efdfc53a7f990fa0e1df245e11be3a864feaacc694e90249b0178eb069e805bf | EFDFC53A7F990FA0E1DF245E11BE3A864FEAACC694E90249B0178EB069E805BF |
| Sanchez.png | 01-31-2024 | 01-31-2024 | 5938a8b3196da022ee96ae96c8af602674d3787b516e59d30df57bf143d42978 | 5938A8B3196DA022EE96AE96C8AF602674D3787B516E59D30DF57BF143D42978 |

## Methods and Tools Used

Python

Steganography

Visual Studios

A screenshot of a computer program

Description automatically generated

Figure 1: Python script “Hidden Messages.PY”

Google Colab

https://colab.research.google.com/drive/1wX46WaXmuQ9Np4MAt0wgMFp6LFDUX\_Mx?usp=sharing

Windows PowerShell

# Specify the path to the directory containing PNG files

$directoryPath = "C:\Users\BlueBravo\OneDrive - West Texas A and M University\Masters\SP2024\CIDM 6356 DF\Week 3\files to analyze"

# Specify the path for the output CSV file

$outputCsvPath = "C:\Users\BlueBravo\OneDrive - West Texas A and M University\Masters\SP2024\CIDM 6356 DF\Week 3\files to analyze\output.csv"

# Get all PNG files in the specified directory

$pngFiles = Get-ChildItem -Path $directoryPath -Filter \*.png

# Initialize an array to store hash results

$hashResults = @()

# Loop through each PNG file and calculate the hash

foreach ($file in $pngFiles) {

$hash = Get-FileHash -Path $file.FullName

$hashResults += [PSCustomObject]@{

FileName = $file.Name

Hash = $hash.Hash

}

}

# Output the results to a CSV file

$hashResults | Export-Csv -Path $outputCsvPath -NoTypeInformation

Write-Host "Hash calculation completed. Results saved to: $outputCsvPath"

## Relevant Findings

|  |  |
| --- | --- |
| Table 2: Messages Found | |
| PNG File | Hidden Message |
| cornfield\_kuehler\_modified.png | Why did the scarecrow win an award? Because he was outstanding in his field! |
| correa.png | Domingo is the best student in this class |
| f16\_modified\_Yang.png | Generation Four |
| fox\_modified\_tanquerido.png | What does the fox say? |
| iron\_FUDALA\_modified.png | Don't meddle with things, you don't understand |
| Knight\_modified\_Tarrant.png | He who kneels before God can stand before anyone |
| LanaBracken\_buffalo\_modified.png | On, on Buffaloes,,, we'll bring home the victory! W-T-A-M-, WTAM, Fight! Fight! Fight! |
| maroon\_bells\_modified\_by\_wang.png | 404 |
| Palace\_Modified\_Collier.png | The idyllic city of Beauclair and its palace at night. |
| PointMuguBurkett\_modified.png | These trails are by the beach. |
| sadcat\_modified.png | My Monday Mood |
| Sanchez.png | Do I really look like a guy with a plan? You know what I am? I'm a dog chasing cars. I wouldn't know what to do with one if I caught it! |
| secret\_sunset\_JAGDALE.png | I <3 Chai |
| simplyhired\_modified\_Kennady.png | Capture Flag event is my first assignment in Digital Forensics |
| stars\_modified\_Mayilsamy.png | Hi!! My name is Priya. Nice to meet you ! |
| Sunset-Mountains\_modified.png | May the force be with you. |
| sunset\_Dupree.png | Just like the moons and the suns, With the certainty of the tides, Just like the hopes springing high, Still I rise. |
| universe\_modified - Noroozi.png | life is full of surprises |