# Summary of Analysis

In this analysis, I first downloaded the PNGs and used Windows Powershell with the Get-fileHash for each file within the “files to analyze” folder. All of this was to obtain the hash numbers on my PC to compare to the hash numbers from the source. As seen below is the table of the hash numbers along with their file name, date of the file, and the date I received it. Afterward, I made a new Google Colab file to reveal the hidden message for each image. I used a method that allows me to grab all the image files within a certain directory to show all the hidden messages at once. After receiving the hidden messages, I used another table below to show each of them with their respective file name.

# Objectives

For this steganographic analysis there are two primary objectives. The first is obtaining the hash numbers of the PNG files on my computer to verify the integrity of said files. The second is to reveal the hidden messages within each image. Of course, there are some secondary objectives for this analysis. Those being to find the date of creation for the files and the date that I received them. This step is simple but is good for reinforcing the chain of custody below.

# Chain of Custody

|  |  |  |  |
| --- | --- | --- | --- |
| Original Hash Number/Obtained Hash Number | File Name | Date of File | Date Received |
| 759a251393d598318187c7ec00eb743297d95bf179149d0e05bb5e64ea455576  759A251393D598318187C7EC00EB743297D95BF179149D0E05BB5E64EA455576 | cornfield\_kuehler\_modified.png | 1/31/24 10:33:42 AM | 1/31/24 6:07:58 PM |
| e2ab329a4a7c5fc5cd5078b80ac3afa3755d9c6ce83f6f5a58f79c4940ab39fd  E2AB329A4A7C5FC5CD5078B80AC3AFA3755D9C6CE83F6F5A58F79C4940AB39FD | correa.png | 1/31/24 10:33:42 AM | 1/31/24 6:07:58 PM |
| 8a7c09523511e8983828d78e0d5f30442a367bb80a05afb1ccc78f63c0220860 8A7C09523511E8983828D78E0D5F30442A367BB80A05AFB1CCC78F63C0220860 | f16\_modified\_Yang.png | 1/31/24 10:33:42 AM | 1/31/24 6:07:58 PM |
| 1e5766f65d74a1ee27a1c9703216fc9b540b768807d82664e0e4866a4fad64fd 1E5766F65D74A1EE27A1C9703216FC9B540B768807D82664E0E4866A4FAD64FD | fox\_modified\_tanquerido.png | 1/31/24 10:33:42 AM | 1/31/24 6:07:58 PM |
| 0aae5bcd7e0cd458b8ef9d15b70765bd4e462a5126e21143dd46008ce05c5de3 0AAE5BCD7E0CD458B8EF9D15B70765BD4E462A5126E21143DD46008CE05C5DE3 | iron\_FUDALA\_modified.png | 1/31/24 10:33:44 AM | 1/31/24 6:07:58 PM |
| f146853c556071f7d618ed14c93f69d1fa14074099e93bc05b35c0465c8e4e7b F146853C556071F7D618ED14C93F69D1FA14074099E93BC05B35C0465C8E4E7B | Knight\_modified\_Tarrant.png | 1/31/24 10:33:44 AM | 1/31/24 6:07:58 PM |
| d4a27e01a13468d7d18c8fbd8a8a78177dbc6df77b7f3058fb83a90182b89b00 D4A27E01A13468D7D18C8FBD8A8A78177DBC6DF77B7F3058FB83A90182B89B00 | LanaBracken\_buffalo\_modified.png | 1/31/24 10:33:44 AM | 1/31/24 6:07:58 PM |
| 41b0996bb11bdb5d84c8cca2610f07a157fc7d4d19359830dabad64fafb17571 41B0996BB11BDB5D84C8CCA2610F07A157FC7D4D19359830DABAD64FAFB17571 | maroon\_bells\_modified\_by\_wang.png | 1/31/24 10:33:42 AM | 1/31/24 6:07:58 PM |
| fc5b9f005c8e313acf1e168df1642854700d304132c09e2203023763c4ae28d9 FC5B9F005C8E313ACF1E168DF1642854700D304132C09E2203023763C4AE28D9 | Palace\_Modified\_Collier.png | 1/31/24 10:33:42 AM | 1/31/24 6:07:58 PM |
| 565cfebbdca10c03214aec3a9ac787bdb8cecc00d924300c637dd1378d1f9bdf 565CFEBBDCA10C03214AEC3A9AC787BDB8CECC00D924300C637DD1378D1F9BDF | PointMuguBurkett\_modified.png | 1/31/24 10:33:42 AM | 1/31/24 6:07:58 PM |
| efdfc53a7f990fa0e1df245e11be3a864feaacc694e90249b0178eb069e805bf EFDFC53A7F990FA0E1DF245E11BE3A864FEAACC694E90249B0178EB069E805BF | sadcat\_modified.png | 1/31/24 10:33:42 AM | 1/31/24 6:07:58 PM |
| 5938a8b3196da022ee96ae96c8af602674d3787b516e59d30df57bf143d42978 5938A8B3196DA022EE96AE96C8AF602674D3787B516E59D30DF57BF143D42978 | Sanchez.png | 1/31/24 10:33:42 AM | 1/31/24 6:07:58 PM |
| 8fddf28eb07ab4c30bf359d8829427e350ab48177663271b1f994a05de31e293 8FDDF28EB07AB4C30BF359D8829427E350AB48177663271B1F994A05DE31E293 | secret\_sunset\_JAGDALE.png | 1/31/24 10:33:44 AM | 1/31/24 6:07:58 PM |
| 0c13174e19d5e4b61a3ce10e34cb1470f1f2893b9a1a902c10cae280e64e4e04 0C13174E19D5E4B61A3CE10E34CB1470F1F2893B9A1A902C10CAE280E64E4E04 | simplyhired\_modified\_Kennady.png | 1/31/24 10:33:42 AM | 1/31/24 6:07:58 PM |
| 2a0317b1d424794aff665c7d819af233e8e34e6d3306850d56951d6772da7c42 2A0317B1D424794AFF665C7D819AF233E8E34E6D3306850D56951D6772DA7C42 | stars\_modified\_Mayilsamy.png | 1/31/24 10:33:42 AM | 1/31/24 6:07:58 PM |
| 4bc9d5bfa03c0f196dae2bb8dd62661ef2c9a45e825ba027b2d26729e314861e 4BC9D5BFA03C0F196DAE2BB8DD62661EF2C9A45E825BA027B2D26729E314861E | Sunset-Mountains\_modified.png | 1/31/24 10:33:42 AM | 1/31/24 6:07:58 PM |
| 539bc04d998a0b1e06101289adf9e8dc9d143e3b1c34cafdef4fce94cbc973cd 539BC04D998A0B1E06101289ADF9E8DC9D143E3B1C34CAFDEF4FCE94CBC973CD | sunset\_Dupree.png | 1/31/24 11:29:54 AM | 1/31/24 6:07:58 PM |
| 500f06b8ec5313b055b2c1f3a17cfa414f62c27373ca1483bc7e9e3d98f409d6 500F06B8EC5313B055B2C1F3A17CFA414F62C27373CA1483BC7E9E3D98F409D6 | universe\_modified - Noroozi.png | 1/31/24 10:33:42 AM | 1/31/24 6:07:58 PM |

# Methods and Tools Used

In Windows Powershell:

Get-fileHash {filename}

The above is used when already within the directory of the images, so there is no need to specify it beforehand. Regardless, do this for each PNG to retrieve the hash number.

Date of File:

For this step, all I did was inspect the properties of each PNG to check the date that they were created.

Google Colab Code:

#Specify content directory path for image files

directory\_path= '/content'

#Function for extracting messages from the images

def extract\_message(image\_path):

  img=Image.open(image\_path)

  try:

    extracted\_message = lsb.reveal(img)

    return extracted\_message

  except Exception as e:

    return f"Error: {str(e)}"

#Process all PNG files in the content directory

for filename in os.listdir(directory\_path):

  if filename.endswith(".png"):

    image\_path = os.path.join(directory\_path, filename)

    extracted\_message = extract\_message(image\_path)

    print(f"Filename: {filename}, Hidden Message: {extracted\_message}")

Google Colab Link: <https://colab.research.google.com/drive/1yBrDeEZCx7YDSSp5Qe4EwD03w0OuH2Wo?usp=sharing>

# Relevant Findings

|  |  |
| --- | --- |
| File Name | 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” |