



# Cyber Security Initiative for Nevada Teachers (CSINT)

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## Cyber Security Implementation

### Mission:

Explore cyber security concepts by engaging students through online discovery activities and in person cyber team problem solving.

Where applicable, provide optional route to earn assignment credit using concepts of cyber security.

### Target:

Students, Staff & Administration. Desired Outcome: Develop problem solving skills through the acquisition of cybersecurity knowledge.

## Cyber Team : Exploration

Ethics: Formal discussions and debates on the efficacy of ethical hacking and cyber citizenship.

Coding : Introduction to computer languages. (Hour of Code/Code Academy/Code Combat)

### Digital Forensics

Time Tool Validating, Hashing, Metadata, Web Artifacts, Thumbnails, Event Logs, Registry, Shell Bags, File Carving, Key Logger, Write Blocking Imaging

### Networking & Communications

Packets, IP & MAC address, ICMP Protocols, LINUX, Virtual Machine, Virtual Networks.

### Biometrics

Verification & Identification, Automatic recognition, Biometric Traits, Applications, System Steganography

### Robotics

Order of Operations, Coding, Human/Robot relations, Data Security

## In Class : Enrichment

Concept: Weekly cybersecurity lessons hosted on-site and cast in the live lesson room.

Prospective Courses: Computer Applications, Emergent Computer Technologies, Intro to Law, Intro to Criminal Justice, Photography, Digital Media, Art History, Career Exploration

## Hashing - Validation

Exploration into the significance of hash. Proceeded by write blocker, registry and image software exposure.

Applicable uses : HASH validates downloaded files and forensic uses to work with data.

### HASHED messages in Text Files

File Name	Contents
text1.txt	"the quick brown fox jumped over the lazy dogs back"
text2.txt	"THE QUICK BROWN FOX JUMPED OVER THE LAZY DOGS BACK" (typed in all caps)
text3.txt	"the quick brown fox jumped over the lazy dogs back" (spaces added at end of sentence)
text4.txt	"The quick brown fox jumped over the lazy dogs back" (first letter of the first word in upper case)
test4 renamed.txt	"The quick brown fox jumped over the lazy dogs back" File renamed and saved text4.txt to test4 renamed.txt

## Geolocation Scavenger Hunt

Using EXIFTOOL students will investigate metadata and privacy considerations via a scavenger hunt on campus. In person activity may be modified to include off-campus field trip locations to engage students in team building activities as well..

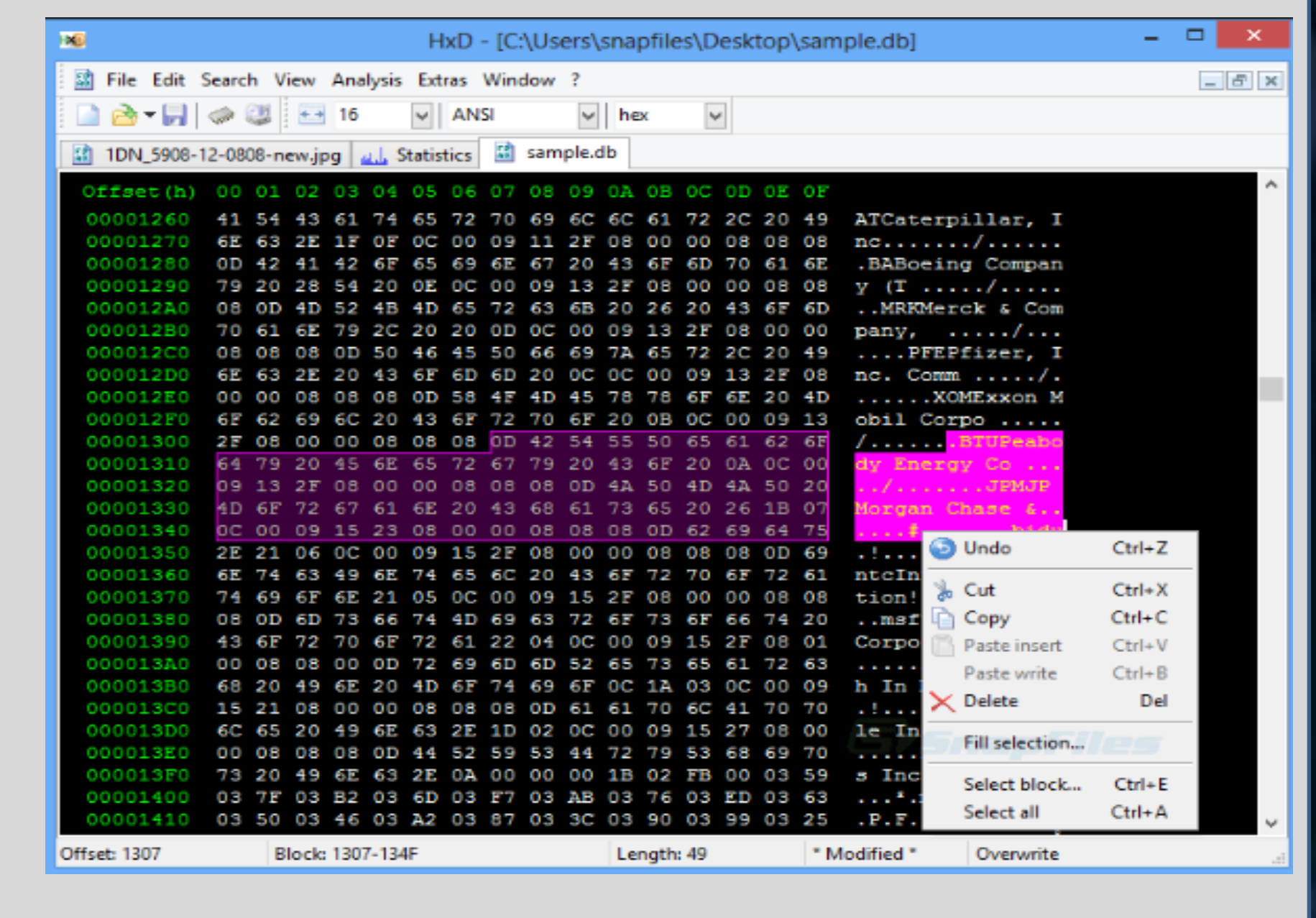
### Geolocation Exercise

- Get into groups of two; one member needs to have a smart [iPhone] phone.
- Go to RET repository (on the RET Google Drive) and download images from the forensics\_images file. Number teams 1-6 and use the corresponding image and metadata files. Each team will use one abstract photo and one building photo.
- Use EXIFTOOL on your computer and extract metadata from photo. Compare this to the text files in the forensics\_metadata file to check for accuracy.
- Plot photo on a geo-location tool (i.e. Google Maps) and try to find it on campus.
- Take note of the metadata and attempt to duplicate the photo with your phone.
- Upload the new photo to your computer and compare metadata.
- Upload the photo to 2 or 3 social networking sites (Facebook, Twitter, etc.).
- What metadata is stripped from the photo? Which sites leave the data intact?
- Research the Exiftool documentation, try to change data found in the tags.

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## File Carving

Recover deleted files on a drive. Students will use hex editing software file types to recover various images, audio and video files.



## Steganography

Introduction to various methods of Anti-Forensics, create and decode secret messages in files.

Hidden message: 101001...

144 141 81

145 140 81

146 142 81

## Resources

## Assessment Methods

