OKLAHOMA CHRISTIAN UNIVERSITY

CAE IN CYBERSECURITY COMMUNITY

WELCOME TO CYBER SLEUTHING 101

AN ADVANCED PROGRAM FOR HIGH SCHOOL HONORS SUMMER ACADEMY

AGENDA

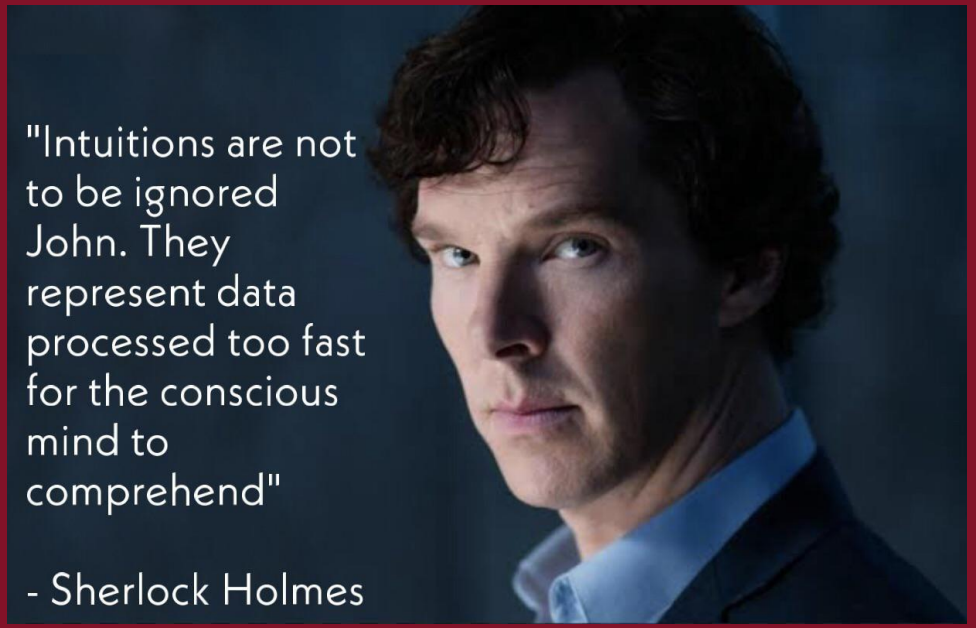
- Introduction to Cyber Sleuthing 101
- Day 1 – Malware & Social Engineering Attacks
- Day 2 – Classical Cryptography
- Day 3 – Password Cracking
- Day 4 – OSINT & Field Trip
- Day 5 – Final Exam (Escape Room)
- Escape Room Resources

- This course is designed to introduce high school students to the exciting science of Cybersecurity
- An experiential approach to learning Computer Science, with an emphasis on application and teamwork
- Students are introduced to classical cryptography, malware and social engineering attacks, password cracking, and open source intelligence.
- The final exam is a practical exam: the Sherlock Holmes Escape Room
- Students work in teams and apply cybersecurity principles and skills to solve a cyber-mystery to escape from Sherlock's Library.

CYBER SLEUTHING 101

- You have been invited to become a member of Sherlock's elite detective team – the Baker Street Irregulars!
- But first, you must be trained in Cyber Sleuthing techniques and methodology before you can be of use in the field.

- Introduction with team building games
- Types of Malware
  - Virus/Worm
  - Spyware
- Engineering Attacks
  - Baiting
  - Impersonation
  - PII Data Leakage
- Attack Simulations
- How to defend yourself

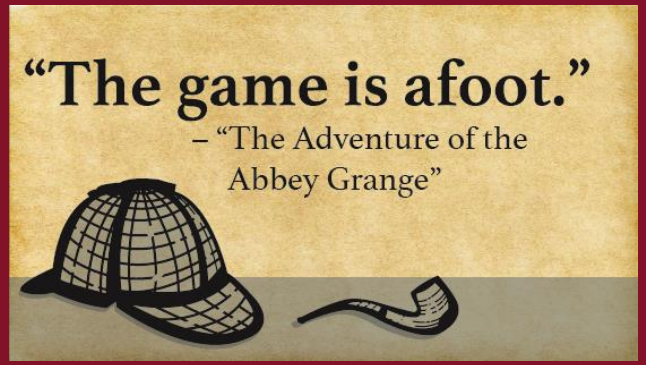


- Terminology
- Two Basic Types of Codes
  - Substitution
    - Caesar Cipher
    - Atbash Cipher
    - Vigenere Cipher
  - Transposition
    - Rail Fence
    - Numbered-based Codes
    - Morse Code
- Decoding Tools

"I am fairly familiar with all forms of secret writings, and am myself the author of a trifling monograph upon the subject, in which I analyze one hundred and sixty separate ciphers."

Sherlock Holmes - THE DANCING MEN

Classical Cryptography Assignment (250 points)



Cyber Sleuthing 101
Classical Cryptography Assignment

Student Name: _____

(25 points) Cipher Type: _____
20 8 5 23 1 25 20 15 7 5 20 19 20 1 18 20 5 4 9 19 20 15 17 21 9 20 20 1
12 11 9 14 7 1 14 4 2 5 7 9 14 4 15 9 14 7

(25 points) Cipher Type: _____
84 104 101 32 112 101 115 115 105 109 105 115 116 32 115 101 101 115
32 100 105 102 102 105 99 117 108 116 121 32 105 110 32 101 118 101
114 121 32 111 112 112 111 114 116 117 110 105 116 121 46 32 84 104

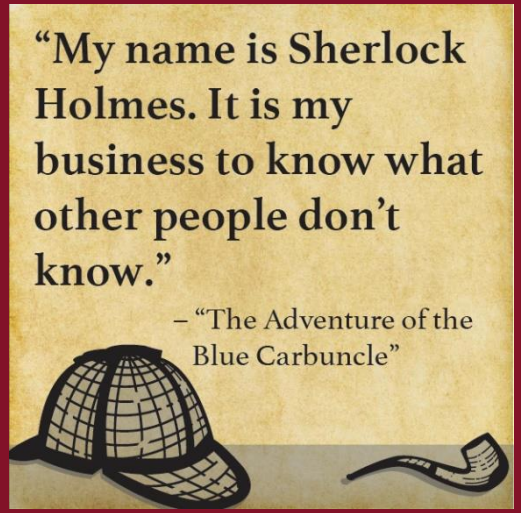
- Computer Accounts
- Guess How Long It Takes To Crack A Password
- Creating A Strong Password
- Password Cracking Methods

- Tools for Baker Street Irregulars

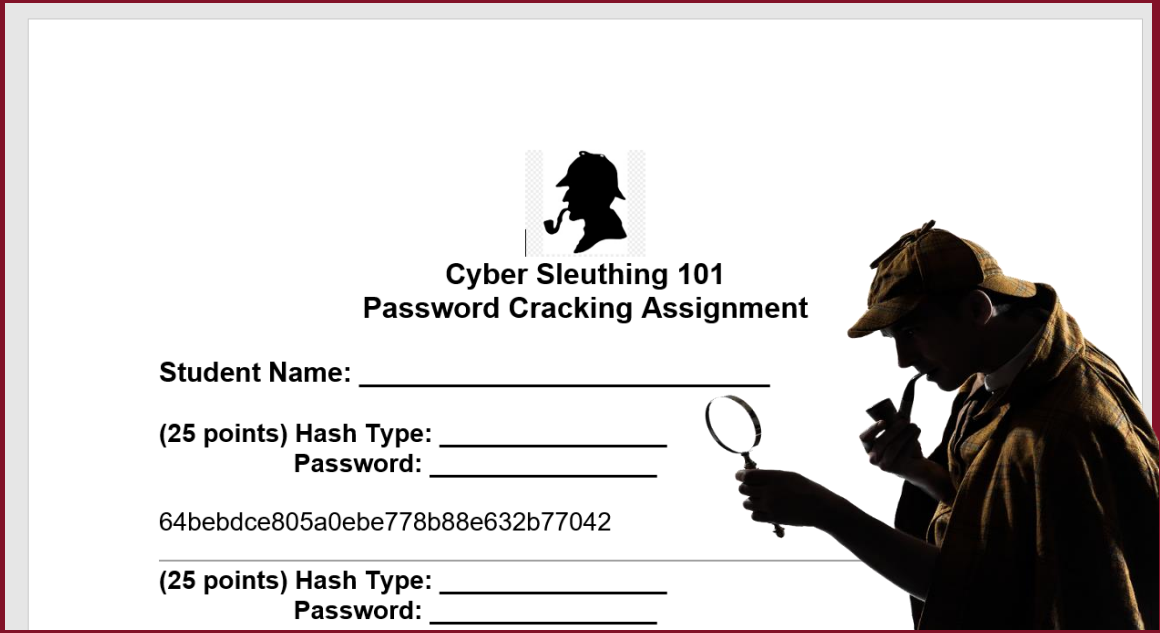
1. Hashcat
2. THC Hydra
3. Brutus
4. Aircrackng (WiFi)

On-Line Tools

- tunnelsup.com/hash-analyzer
- Crackstation.com
- Objectif-securite.ch/en/ophcrack



Can you crack these passwords, and tell me what hash algorithms were used?



Cyber Sleuthing 101
Password Cracking Assignment

Student Name: _____

(25 points) Hash Type: _____
Password: _____

64bebdce805a0ebe778b88e632b77042

(25 points) Hash Type: _____
Password: _____

- Network Security:
  - *Configure and use Windows Defender Firewall*
  - *Online Password Cracking Tools*
- Threats and Vulnerabilities:
  - *Recognizing Malware / Social Engineering Attacks*
  - *Implement Malwarebytes Anti-Virus Software*
- Cryptography:
  - *Cracking Substitution Ciphers, Cracking Transposition Ciphers, Cipher Breaking Online Tools*
- Open Source Intelligence (OSINT):
  - *OSINT Framework for digital investigation*
  - *EXIF to reveal Metadata hidden in photographs*

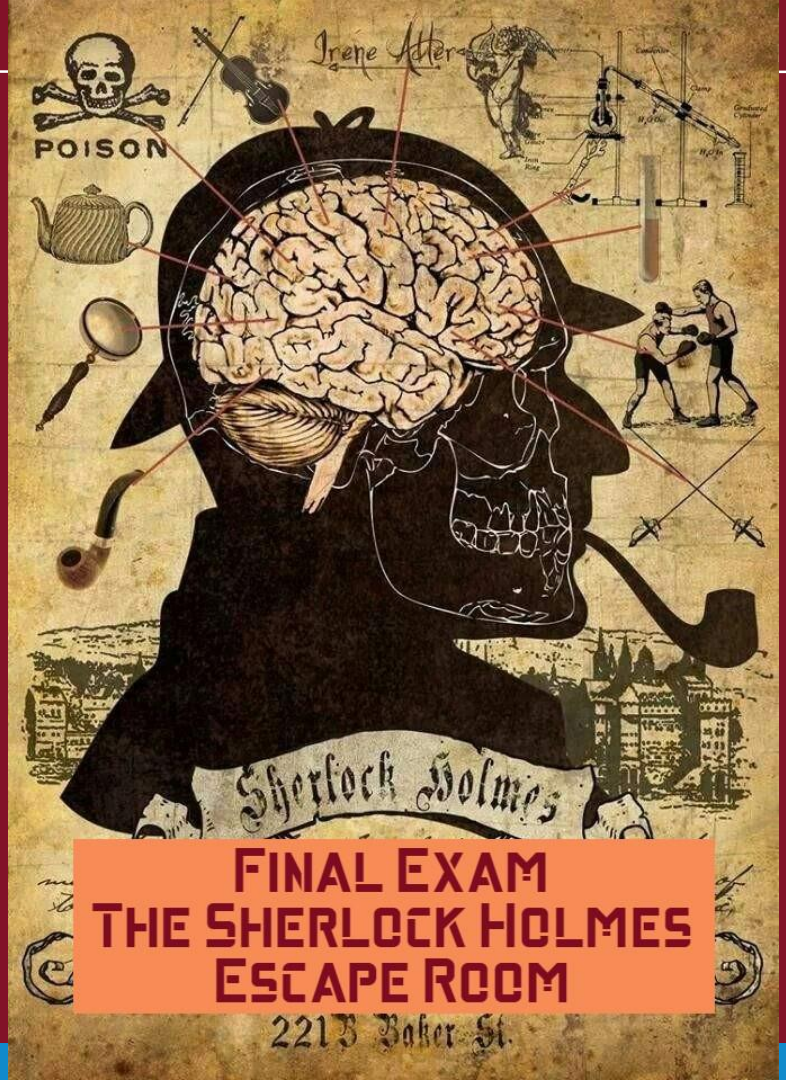
Tour Day Schedule

2:00pm	Depart OC
2:30pm	Arrive at Rack59
2:30-4:00pm	Rack59 Data Center Tour
4:00pm	Depart Rack59
4:30pm	Arrive at OC

The Practicum Final Exam

Only bring your Baker Street Irregular notepad

(no laptop, watches, or phones)



Day: Friday, July 15th

Time: 1:00pm-1:50pm

Where: Garvey Center, Room GC-174

SHERLOCK HOLMES
Escape Room

RESOURCES USED

- Legacy Escape Box – Sherlock Holmes
  - LegacyEscapeBox.com/sherlock-holmes-room-1
- Catch the Big Bad Wolf – Cybersecurity Themed
  - Indiana University Escape Room Kit
  - ItTraining.iu.edu/explore-topics/titles/cscer/index.html

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