# Matrix Cipher

Chis Kalahiki, Colby Austin, Ben Toups, Broy Hudson

# Introduction

We created an encryption system that swaps characters based on the time that the message was encrypted. Each shift originates from the center and goes outward in the direction that the clock hand would go.

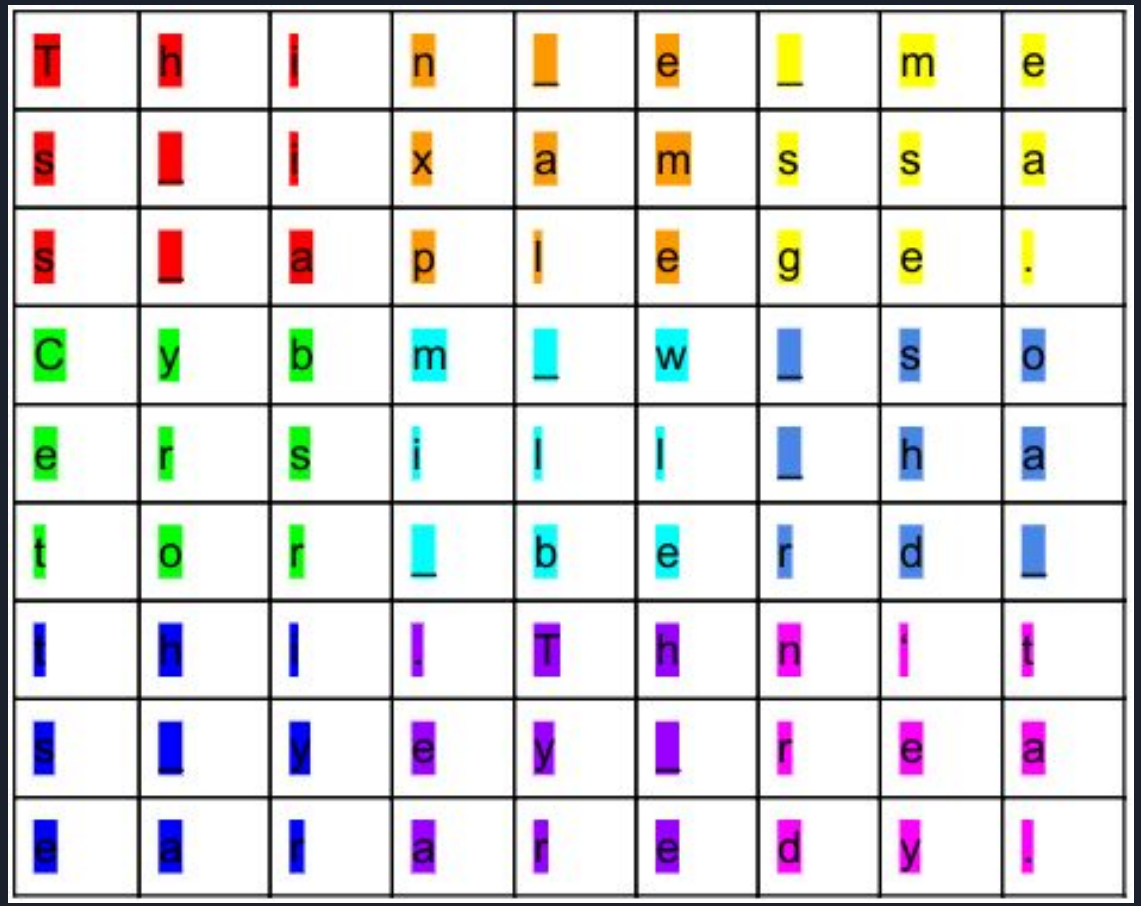
| | | |
|---|---|---|
| 10.11 | 12 | 1,2 |
| 9 | | 3 |
| 7,8 | 6 | 4,5 |

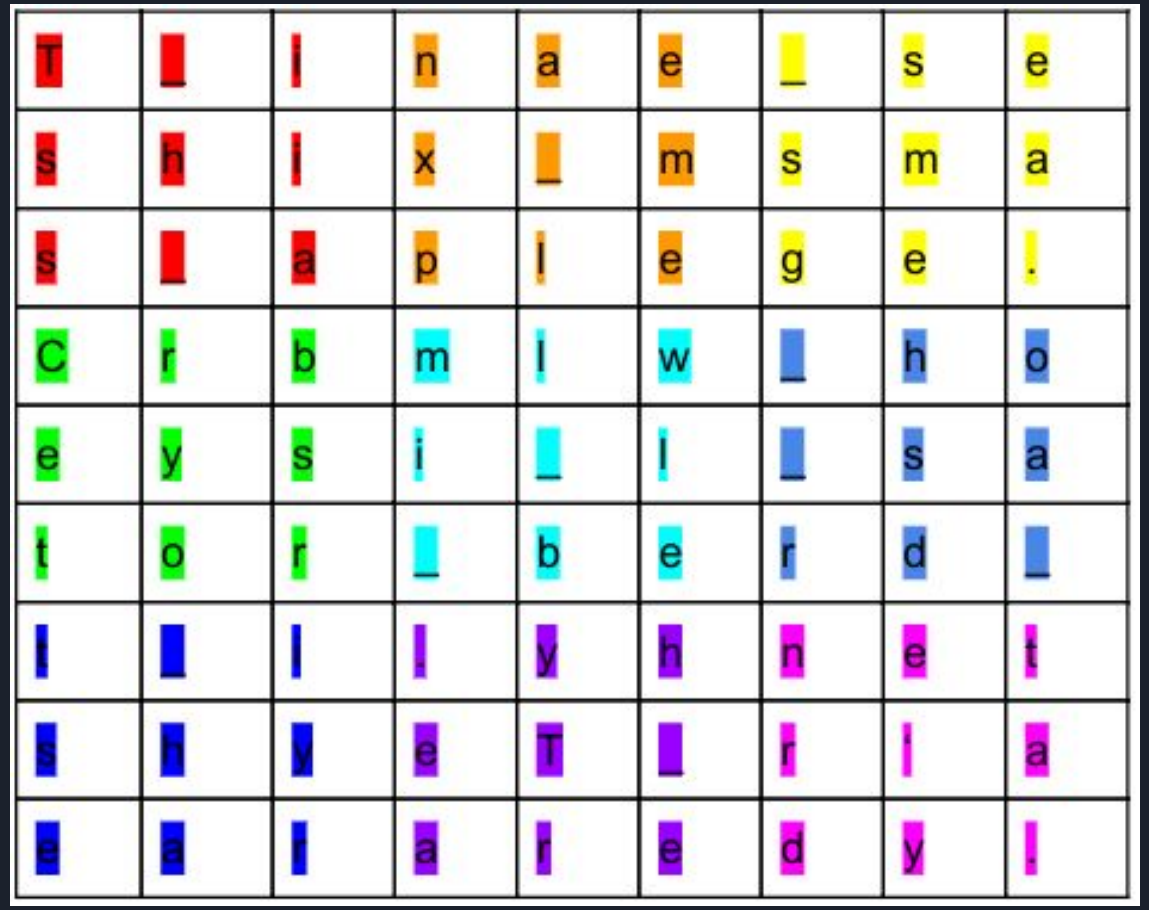
| | | |
|---|---|---|
| 50 to 55 | 56 to 4 | 5 to 10 |
| 41 to 49 | | 11 to 19 |
| 35 to 40 | 26 to 34 | 20 to 25 |

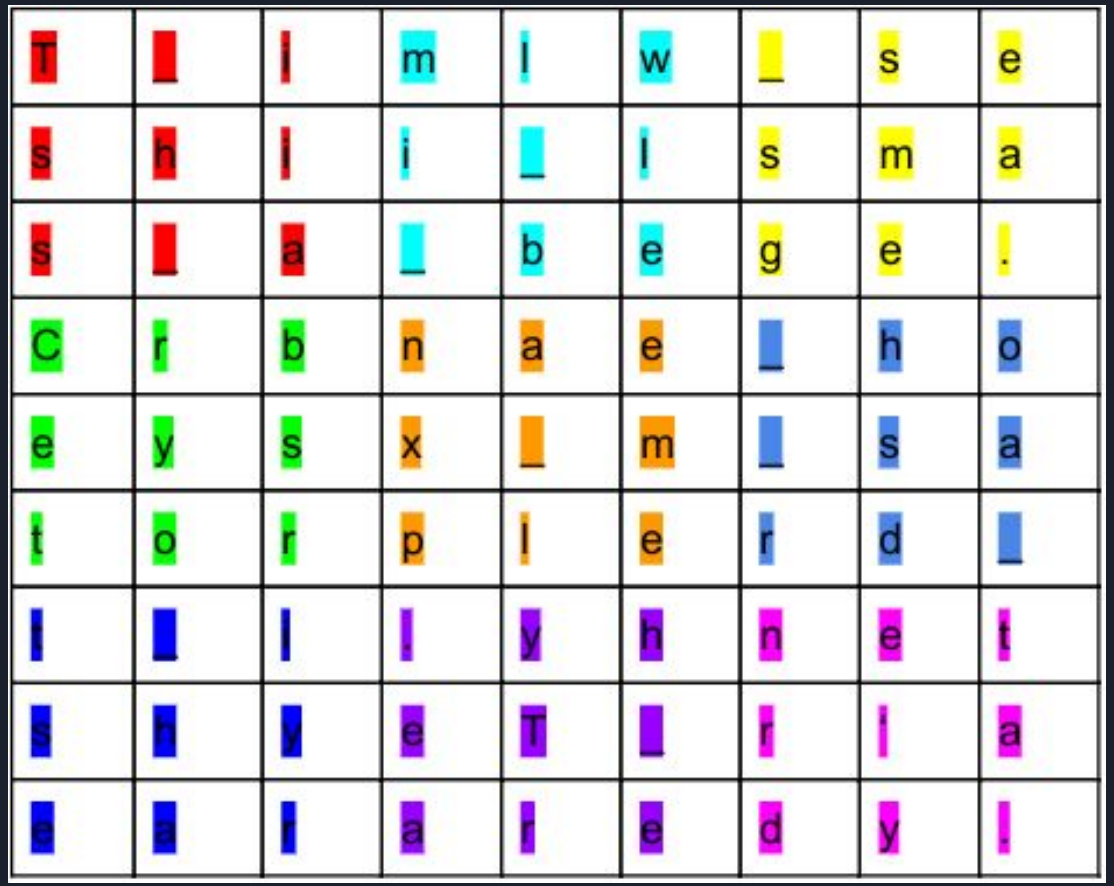
| | | |
|---|---|---|
| J | u | k |
| e | b | o |
| x | e | s |

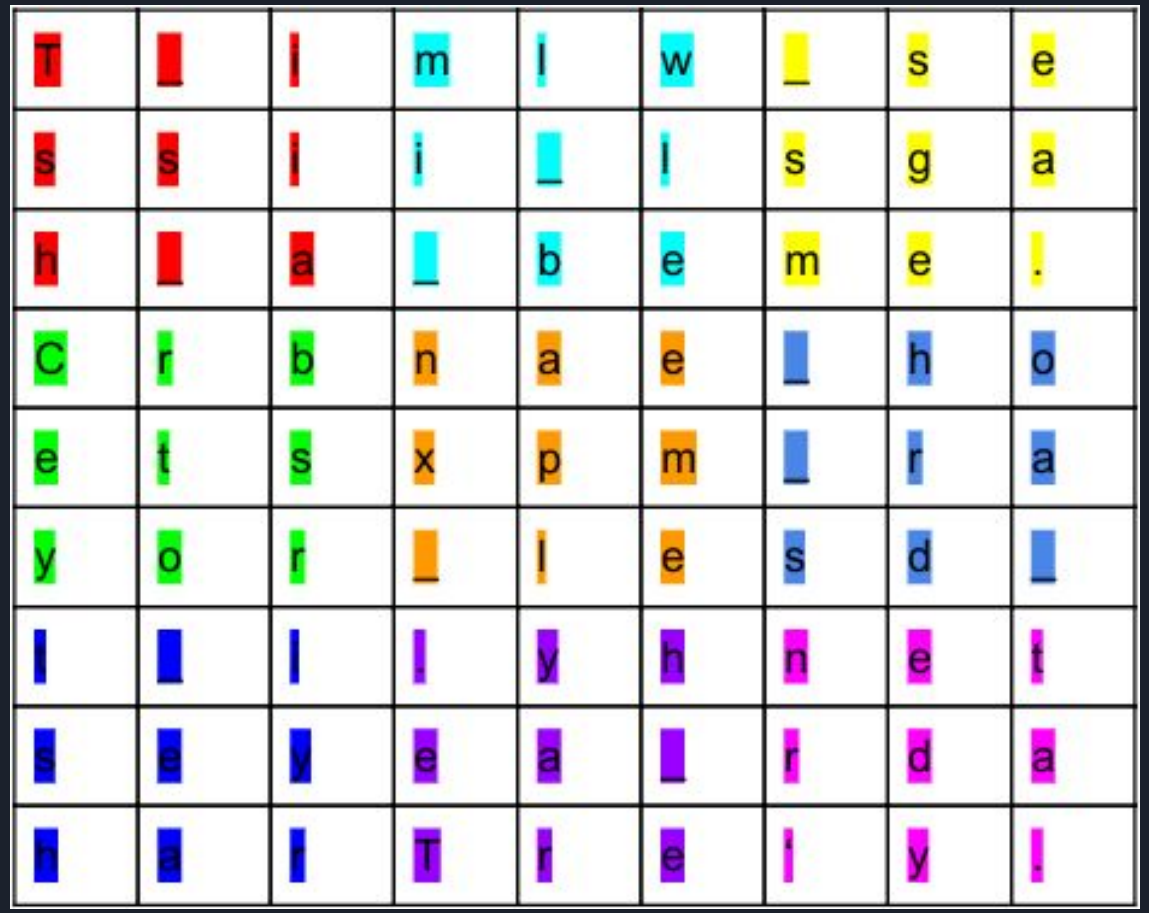
| | | |
|---|---|---|
| J | u | k |
| b | e | o |
| x | e | s |

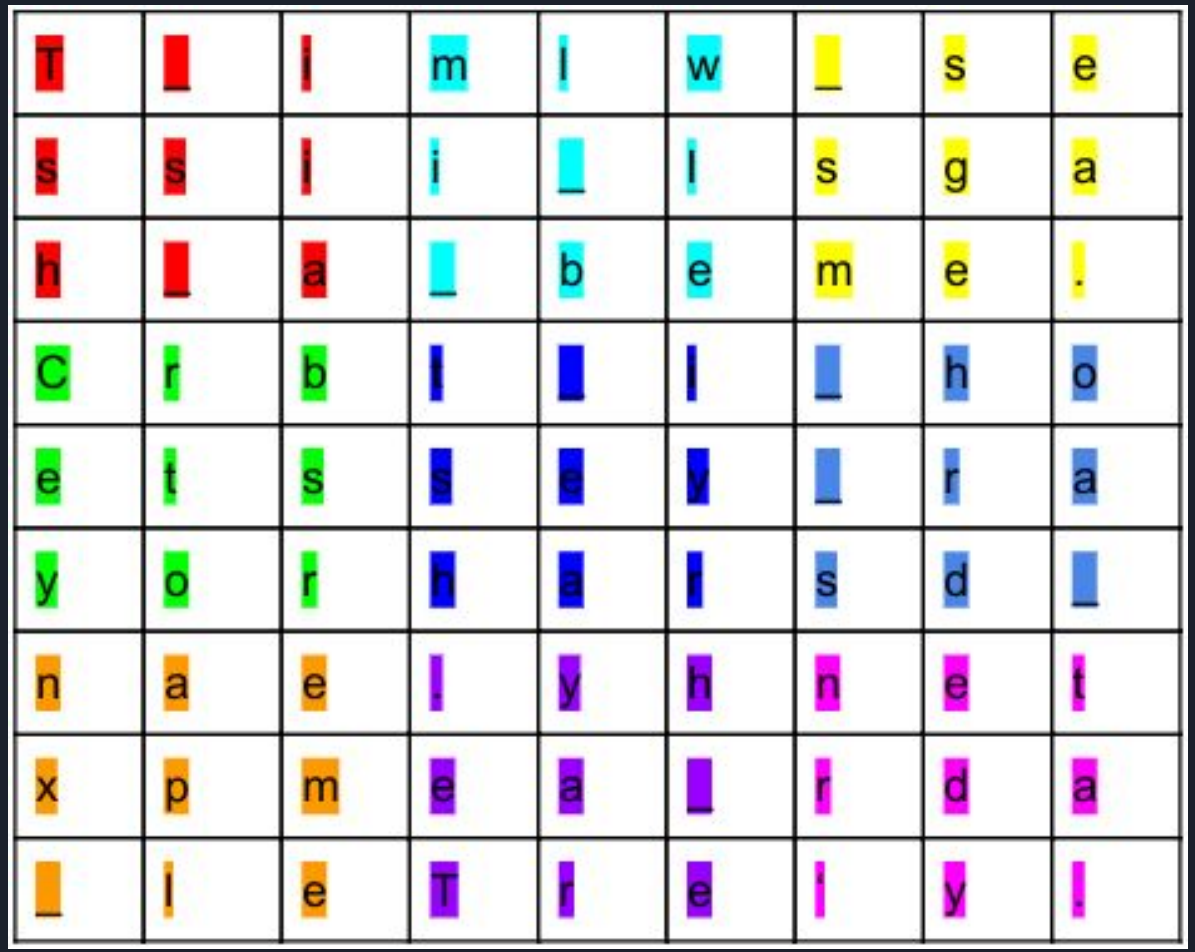
| | | |
|---|---|---|
| J | u | e |
| b | k | o |
| x | e | s |


T h i n _ e _ m e
s _ i x a m s s a
s _ a p l e g e .
C y b m _ w _ s o
e r s i l l _ h a
t o r _ b e r d _
l l l . T h n i t
s _ w e y _ r e a
e a t a r e d y .


T _ l n a e _ s e
s h l x _ m s m a
s _ a p l e g e .
C r b m l w _ h o
e y s i _ l _ s a
t o r _ b e r d _
l _ l ! y h n e t
s h w e T _ r i a
s a t a r e d y !


T _ i m l w _ s e
s h i i _ l s m a
s _ a _ b e g e .
C r b n a e _ h o
e y s x _ m _ s a
t o r p l e r d _
l _ l l y h n e t
s h y e T _ r l a
e a l a r e d y !


T _ i m l w _ s e
s s l i _ l s g a
h _ a _ b e m e .
C r b n a e _ h o
e t s x p m _ r a
y o r _ l e s d _
l _ l ! y h n e t
s e y e a _ r d a
h a l T r e ' y !


T _ i m l w _ s e
s s i i _ l s g a
h _ a _ b e m e .
C r b l _ l _ h o
e t s s e y _ r a
y o r h a f s d _
n a e ! y h n e t
x p m e a _ r d a
_ l e T r e i y !

# Bill of Materials

- A single flash-drive

# Set-Up and Deployment

- Give each team a slip of paper that has “Your mission, should you accept it, begins by getting a ZIP file from the challenge team.”
- Once the teams approach us for a ZIP file copy the content of the flash-drive to the computer of a single member on each team.
- After a team completes any layer of the challenge, unlock the next folder for them to continue.
- Once the team completes all 3 layers, award the team with points.

# Student Introduction

- Students will be given a slip of paper that reads “Your mission, should you accept it, begins by getting a ZIP file from the challenge team.”
- Once they approach the challenge team, they will be able to copy the required ZIP file from a flash-drive and begin the challenge.
- After completing a layer, the team will need to get the challenge team to confirm that the step is finished and unlock the next layer of the challenge.

# Step 1

- Teams are given a ReadMe.txt file and 3 messages
- Each message contains a timestamp in the file name and contains an encrypted message
- The decrypted messages, when put in order contain a hint to the final answer to the challenge
- Teams who decrypt the message can then have the next layer of the challenge unlocked

# Step 2

- Teams are given a ReadMe.txt file and a large message
- The message contains a timestamp in the file name and contains a much larger encrypted message
- This message, once decrypted, will provide a vital piece of finishing the challenge
- Teams who decrypt the message can then have the next layer of the challenge unlocked

# Step 3

- Teams are given a ReadMe.txt file and an even bigger message
- The message contains a timestamp in the file name and contains a much larger encrypted message
- Once decrypted, the message contains song lyrics
- Using hints from the previous layers of the challenge, teams will sing the necessary portion of the song lyrics to us for full points

# Time for the Demo!

# Timeline

- Weeks 1 and 2: The Concept
  - The team spent the first few weeks coming up with a concept for a new cipher that we wanted to create
  - Colby and Broy took point on background research on matrix-related ciphers
- Week 3: Encryption
  - Chris and Colby each worked on a different method of implementing an encryption program in Python.
  - Broy and Ben brainstormed possible messages to encrypt and hints to give
- Week 4: Decrypt
  - Ben worked on creating a working decrypt function for our cipher
  - Chris and Colby worked on deciding how to deliver each piece of the challenge to teams
- Weeks 5: The Write-Up
  - Chris worked on filling out the template for the write-up
  - Ben and Broy worked on the slides for the presentation
  - Colby and Chris came up with a theme for the encrypted messages

# Scoring

- Solving first step: 1%
- Solving second step: 10%
- Solving third step: 100%

# Questions?