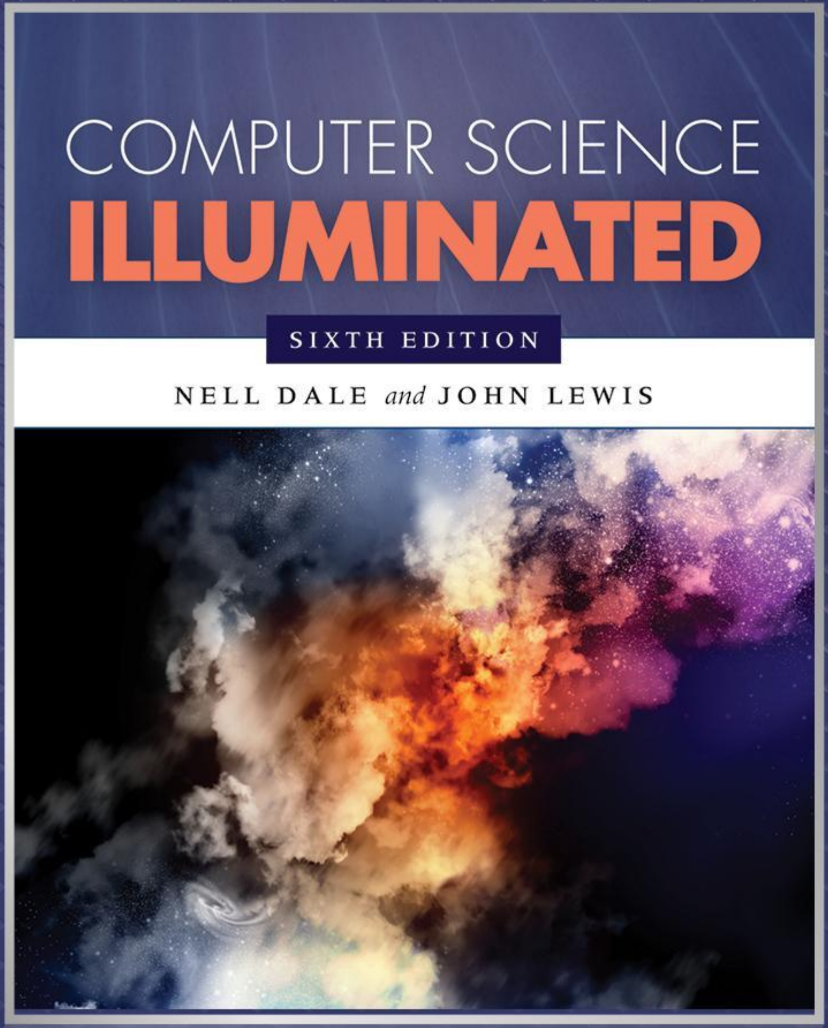
Computer Security



COMPUTER SCIENCE
ILLUMINATED

SIXTH EDITION

NELL DALE *and* JOHN LEWIS

Edits by Michael Edwards

Chapter Goals

- Discuss the CIA triad
- List three types of authentication credentials
- Create secure passwords and assess the security level of others
- Define categories of malware
- List the types of security attacks
- Define cryptography

Chapter Goals

- Encode and decode messages using various ciphers
- Discuss the challenges of keeping online data secure
- Discuss the security issues related to social media and mobile devices

Information Security

Information security

The techniques and policies used to ensure proper access to data

Confidentiality

Ensuring that data is protected from unauthorized access

What's the difference between file protection and information security?

CIA Triad of Information Security

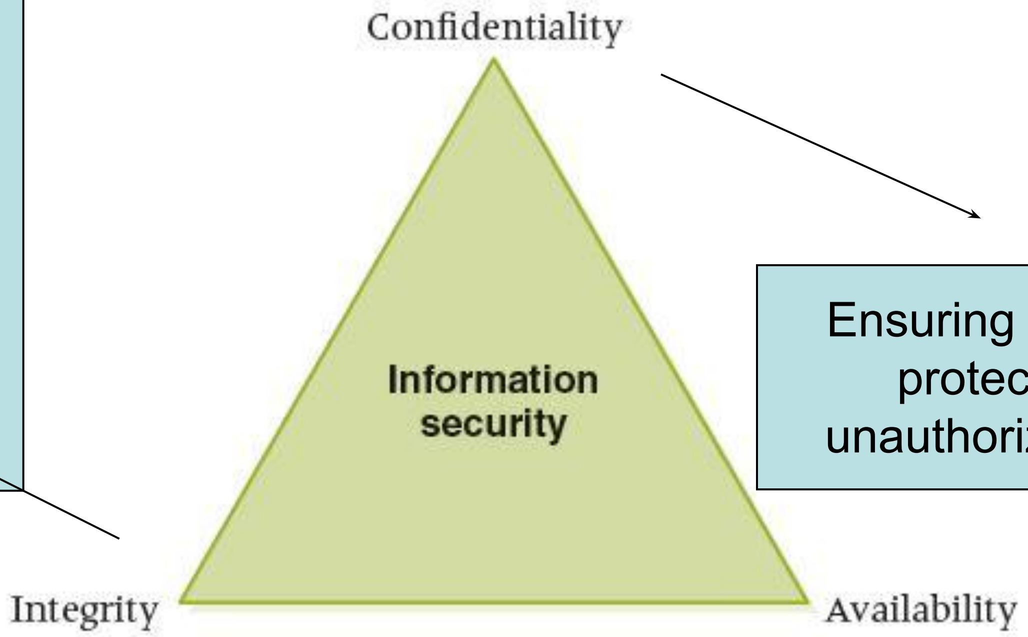


FIGURE 17.1 The CIA triad of information security

Ensuring that data can be modified only by appropriate mechanism

Ensuring that data is protected from unauthorized access

The degree to which authorized users can access information for legitimate purposes

Information Security

Rick Analysis

Determining the nature and likelihood of the risks to key data

Planning for information analysis requires risk analysis

Goal is to minimize vulnerability to threats that put a system at the most risk

Preventing Unauthorized Access

Authentication credentials

Information users provide to identify themselves for computer access

- **User knowledge** Name, password, PIN
- **Smart card** A card with an embedded memory chip used for identification
- **Biometrics** Human characteristics such as fingerprints, retina or voice patterns

Preventing Unauthorized Access

Guidelines for passwords

- Easy to remember, hard to guess
- Don’t use family or pet names
- Don’t make it accessible
- Use combination uppercase/lowercase letters, digits and special characters
- Don’t leave computer when logged in
- Don’t ever tell anyone
- Don’t include in an email
- Don’t use the same password in lots of places

Preventing Unauthorized Access

Typical Password Criteria

- Contain six or more characters
- Contain at least one uppercase and one lowercase letter
- Contain at least one digit
- Contain at least one special character

Good or Bad?

nelldale
JohnLewis
GingerCat
Longhorns
aatnv.AATNV
One2Three
7December1939

red&whIte%blUe7
g&OoD#3PaSs

Worst? Acceptable? Marginable? Good?

Preventing Unauthorized Access

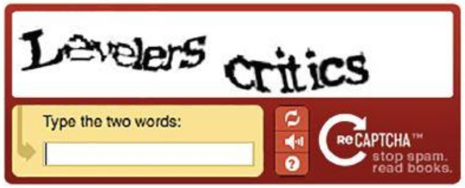


FIGURE 17.2 A CAPTCHA form verification

Courtesy of Google

CAPTCHA

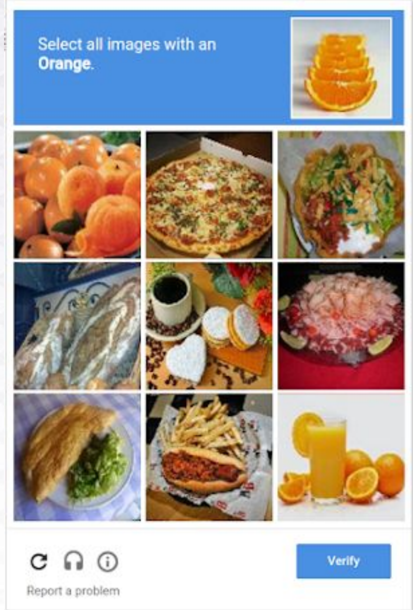
Software that verifies that the user is not another computer

reCAPTCHA

Helps digitize books at the same time

You have to look at a weird set of characters and key them back in.

Why does this work?


Select all images with an Orange.

https://support.google.com/recaptcha/?hl=en

© reCAPTCHA

Preventing Unauthorized Access

Fingerprint analysis – a stronger level of verification than username and password

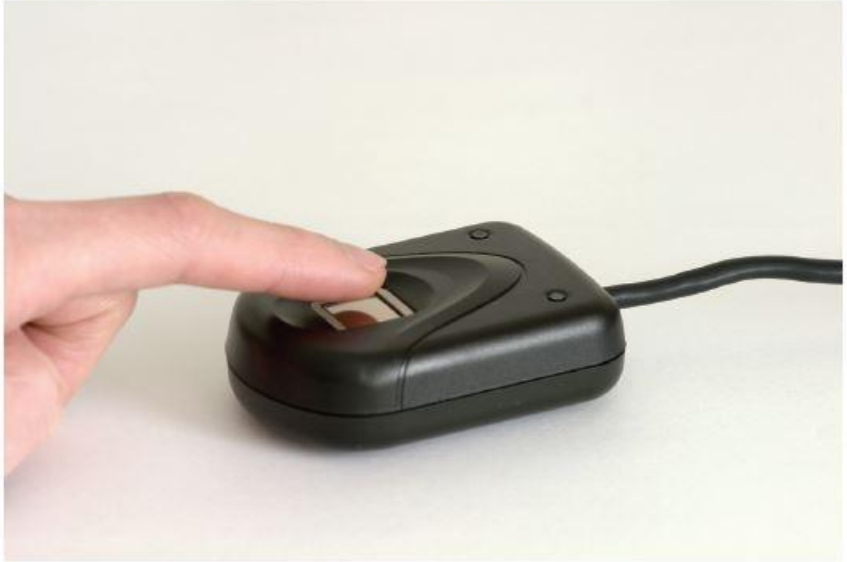


FIGURE 17.3 A fingerprint scanner

© LongHa2006/Getty Images

What if somebody steals your digitized fingerprint?

Computer Security

Malicious Code

A computer program that attempts to bypass appropriate authorization and/or perform unauthorized functions

- **Worm** stands alone, targets network resources
- **Trojan horse** disguised as benevolent resource
- **Virus** requires host to run and replicate
- **Logic bomb** set up to execute at system event

Antivirus Software

Software installed to detect and remove malicious code

Signature detection recognizes known malware and removes

Heuristics are strategies used to identify general patterns

Computer Security

Security Attacks

An attack on the computer system itself

- **Password guessing** Obvious
- **Phishing** Trick users into revealing security information
- **Spoofing** Malicious user masquerades as authorized user
- **Back door** Unauthorized access to anyone who knows it exists

Computer Security

Buffer overflow Defect that could cause a system to crash and leave the user with heightened privileges

Denial-of-service Attack that prevents authorized user from accessing the system

Man-in-the-middle Network communication is intercepted in an attempt to obtain key data

Have you ever experienced one of these?

Cryptography

Cryptography

The field of study related to encoded information (comes from Greek word for "secret writing")

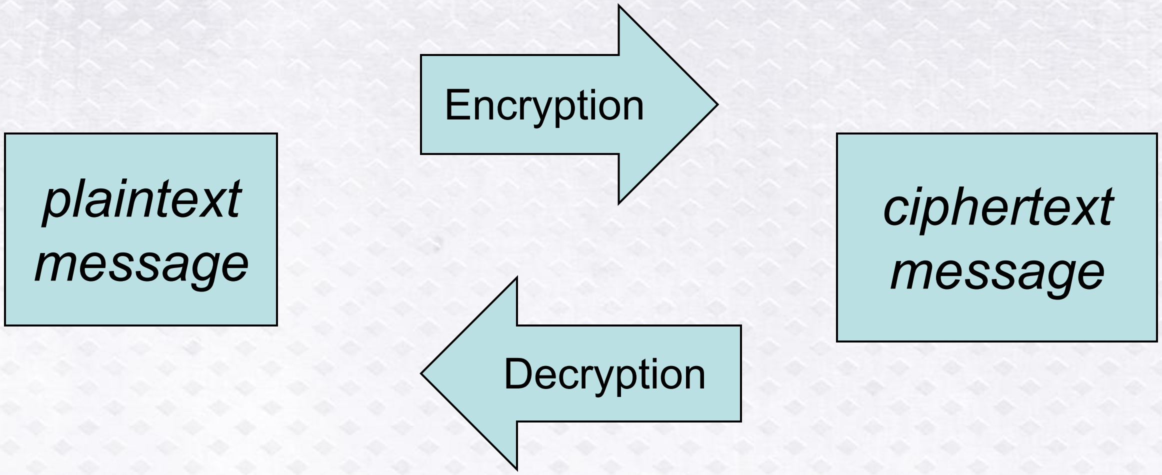
Encryption

The process of converting plaintext into ciphertext

Decryption

The process of converting ciphertext into plaintext

Cryptography



Encrypted(Information) cannot be read

Decrypted(Encrypted(Information)) can be

Cryptography

Cipher

An algorithm used to encrypt and decrypt text

Key

The set of parameters that guide a cipher

Neither is any good without the other

Cryptography

Substitution cipher

A cipher that substitutes one character with another

Caesar cipher

A substitution cipher that shifts characters a certain number of positions in the alphabet

Transposition ciphers

A cipher that rearranges the order of existing characters in a message in a certain way (e.g., a route cipher)

Substitution cipher

```
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
D E F G H I J K L M N O P Q R S T U V W X Y Z A B C
```

Substitute the letters in the second row for the letters in the top row to encrypt a message

Encrypt(COMPUTER) gives FRPSXWHU

Substitute the letters in the first row for the letters in the second row to decrypt a message

Decrypt(Encrypt(COMPUTER)) gives COMPUTER

Why is this called the Caesar cipher?
What is the key?

Transposition Cipher

```
T O D A Y
+ I S + M
O N D A Y
```

Write the letters in a row of set length, using '+' as a blank. Encrypt by placing the message into the new 2D format.

Encrypt(TODAY IS MONDAY) gives T+ONDAYMYADOIS+

Decrypt by recreating the grid and reading the letters across the row

The key is the dimensions of the grid and pad symbol.

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +
Width = 4
Path = Top Left, Spiral Clockwise

T			

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T	O		

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +
Width = 4
Path = Top Left, Spiral Clockwise

T	O	D	

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +
Width = 4
Path = Top Left, Spiral Clockwise

T	O	D	A

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T	O	D	A
Y			

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T	O	D	A
Y	+		

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +
Width = 4
Path = Top Left, Spiral Clockwise

T	O	D	A
Y	+	I	

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +
Width = 4
Path = Top Left, Spiral Clockwise

T	O	D	A
Y	+	I	S

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T	O	D	A
Y	+	I	S
+			

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T	O	D	A
Y	+	I	S
+	M		

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T	O	D	A
Y	+	I	S
+	M	O	

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T	O	D	A
Y	+	I	S
+	M	O	N

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +
Width = 4
Path = Top Left, Spiral Clockwise

T	O	D	A
Y	+	I	S
+	M	O	N
D			

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +
Width = 4
Path = Top Left, Spiral Clockwise

T	O	D	A
Y	+	I	S
+	M	O	N
D	A		

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +
Width = 4
Path = Top Left, Spiral Clockwise

T	O	D	A
Y	+	I	S
+	M	O	N
D	A	Y	

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +
Width = 4
Path = Top Left, Spiral Clockwise

T	O	D	A
Y	+	I	S
+	M	O	N
D	A	Y	+

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +
Width = 4
Path = Top Left, Spiral Clockwise

T	O	D	A
Y	+	I	S
+	M	O	N
D	A	Y	+

Send Message:

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T ●	O	D	A
Y	+	I	S
+	M	O	N
D	A	Y	+

Send Message: T

Transposition Cipher Example

Original message: TODAY IS MONDAY

Key: Pad = +
Width = 4
Path = Top Left, Spiral Clockwise

T ●	O ●	D	A
Y	+	I	S
+	M	O	N
D	A	Y	+

Send Message: TO

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T ●	O ●	D 🟢	A
Y	+	I	S
+	M	O	N
D	A	Y	+

Send Message: TOD

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T ●	O ●	D ●	A 🟢
Y	+	I	S
+	M	O	N
D	A	Y	+

Send Message: TODA

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T ●	O ●	D ●	A ●
Y	+	I	S 🟢
+	M	O	N
D	A	Y	+

Send Message: TODAS

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +
Width = 4
Path = Top Left, Spiral Clockwise

T ●	O ●	D ●	A ●
Y	+	I	S ●
+	M	O	N 🟢
D	A	Y	+

Send Message: TODASN

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +
Width = 4
Path = Top Left, Spiral Clockwise

T ●	O ●	D ●	A ●
Y	+	I	S ●
+	M	O	N ●
D	A	Y	+ 🟢

Send Message: TODASN+

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T ●	O ●	D ●	A ●
Y	+	I	S ●
+	M	O	N ●
D	A	Y 🟢	+ ●

Send Message: TODASN+Y

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +
Width = 4
Path = Top Left, Spiral Clockwise

T ●	O ●	D ●	A ●
Y	+	I	S ●
+	M	O	N ●
D	A 🟢	Y ●	+ ●

Send Message: TODASN+YA

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T ●	O ●	D ●	A ●
Y	+	I	S ●
+	M	O	N ●
D 🟢	A ●	Y ●	+ ●

Send Message: TODASN+YAD

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T ●	O ●	D ●	A ●
Y	+	I	S ●
+ 🟢	M	O	N ●
D ●	A ●	Y ●	+ ●

Send Message: TODASN+YAD+

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T ●	O ●	D ●	A ●
Y 🟢	+	I	S ●
+ ●	M	O	N ●
D ●	A ●	Y ●	+ ●

Send Message: TODASN+YAD+Y

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T ●	O ●	D ●	A ●
Y ●	+ 🟢	I	S ●
+ ●	M	O	N ●
D ●	A ●	Y ●	+ ●

Send Message: TODASN+YAD+Y+

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T ●	O ●	D ●	A ●
Y ●	+ ●	I 🟢	S ●
+ ●	M	O	N ●
D ●	A ●	Y ●	+ ●

Send Message: TODASN+YAD+Y+I

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T ●	O ●	D ●	A ●
Y ●	+ ●	I ●	S ●
+ ●	M	O 🟢	N ●
D ●	A ●	Y ●	+ ●

Send Message: TODASN+YAD+Y+IO

Transposition Cipher Example

Original message: `TODAY IS MONDAY`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T ●	O ●	D ●	A ●
Y ●	+ ●	I ●	S ●
+ ●	M 🟢	O ●	N ●
D ●	A ●	Y ●	+ ●

Send Message: TODASN+YAD+Y+IOM

Transposition Cipher Example

Received message: `TODASN+YAD+Y+IOM`

Key: Pad = +
Width = 4
Path = Top Left, Spiral Clockwise

Original Message:

Transposition Cipher Example

Received message: `TODASN+YAD+Y+IOM`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

Original Message:

Transposition Cipher Example

Received message: `TODASN+YAD+Y+IOM`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T ●			

Original Message:

Transposition Cipher Example

Received message: `TODASN+YAD+Y+IOM`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T ●	O ●		

Original Message:

Transposition Cipher Example

Received message: `TODASN+YAD+Y+IOM`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T ●	O ●	D ●	

Original Message:

Transposition Cipher Example

Received message: TOD**A**SN+YAD+Y+IOM

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T ●	O ●	D ●	A ●

Original Message:

Transposition Cipher Example

Received message: TODASN+YAD+Y+IOM

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T ●	O ●	D ●	A ●
			S ●

Original Message:

Transposition Cipher Example

Received message: TODAS**N**+YAD+Y+IOM

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T ●	O ●	D ●	A ●
			S ●
			N 🟢

Original Message:

Transposition Cipher Example

Received message: `TODASN+YAD+Y+IOM`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T ●	O ●	D ●	A ●
			S ●
			N ●
			+ 🟢

Original Message:

Transposition Cipher Example

Received message: `TODASN+`**`Y`**`AD+Y+IOM`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T ●	O ●	D ●	A ●
			S ●
			N ●
		Y ●	+ ●

Original Message:

Transposition Cipher Example

Received message: `TODASN+Y`**`A`**`D+Y+IOM`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T ●	O ●	D ●	A ●
			S ●
			N ●
	A 🟢	Y ●	+ ●

Original Message:

Transposition Cipher Example

Received message: `TODASN+YA`**`D`**`+Y+IOM`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T ●	O ●	D ●	A ●
			S ●
			N ●
D 🟢	A ●	Y ●	+ ●

Original Message:

Transposition Cipher Example

Received message: `TODASN+YAD+Y+IOM`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T ●	O ●	D ●	A ●
			S ●
+ 🟢			N ●
D ●	A ●	Y ●	+ ●

Original Message:

Transposition Cipher Example

Received message: `TODASN+YAD+`**`Y`**`+IOM`

Key: Pad = +
Width = 4
Path = Top Left, Spiral Clockwise

T ●	O ●	D ●	A ●
Y 🟢			S ●
+ ●			N ●
D ●	A ●	Y ●	+ ●

Original Message:

Transposition Cipher Example

Received message: `TODASN+YAD+Y+IOM`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T ●	O ●	D ●	A ●
Y ●	+ 🟢		S ●
+ ●			N ●
D ●	A ●	Y ●	+ ●

Original Message:

Transposition Cipher Example

Received message: `TODASN+YAD+Y+`**`I`**`OM`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T ●	O ●	D ●	A ●
Y ●	+ ●	I 🟢	S ●
+ ●			N ●
D ●	A ●	Y ●	+ ●

Original Message:

Transposition Cipher Example

Received message: `TODASN+YAD+Y+IOM`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T ●	O ●	D ●	A ●
Y ●	+ ●	I ●	S ●
+ ●		O 🟢	N ●
D ●	A ●	Y ●	+ ●

Original Message:

Transposition Cipher Example

Received message: `TODASN+YAD+Y+IO`**`M`**

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T ●	O ●	D ●	A ●
Y ●	+ ●	I ●	S ●
+ ●	M 🟢	O ●	N ●
D ●	A ●	Y ●	+ ●

Original Message:

Transposition Cipher Example

Received message: `TODASN+YAD+Y+IOM`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

T	O	D	A
Y	+	I	S
+	M	O	N
D	A	Y	+

Original Message:

Transposition Cipher Example

Received message: `TODASN+YAD+Y+IOM`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

	O	D	A
Y	+	I	S
+	M	O	N
D	A	Y	+

Original Message: T

Transposition Cipher Example

Received message: `TODASN+YAD+Y+IOM`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

		D	A
Y	+	I	S
+	M	O	N
D	A	Y	+

Original Message: TO

Transposition Cipher Example

Received message: `TODASN+YAD+Y+IOM`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

			A
Y	+	I	S
+	M	O	N
D	A	Y	+

Original Message: TOD

Transposition Cipher Example

Received message: `TODASN+YAD+Y+IOM`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

Y	+	I	S
+	M	O	N
D	A	Y	+

Original Message: TODA

Transposition Cipher Example

Received message: `TODASN+YAD+Y+IOM`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

	+	I	S
+	M	O	N
D	A	Y	+

Original Message: TODAY

Transposition Cipher Example

Received message: `TODASN+YAD+Y+IOM`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

		I	S
+	M	O	N
D	A	Y	+

Original Message: TODAY

Transposition Cipher Example

Received message: `TODASN+YAD+Y+IOM`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

			S
+	M	O	N
D	A	Y	+

Original Message: TODAY I

Transposition Cipher Example

Received message: `TODASN+YAD+Y+IOM`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

+	M	O	N
D	A	Y	+

Original Message: TODAY IS

Transposition Cipher Example

Received message: `TODASN+YAD+Y+IOM`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

	M	O	N
D	A	Y	+

Original Message: TODAY IS

Transposition Cipher Example

Received message: `TODASN+YAD+Y+IOM`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

		O	N
D	A	Y	+

Original Message: TODAY IS M

Transposition Cipher Example

Received message: `TODASN+YAD+Y+IOM`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

			N
D	A	Y	+

Original Message: TODAY IS MO

Transposition Cipher Example

Received message: `TODASN+YAD+Y+IOM`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

D	A	Y	+

Original Message: TODAY IS MON

Transposition Cipher Example

Received message: `TODASN+YAD+Y+IOM`

Key: Pad = +
Width = 4
Path = Top Left, Spiral Clockwise

	A	Y	+

Original Message: TODAY IS MOND

Transposition Cipher Example

Received message: `TODASN+YAD+Y+IOM`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

		Y	+

Original Message: TODAY IS MONDA

Transposition Cipher Example

Received message: `TODASN+YAD+Y+IOM`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

			+

Original Message: TODAY IS MONDAY

Transposition Cipher Example

Received message: `TODASN+YAD+Y+IOM`

Key: Pad = +

Width = 4

Path = Top Left, Spiral Clockwise

Original Message: TODAY IS MONDAY

Cryptanalysis

Cryptanalysis

The process of decrypting a message without knowing the cipher or the key used to encrypt it

Substitution and transposition ciphers are easy for modern computers to break

To protect information more sophisticated schemes are needed

Public/Private Keys

Public-key cryptography

An approach in which each user has two related keys, one public and one private

One's public key is distributed freely

A person encrypts an outgoing message, using the receiver's public key.

Only the receiver's private key can decrypt the message

Public/Private Keys

Digital signature

Data that is appended to a message, made from the message itself and the sender's private key, to ensure the authenticity of the message

Digital certificate

A representation of a sender's authenticated public key used to minimize malicious forgeries

Protecting Online Information

Be smart about information you make available!!!!!

- 25% of Facebook users don’t make use of its privacy controls or don’t know they exist
- 40% of social media users post their full birthday, opening themselves up to identity theft
- 9% of social media users become victims of information abuse

Protecting Online Information

Why are smart people dumb about protecting online information?

- The Internet creates a false sense of anonymity
- People make assumptions about how securely their information is being treated
- People don't think about the ramifications of sharing information

Security and Portable Devices

Smartphones, tablets, and laptops combined with GPS capabilities can pose ethical problems

- Apple iPhone and Google log and transmit data about users
- Law enforcement makes use of this data in criminal investigations
- U.S. Customs and Border Protection asserted the authority to seize and copy information in portable electronic devices for any reason

Security and Portable Devices

What is a wiki?

What do you think of when you hear WikiLeaks?

Is WikiLeaks a wiki? If not, what is it?

What is the relationship between WikiLeaks and Britain’s Guardian newspaper?

Where is Julian Assange now?

Ethical Issues

Blogging

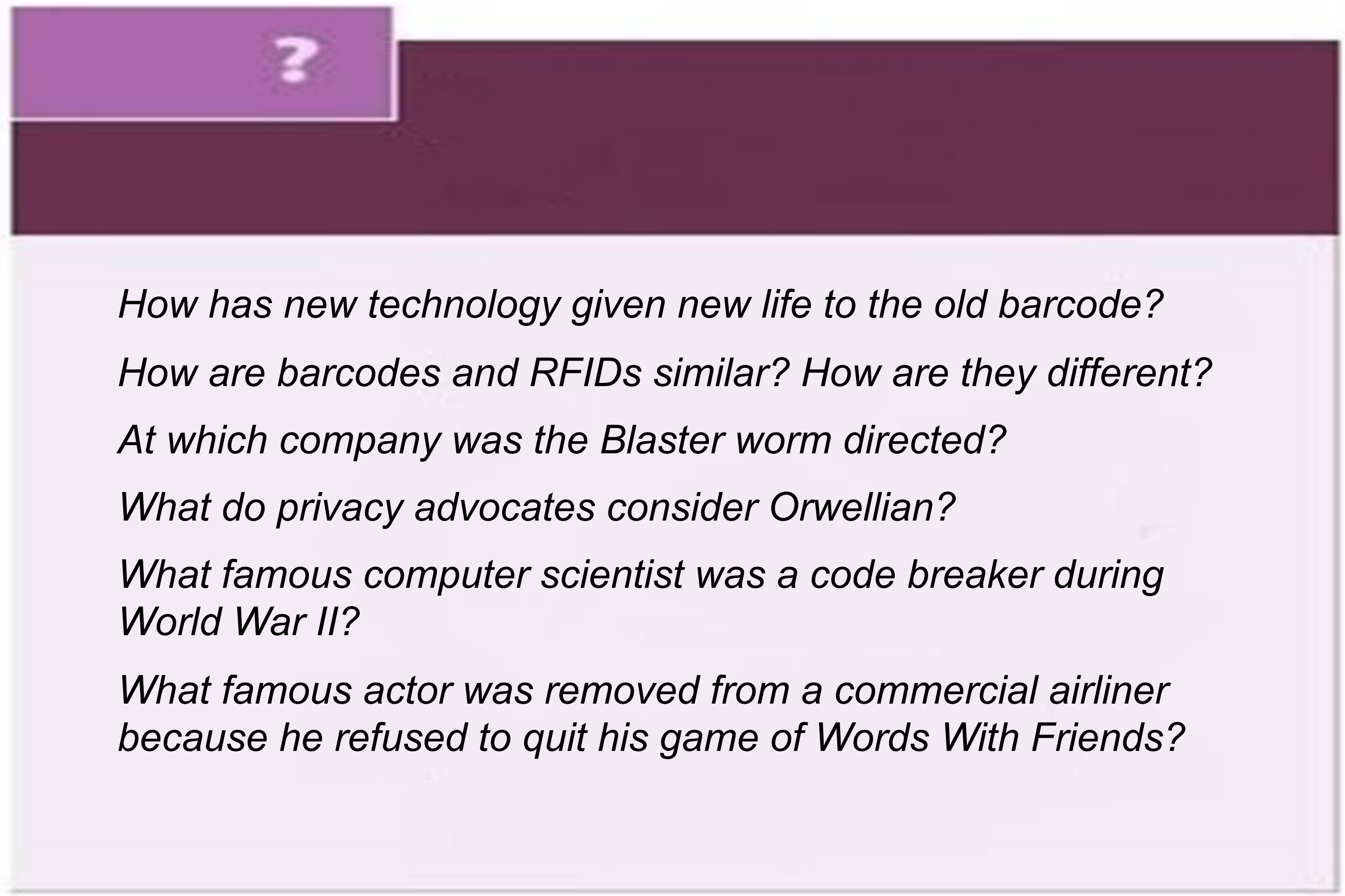
What is the blogosphere?

Give several examples of how blogs have made national headlines

Should bloggers have the same protections as regular journalists?

What did the U.S. Court of Appeals for the Ninth Circuit have to say about bloggers' protections in January 2014?

Do you know?



How has new technology given new life to the old barcode?

How are barcodes and RFIDs similar? How are they different?

At which company was the Blaster worm directed?

What do privacy advocates consider Orwellian?

What famous computer scientist was a code breaker during World War II?

What famous actor was removed from a commercial airliner because he refused to quit his game of Words With Friends?