Careers in Cybersecurity

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What is cybersecurity?

Cybersecurity is:

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the art of protecting networks, devices, and data from unauthorized access or criminal use.

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What are the risks of poor cybersecurity?

Lack of Cybersecurity Risks:

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Personal

- Stolen Identity
- Private Data sold/lost
- Theft

Business

- Ransomware
- Corporate espionage

Government

- Infrastructure damage
- Physical Attacks
- Espionage

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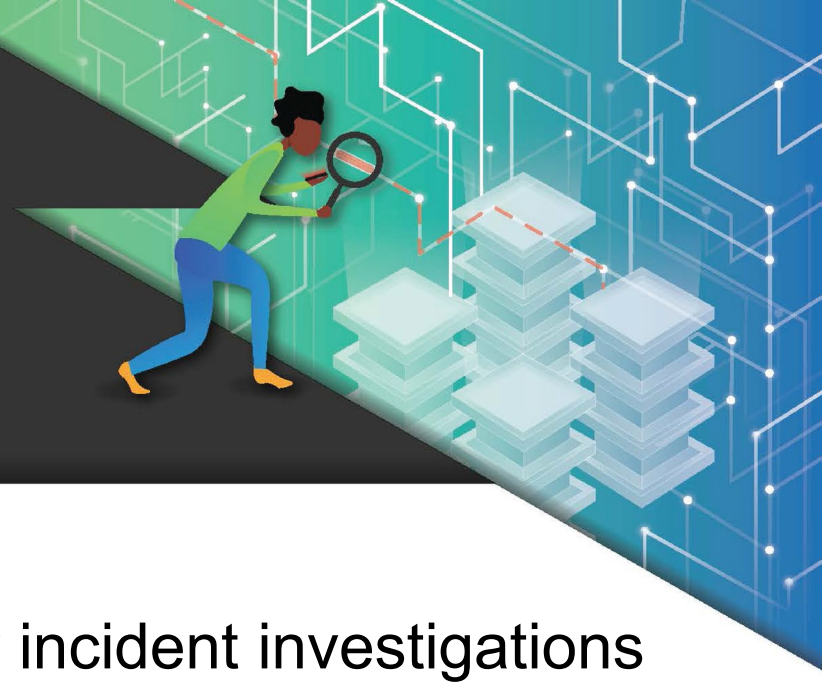
A career in cybersecurity might be perfect for you!

CAREER PROFILE:
Cyber Forensic Expert



Degree Required?

YES

Bachelor's Degree in Cybersecurity or Computer Science

Median Salary

+$70,000

Job Growth

28%

Common Job Duties

- Conduct data breach and security incident investigations
- Recover data from computers and electronic storage devices
- Dismantle and rebuild damaged systems to retrieve lost data
- Compile evidence for legal cases
- Identify systems/networks compromised by attacks
- Draft technical reports and prepare evidence
- Give counsel to attorneys about evidence in a case

CAREER PROFILE:
Cryptographer

Degree Required?

YES

Master's Degree in Mathematics or Computer Science

Median Salary

+$100,000

Job Growth

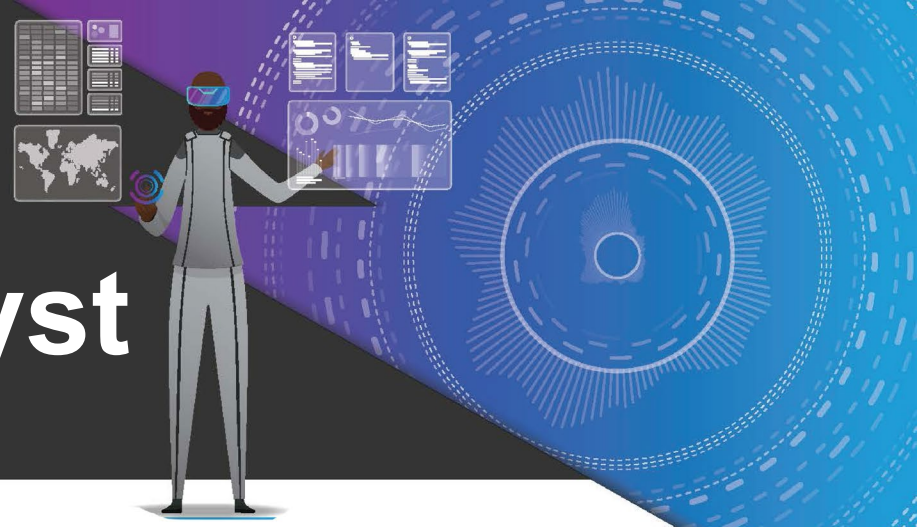
21%

Common Job Duties

- Protect important information from interception, copying, modification and/or deletion
- Evaluate, analyze and target weaknesses in cryptographic security systems and algorithms
- Design robust security systems to prevent vulnerabilities
- Develop statistical and mathematical models to analyze data and solve security problems
- Test computational models for reliability and accuracy

CAREER PROFILE:

Information Assurance Analyst



Degree Required?

YES

Bachelor's Degree in Cybersecurity or Computer Science

Median Salary

$100,000

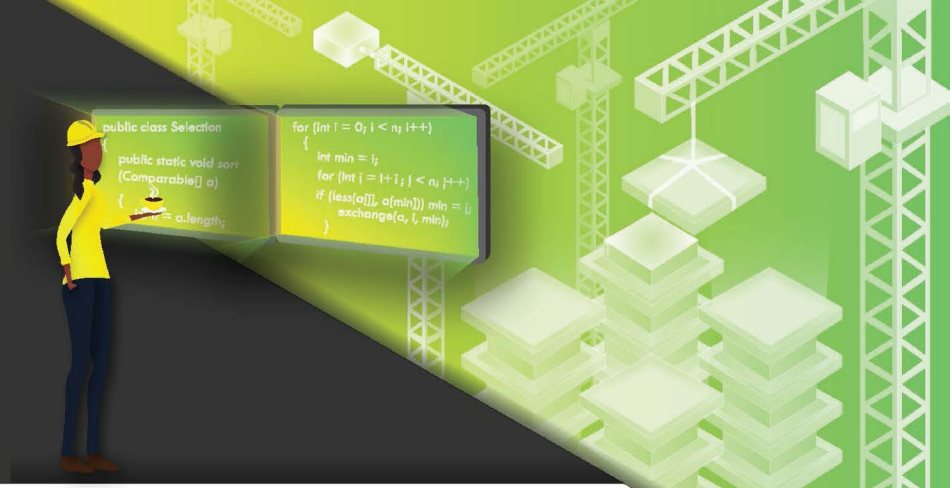
Job Growth

31%

Common Job Duties

- Develop and implement plans to safeguard various types of files and stored data
- Configure, install, operate, & maintain hardware & software for an organization
- Develop new and evolve existing infrastructure and participate in technical research to identify best-practices
- Ensure all organization operating systems, software, & system hardware are protected, and compliant with rules & policies

CAREER PROFILE:
Software Developer



Degree Required?

YES

Associate's Degree
(A Bachelor's or Master's in Computer Science is helpful)

Median Salary

+$70,000

Job Growth

24%

Common Job Duties

- Develop, create, maintain, and write/code computer applications, software, or utility programs
- Design, implement, and test software
- Create new software systems or forensic tools
- Participate in the life-cycle development of software systems using different methodologies
- Institute programming techniques that are free from logical design and technical implementation flaws

CAREER PROFILE:

Pen Tester

Degree Required?

YES

Bachelor's Degree in Cybersecurity or Computer Science

Median Salary

+$85,000

Job Growth

30%

Common Job Duties

- Identify and attempt to exploit weaknesses in computer networks and systems
- Simulate cyber attacks to access secure information
- Bypass established security protocols and defenses
- Ethically hack into computer networks and data servers
- Identify and configure tools to break into computers, networks, and servers
- Communicate exposed vulnerabilities and risk-level of computer systems and networks

Want to learn more?

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If you're interested in a career in cybersecurity, you can:

1. Participate in Cybersecurity Summer camps
   - IUP GenCyber
   - WCCC Coding Camps for Kids-coming soon!
   - iD Tech Camps- Carnegie Mellon

2. Play Cybersecurity related games
   - Defend the Crown
   - Nova Labs

3. Work on developing your skills through classes or online self-study!

Activity Time!

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Encryption is one of the many ways we can ensure our private information is secure.

Let’s decrypt a few secret messages!

Caesar Cipher or Caesar Shift

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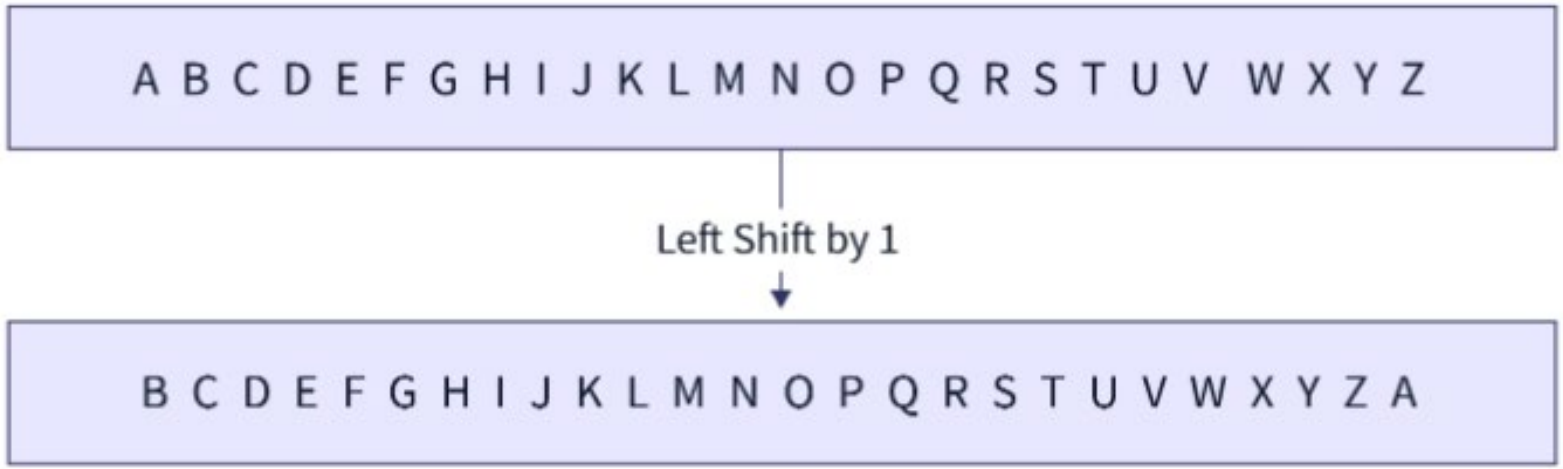
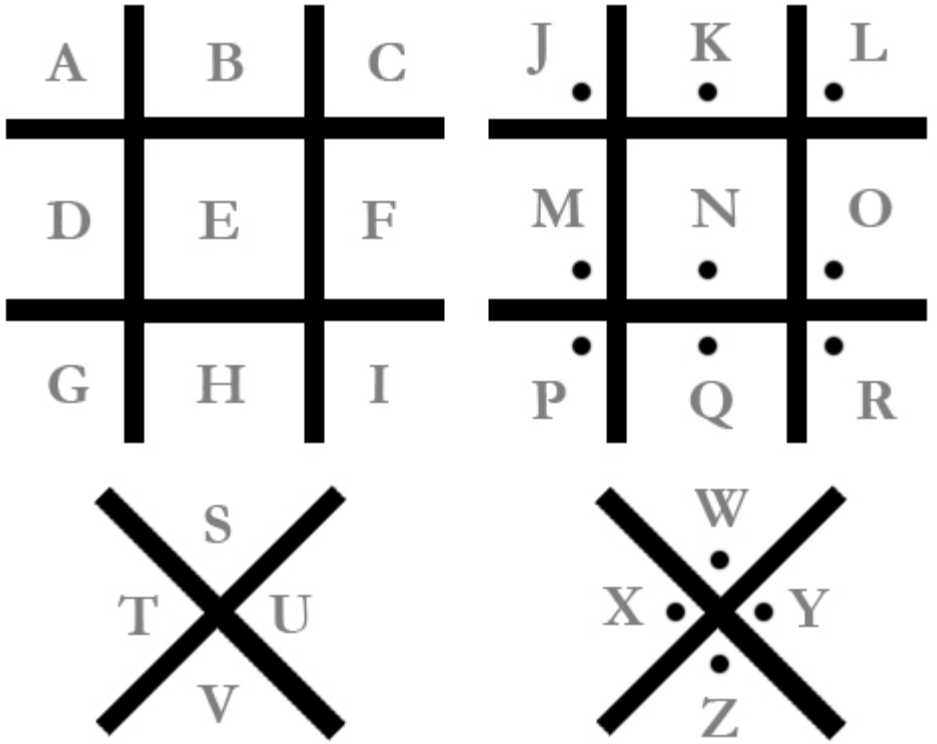
- Ancient technique to encrypt data by shifting characters in the alphabet.
- The example below shows a shift of 1. Because we know the shift, we can work backwards to decode messages. What does the message below say?

Dzcfstfdvsjuz jt gvo!



Pig Pen Cipher

- A simple type of substitution cipher where the alphabet is replaced with symbols.
- To decode this type of cipher, you must have the “Key.” Can you decode this message?



BIFID Cipher

- This type of cipher also involves a Key, but here we turn letters into numbers, and use those numbers to encrypt the message.

MESSAGE: GUESS

G U E S S

2 4 1 4 4

2 5 5 3 3

↓

24 14 42 55 33

↓

IDRZN

	1	2	3	4	5
1	A	B	C	D	E
2	F	G	H	I/J	K
3	L	M	N	O	P
4	Q	R	S	T	U
5	V	W	X	Y	Z