

# Cyber Security

Defending electronic device hardware and software from malicious attacks

## Cryptography

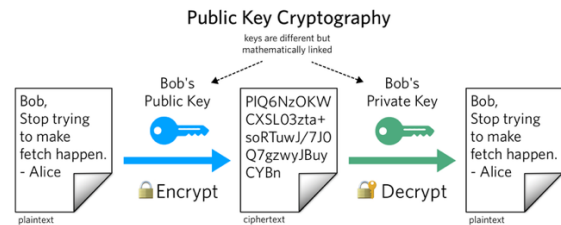
Cryptography is the practice of using secret keys to encrypt and decrypt data. Cryptography is used in modern web applications and computer communication to avoid others from listening to messages. For example, logging in to your bank's website.

Example:

Can you decipher?

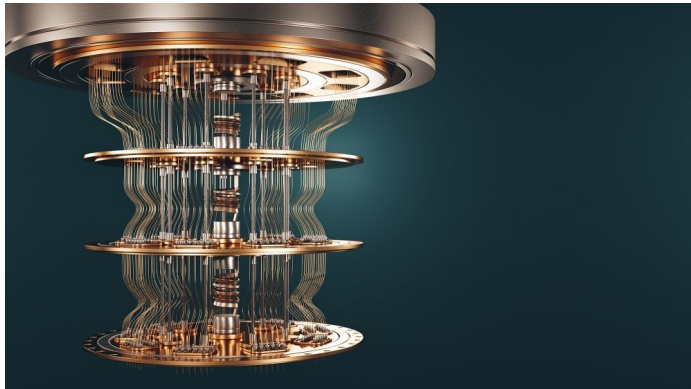
Xfmdpnf up Dszquphsbqiz!

Hint: one of the oldest methods of cryptography using the alphabet.



Most computers use complex mathematical formulas that are easy to encrypt but infeasible to decrypt unless you store the "key". In the example above, the "key" was the alphabet shift.

## Emerging Threat of Quantum Computers



Normal computers would take hundreds, maybe thousands of years to decrypt most modern standard mathematical algorithms used in banking websites, amazon, and many other web applications. However, new algorithms are being researched to avoid quantum computers from deciphering encrypted messages with their immense computational speed.

## Cyber Security in General

Cyber security is not just cryptography. Cryptography only works if people are attempting to access information authentically. However, sometimes software or hardware are not built secure enough and people can access information illegitimately.

Most cyber security pen-testing doesn't even require programming knowledge. Most software to break into systems is already programmed. Vulnerabilities to systems are also made public:

For example, the following link shows well-known software applications and their vulnerabilities:  
[http://cve.mitre.org/cve/search\\_cve\\_list.html](http://cve.mitre.org/cve/search_cve_list.html)

