



# Review of the Week

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GenCyber Workshop



# Agenda

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- Review
- Cybersecurity Layers
- CIA
- The Ten Principles
- To Do



# Learning Objectives

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- Describe the five layers of cybersecurity
- Explain the concepts of confidentiality, integrity, and availability and how they relate to what we have discussed this week
- Provide an overview of the 10 principles of cybersecurity



# Review

- Congratulations, you have made it to the last day of Gencyber 2021!
  - To finish up, let us do a quick review





# Cybersecurity Layers

## PHYSICAL

buildings, hardware equipment, etc.



## NETWORK

network infrastructure and the nodes that belong to the network



## OPERATING SYSTEM

Windows, iOS, Raspbian, etc.



## APPLICATIONS

email, social media, etc.



## DATA

personal information, proprietary company information, etc.



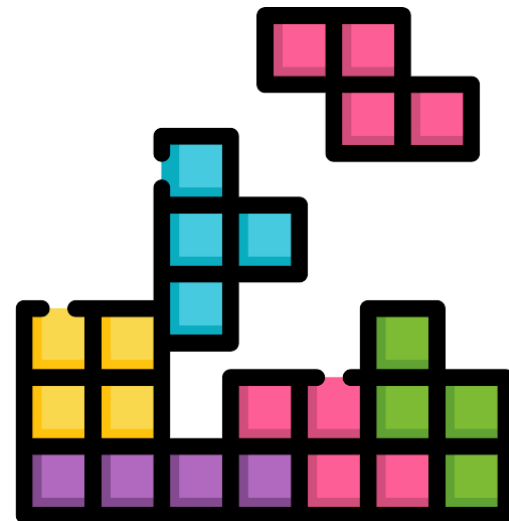
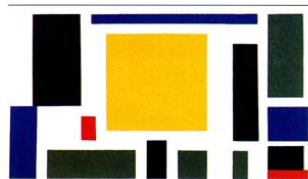
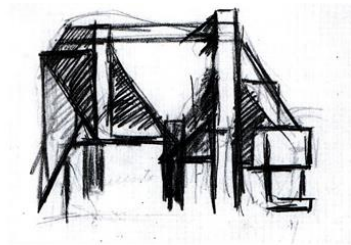
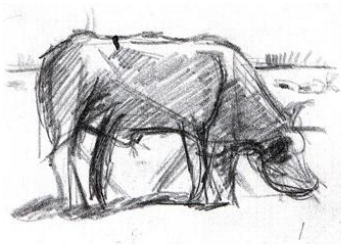


# CIA



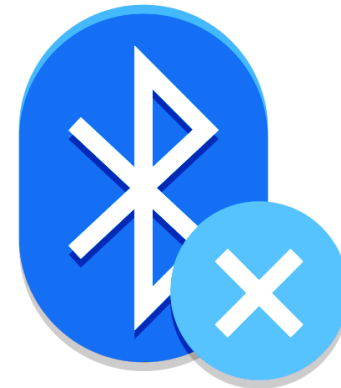
# The Ten Principles

- **Abstraction**
  - reduce components down to only the essential attributes
  - exclude any details of the system that the user doesn't need to know
- **Modularity**
  - separate a program into interchangeable modules
  - reduces damage to one module



# The Ten Principles

- **Minimization**
  - keep elements as small and simple as possible while still meeting the user's needs
  - ex: turning off Bluetooth when it's not needed
  - lowering the level of complexity limits the points of attack
- **Simplicity**
  - ensure that security mechanisms are easy to follow and maintain
  - You wouldn't want the Bluetooth disable button to be somewhere where users couldn't find it





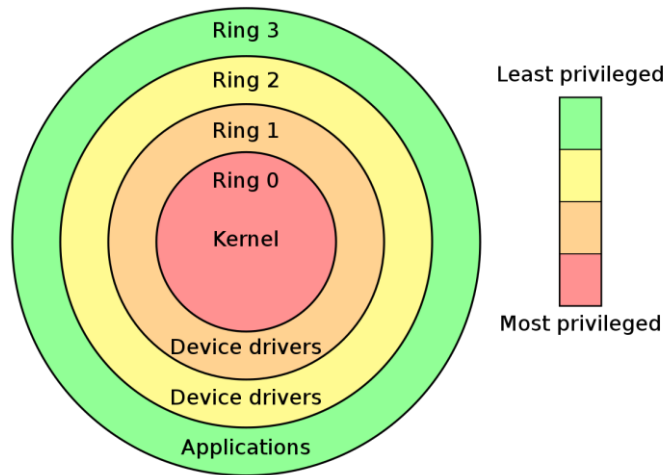
# The Ten Principles

- **Data Hiding**
  - Hide data that users do not need to access
  - prevents unauthorized users from viewing or changing data
  - ex: displaying a person's username but hiding their password, email, phone number, etc.



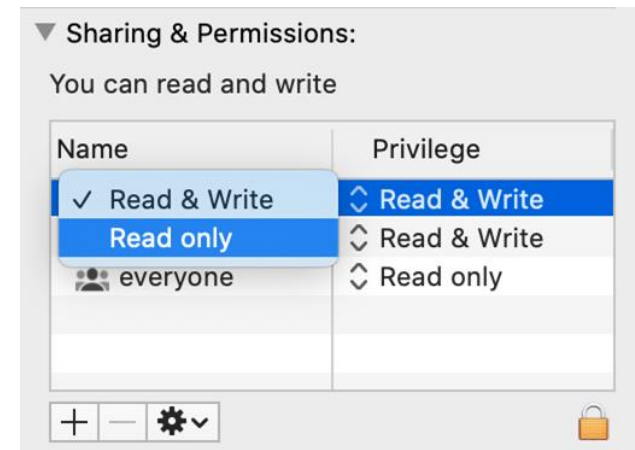
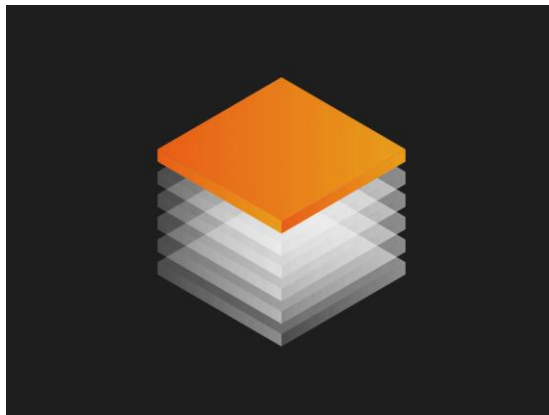
# The Ten Principles

- **Domain Separation**
  - separate data and processes into different domains
  - allows different security rules to be set for the different domains
  - ex: In super user mode, the user can run special instructions that could potentially damage the system
    - In user mode, the user does not have the power to run these instructions



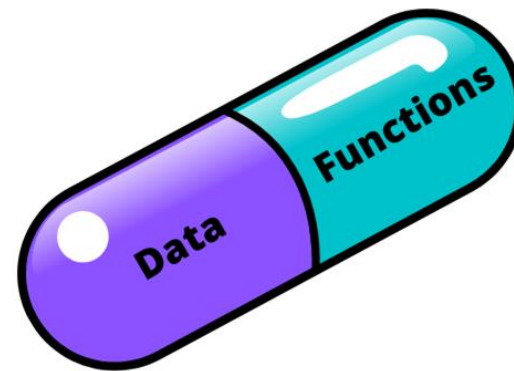
# The Ten Principles

- **Layering**
  - Security should be implemented in each layer of the system
  - slows down the attacker since they have to break through each layer
- **Least Privilege**
  - Assign each user the least amount of privilege that they need
  - ex: A sales associate and a manager should not be able to access the same records



# The Ten Principles

- **Process Isolation**
  - Separate each running process from one another to make sure that they don't interfere with each other
- **Resource Encapsulation**
  - Place data and functions that act on that data into one component
  - prevents users from accessing or modifying the data in an unintended way





# To Do

- Finish up your projects before presentation time.