Privacy

INTRODUCTION TO DATA PRIVACY

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Privacy's origin story

- 1800s conversations about technology and Privacy:
  - Individuals' rights
  - Sensationalist reporting
- **Privacy** - The right to be left alone, or freedom from interference or intrusion.

[1] Samuel D. Warren and Louis D. Brandeis, "The Right to Privacy," Harvard Law Review, 4 (5), (1890): 193-220, p. 195, citing Judge Cooley in Cooley on Torts, 2nd ed.

Digging into today's definition of Privacy

- ***Data Privacy*** - control over how personal data is collected and used.
- "The authorized and valid processing of personal information."

[1] Bhajaria, Nishant, and Neil Hunt. Data Privacy: A Runbook for Engineers. Manning Publications Co., 2022.

Personal data

- ***Personal data*** - data related to a person or can be used to identify an individual.
  - Examples:
    - Date of birth (DOB)
    - Name
    - Geolocation
- Goal to keep personal data safe

Privacy's expanding implications

- Increase discussions in 21st-century due to:
  - Internet
  - Applications
  - Larger data footprint
- Privacy concerns include:
  - Surveillance
  - Big data analytics
  - 3rd party providers

State of Privacy today

- 59%+ of Americans do not know what is being done with their data.
- 81% of Americans say that the risks of collecting data about them outweigh the benefits.

- Potential causes:
  - Lack of Privacy knowledge
  - Lack of trust
  - Lack of standardized regulation

Privacy Implications

Privacy has different implications for different groups

Personas	Why Privacy Matters	Consequences
User	• User Trust • Confidence	• Violation of individual's rights • Increased risk of data misuse
Company	• Compliance • Protecting Users	• Financial loss • Legal repercussions
Regulator	• Standardization • Protecting Users	• Loss of public confidence • Exploitation of the public

PREACH

- **P (Purpose)** - Why is the company asking to use your data?
- **R (Right to Request)** - Do you have the ability to request changes to your information?
- **E (Easy to understand)** - Is it easy to understand a company's policies?
- **A (Alerting)** - Will you be alerted if the company mishandles your data?
- **C (Consent)** - Have you given consent (i.e., permission) for your information to be used?
- **H (How)** - How is the company or service planning to use your data?

Let's practice!

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Security

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Why are we talking about Security?

- Security is a precursor to Privacy.
- Security and Privacy programs are like an ice cream sundae:
  - Security = ice cream
  - Privacy = toppings

What is Information Security?

> ***Information Security (InfoSec)*** - "The protection of information and information systems from unauthorized access, use, disclosure, disruption, modification, or destruction in order to provide confidentiality, integrity, and availability."

[1] https://www.nist.gov/blogs/cybersecurity-insights/next-generation-security-and-privacy-controls-protecting-nations

CIA Triad

- Popular security model
- *CIA Triad* helps companies identify and understand security controls
- **Note:** Many security models exist
  - Example - *DIE*
    - Distributed
    - Immutable
    - Ephemeral

CIA Triad breakdown

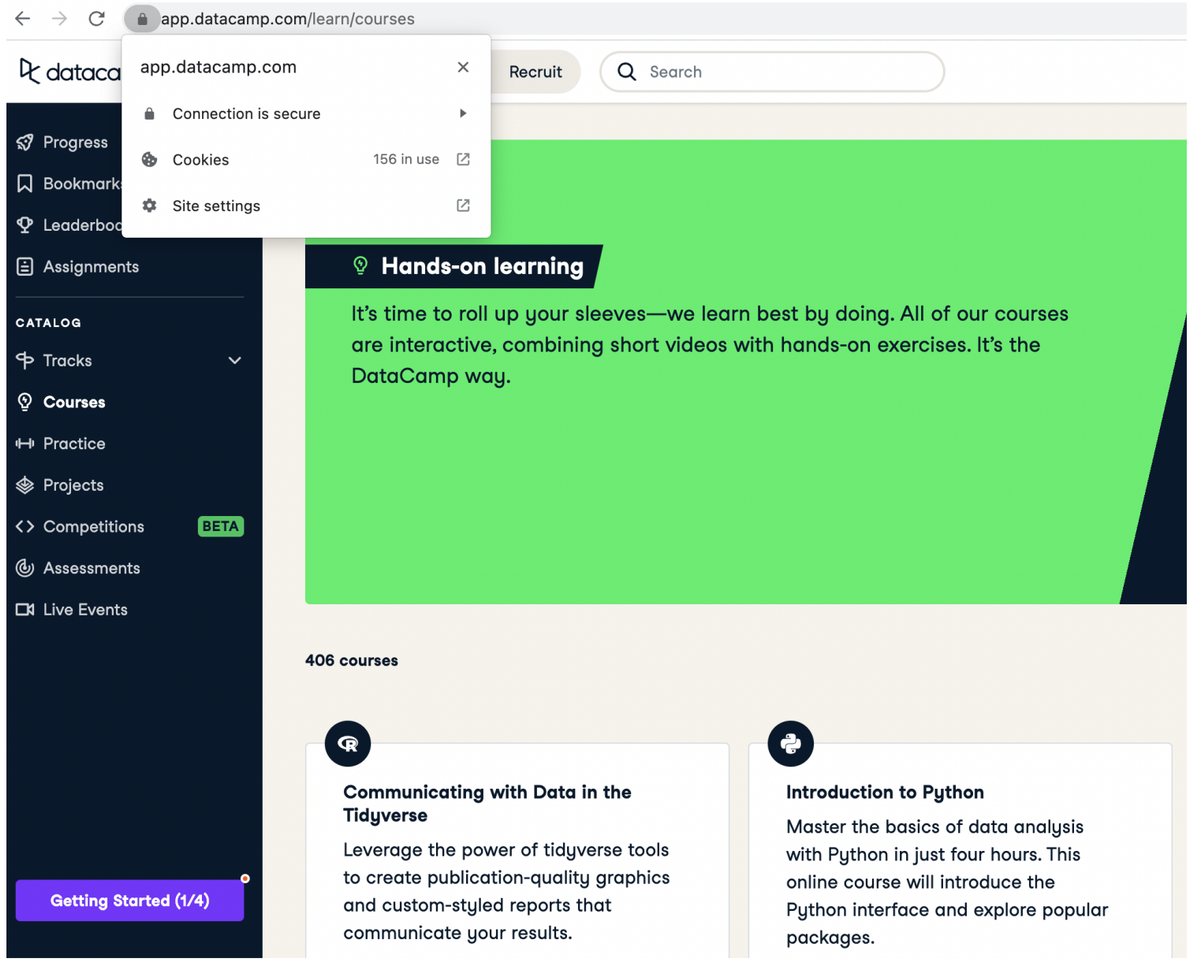
- CIA Triad represents:
  - **Confidentiality** - data is protected and not accessed by unauthorized parties.
  - **Integrity** - data is not altered or modified unexpectedly.
  - **Availability** - data systems are running as expected.

Confidentiality - Identity Access Management (IAM)

- **Confidentiality** system's ability to ensure that only correct users have access to information.
- **Identity Access Management (IAM)**
  - Ensures right people have access to the right resources at the right time.
- Real World Example - Limiting employee access to resources:
  - Company email address
  - Access to corporate network
  - Access during working hours - 8AM to 5PM

Integrity - encryption and hashing

- **Integrity** - data can be trusted and has not been inappropriately modified
  - **Encryption** - is a process that makes readable data undecipherable.
    - "midnight" -> "Y!lay.ig"
  - **Hashing**- converting data to a standardized algorithmic output
- Real World: HTTPS communications



Availability - Business Continuity and Disaster Recovery

- **Availability** systems are accessible and available.
- **Business Continuity and Disaster Recovery (BCDR)** the processes, policies, and people used to help an organization continue during an unplanned event.
- Example - Flood damages data center

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The relationship between Security and Privacy

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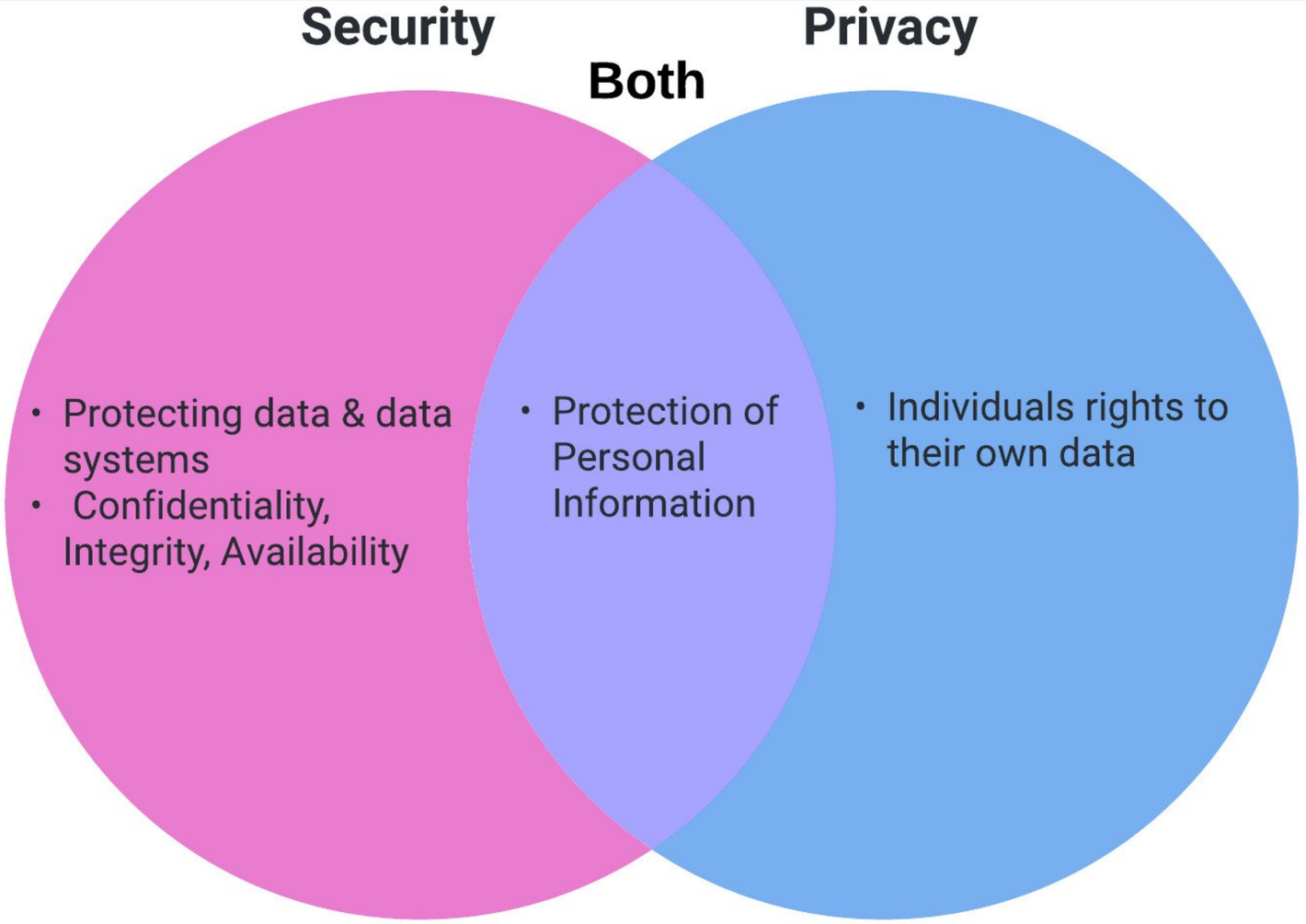
Security fundamentals

- Preventing unauthorized use, disclosure, and alteration of data:
  - CIA Triad
- Examples:
  - Encryption
  - Identity Access Management

Privacy fundamentals

- Data processed in a valid manner that has been authorized by the user
- Examples:
  - Notifications
  - Encryption

Security and Privacy Venn diagram



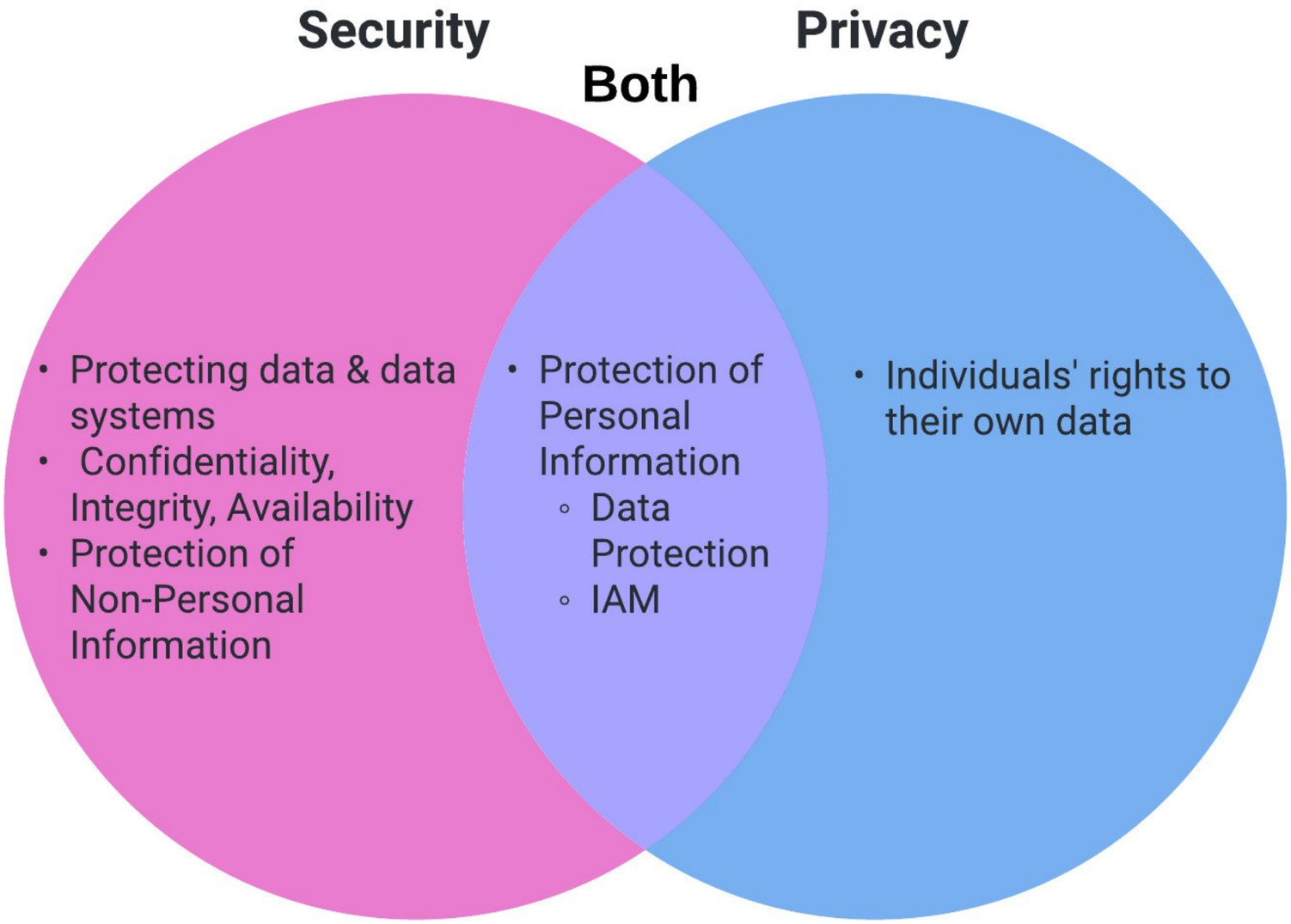
Packing what we've learned

- Backpack startup
- Security and Privacy concerns
- Analyze:
  - Product data
  - Personal information

Security Controls

Privacy Controls

Security and Privacy Venn diagram



Security and Privacy failure

- Privacy requires explicit authorization from users to:
  - disclose
  - alter
  - change how data is used
- Stolen data - no consent or authorization from users

Data breach

> **Data Breach** - a security event where data is unlawfully disclosed, altered, or taken by an unauthorized party.

- Example: Yahoo data breach in 2013
  - Affected over 3 billion users
  - Hackers attempted to sell the data

[1] https://www.nytimes.com/2017/10/03/technology/yahoo-hack-3-billion-users.html

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