



Lecture 6-1

Privacy and the Government

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Participation Quiz (a student question from a past offering of 430)

Do you think there should be more women in Computer Science?

- a) Meh, I don't really care
- b) No, I think things are right the way they are
- c) Yes, but I don't think much can be done about it
- d) Yes, and I think we should do something about it
- e) Increasing diversity in dimensions other than gender should be a bigger focus

Data Mining

- Data mining
 - Searching for patterns or relationships in one or more databases
 - This info typically provided by the customer for another purpose
- Many internet services are essentially provided as an opportunity to gather valuable data
 - Google; Facebook; free online courses
- Also performed by the government
 - Efforts to detect terrorism via phone, bank, travel records
 - Tax audits
- *Questions:*
 - *Ownership: do you have any rights over information arising from transactions in which you participated?*
 - *Ethics: what data mining activities are unethical? Which are ethical?*
 - *Does it make a difference whether DM is opt-in or opt-out?*
 - *At what point does DM become “creepy”?*
 - *Should we worry about ending up in a “personalization bubble”?*

Solove's Taxonomy of Privacy

Privacy can become an issue in four different ways:

- **Information collection:** gathering personal information
 - “How much information do I have to give to rent a car?”
- **Information processing:** storing, manipulating, and using information that has been collected
 - “Should Google use the content of my emails to target ads?”
- **Information dissemination:** spreading personal info
 - “Is it wrong to forward an email that was sent to me?”
- **Invasion:** intruding upon a person's daily life
 - “Is it a good idea to email professors you might be interested in working with in grad school? How many: 2, 10, 100, 1000?”

Encryption

- Method for concealing the content of a message
- Symmetric encryption:
 - Single key used to encrypt and decrypt a message
 - Problem: How does sender get key to receiver?
- Public-Key encryption (e.g., RSA):
 - Each person has two keys: public and private
 - To send **R** a message, encrypt it with **R**'s public key
 - **R** decrypts message with **R**'s private key
 - No need to communicate private keys
- SSL (<https://...>) is based on public-key encryption:
 - Upon connection, server reports its public key and a trusted certificate authority that can verify it. The client may verify the key.
 - The client encrypts a random number with the server's public key and sends the result to the server.
 - The server decrypts it with its private key.
 - From the random number, both parties generate key material for encryption and decryption.

Strong Encryption

- Strong encryption: encryption at a level that is believed not to be breakable by any other than sender/receiver
 - e.g., 256-bit AES
 - mathematical reasons to believe governments can't break it either
- Availability of strong encryption
 - Previously classified as a munition by US, regulated
 - 1991: US Senate passed a law requiring all encryption systems to include a “back door”
 - In response, Phil Zimmerman created PGP
 - Government tried to shut it down
 - 1999, 2000: courts ruled that these restrictions are illegal, encryption protects privacy and free speech
- *Questions*
 - *Should there be laws against use/distribution of strong encryption?*
 - *How should governments respond to its existence?*

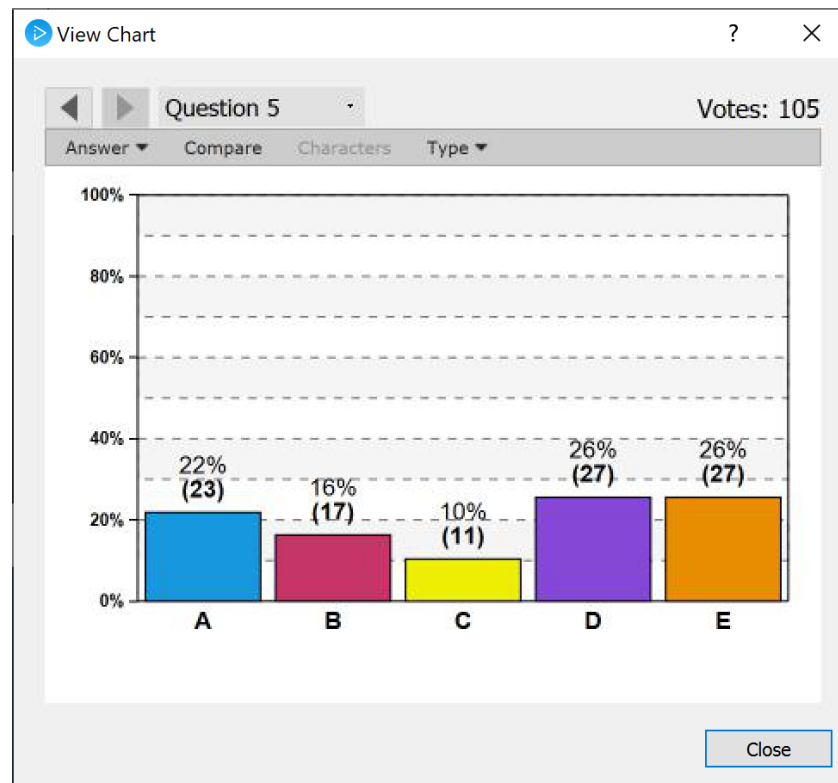
FBI–Apple encryption dispute (2015-2016)

Follows https://en.wikipedia.org/wiki/FBI%E2%80%93Apple_encryption_dispute

- In 2015 and 2016, Apple Inc. received and objected to or challenged at least 11 orders issued by United States district courts seeking to compel it "to use its existing capabilities to extract data like contacts, photos and calls from locked iPhones running on operating systems iOS 7 and older" in order to assist in criminal investigations and prosecutions.
 - Newer phones use strong encryption, which Apple can't break
 - The government has sought to compel Apple to write new software that would let the government bypass these devices' security and unlock the phones
- Best known case:
 - Feb 2016: FBI wanted Apple to create and electronically sign new software that would enable the FBI to unlock a work-issued iPhone 5C it recovered from one of Dec 2015 San Bernardino terrorists (killed 14 people, injured 22)
 - The phone was locked with a four-digit password and was set to eliminate all its data after ten failed password attempts
 - Apple declined to create the software
 - A day before the hearing was supposed to happen, the government obtained a zero-day exploit and unlocked the iPhone itself
 - The Los Angeles Times later reported "the FBI eventually found that Farook's phone had information only about work and revealed nothing about the plot"

Privacy and the Government

“It should be illegal to sell a mobile phone that cannot be decrypted by the police if so ordered by a court.”



Snowden and the NSA Scandal

In the fall of 2013, it has emerged that the NSA has been engaged in a very wide range of wiretapping activities.

[https://en.wikipedia.org/wiki/Global_surveillance_disclosures_\(2013%E2%80%93present\)](https://en.wikipedia.org/wiki/Global_surveillance_disclosures_(2013%E2%80%93present))

Most notably: PRISM; XKeyscore

What do you think about wiretapping more broadly?

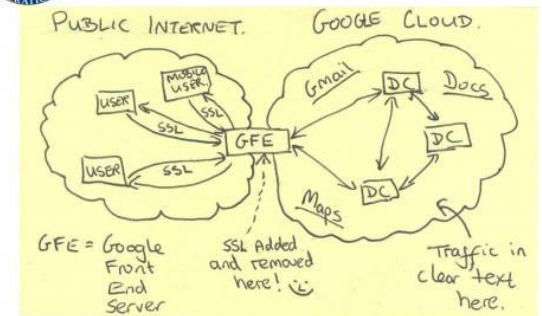
Do you think Snowden behaved unethically?



TOP SECRET//SI//NOFORN



Current Efforts - Google



TOP SECRET//SI//NOFORN