Ap CSP Summer Assignment

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1 Digital Explosion

1.1 Vocabulary

1. Word: bit

Definition: (n) **bit** (a unit of measurement of information (from binary + digit); the amount of information in a system having two equiprobable states) "there are 8 bits in a byte"

Ref: WordNet Search - 3.1. http://wordnetweb.princeton.edu/perl/webwn?s=bit&sub=Search+WordNet&o2=&o0=1&o8=1&o1=1&o7=&o5=&o9=&o6=&o3=&o4=&h=. Accessed 18 July 2021.

2. Word: koan

   Definition: (n) **koan** (a paradoxical anecdote or a riddle that has no solution; used in Zen Buddhism to show the inadequacy of logical reasoning)

   Ref: WordNet Search - 3.1. http://wordnetweb.princeton.edu/perl/webwn?s=koan&sub=Search+WordNet&o2=&o0=1&o8=1&o1=1&o7=&o5=&o9=&o6=&o3=&o4=&h=. Accessed 18 July 2021.

3. Word: ping

   Definition: (v) **ping** (send a message from one computer to another to check whether it is reachable and active) "ping your machine in the office"

   Ref: WordNet Search - 3.1. http://wordnetweb.princeton.edu/perl/webwn?s=Ping&sub=Search+WordNet&o2=&o0=1&o8=1&o1=1&o7=&o5=&o9=&o6=&o3=&o4=&h=. Accessed 23 July 2021.

4. Word: benign

   Definition: (adj) **benign** (not dangerous to health; not recurrent or progressive (especially of a tumor))

   Ref: WordNet Search - 3.1. http://wordnetweb.princeton.edu/perl/webwn?s=benign&sub=Search+WordNet&o2=&o0=1&o8=1&o1=1&o7=&o5=&o9=&o6=&o3=&o4=&h=0000000. Accessed 23 July 2021.

5. Word: utopian

   Definition: (n) **utopian** (an idealistic (but usually impractical) social reformer) "a Utopian believes in the ultimate perfectibility of man"

   Ref: WordNet Search - 3.1. http://wordnetweb.princeton.edu/perl/webwn?s=utopian&sub=Search+WordNet&o2=&o0=1&o8=1&o1=1&o7=&o5=&o9=&o6=&o3=&o4=&h=0000000. Accessed 23 July 2021.

6. Word: err

   Definition: (v) **err**, mistake, slip (to make a mistake or be incorrect)

   Ref: WordNet Search - 3.1. http://wordnetweb.princeton.edu/perl/webwn?s=err&sub=Search+WordNet&o2=&o0=1&o8=1&o1=1&o7=&o5=&o9=&o6=&o3=&o4=&h=0000000. Accessed 23 July 2021.

7. Word: paradoxically

   Definition: (adv) **paradoxically** (in a paradoxical manner) "paradoxically, ice ages seem to occur when the sun gets hotter"

   (adj) **paradoxical**, self-contradictory (seemingly contradictory but nonetheless possibly true) "it is paradoxical that standing is more tiring than walking"

   Ref: WordNet Search - 3.1. http://wordnetweb.princeton.edu/perl/webwn?s=paradoxically&sub=Search+WordNet&o2=&o0=1&o8=1&o1=1&o7=&o5=&o9=&o6=&o3=&o4=&h=0000000. Accessed 23 July 2021.

8. Word: expunge

   Definition: (v) **expunge** (remove by erasing or crossing out or as if by drawing a line)

   Ref: WordNet Search - 3.1. http://wordnetweb.princeton.edu/perl/webwn?s=expunge&sub=Search+WordNet&o2=&o0=1&o8=1&o1=1&o7=&o5=&o9=&o6=&o3=&o4=&h=0000000. Accessed 23 July 2021.

9. Word: database

   Definition: (n) **database** (an organized body of related information)

   Ref: WordNet Search - 3.1. http://wordnetweb.princeton.edu/perl/webwn?s=database&sub=Search+WordNet&o2=&o0=1&o8=1&o1=1&o7=&o5=&o9=&o6=&o3=&o4=&h=0000000. Accessed 23 July 2021.

10. Word: blacklist

    Definition: (v) **blacklist** (put on a blacklist so as to banish or cause to be boycotted) "many books were blacklisted by the Nazis"

    Ref: WordNet Search - 3.1. http://wordnetweb.princeton.edu/perl/webwn?s=blacklist&sub=Search+WordNet&o2=&o0=1&o8=1&o1=1&o7=&o5=&o9=&o6=

&o3=&o4=&h=0000000. Accessed 23 July 2021.

1.2 Ideas:

1. Companies keep records of cellphone locations (Page 1)
2. “Its all just bits” (Page 5)
3. “In fact, processors have hardly grown faster at all” (Page 8)
4. “By 2011, we may be producing more bits than we can store” (Page 10)

1.3 Journal Entry

1. I support the idea of companies keeping track of cellphone locations, as long as that information is kept private and in the hands of only the government. Cellular locations are incredibly useful for finding missing people, and quickly reacting to emergencies, such as in Tanya’s case.

   However, the key term is *as long as that information is kept private and in the hands of the government.* Private companies shouldn’t be able to get the locations of users. These locations are often sold to advertising firms. Companies like Cuebiq make money by collecting location data from smartphone users who agree to share their locations for weather or maps, then analyse and sell that data to advertisers and marketers. Location data shouldn’t be used to target people, and should be used as a last resort

2. While technically it is all just bits, personally I believe we shouldn’t think of it as such. Thinking of computers in terms of bits is like thinking of writing in terms of atoms on a piece of paper. While all handwritten work is technically just graphite on paper, we interpret it as much more than that. We think of writing in terms of words, phrases, paragraphs, and should think of the computer experience in terms of experiences. Similarly, copyright law is based on text, and so laws pertaining to computers should be based on the end user’s experience, not what delivers that experience

3. Considering the next sentence is talking about “multiple processors on the same chip” I assume this statement is talking about the processor cores themselves. However, data shows that the fastest processors today are about 80 times faster in terms of single core performance with the same efficiency. Still, its true that

processor cores have increased over the years (from single core chips to server chips with over 128 cores in the span of just 20 years).

In my opinion we should focus more on processor efficiency and less on raw processor speed. Processor's these days, even budget ones, are more than fast enough for the majority of use cases. The market for large, high end HEDT processors is extremely small compared to the market share of their lower end counterparts. The future is about switching to arm-based processors in laptops, which should give much more performance at the same wattage.

4. I found this statement the most interesting in this chapter. We've made leaps and bounds in storage technology since then, nowadays you can buy tens of terabytes of storage for quite cheap, compared to the expensive "high end" 80gb drives you could get in 2008, back when this textbook released.

   Similar my opinion on processor speed, instead of focusing on storage size and how much data we can store, we should talk about how we store data. Companies are moving to cloud-based centralized storage, and as of 2020 50% of all corporate data is stored in the cloud, up from 30% just 5 years earlier. As more and more people start using cloud services (e.g. OneDrive, iCloud, Google Drive), we should focus on make data transfer to and from those drives quicker and more secure.

2 Naked in the Sunlight

2.1 Vocabulary

1. Word: pervasive

   Definition: per · va · sive | pər vāsiv | adjective (especially of an unwelcome influence or physical effect) spreading widely throughout an area or a group of people: ageism is pervasive and entrenched in our society.

   Ref: WordNet Search - 3.1. http://wordnetweb.princeton.edu/perl/webwn?s=pervasive&sub=Search+WordNet&o2=&o0=1&o8=1&o1=1&o7=&o5=&o9=&o6=&o3=&o4=&h=. Accessed 18 July 2021.

2. Word: cleric

   Definition: cler · ic | klerik | noun a priest or religious leader, especially a Christian or Muslim one.

Ref: WordNet Search - 3.1. http://wordnetweb.princeton.edu/perl/webwn?s=cleric&sub=Search+WordNet&o2=&o0=1&o8=1&o1=1&o7=&o5=&o9=&o6=&o3=&o4=&h=. Accessed 18 July 2021.

3. Word: disseminate

   Definition: dis · sem · i · nate | də semə nāt | verb [with object] spread (something, especially information) widely: health authorities should foster good practice by disseminating information.

   Ref: WordNet Search - 3.1. http://wordnetweb.princeton.edu/perl/webwn?s=disseminate&sub=Search+WordNet&o2=&o0=1&o8=1&o1=1&o7=&o5=&o9=&o6=&o3=&o4=&h=. Accessed 23 July 2021.

4. Word: encode

   Definition: en · code | in kōd, en kōd | verb [with object] convert into a coded form: using this technique makes it possible to encode and transmit recorded video information.

   Ref: WordNet Search - 3.1. http://wordnetweb.princeton.edu/perl/webwn?s=encode&sub=Search+WordNet&o2=&o0=1&o8=1&o1=1&o7=&o5=&o9=&o6=&o3=&o4=&h=0000000. Accessed 23 July 2021.

5. Word: RFID

   Definition: RFID **(abbreviation)** radio frequency identification, denoting technologies that use radio waves to identify people or objects carrying encoded microchips.

   Ref: WordNet Search - 3.1. http://wordnetweb.princeton.edu/perl/webwn?s=RFID&sub=Search+WordNet&o2=&o0=1&o8=1&o1=1&o7=&o5=&o9=&o6=&o3=&o4=&h=0000000. Accessed 23 July 2021.

6. Word: exonerate

   Definition: ex · on · er · ate | i zänə rāt | verb [with object] 1 (especially of an official body) absolve (someone) from blame for a fault or wrongdoing, especially after due consideration of the case: they should exonerate these men from this crime

   Ref: WordNet Search - 3.1. http://wordnetweb.princeton.edu/perl/webwn?s=exonerate&sub=Search+WordNet&o2=&o0=1&o8=1&o1=1&o7=&o5=&o9=&o6=&o3=&o4=&h=0000000. Accessed 23 July 2021.

7. Word: discourse

   Definition: noun | dis kôrs | written or spoken communication or debate: an imagined discourse between two people traveling in France.

   Ref: WordNet Search - 3.1. http://wordnetweb.princeton.edu/perl/webwn?s=discourse&sub=Search+WordNet&o2=&o0=1&o8=1&o1=1&o7=&o5=&o9=&o6=&o3=&o4=&h=0000000. Accessed 23 July 2021.

8. Word: profilerate

   Definition: (v) **profilerate** increase rapidly in numbers; multiply.

   Ref: WordNet Search - 3.1. http://wordnetweb.princeton.edu/perl/webwn?s=profilerate&sub=Search+WordNet&o2=&o0=1&o8=1&o1=1&o7=&o5=&o9=&o6=&o3=&o4=&h=0000000. Accessed 23 July 2021.

9. Word: prodigious

   Definition: pro · di · gious | prə dijəs | adjective, remarkably or impressively great in extent, size, or degree: the stove consumed a prodigious amount of fuel.

   Ref: WordNet Search - 3.1. http://wordnetweb.princeton.edu/perl/webwn?s=prodigious&sub=Search+WordNet&o2=&o0=1&o8=1&o1=1&o7=&o5=&o9=&o6=&o3=&o4=&h=0000000. Accessed 23 July 2021.

10. Word: clairvoyant

    Definition: clair · voy · ant | kler voiənt | noun a person who claims to have a supernatural ability to perceive events in the future or beyond normal sensory contact

    Ref: WordNet Search - 3.1. http://wordnetweb.princeton.edu/perl/webwn?s=clairvoyant&sub=Search+WordNet&o2=&o0=1&o8=1&o1=1&o7=&o5=&o9=&o6=&o3=&o4=&h=0000000. Accessed 23 July 2021.

2.2 Ideas:

1. The notion of privacy has become fuzzier at the same time as the secrecy-enhancing technology of encryption has become widespread (Page 21)

2. His car had a black box-an EDR, that captured every detail about what was going

on before the crash (page 27)

3. Bits mediate our daily lives. It is almost as hard to avoid leaving digital footprints as it is to avoid touching the ground when we walk

4. "There is no patient confidentiality" said Dr. Joseph Heyman. "It's gone"

2.3 Journal Entry

1. I agree with the notion that privacy has become fuzzier over time. As encryption and security technologies are becoming more widespread, it seems people are caring less and less about their privacy when really they should be caring more. Companies give us a false sense of privacy, when really they are breaching it more than ever.

   The greatest example of this is google. When you open up www.google.com, you can see multiple mentions of privacy. In reality, google is notorious for using user information to target ads and search results. They have multiple analytics and adsense services that companies can purchase.

2. I agree with the idea of having tracking devices in cars. If most people are given the choice between getting an expensive ticket and facing criminal charges or lying, most people will choose to lie. Devices like the EDR ensure we can make a conclusion based on actual data rather than from the victims point of view.

   However, similar to the issue with cellphone locations the key term is *as long as that information is kept private and in the hands of the government.* Private companies shouldn't be able to get the locations of users and use it when it isn't needed. Examples of this can be determining how to price billboard advertising, requiring cars to be serviced ever x miles. There can be certain exceptions (e.g. An insurance company trying to determine who is at fault), but for the most part this information should be for the government, and even then only for when the government absolutely requires it

3. Its true that now its extremely difficult to do anything without leaving digital traces everywhere. I personally think this issue is linked to idea #1, people value convenience over privacy. Companies create a false sense of privacy, and justify all the analytics with improved convenience.

   Most people don't want to put effort into maintaining their privacy, or resist changes to their workflow and life .

4.

3 Ghosts in the Machine

3.1 Vocabulary

1. Word: metadata

   Definition: noun Data that describes other data, as in describing the origin, structure, or characteristics of computer files,

   Ref: WordNet Search - 3.1. http://wordnetweb.princeton.edu/perl/webwn?s=metadata&sub=Search+WordNet&o2=&o0=1&o8=1&o1=1&o7=&o5=&o9=&o6=&o3=&o4=&h=. Accessed 18 July 2021.

2. Word: open source software

   Definition: Programs for which the source code is freely available and freely redistributable, with no commercial strings attached.

   Ref: WordNet Search - 3.1. http://wordnetweb.princeton.edu/perl/webwn?s=open-source-software&sub=Search+WordNet&o2=&o0=1&o8=1&o1=1&o7=&o5=&o9=&o6=&o3=&o4=&h=. Accessed 18 July 2021.

3. Word: ascii

   Definition: noun (computer science) a code for information exchange between computers made by different companies; a string of 7 binary

   Ref: WordNet Search - 3.1. http://wordnetweb.princeton.edu/perl/webwn?s=ascii&sub=Search+WordNet&o2=&o0=1&o8=1&o1=1&o7=&o5=&o9=&o6=&o3=&o4=&h=. Accessed 23 July 2021.

4. Word: steganography

   Definition: noun The deliberate concealment of data within other data, as by embedding digitized text in a digitized image.

   Ref: WordNet Search - 3.1. http://wordnetweb.princeton.edu/perl/webwn?s=steganography&sub=Search+WordNet&o2=&o0=1&o8=1&o1=1&o7=&o5=&o9=&o6=&o3=&o4=&h=0000000. Accessed 23 July 2021.

5. Word: blocks

   Definition: noun (Computer Science) a block is a segment of a large area that can be used to assign data

   Ref: WordNet Search - 3.1. http://wordnetweb.princeton.edu/perl/webwn?s=block&sub=Search+WordNet&o2=&o0=1&o8=1&o1=1&o7=&o5=&o9=&o6=&o3=&o4=&h=0000000. Accessed 23 July 2021.

6. Word: algorithm

   Definition: noun A finite set of unambiguous instructions that, given some set of initial conditions, can be performed in a prescribed

   Ref: WordNet Search - 3.1. http://wordnetweb.princeton.edu/perl/webwn?s=algorithm&sub=Search+WordNet&o2=&o0=1&o8=1&o1=1&o7=&o5=&o9=&o6=&o3=&o4=&h=0000000. Accessed 23 July 2021.

7. Word: pixel

   Definition: noun One of the tiny dots that make up the representation of an image in a computer's memory.

   Ref: WordNet Search - 3.1. http://wordnetweb.princeton.edu/perl/webwn?s=pixel&sub=Search+WordNet&o2=&o0=1&o8=1&o1=1&o7=&o5=&o9=&o6=&o3=&o4=&h=0000000. Accessed 23 July 2021.

8. Word: raster

   Definition: (v) noun A bitmap image, consisting of a grid of pixels, stored as a sequence of lines.

   Ref: WordNet Search - 3.1.

http://wordnetweb.princeton.edu/perl/webwn?s=raster&sub=Search+WordNet&o2=&o0=1&o8=1&o1=1&o7=&o5=&o9=&o6=&o3=&o4=&h=0000000. Accessed 23 July 2021.

1. Word: render

   Definition: transitive verb (Computers) To convert (graphics) from a file into visual form, as on a video display.

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http://wordnetweb.princeton.edu/perl/webwn?s=render&sub=Search+WordNet&o2=&o0=1&o8=1&o1=1&o7=&o5=&o9=&o6=&o3=&o4=&h=0000000. Accessed 23 July 2021.

1. Word: spam

   Definition: noun Unsolicited e-mail, often of a commercial nature, sent indiscriminately to multiple mailing lists, individuals, or

   Ref: WordNet Search - 3.1.

http://wordnetweb.princeton.edu/perl/webwn?s=spam&sub=Search+WordNet&o2=&o0=1&o8=1&o1=1&o7=&o5=&o9=&o6=&o3=&o4=&h=0000000. Accessed 23 July 2021.

3.2 Ideas:

1. Metadata can help or refute claims (Page 78)

2. With some clever programming, the process could be made unnoticeable, but so far neither Microsoft nor Apple has made the necessary software investment (Page 102)

3. Free software is a matter of the users freedom to run, copy, distribute, study, change, and improve the software (page 94)

4. If google holds your documents, they are accessible from anywhere the internet reaches

3.3 Journal Entry

1. As the text after that statement mentioned, metadata can be easily altered to match a criminals statement. Although most people won't know about metadata and how to alter it, this makes it ineffective for most purposes.

   Personally, I think we should remove most metadata. It ends up doing more harm than good, especially in the case of images, where metadata can help trace the location where the image was taken. In the case of documents, it provides easily forge-able data that serves no purpose.

2. In my opinion, there isn't a need to zero all abandoned blocks by default. This is for several reasons. Firstly, the majority of people have no intention to sell their

storage. The majority of laptops nowadays have storage soldered down, which would make those drives impossible to resell. Secondly, those who care about their privacy will likely have other methods to zero their storage anyways.

Additionally, making this zero-ing behavior the default will bring performance implications as mentioned in the textbook. It's a slow process writing to all of the abandoned blocks. The author mentions this issue could be solved "with some clever programming," but programming isn't magic, in the end to properly erase these blocks you will have to write to then. A better solution would be to incorporate this behavior into the filesystem itself, prioritizing writing to abandoned blocks before free ones. This system increases drive longevity, reduces the chance of abandoned blocks, and is already incorporated in many filesystems today

3. I support the Free and Open Source movement. Open source software gives power to the users. With the open source model come better security, more features, and more support for users. Compared to commercial (paid) software, users can not only identify and report bugs, but also fix those bugs themselves. Since the source code for open source applications is available, you can clone the repository, change the insecure code, and submit your changes. On the other hand, with commercial software, you will have to wait until the company updates the application.

   Additionally, you can add features to open source software. If Microsoft Word is missing a feature, you can only request Microsoft to add it. However, if there is an open source editor missing a feature, you can simply fork it and add the feature yourself. Likewise, most open source editors will never die, since there is always a community of people working on it, whereas most commercial software is dependant on the future of the company producing it.

   However, there are also drawbacks with open source software. Since there is no financial backing for most projects, maintainers don't have an incentive to keep working. Similarly, since coders aren't paid the quality work may not be as good as that of a commercial project.

4. I support the idea of using cloud-based storage solutions. As of 2020 50% of all corporate data is stored in the cloud, up from 30% just 5 years earlier. As more and more people start using cloud services, we should focus on make data transfer to and from those drives quicker and more secure. Otherwise, cloud storage is superior to offline storage except for solutions which require speed (e.g. boot drives) or high security.

4 Needles in the Haystack

4.1 Vocabulary

1. Word: metadata

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   Definition: transitive verb (Computers) To convert (graphics) from a file into visual form, as on a video display.

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10. Word: spam

Definition: noun Unsolicited e-mail, often of a commercial nature, sent indiscriminately to multiple mailing lists, individuals, or

Ref: WordNet Search - 3.1. http://wordnetweb.princeton.edu/perl/webwn?s=spam&sub=Search+WordNet&o2=&o0=1&o8=1&o1=1&o7=&o5=&o9=&o6=&o3=&o4=&h=0000000. Accessed 23 July 2021.

4.2 Ideas:

1.
2.
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4.

4.3 Journal Entry

1.
2.
3.
4.