This file contains the discussion post topics and my responses.

L01: Discussion - Introduce Yourself and Explain What Interests You Most in IT

For this discussion include the following:

* From the online readings listed for this lesson. select the IT discipline that most appeals to you, and do some research on it. Identify the strengths that you feel the discipline brings to the field; also, identify some of the limitations that you see with your chosen discipline. Try to identify potential job titles that people within the discipline might pursue. Incorporate the results of this research in your post.
* Introduce yourself to your classmates and your instructor.
* Indicate your major (or planned major) if known.
* Provide some information about your current technical strengths and weaknesses.
* If you are willing, share some information about yourself -- interests, hobbies, family, location, etc.

Hi, I am Rayan Ghaffar, a junior at Penn State majoring in computer science. Some of my hobbies are soccer, investing, and hanging out with friends. I also have a passion for programming and problem solving which led me to choose computer science as my degree. The discipline I chose is Software Engineering. This is a broad subject of developing code, brainstorming solutions, testing procedures, etc. I have always been drawn to it because of my interests and skills as this is what I want to do as a full time job. After reading this article, I learned an immense amount about how data is at the focal point of everything in the modern day, and how software engineering is powering the world and driving the future of technology in practically every field. I have seen this myself in my previous internships as a software engineer and it really amazes me how cohesive technology is around the world. I also learned first hand that software engineering is a complex field that poses many barriers due to the knowledge it requires, but it is a prospective job market for those up to the task which I am.

Davoudian, A., & Liu, M. (2021). Big data systems: A software engineering perspective.*ACM Computing Surveys, 53*(5), 1-39. [https://doi.org/10.1145/3408314Links to an external site.](https://doi.org/10.1145/3408314)

L02: Discussion- Binary Statement

Prompt:

1. Binary Code Translations: You'll be given a series of binary code strings. Your task is to translate these binary sequences into their corresponding text characters using an ASCII table. Each binary string corresponds to a character (letter, number, punctuation, or symbol) in the ASCII character set.
2. Instructions:
   * Translate each binary code string provided below into its corresponding ASCII character.
   * Post the translated text characters in the discussion forum.

Binary Code Strings:

1. 01001000 01100101 01101100 01101100 01101111
2. 01010100 01101000 01101001 01110011 00100000 01101001 01110011 00100000 01100001 00100000 01100010 01101001 01101110 01100001 01110010 01111001 00100000 01100011 01101111 01100100 01100101
3. 01001001 00100000 01101100 01101111 01110110 01100101 00100000 01100100 01100001 01110100 01100001 00001010 00001010

1) Hello

2) This is a binary code

3) I love data

This activity helped me immensely fully grasp the concepts of the base 2 system

L03: Discussion Data Analytics

Prompt:

1. Identifying Muddiest Points:
   1. Reflect on the data analytics terms: descriptive, predictive, and prescriptive. Identify any specific concepts or aspects that you find particularly confusing or unclear.
   2. Share your muddiest points with the group, providing a brief description of the confusion.
2. Peer Clarification:
   1. Engage with your peers' muddiest points by offering insights, explanations, or examples that might help clarify the confusion.
   2. If you have a clear understanding of a concept, share your perspective on how you approached that particular concept and what helped you grasp it.
3. Discussion and Reflection:
   1. Engage in a reflective discussion on how the clarifications and analogies have helped to clear up your muddiest points. Have your understandings evolved? Are there still aspects that need further exploration?

I initially struggled on knowing which time/setting applies to each of the terms. It took me a bit to understand that descriptive is the past like describing an action that happened, while predictive is the future like how someone predicts the future. Thinking about the root word and connecting it to my knowledge helped me better understand what each term means.

L04: Discussion – Hardware

Prompt

1. Key Components: Identify and briefly explain the essential components of a computer hardware setup. Mention components such as the CPU, RAM, storage devices, motherboard, and input/output devices.
2. Component Functions: Choose one component from the list and delve deeper into its function. How does it contribute to the overall performance and functionality of a computer system?
3. Hardware Evolution: Reflect on the evolution of computer hardware over the years. How have advancements in technology led to the development of faster processors, larger storage capacities, and more efficient devices?
4. Personal Devices: Discuss the role of computer hardware in personal devices such as smartphones, tablets, and wearables. How do hardware components differ between traditional computers and these portable devices?
5. Gaming and Graphics: Explore the importance of hardware in the gaming and graphics industries. How do high-performance GPUs and dedicated hardware impact gaming experiences and visual content creation?
6. Trends and Innovations: Research current trends and innovations in computer hardware. Are there any emerging technologies or breakthroughs that are shaping the future of hardware development?
7. Environmental Impact: Consider the environmental implications of hardware production, consumption, and disposal. How can sustainable practices be integrated into the design and lifecycle of computer hardware?

1) Key Components: a modern computer has several parts that work together to provide a user with the experience they are familiar with. Parts like the Central Processing Unit (CPU) act as the brains of the computer where calculations, managagement of other parts, and register assignment occur. RAM is a form of short term memory which is low in volume but fast in speed; data will be loaded here temporarily so they can be used quickly by the CPU. Longer term storage drives include Hard Disk Drives and Solid State Drives; these allow for storage that is long term (including when the computer is turned off) and cheaper per byte, however, they are slower and used in tandem with RAM to offload the speed issue. This is where your word documents, photos, and all else in your computer is stored. The motherboard is an interface for all the devices to interact. This allows for the storage drives to connect to the CPU and the RAM dimms to be connected with the storage and CPU, along with the other parts. Essentially, it is the bridge for all the hardware. Input/Output are ways for the user to directly interact with the computer; this can include ports such as USB, audio jack, SD card, and so on. A common output is HDMI and DP allowing for visual playback, basically what allows for your monitor to to display your screen.

2) Gaming and Graphics: Gaming and visual editing softwares are incredibly demanding programs for a computer to run. They require high-end hardware to run the program adn proper cooling systems. While it is necessary to have a CPU, RAM, and power supply that can match your requirements and don't bottleneck your performance, by far the most important piece of hardware is the graphics card. A Graphical Processing Unit (GPU) is essentially a separate processor, like a CPU, that is a standalone item that is specifically designed to perform calculations for visual displays. Because graphics computations are incredibly complex, a dedicated GPU is necessary to offload the work from the CPU. Typically, the higher end the GPU is, the better graphical performance is, This means running games are higher frame rates or better resolutions or running video editing softwares in higher resolutions like 4k. This also requires other parts to match the higher performance like a better CPU, more RAM, and even a better monitor that is capable of showcasing these graphics. The better the parts, the better they appear, and the opposite is true.

L05: Discussion- Operating System

Choose either Option A or Option B to complete this activity:

1. Love Letter Imagine writing a love letter to an operating system or application that you absolutely adore and can't imagine living without. Pour your feelings into words and let your appreciation shine through.
2. Break-up Letter Picture yourself writing a break-up letter to an operating system or application that has caused you frustration, annoyance, or disappointment. Express your feelings honestly while using a touch of humor.

Dear Microsoft Solitaire,

My ever dependable soulmate.

You’ve been my quiet companion for as long as I can remember. Through boring classes and long car rides when I just needed a mental escape. There’s something magical about your simplicity. The familiar green backdrop, the satisfying click of cards snapping into place, and the sweet thrill of victory never gets old.

You’ve taught me patience and focus, and you never asked for fancy graphics or complex storylines—just a deck of cards and the promise of another game. You are always there for me when I need you the most. I cherish all the little things you give me.

Thank you for being my reliable escape whenever I need a break.

Love,

Rayan

L06: Discussion- Programming Languages

I accidentally forgot to do this discussion

L07: Discussion- Data Organization

Prompt:

1. Finding an Example: Search for a real-world example of an Excel macro. This could be a specific task or process that is automated using macros. Find an example that interests you and has practical applications.
2. Explanation and Purpose: Share the example you found with the group. Explain the task or process that the macro automates. What is the purpose of automating this task? How does the macro enhance efficiency or accuracy?
3. Macro Components: If possible, break down the components of the macro. Discuss any coding or scripting involved. What actions or commands does the macro include? How does it interact with Excel's features?
4. Benefits and Challenges: Discuss the benefits of using a macro in this context. How does it save time, reduce errors, or improve the overall workflow? Are there any potential challenges or limitations associated with using macros for this task?
5. Customization and Adaptability: Consider whether the macro can be customized or adapted for different scenarios. Can users modify the macro's behavior to suit their needs, or is it designed for a specific purpose?
6. Learning Resources: Share any resources or tutorials you found that explain how to create similar macros. Are there online guides, videos, or courses that teach users how to implement this type of automation?
7. Security Considerations: Discuss any security considerations related to using macros in Excel. How can users ensure that the macros they download or create are safe and not a security risk?
8. 1) An example I found is for automated invoice generation
9. 2) The macro generates invoiced using a base template. It will take customer data like the name, service, rate, etc. and format it into a professional invoice. The purpose of automating this is to save time as filling this by hand is a cumbersome, labor intensive task. It also increases accuracy as Excel does all the calculations and formatting which elimates the human error aspect such as not carrying over a digit when doing math or sloppy handwriting.
10. 3) The macro uses an excel sheet template with pre-defined files for client information. It uses Visual Basic for Applications (VBA) scripting to father and compute data. This includes iterating through all data, reading and writing data, and calculating numbers. Here is a snippet of the code:  
    A screenshot of a computer

    Description automatically generated
11. This uses variables to store data, the range function, and export commands to send the data to a cell for output. Numbers are outputted and can be by a user or as input for another calculation.
12. 4) Benefits include saving lots of time of repetitive tasks and calculations, especially over the long run, improved accuracy as mentioned before, and a professional look as it is computer generated and not handwritten. A major challange can be learning VBA as not everyone knows how to use it (fortunately there are a lot of great tutorials and documentation online).
13. 5) This macro is highly customizable and adaptable as the user can add and remove fields as needed. If they need to factor is a discount or a tax, they can add a parameter into their calculations. Depending on the invoice needed, the user can change the styles of the template and the input and output fields as needed.
14. 6) I learned about this from this video. It taught how to create it, utilize VBA, and everything else. It was a great in-depth, yet simple to understand guide.[https://www.youtube.com/watch?v=jZmKSLnKAicLinks to an external site.](https://www.youtube.com/watch?v=jZmKSLnKAic)[A black and grey play button

    Description automatically generated](https://www.youtube.com/watch?v=jZmKSLnKAic)
15. 7) To ensure safety, users should only download/copy macros from trusted sources such as Microsoft directly and professional businesses. This way, we can ensure they are made from trusted sources. Microsoft does frequently update Excel to provide security protections so it wise to always update to the latest stable version when possible.

L09: Discussion- The Internet and the Web

Prompt:

Defining the Internet and the Web: Differentiate between the terms "Internet" and "World Wide Web." What is the Internet, and what role does it play in enabling global connectivity? How does the Web relate to the Internet, and what additional layer does it bring to the digital experience?

Include the prompt and two of the following topics in your post:

* Historical Context: Explore the origins and evolution of both the Internet and the Web. What were the driving forces behind their development, and how have they transformed over the years to become integral to our daily lives?
* Underlying Technologies: Delve into the underlying technologies that power the Internet and the Web. Discuss key concepts such as protocols, servers, browsers, and hyperlinks. How do these technologies enable the seamless exchange of data and information?
* Internet vs. Web: Discuss scenarios where the Internet and the Web are used interchangeably, even though they have distinct meanings. How does this interchangeability contribute to misconceptions about their roles?
* Global Impact: Examine the global impact of the Internet and the Web on various aspects of society, including communication, commerce, education, and social interactions. How have these technologies revolutionized the way we access information and engage with the world?
* Emerging Trends: Research and share emerging trends related to the Internet and the Web. Are there technological advancements, such as the Internet of Things (IoT) or the evolution of Web standards, that are shaping the future of digital connectivity?
* Challenges and Ethical Considerations: Consider the challenges and ethical considerations associated with the Internet and the Web. How do issues like privacy, security, and the digital divide come into play? How can we address these challenges to ensure a safe and inclusive online environment?

While the terms "Internet" and "World Wide Web" are often used interchangeably,  they refer to different ideas. The Internet is a vast network infrastructure that allows devices across the globe to communicate. It uses protocals such as TCP and IP to deliver data.  The Web is a service that operates on top of the Internet. It provides an additional layer to this network by enabling easy access to interlinked information through web pages. It introduced the concept of hyperlinks and web browsers allowing the Internet to evolve and allow for easier usability.

Historical Context

The modern Internet began in the 1960s as ARPANET. This was developed by the U.S. Department of Defense as a packet-switching technology during the Cold War. This created the foundation for modern Internet protocols like TCP and IP in the 1980s, enabling  data exchange across networks.

The Web was created by Tim Berners-Lee in 1989, and it made the Internet accessible to the public through HTML and HTTP. It was originally designed to share information with other scientists, but was later adapted to a webserver in HTML. Webpages allow for a user-friendly, graphical experience.

Internet vs. Web

While the Internet and the Web are distinct, they are often used interchangeably due to their interdependent nature. A common phrase we hear is "searching the Internet" when it should actually be "browsing the Web". This interchangeability comes from most people not knowing the differences and just assuming they are synonyms. This blurs the distinction between the Internet, the infastructure, and the Web, the service.

L11: Discussion - Database Technology and Privacy Issues

Assignment

The major purpose of this assignment is to have you do some academic library research involving the issues of databases and privacy, then do some critical thinking and analysis about these issues, and finally present the results in an organized and professional post (do not submit extemporized personal opinions). (Tip: Don't forget about the resources found at [Writing Assignments: APA Style, and Library Research InformationLinks to an external site.](https://guides.libraries.psu.edu/apaquickguide).)

Cultural analysts have argued that privacy is less important to a generation that grew up with YouTube, Facebook, Twitter, and texting. On the other hand, this same generation has grown up with database technology more ubiquitous and capable than ever before. Think about how many times this week you've been involved (knowingly or not) with database systems. How do you think the tension between privacy and database technology will or should play out as powerful database applications become ever more pervasive in our world?

Don't just post your opinion -- do some research and cite studies, give anecdotal examples, create hypotheticals, etc.  You must include cites. Your post can be insightful and creative, it can be scholarly, or it can be both; it should not be just your personal opinion.

As the collection of data and database technolgies have drastically increased year over year, concerns over the rights and fair play of personal information has come into question. In class we have seen examples of the FBI and various intelligence agencies use CODIS, a foresenic database matching tool, to solve crimes that have been cold for decades. CODIS has helped solve thousands of cases in which authorities did not have the evidence at the time, but do now (Lovell). While this is an instance of civillian's having their be collected for their betterment, there are cases where the data is exploited for other's gain.

During the 2016 U.S. presidential election, Cambridge Analytica utilized Facebook's corrupt data harvesting practices to obtain personal information of around 87 million Americans (Schneble). This information allowed for members of the British consulting firm, a company that has deep monetary and personal connections with the Republican party, to personally target individual users on Facebook with political ads. These ads were critical in boosting the public image of then candidate Donald Trump as they were heavily pro-Trump or anti-Hillary Clinton, his opposition in the election. Cambridge Analytica captured all this data due to creating a Facebook based application relying on 3rd party data control; practically stealing the data from Facebook. Facebook only had this data in the first place because it abused its power over its users and collection data without the client knowing. With 87 million people's worth of political ads, Cambridge was able to successfully alter the perception of the candidates for countless people being a key contributor to how Donald Trump won the presidency. For this abuse and theft of data, Facebook would later be fined $5 Billion from the FTC and Cambridge Analytica would go bankrupt as the storage and use of the data was never made aware to the users.

These cases go to show that our data can fundamentally impact the world and is a powerful tool. In my opinion, data should be a privacy reserved with the individual. While I personally trust the government to have it over a for profit company, it should be up to the person to opt into these programs and use of their data should be made aware of prior to opting in.  
In terms of the importance of data privacy, I feel that are generation does not care as much as we should. Big companies using our data and us clicking "accept" on the terms and agreement page of any app has become so common, most of us blindly accept without even knowing what we are getting ourselved into. It is definitely something that we should work on.

* Lovell, R. E., Singer, M., Flannery, D. J., & McGuire, M. J. (2021). The case for “investigate all”: Assessing the cost‐effectiveness of investigating no CODIS hit cases in a sexual assault kit initiative.*Journal of Forensic Sciences, 66*(4), 1316-1328. [https://doi.org/10.1111/1556-4029.14686Links to an external site.](https://doi.org/10.1111/1556-4029.14686)
* Schneble, C. O., Elger, B. S., & Shaw, D. (2018). The cambridge analytica affair and Internet‐mediated research.*EMBO Reports, 19*(8), n/a. [https://doi.org/10.15252/embr.201846579Links to an external site.](https://doi.org/10.15252/embr.201846579)

L13: Discussion- Crowdsourcing

Discussion Prompt: [select two]

1. Definition and Basics: Define crowdsourcing and briefly explain how it works. How does crowdsourcing tap into the wisdom of the crowd to achieve outcomes that might be difficult for a single entity to achieve?
2. Benefits and Opportunities: Share examples of how organizations have benefited from crowdsourcing. How can crowdsourcing lead to diverse perspectives, rapid idea generation, and reduced costs?
3. Challenges and Limitations: Discuss potential challenges of crowdsourcing, such as quality control, information overload, and potential conflicts of interest. How can these challenges be mitigated?
4. Types of Crowdsourcing: Explore different types of crowdsourcing, including idea competitions, microtasks, open innovation, and crowdfunding. How do these variations cater to different needs?
5. Real-World Applications: Share instances where crowdsourcing has been employed successfully, such as Wikipedia, citizen science projects, or design challenges. How did crowdsourcing contribute to the success of these initiatives?
6. Ethical Considerations: Discuss ethical aspects of crowdsourcing, including compensation for contributors, protection of intellectual property, and ensuring privacy and data security.
7. Crowdsourcing's Future: Predict how crowdsourcing might evolve in the future. How could emerging technologies like AI and blockchain impact the way crowdsourcing is conducted?

1) Definition and Basics: Crowdsourcing is when various people gather ideas, money, or other resources together to complete a task. This allows for a diverse range of input to achieve outcomes that a single individual might find struggle with. This allows for more accurate information as people in the group can peer review each other.

4) Types of Crowdsourcing: Crowdsourcing has many diferent forms such as think tanks - multiple people work together ot think of solutions and crowdfunding - large amount of people pool money together to raise capital for a product. A great example of crowdsourcing online is through the webstie Kickstarter where nearly anyone can contribute money to an early release/discounted product. One success story on Kickstarter was the Oculus Rift, a VR headset that was recently accquired by Meta.