**CSC435 Study Log – Jessica Bender**

DePaul University Winter Quarter 2021 – Dr. Clark Elliott

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# ****Twenty Concepts:****

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# ****Discussion Forums****

## ****Hello Back Responses****

### ****Replies to my post:****

* No, I still have no idea what the meal was exactly. I know it was a type of gnocchi but not sure what the sauce was. Wish I had taken a photo of the menu so I could stop guessing what it was. I have tried to make it at home so many times by looking up different gnocchi recipes. However, I have not found the right one. Guess I need to go back to Italy to try and find out.
* Hi Linh, I trained all summer. I used to be a gymnast in high school and did yoga in undergrad so I staid fairly active over the years just not any major cardio, so it was not easy! But if you try anything is possible.

I had the gnocchi in Pollenzo Italy at some small pizza place.

Top of Form

* I got into film photography in high school as well and it has been draining my wallet ever since! I just started my first "Adult" job and having adult money is not helping I swear I have no idea where my paycheck goes every month.
* I like iOS programming so far! I have always like Web and App dev more. Seeing everything come to life on a screen is just more appealing to me for some reason. Running everything on the command line just does not do it for me.   
  Also Highly recommend taking the test in your free time! Let me know what you get :)

### Reply to Tsvety Sotonov****:****

* Hi Tsvety, Pleasure to meet you! I think you are also in the iOS class with me this quarter. Pleasure to have you in not one but two classes this quarter. Should be a good one.

### Reply to Haider Khan:

* Pleasure to have you in class. I would love to hear any technical books you suggest reading. I am always looking to continue my learning on the summer and winter breaks.
* Thanks for the suggestions! I’ll be sure to check them out over the summer :)

### Reply to Rachel Jacobsohn:

* Loved reading your background! I too also like the bake this year since we could not see a lot of family for the holidays, I made about 400 and delivered them to my family and friends! I wish I could bake more but I never have an excuse to bake and I cannot eat a who cake myself. Actually, I probably could but I shouldn't.

### Reply to Devin Garrett:

* Hello, pleasure meeting you virtually! I also went to DePaul for my undergrad in CS and am now getting my masters SE. I also absolutely love React. It has to be my favorite thing I have learned ever. I also really enjoy what you had to say about life goals. Mental health is a big thing for me along with building relationships with people. I like how you put time with money I have not really thought of it that way, but I agree with your reasoning. I have always had the mindset that I would not give someone the time of day if they were not worth my time or were hindering my life in any way. I also Love Ariana Grande! cannot wait to get to know you more in this class and maybe future classes!

### Reply to Jessica Wilson:

* Hi Jessica! Im also a Jessica I prefer Jess however lol! Congrats on the upcoming wedding! That is so exciting. Hopefully COVID-19 is cleared up enough for all your friends and family to enjoy the day with you! I have to also say I am an extremely picky eater. My basics are chicken and pasta. My boyfriend is getting tired of eating only chicken and pasta with me though so I told him as a goal for 2021 is I will try one new food of his choosing a month. Glad to meet you!

### Reply to Zeying Yu:

* Congrats on this being your last quarter!

### Reply to Kyle Mastrangeli:

* Hi Kyle! Correct me if I am wrong but your name looks very familiar were you in SE350 in Spring 2020? That class was fun...   
  Anyways, it is a pleasure meeting you virtually, I also enjoy running. I just got really into it this summer, running my first ever 5 and 10k along with completing a challenge to run 200 miles in 3 months! Running has been a good way for me to stay active. If your sprint career does not pan out, you should get into long distance running I know people (my parents being one of them) who run marathons for years and years.

## General Postings / Course Discussion

### Posts:

* Hello,

I was looking for a schedule/ list of when we should have all readings done by and what those readings are. I see there is associated quizzes for reading chapters. However, I see that chapters 1-3 quiz is due on January 27th but according to the check in posted in the news we should have them read already. Thus, I am confused when you suggest having the rest of the readings done in order to stay on track with the class?

I looked in the syllabus for this and it states that exact list of readings is available on the course website, however I am struggling to find that. Can anyone point me in the correct direction?

Also, what readings do you recommend reading in the Recommended background text, Computer Networking: A Top-Down Approach?

Thanks in advance for the help!

* I was looking at the extra credit opportunities and found the research study participant interesting. I was trying to request an account here <https://depaulurparticipant.sona-systems.com/student_new_user.aspx> but I do not see our class listed as an option? Thanks in advance for the help!
* Hello, I saw for week 1 lecture check it was due on Sunday (yesterday) however looking ahead, I do not see any due dates on the other lecture checks. Should I assume they are always due on Sundays?

Thanks! Just want to make sure I do not miss a date by accident.

### Reply to Extra Credit Opportunities, can someone advise?

* <https://condor.depaul.edu/~elliott/435/hw/>

Here is the exact link :) If you are interested in the [Research subject participant](http://www.cdm.depaul.edu/academics/research/Pages/Instructions-for-Participants.aspx). They are doing a study this weekend on News on Social Media. I just did the study today and it was very interesting! And the girl who conducted it was very nice.

## JokeServer (and Inet)

### Posts:

* Hi this is not specific to the JokeServer or Inet but does anyone use VScode? For some reason every time I save a file it deletes random things in my code see screenshot from Inet code. Does anyone know why? or how I can fix this? Thanks in advance
  + Also, not sure why my things are in so many colors. I.e., why is class all purple but the last letter?
  + I’m using another editor for now but I prefer VScode its just acting funky today will see if I can fix it :Top of Form)
  + I think this was the issue! It looks like one of the extensions I installed to run java was installed incorrectly so when I uninstalled it and reinstalled vscode seems to be working fine now! Thank you.Bottom of Form

### Reply to Anyone Using Eclipse IDE:

* In case anyone is looking for any other IDE to use other than eclipse(I personally do not prefer it). I recommend IntelliJ for java as a student you can get a free education license <https://www.jetbrains.com/shop/eform/students> I also really like VScode it puts the code into very pretty colors. :)

Going to also put this here if anyone is looking for a source control github is a go to. Here is a link to get GitHub pro for free as a student <https://education.github.com/discount_requests/student_application> + if you get the GitHub student developer pack there are a lot of other developer perks! <https://education.github.com/pack>. These are the free perks I found as a student developer.

* I second gitbash. Not only does it allow you to get use to Linux commands, but it makes pushing/ pulling from git a lot easier in my opinion. It displays what branch in git you are in blue parentheses. I find this very helpful as I am pushing things up to my git throughout the day or week, I tend to forget what my branch I'm currently using is called.   
  Here is the link to download it if anyone need it! :) <https://git-scm.com/downloads>

### Reply to Turn it in:

* A little late to the topic as the assignment is past due. But, for future assignments adding extensive comments will also help bring down your score. I wrote comments on what each line of code stating what the code is doing/why I am using it. Not only does it help you learn the code better, but it will also bring your score down significantly.   
  But like everyone else said even one line of code can be flagged, so just make sure everything is your own, but comments should help bring it down if you are worried about the high numbers.

### Reply to Favorite Joke?:

* I am awful with jokes, so I was looking up jokes to use for this assignment and I came across:

I invented a new word! Plagiarism!

and it made me giggle.

## Network Labs

### Post: One Page Write-up Question

* I am a little confused on what details to include in the one pager and what not to. Am I supposed to strictly write what I did, or should I also write about what I found i.e. observations I noticed, as for those answers are different then then my answers for the labs questions? If I were to include these observations in the write up it would be a lot longer than one page. Should I be saving the observations to be put in my study log and keep what this one pager to what I did and keep the length to one page?

### Post: Something Interesting I noticed

* I noticed when filtering by UDP that it also displayed a protocol called MDNS or Multicast Domain Name System. I found this interesting because it listed all the Google homes, Google home minis, Google chrome casts and the Google nest we have in our home. But we also have some Amazon Echo’s, Dots and Amazon fire sticks that were not picked up. Only google products were. I tried to google why this was the case. It was hard to find a solid answer. The only thing I found was that amazon products have a secret key that doesn’t allow them to be captured.

This filter also showed a DHCP or Dynamic Host Configuration Protocol for discover, where I work. I thought it was cool to see on there because I am doing this assignment on my personal computer not work computer. But it is still able to capture that because both computers are on the same network.

### Reply: DNS Lab keeps returning timed-out request:

* I am also having this issue I have tried editing the firewall and using windows and Linux (though gitbash) and no luck.

### Reply to- Deliverables:

* From what I understand, Just the one page writes up attached to the bottom of our checklist.

### Reply to - Network IntroLab Cannot find HTTP packets:

* I am also using wireless.

(Photo)

these are the options I have. I was able to get Microsoft: WIFI to show the information needed for the intro and the first lab so far.   
I was also very confused because the screenshots on the examples are older than the Wireshark I downloaded. Hope this gives some direction.

### Reply to - The Importance of Checksum:

* Thanks for the information! This was new information to me and I found it interesting how some checksums were verified and some were unverified. In my case almost all my pockets came back unverified. I did some investigation on why they might be unverified. I saw something that was posted on Wireshark that explained it would be unverified because th3e dissector never even tried to verify it.

It also gave definition for what Bad, Good and Not present status meant. I found it very insightful.

<https://www.wireshark.org/lists/wireshark-dev/201607/msg00022.html>

## MyWebserver & MiniWebserver

## Blockchain

## Fun Random Thoughts

### Posts:

* Wanted to share this in case anyone else was interest. I found this bed desk on amazon and I think it was my favorite purchase from the pandemic! It makes late night homework so much better. It is useful for doing homework on the couch in your bed and even on the floor. I am always looking for different spots in my home to do work and school this has made it so easy. Easily holds a laptop and notebook and has a stand your textbook.

Highly recommend.

<https://www.amazon.com/gp/product/B07JZCND72/ref=ppx_yo_dt_b_asin_title_o04_s02?ie=UTF8&psc=1>

### Reply to Study Break:

* I am a little late to the reply but I am going to have to try this recipe for my mom. She just started a no dairy and no grains diet! I'll have to surprise her and make it one weekend.

## Chapter One

### Posts:

* I just wanted to jump on here and share my thoughts on chapter one in our Distributed Systems textbook. In chapter one the design goals section really spoke to me. It gave me a more in-depth reason for why I am taking this class other than it was required on my degree progress report. The specific goal that stood out to me the most was scalability. I am only 23 so I have not witnessed the invention of the internet and the first home computers, but I have seen phones go from flip phone to miniature computers that can fit in our pockets. Growing up my father was an electrical engineer for Motorola, working on the cell phone to be exact. It was always interesting to me to see the newest phone being brought home to be tested. We had small smart phone we had large smart phones, we had smartphones that were touch screen only and we had some that had a slide out keyboard. I think there was some type of new phone every 4-6 months in our home. It is crazy to look back on and see how everything use to be stored and now everything is on a small device and in the cloud. Seeing technology change as a kid made this section very intriguing to me. I saw phone go from big to small back to big with the iPhone 6 plus and now small again with the iPhone 12 mini. This section reminded me how that memory relates to my current field and this class. With technology being so vast it is often easy to forget there was still limitations that can lead to flaws in our code.
  + I wish we could remove our phones batteries. My phone is always dead. Off topic but I also am not a fan the design choice of having only the charging port. I miss my headphone port. Because my Bluetooth headphone are also always dead. Too many things to remember to charge at night.

But I think if there was a way to connect your phone to a charger and the keyboard, mouse and monitor then it wouldn't be too bad battery wise. But there is also the fact that most phone go bad after a year or two while computers have a much longer lifespan.

### Reply to DS Administration:

* I think the biggest nightmare would be losing all your data. The purpose of this class is to learn how to organize our data so it does not get lost but losing it will always be a big fear of mine no matter what. I have had too many times where I have lost documents due to a whole flash drive crashing. I do not want to lose data in anyway weather it’s in code or on a flash drive. It is a nightmare!

## Chapter Two

## Chapter Three

## Chapter Four

## Chapter Six

## CDK Chapter 7 Security

## CDK 2 / Hadoop / NAT / Bluetooth / Etc.

# ****Readings:****

## ****Distributed Systems****

### ****Chapter One: Introduction****

**Text Here…**

### ****Chapter Two: Architectures****

**Text Here…**

### ****Chapter Three: Processes****

**Text Here…**

## ****Computer Networking:****

### ****Chapter One: Computer Networks and the Internet****

**Text Here…**

### ****Chapter Two: Application Layer****

**Text Here…**

### ****Chapter Three: Transport Layer****

**Text Here…**

### ****Chapter Four: The Network Layer****

**Text Here…**

### ****Chapter Eight: Security in Computer Networks****

**Text Here…**

# ****Network Labs:****

## Wireshark Intro Lab & Setup

I ran into a little difficulty with the intro lab. The example shown in the pdf in figure 4 was not what I was seeing on my screen. I have about 11 different capture interfaces that were available on my Wireshark. Whereas the example only had two capture interfaces. The example also said to select Gigabit Network Connection, and I did not have that option on my Wireshark. Thus, it took me a little bit to figure out what one I needed to use for the intro lab and to follow the examples. I eventually found out it was Microsoft: Wi-fi that I wanted to use. I figured this out because it was the only one out of my eleven choices that outputted the intro-wireshark-file1.html.

Another issue I ran into while doing the intro lab was again in figure 4. In figure 4 it showed a start button right next to the options. Mine did not have any start buttons at all. I was just randomly clicking and saw that I could just double click on the selection I wanted, and it ran.

After my first attempt at the intro lab, I knew I was still a little confused what I was trying to accomplish with Wireshark. So, I decided to go back and run it and reread the document to ensure I fully understood the lab.

## IP Lab

For this lab I downloaded ping plotter to capture my pockets. I then recorded the pockets with Wireshark. I captured pockets from [www.pingplotter.com](http://www.pingplotter.com) on ping plotter. I captured 3 different packet sizes at 56, 2000, and 3500. I then analyzed all the information on Wireshark and ran though the questions in the lab. Showed me how ICMP Request has all different identifications and Time to Live, whereas the ICMP Time to Live all have the same identifications and Time to Live for the same sources. I found this interesting because I would have thought identifications should be different for all but it’s not the case for ICMP Time to Live.

In the question on the lab, they also asked us to investigate the fragment offsets for the 3 different pocket sizes. For my offset I noticed that for 56 the offset was 0 but for 2000 and 3500 the offset was the pocket size -20. For the replies however, there was a new section for the 2000 and 3500 with the IPv4 fragments. Each fragment is divided up by 1480 bytes and then the remainder.

## DNS Lab

For this lab I ran nslookup in my windows command prompt. I ran the code suggested in the lab as nslookup [www.mit.edu](http://www.mit.edu) I also ran nslookup [www.studentaid.gov](http://www.studentaid.gov). In the example they showed the command had a server name. However, when I ran both commands my server name came up as unknow. Same thing happened when I ran the second command. However, when I ran the third command it gave me a server name, but the DNS timed out. I decided I would continue with the lab and further investigate the issue later.

I investigated trying to get the issue resolved however, I was not able to. I tried to edit my firewall but could not find a workaround. Thus. I continued with the rest of the lab hoping I could still complete it.

I then used Wireshark to capture the DNS from the given website. I found out that my DNS pockets were being sent over UDP. I was able to use ipconfig to compare the results from that to Wireshark.

I noticed while comparing results that the information in the ipconfig was all the same as the data captured in the Wireshark. I also tried this with our course website to see if the data was the same. I saw that it was almost the same. The only difference I noticed with this was the Time to Live was slightly lower in the ipcongig command than it was in the wireshark.

The next part of the lab required to capture pockets with Wireshark and nslookup. At this point I stopped the lab because my nslookup was not working. I am going to see if I can get it to work on my mac or other windows. So, after a few hours of trying, I was not able to get the nslookup to work on any of the 4 computers in my home. Therefore, for this lab I downloaded the zip folder provided and looked at their data for the second half of this lab. I then went through the questions for each nslookup command and compared each data.

For the second part of the lab, I observed that the command nslookup [www.mit.edu](http://www.mit.edu) the first query was PTR type, and the other two queries were Type A. The first ones name also had the source IP address in reverse. The second one had mit.edu.poly.edu in the name. Then, the last one had just mit.edu for the name. I also noticed that the third response had Additional records, Authoritative namesevers, Answers and Queries while the second response only had Authoritative namesevers, Answers and Queries, and the first response only had Answers and Queries.

For the second nslookup command I noticed that the first and second response were like the first nslookup command. With the first response only having queries and answers, and the second one having queries, answers and Authoritative namesevers. But unlike the first command this ones third response had queries and answers and Additional records but does not have Authoritative namesevers. This one also had the first query type as PTR but the other two Types were NS.

For the last command the first and third responses had all 4(Additional records, Authoritative namesevers, Answers and Queries) but the second one only had Queries and Authoritative namesevers. The types for this lookup, like the last two lookups have PTR as the first type and A as the second and third type.

## HTTP Lab

For this lab I captured a http pocket in Wireshark with the given 1-line html document. This one already looked different then the other labs I have done because it only produced 2 http pockets. All the other pockets I captured so had a lot more even with the filters on. I then ran thought the questions on the lab answering everything they asked. Then, I compared those answers with the raw data in the inspect on the html document. I found most the information was the same as the information in Wireshark. However, I did notice there were a few fields that were not in Wireshark. Cache-control, If-Modified since, if none match, and upgrade-insecure-requests were all listed in the raw data but not in the data in Wireshark.

As I was answering the questions, I got to one question that asked me according to the Wireshark when the file was last modified. The answer was very close to the time that I opened the document. As I continued the lab they explained why.

I then ran the second html file and captured the pockets in Wireshark. This time I noticed that it had If-Modified since, if none match, Cache-control, and upgrade-insecure-requests listed in the Wireshark Get. As noted before those were not listed there in the first file. However, It did not give the line based text like the first file and third file did. I also noticed that the Status code and phrase for files one and three were the same but for this second file the status code and phrase were changed.

I ran though and looked at the data for the fourth file as well. I noticed that it was similar to the second file. Lastly, I ran the fifth file twice. I ran it two times because the first time I did not read far enough in the lab to see they gave you a user name and password. Thus, the first one I ran gave back an unauthorized request and the second one gave back the expected result. This was an interesting comparison because unauthorized request I made gave back all HTTP protocols but when I entered the username and password it also returned an OCSP response. OCSP stands for Online Certificate Status Protocol. Within this I can see new data including the tbsResponce data, and signature algorithm to name a few. Whereas in the unauthorized I can only see the Line-based text data with the unauthorized message the site gave me.

For the successful file five I can also see a few new differences that are different from the first four files in the OCSP. I can see a date field. This field shows me the date and time that I entered the site and it also gives an expires date. I can also see the Last modified field like the last files in the HTTP. It has the same time and date as the first four files.

## ****TCP Lab****

For the TCP Lab I downloaded the given alice.txt file and then uploaded it to the gaia website given. After uploading the file, I ran my Wireshark to capture TCP pockets. Then, I hit the upload button on the website to fully upload the alice.txt file. I was able to capture quite a few TCP pockets. When filtering buy TPC I was also able to see two HTTP pockets listed for the website I used. I ended up hiding those pockets so I could focus on just the TCP pockets.

After looking at the data and answering some of the lab’s questions. I looked at the Round-Trip Time graph. For this graph I could only see one dot placed at approximately 55.2 Round Trip Time (ms) and 0.279447 Time(s). I played around with the Stream number in the graph depending on what number the stream is on the dot changes. And for this particular graph it disappeared completely at 14.

Looking at the next graph in the lab, Sequence Numbers (Stevens), I noticed right away mine was very different. They had a lot of dots in the graph that went from left to right upward. Whereas mine was a straight line on 0. I opened a few more of my pockets into the graph and noticed they all had straight lines or a single dot.

## UDP Lab

This lab had me capture UDP pockets in Wireshark. Right off the bat this was different than the other labs so far. I was able to capture UPD pockets without doing anything at all, other than capturing pockets. I then answered the questions that were pervaded with the lab. Though the data that was given I was able to figure out the max number of bytes that my UDP pocket could hold and the max port number. I also looked for what the protocol number was for my UDP pockets, 17, and was able to highlight over that data and see that the hexadecimal was also highlighted, 0x11.

I also noticed some other cool information while doing this lab that I posted to our discussion board.

## ****SSL Lab****

For this lab they had me go shopping! I went on to my favorite cheap clothing store, Shein and looked at some clothes and added them to my cart. But because I am broke, I did not purchase anything and stopped collecting pockets there. For some reason, my pockets did not capture and SSL though. So, I downloaded the sample file and tried to filter by SSL, and it would not let me. So, I did some googling and it allowed me to filter by TLS and it showed me SSLv3 protocols. This still did not have an SSL head; however, it did have TLS and after looking at the image in the lab and the data I had I saw they were same information.

I looked at the data given in ClientHello SeverHello, changed Cipher Spec, Client Key Exchange, and Application Data and went through the lab questions that followed each section.

After I answered the question based on the labs example, I went back to the pockets I captured and filtered them by the TLS. This time when I filtered it did not give an SSL, but it gave a TLSv1.2 and TLSv1.3. I looked thought the data on these fields as well and saw that all the headers under its TLS were the same as the examples. Thus, I ran though the lab questions again with my own pockets.

# Programming Assignments:

## InetServer

## JokeServer

## Mini Webserver

## Blockchain

## HostServer

# Lectures:

## Week One

## Week Two

## Week Three

## Week Four

## Week Five

## Week Six

## Week Seven

## Week Eight

## Week Nine

## Week Ten

# Further Research:

# ****Extra Credit:****

## University Institutional Research Board (IRB) Training:

### ****COVID-19: Back to Campus (Fall 2020):****

#### COVID-19: An Introduction

In this module I learned about Zoonotic Infections and how they can get transmitted to humans and how it relates to covid-19. I also learned that the science indecency has known about coronavirus for a few years now. It is not new! That is something I did not know I thought it just came about in 2019.

I heard rumors about the coronavirus being from someone who ate a bat in china. This video confirmed that that could be a possibility, but it is also possible that coronavirus was transmitted from a bat to another animal we eat normally, for example, cows and pigs. It is interesting to think that coronavirus lives naturally in bats but can be so harmful and contagious to humans.

Before Covid-19 there was 2 other coronavirus outbreaks one in 2002 that killed 10% of the infected and one that started in 2012 and is still ongoing that has so far killed 35% of its infected. Compared to the number of deaths Covid-19 has had vs the two other coronavirus the rates are much much lower. However, Covid-19 is a lot more contagious making the number of deaths greater than the percentage.

#### COVID-19: Prevention Strategies

Covid-19 is spread mainly from person to person, by interacting with others. Covid-19 is a respiratory infection meaning it can be transmitted to you when someone coughs sneezes or even talks too close to you.

#### COVID-19: Moving Forward

### ****COVID-19: Insights for Higher Ed Leaders:****

#### COVID-19 Strategic Planning: Insights and Advice for 2021

#### COVID-19 Strategic Planning: Campus Health and Safety Operations

#### COVID-19 Strategic Planning: Restarting and Continuing Research and Lab Operations

### ****Faculty/Staff/Outside Collaborators/Students:****

#### Students in Research

#### Defining Research with Human Subjects – SBE

#### Assessing Risk - SBE

#### History and Ethical Principles - SBE

#### The Federal Regulations – SBE

#### Informed Consent – SBE

#### Internet-Based Research – SBE

#### Privacy and Confidentiality – SBE

#### Research with Prisoners – SBE

#### Research with Children – SBE

#### Research in Public Elementary and Secondary Schools – SBE

#### International Research – SBE

#### Unanticipated Problems and Reporting Requirements in Social and Behavioral Research

#### Conflicts of Interest in Human Subjects Research

#### FERPA: An Introduction

#### FERPA for Researchers

#### DePaul University

**Participating in Vaccine Research:**

#### Participating in Vaccine Research

### ****Remote Contact Tracing:****

#### Remote Contact Tracing Basics for COVID-19

#### Investigating and Tracing a Case’s Contacts

#### Contact Tracing Ethics and Responsibilities

## MyWebServer

## Research Subject Participant

### Truth in News

For this study they were collecting data on how people interact with news given on social media. They were mainly looking how I validate if a news source given on twitter is valid new or fake news. They gave me three different news sources on twitter with all linked articles. The first one in my opinion did not look very reliable. It was very short and was not a website I recognized. The second source they gave me I also did not recognize however I thought it looked a little more reliable then the first one. It was a lot longer and had a lot of information and quotes. The third article they had me look at was from the Washington post. That was a site that I knew. I thought because it was a well-known site it could be reliable. I thought this study was well conducted they only suggestion I gave them was to use other social media outlets other than twitter. For example, Facebook, Instagram and Tok-tok.

### VIRTUAL User Interviews - Habit-Building Mobile App

Info here

### Social Media Anxiety

Info here

# Books Referenced:

Maarten van Steen and Andrew S. Tanenbaum, *Distributed Systems*, Third Edition – Version 01 (February 2017). Published by Maarten van Steen.

James F. Kurose and Keith W. Ross, *Computer Networking A Top-Down Approach*, Sixth Edition – International Edition (2013). Published by Pearson.