



DSI AITS Newsletter

DECEMBER 2022



Enjoy this brain teaser ☺

The following cipher encodes a quotation by American author Erica Jong from her book *Fear of Flying* (1973):

20 12 8 8 18 11

18 8

7 19 22

12 11 18 26 7 22

12 21

7 19 22

12 11 11 9 22 8
22 23

Can you decode it?

Pulchritudinous [Abraham John, Asst VP, DSI AITS]

Like most of my fluff articles this too will be an arcane thing that may have you rolling in laughter or drive you to boredom! The thought for this article came about as a result of trying to address indolence on my part ☺. I will briefly explore a sort algorithm in a memory constrained environment that I implemented many years ago. *Before I get started with the article I want to share with our readership that this will be the last issue of the AITS newsletter as the DSI AITS newsletter. We will be moving to the Division of the UNT CIO sometime in January 2023. We were part of the Division of Digital Strategy and Innovation (DSI) under the leadership of Dr. Fein. In that time per Dr. Fein, we served him and DSI well. In our new home under the leadership of James Garrison, we will do the same. We will serve the new Division and James Garrison well. Under James' leadership we will do the work to build a Division that will serve UNT in its IT needs effectively in the years to come. I would like to thank my team for the tremendous work that they have done for each of the divisions and departments that we serve. They have done this with unswerving loyalty and dedication for almost 14 years. I am humbled and privileged to have been given the opportunity to build and lead this team of professionals through these 14 years after leaving student affairs and during a time when so much could have gone wrong. We saw other teams falling by the wayside but we persevered. I look forward to the work before us to build the Division of the CIO. I also look to the next generation of IT leaders we are mentoring within AITS with great pride and joy. These individuals will carry forward the lessons from their current environment to build effective IT structures and be an asset to their chosen profession. No human venture is perfect, but my team comes pretty close!!*

As I worked through my lazy (more on this later in the article) phase, a thought that pressed in was the Shell-Metzner implementation I did many years ago – yeah I know nerdy! Admittedly quicksort was the first method that I considered. The quicksort algorithm is also cool and sexy – well recursion is always cool and sexy, if such terms can describe an algorithm, but physical memory being at a premium I looked for another way and settled on the Shell-Metzner sort.

Using Shell-Metzner vs. Quicksort meant that I could forego recursion and consume less stack storage. It is also a relatively fast sort, very good for small to mid-sized data sets and excellent for memory constrained platforms.

Remembering odd snippets like this, probably a result of my misspent youth, leaves me feeling blessed at having had the opportunity to address a need for my university and the people this solution served. Most of the systems at the time were built in-house since there weren't many off-the-shelf options – ah yes those carefree days of building something just for the fun of it!

Every odd memory journey has a genesis and this one is no different. The jolts that brought me out of my indolent phase – more on this later in the article – led to me think about Shell-Metzner implementation.

Now on to the Shell-Metzner algorithm description and implementation. Shell-Metzner or Shell sort was created by Donald Shell in 1959 and was later implemented by Marlene Metzner in Fortran a few years later. Although we refer to it as the Shell-Metzner sort, Marlene Metzner leaves no doubt in a NIST article that



Golden
Poison Dart Frog



the full credit for this algorithm belongs to Donald Shell. It is a modified insertion and in-place sort that divides a large list into smaller lists for sorting. The following code snippet implements this in C++ and shows how this works with integers. Forgive the roughness of the code since I took a sample and made the edits necessary to make it work for this article. If used in production, I would tighten it up!

Since I used an array of integers calculating the number of array elements is straightforward. The `sizeof()` function will return the size of the array in bytes. In this case that size is 80 bytes. In this implementation the `sizeof()` for a single element is 4 bytes i.e. an integer data type takes 4 bytes of memory. Taking the size of the array and dividing it by the size of the `int` data type yields 20 elements. For both 32bit and 64bit OS's the size of the `int` data type is 4 bytes but if this were done on a 16 bit OS the `int` data type would only consume 2 bytes. This detail is accounted for by the compiler. When dealing with an array of strings, the process to determine the number of array elements is slightly more complicated. For the next issue I will implement this sort with a dynamic array of strings. Unless, of-course, some other interesting programming or tech bit comes to mind ☺.

```
#include <cstdio>
#include <iostream>
using namespace std;

void swap_elements(int& a, int& b)
{
    int temp = a;
    a = b;
    b = temp;
}

void printArray(int arr[], int n)
{
    for (int i = 0; i <= n; i++)
        cout << arr[i] << " ";
    cout << "\n\n";
}

void sort_shell_metzner(int arr[], int n)
{
    int smaller_element, starting_point, upper_limit, larger_element, step_size;

    step_size = n;

    while (step_size > 0) {
        step_size /= 2;
        upper_limit = n - step_size;
        starting_point = 0;
        do {
            smaller_element = starting_point;
            do {
                larger_element = smaller_element + step_size;
                if (arr[smaller_element] > arr[larger_element]) {
                    swap_elements(arr[smaller_element], arr[larger_element]);
                    smaller_element -= step_size;
                }
            } else
                break;
        } while (smaller_element >= 0);
        starting_point++;
    } while (starting_point <= upper_limit);
    printArray(arr, n);
}

int main()
{
    int arr[] = { 0, -2, 8, 5, 1, -5, 12, 7, 2, 5, -39, 6, 200, -150, 75, 100, -3, 34, -7, 10 };
    cout << "Size of the array: " << sizeof(arr) << "\n";
    cout << "Size of array element: " << sizeof(arr[0]) << "\n";
    int n = (sizeof(arr) / sizeof(arr[0]))-1;
}
```



Box Jellyfish



```
cout << "Unsorted Array: ";
printArray(arr, n);
sort_shell_metzner(arr, n);

cout << "Sorted Array: ";
printArray(arr, n);
return 0;
```

```
Size of the array: 80
Size of array element: 4
Unsorted Array: 0 -2 8 5 1 -5 12 7 2 5 -39 6 200 -150 75 100 -3 34 -7 10
-7 -39 6 5 -150 -5 12 -3 2 0 -2 8 200 1 75 100 7 34 5 10
-150 -39 -2 -3 -7 -5 5 5 2 0 6 8 7 1 12 10 200 34 75 100
-150 -39 -7 -5 -2 -3 2 0 5 1 6 5 7 8 12 10 75 34 200 100
-150 -39 -7 -5 -3 -2 0 1 2 5 5 6 7 8 10 12 34 75 100 200
-150 -39 -7 -5 -3 -2 0 1 2 5 5 6 7 8 10 12 34 75 100 200
Sorted Array: -150 -39 -7 -5 -3 -2 0 1 2 5 5 6 7 8 10 12 34 75 100 200
```

Regarding the indolence - This may seem silly, but I wake up at 4:30am each morning so that I can peek in on some of my servers by 5am – just my thing so that I am in the trenches with my team and not watching the activity from some distant hill. I started noticing sloth on my part when this slipped to 4:45am and on some days – to 5am – the horror! My concern first was, did this herald the start of some physical failure on my part. Unless this failure was irreversible i.e., physical damage, I had to snap out of this cycle of laziness! 😊

It showed even while working towards providing an article that had some technical depth. There did not seem to be any physical concerns that was leading to my sluggishness, and I had to push through but it was proving to be difficult. There was no loss in productivity, mind you, but there was just enough of a drop in what I consider optimum for myself physically and mentally.

The Shell-Metzner sort has 3 steps:

- Set up an interval or step size by dividing the array size by 2 and divide each iteration by 2 until the interval or step size becomes 1.
- Take each sub-array and divide them into equal arrays based on the interval or step size.
- Sort all the sub-arrays and the last iteration through the list will effectively be an insertion sort

This method allows for work to be done in-place without using the stack space for recursion. The Shell sort is used in the Linux kernel, specifically it is used in the Linux kernel uClib which is used in embedded systems. The bzip2 compression uses Shell sort with Knuth's increments. The reasons to use Shell sort are memory efficiency and speed. If you need to write code for a microcontroller or IoT, you may find the Shell sort to be an excellent solution.

Every push forward just seemed to increase the resistance. It almost appeared to be a feedback loop gone awry. Admittedly I did not expect the avenues that the jolts came from to snap me out of my newfound indolence. This took a couple of paths. One was coming across work being done by *Myriam Reynolds* and her doctoral student, *Lauren Kemble*. It was engaging and intellectually stimulating to hear how Myriam is using art therapy to make inroads in her sessions. I would not have thought that pictures, pottery, collages, etc. would help people in a counseling setting, but it was happening! It was wonderful to hear how she is using this to help people. They were both kind in their explanations of this method to someone who is just a tech geek 😊 – just enough to get the little grey cells churning in the right direction of the good work being done in the service of others. Losing oneself in the



Blowfish



service of others adds joy and beauty to duties that would otherwise be ordinary and colorless.

Next was dealing with a sense of irrelevance that was creeping in and that would require inspiration to renew mind and spirit. Most of what takes place around us is ordinary, with brief interludes of the amazing. Occasionally we see something that quickens the heart and renews the mind. This "something" leaves us, well at least me, amazed and with a new sense of wonder and joy about life in general. I came across such an experience that was so outside the bounds of the ordinary that it left me amazed. These instances always renew my quest to live life abundantly – maybe flight lessons (my first love) at last! It is quite phenomenal and humbling that all the tech in the world cannot match what nature does so effortlessly! Not indolent anymore! Yep - 4:30am and back on schedule 😊 – who can be lazy when nature is so industrious and surrounds us with beauty. Yeah, I know too much emotion for an ops guy! 😊

The platform I implemented the Shell-Metzner sort was a TRS-80 Model 16 PC with 128K of RAM. Although the hardware was capable of a whopping 512K (a luxury in those days) our units did not have the additional 384K. But we did have two 1.25MB 8" floppy drives. The Model 16 had both a 4Mhz Z80 and 6Mhz Motorola 68000 processor – *beautiful little beast* – we got excited about this kind of stuff in the early to mid-80's (last century) 😊. The Z80 was used for I/O even when the OS ran on the MC 68000. From a compatibility perspective because of the Z80 processor the Model II OS was possible and the MC 68000 allowed for Xenix – a scaled down version of Unix – pretty cool stuff for that time of-course! In the absence of local hard disks, one of the floppy drives was dedicated to the OS while the second one was used for data. Lack of network connectivity meant that backups were done by copying data floppies to backup floppies. Interesting but perhaps an embarrassing fact – I could place my hand on the side of a Model 12 or Model 16, close my eyes and based on the drive vibration tell whether it was reading or writing 😊 – try doing that with cloud storage! As a side note, the Motorola 68000 processor was used in the first Apple Macintosh computer – I know that I have just won over all the Apple fans out there 😊.

I hope you found this fairly straight forward "fluff" article about a sort algorithm, interesting. Who knows, maybe you will encounter your own memory constrained setting or want to develop code for an IoT or embedded system where Shell-Metzner may save the day or if you experience an episode of indolence, I hope you come across that which gives you the impetus to push ahead!

At the very least you now know how to implement a Shell-Metzner sort, the lack of which I am sure has meant many a sleepless night for you 😊

As you read the articles included in this issue of our newsletter, maybe get misty eyed or are rolling in laughter by pieces like this one 😊, and take a swing at the brainteaser, we in DSI Administrative Information Technology Services (DSI AITS) wish you a happy and safe holiday season.



UNT Esports

[Dylan Wray, Asst Director, Recreational Sports]

UNT's esports program has some updated renovations and an entire new space for intercollegiate gaming competition and will be fully operational by the end of the Fall 22 semester. After nearly five years of supporting UNT students in varsity collegiate esports, it was time to expand and upgrade our gear to better support our teams and stay relevant with peer universities who are active in the scene.

UNT Esports will have a new lab in Chestnut hall dubbed 'The Greenhouse.' The main competitive space contains 11 Alienware R13 3080's with complementing 240hz monitors on a main column extending from a side of the wall. At the wall there's ten individual power circuits as each station draws enough power that they can't be ran on an individual circuit. The facility has its own dedicated circuit breaker which had to be installed before all of the stations could be turned on. On the other side of the room, there's a lounge space for students to hang out in between classes or matches. The space also functions as a live replay review area with a TV station hooked up to one of the R13's.



Indian Cobra
(been there done
it! – don't
recommend it 😊)

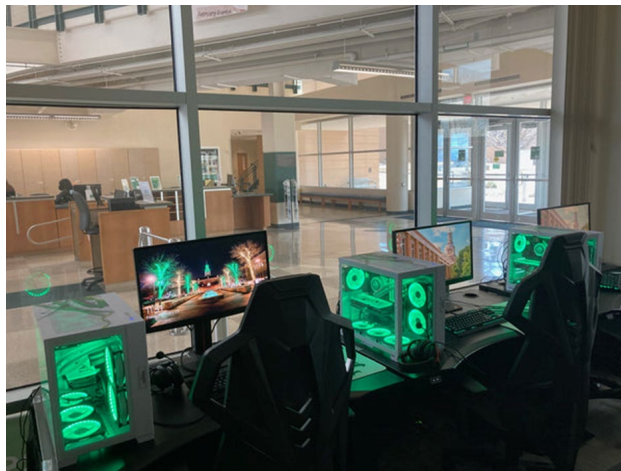


The next room in the space contains one R13 3080 and three R13 3080ti stations consisting of the broadcast studio for the program. The studio during the day is

where our content creation team works on graphics and videos to highlight and promote UNT's program on our social channels. At night, the space functions as a broadcast tv studio for our twitch live stream for students to learn how to broadcast esports matches.



In the Rec center we've upgraded our facility in the space called 'The Eyrie' which has been our public facing facility which helps incoming prospective students see our players as well as the fancy computers inside! In the single team practice facility, we've upgraded the individual parts in the first three PC's that were originally donated by our partners at RGB Custom PC. We've since added 4 more machines that have comparable hardware to the R13's at the Greenhouse. The custom design work on these towers is beautiful and very much captures the mean green pride that is tied to our program.



With these facilities we're confident that our varsity teams will have the hardware they need for years to come to be successful and have a space on campus they can call home. We're very thankful for the DSA leadership, AITS, and the President's office for their continued support of this program. Go Mean Green!



Cone Snail



What is Social Engineering

[Bill Wasson, DSI AITS]

As defined – “*Social Engineering* is a psychological attack against a company or an organization that aims to exploit the natural tendencies individuals possess to trust others. A Social Engineering attacker simulates itself in a way that is familiar to targets, and then preys on their recognizable biases to lull them into a false sense of security and trust. In other words, the attacker assumes an alter ego that its targets tend to naturally trust.”

Using the fictitious trust relationship gained, attackers can persuade a target into exposing sensitive data or performing an action they wouldn't normally perform. Ultimately, leaked data, such as IDs, PINs or other credentials, may be the end goal of the attacker. Other data, such as the names of a departmental leadership, may be a means to an end.

Gaining this type of data may seem trivial, but that very fact is noteworthy for two reasons:

1. Simply because the information doesn't seem important, targets are less likely to guard it closely. Thus, they'll probably reveal it willingly without ever becoming suspicious.
2. Social Engineering is an iterative process. Every bit of information that an attacker gains is information that can be used to further strengthen the apparent legitimacy of the attacker's pretext, which in turn instills greater confidence in targets, who are then more likely to divulge increasingly more sensitive information.



Deathstalker
Scorpion



Common methods used during Social Engineering attacks

Most of the time the goal of an attacker is to try to extract sensitive technical data, which could be obtained by an individual who is posing as IT or help desk personnel. Often an attacker will research their targets via open-source intelligence, gaining public information from company websites, social network, etc., in order to build a plan for their initial attack.

4 Popular Social Engineering attacks are as follows:

- Phone-based attacks – these attacks occur when an attacker directly calls a target and directs them towards a malicious phishing site or even more bravely asks them directly for sensitive data.
- In-person attack – attackers often pose as an individual in a “falsified role” such as a construction worker, a maintenance worker, or similar position of trust to gain access to restricted areas.
- Tailgating – attackers may guise themselves as employees and follow authorized personnel through locked doors into restricted areas.
- Third-party social engineering – attackers often use a third-party; a source being outside of the targeted organization to compromise an individual's phone or computer with a piece of malware, which in turn is connected to the target organization's network. Often, this may be an online dating or social networking site.

What are the conceivable impacts of a successful Social Engineering attack?

As humans, we are often the weakest link in the system, and because social engineering attacks target people, many times even the best technical security controls cannot totally prevent a social engineering attack. To get to the point, social engineering attacks often result in an attacker being able to successfully gain the same access to vital information as an authorized organization member.

What this means is the attacker is allowed to act as a malicious insider with the ability to infiltrate multiple organizational systems and extract sensitive data,

ultimately leading to a complete organizational security breach with a final result of stolen data (be it emails, credentials, source code, or even client data.)

Finally, how can Social Engineering be prevented?

1. *Red team assessments* – these assessments mock true-to-life attack scenarios using known social engineering techniques. The value of these assessments comes after the completion when an assessor can give advice on what actions can be taken to strengthen an organization's security platform.
2. *Awareness training* – considered to be one of the best defenses against social engineering attacks, awareness training of company employees brings social engineering to the forefront of the employee mind-set. By making employees aware of the risks of social engineering and skeptical of suspicious activity, a business culture that promotes secure thought and action can be achieved.



The End of Cable TV

[Ken Smith, DSI AITS]

Many different people contributed to the technology that was used to create the first television. Philo Farnsworth is credited with creating the first working fully electronic TV system in 1927. Since then we have gone from one channel to what seems like endless sources of entertainment. It was thought that broadcast tv and 6 channels was the pinnacle of television and home entertainment. But people wanted more variety and less advertising. Then came the invention of cable with promises of customizable packages and no commercials. And cable delivered on this promise for years until the advertisers came along with their bags of money. With it came plenty of entertainment options and countless commercials. People do what people we wanted more of the good thing, entertainment options, and less of the bad thing, COMMERCIALS. Then along came a company that promised to deliver on everything we wanted for the perfect home entertainment experience.

In 1997 entrepreneurs Reed Hastings and Marc Randolph changed home entertainment really all video entertainment forever with their invention, Netflix. Their business model was laughed at by the tv and movie industry. The entertainment industry thought the consumers would want to continue paying cable bills and watching films in a theatre, because who would want to stream movies. The old model had always worked. So they gave Netflix access to everything in their catalogs. Little did they know by giving Netflix unlimited access to their catalogs they were digging their own graves. Netflix took this and ran with it. They charged a small fee for unlimited dvd rentals and unlimited streaming. At the time Over 70% of U.S. homes had cable before. Now almost 25 years cable has fallen to around 44% in U.S. homes. These are pre-pandemic numbers. Covid only made more people switch to streaming and on-demand viewing options. What was once laughed at has now been adopted by every major network and entertainment studio in the world. Everyone has a streaming service UNT probably has one, Fighting Eagles+.

According to the Pew Research Center "Some 61% of those who are ages 18 to 29 and don't currently receive TV by cable or satellite say they did not do so in the past, compared with around three-in-ten in older age groups. And 91% of nonsubscribers in this age group say a reason they do not subscribe is that they can access the content they want online " With some many people leaving cable the advertisers are back again trying to monetize streaming. So now all major stations and studios have an app to stream on your phone, pc, laptop tablet etc... which means more eyes more ways to advertise. Some have commercials some have paid to tiers for commercial free or less commercials. Seems like we are to streamed cable. I don't what form of entertainment will come next but I'm sure the advertisers and commercials will follow. Stay tuned.



**Africanized
Honey Bees**



Why Are Security Updates Important?

[Lazayvion Hammick, DSI AITS]

So, you've may have seen a notification come across your device that reads "Update Required" or "Update is ready to install." It may seem like notifications like these are always popping up but there's good reason why and there's good reason you should be concerned if you haven't received updates in a while.

For starters, Security Patches (or updates) are a series of updates that are designed to plug a hole or a vulnerability within a piece of hardware or software. Patches are normally included between major update cycles (the updates that bring new features) and bundled with major updates, if necessary. This essentially means, when exploits or vulnerabilities are discovered, patches are released, and the process is repeated. The severity of the vulnerability decides the speed of updates. Most organizations such as UNT often has policies enforcing the installation of security updates to protect its data as much as possible.

Neglecting to actively keep your devices up to date can have serious consequences. Hackers are often looking for the easiest ways to get into your system and wreak havoc on your device. Hackers can use vulnerabilities within devices and computer networks and gain access to confidential files, passwords, and other sensitive data and try to sell it to the highest bidder. Having sensitive information such as passwords in an unprotected area such as your desktop or downloads folder is one of the first locations that are visited.

Below are three steps you can take to make sure you're safe when using internet connected devices.

Cloud Computing – Cloud Services such as OneDrive, Google Drive, & Box are safe places for your data to exist. Cloud providers actively store data in physically and virtually secure facilities and have multiple layers of security to encrypt and decrypt data at your request (i.e. when you log in). Thankfully, the University supplies free unlimited OneDrive storage for all of your work-related files.

Password Management - By now, you've probably heard this one too many times. *Change your passwords often and do not reuse them!* "GreenGrass23" is not a practical password nowadays. Passwords are very easy to crack, and machines are built to crack them in the shortest amount of time possible. Websites such as [How Secure Is My Password?](#) can tell you the length of time it would take for a computer to crack your password! If you have difficulty remembering your massive list of passwords, consider a password manager. BitWarden is a very solid free choice.

Consider Upgrading - If you had a device for some time and notice that the constant reminders for updates have stopped, it's possible your device is no longer supported and therefore no longer gets updates. As technology becomes increasingly progressive, old technology can sometimes no longer keep up. Continuing to use a device that can no longer receive updates is the equivalent of not doing updates at all. By upgrading to a newer device, you can enjoy the peace of mind you'll be getting the latest tech while still being safe online.

Overall, performing updates on your device rarely has any negative downsides. In nearly every instance, the benefits significantly outweigh the bad. So, the next time you get that notification about updates go ahead and get it out of the way! Besides, you're being bugged for a very healthy reason!



Lions



Holiday Tech Gift Guide

[Sharukh Mithani and Samuel Wiggins, DSI AITS]

Picking the perfect tech gift for your friends or family can be tough. As self-professed technophiles, we have compiled some of the best picks for holiday tech gifts under \$150.

8BitDo Pro 2 Controller - \$49.99+

[Sharukh Mithani]



Whether you are gaming on a PC, Nintendo Switch, or a mobile device, the 8BitDo Pro 2 is a fantastic choice. This retro-inspired controller connects via Bluetooth or USB and offers a wide range of compatibility. Not only does the battery last 20+ hours, but it can also recharge via USB-C or accept AA batteries in a pinch. Additionally, it has 2 configurable back buttons, and every button on the controller can be configured via the app. It's the perfect choice for the gamer in your life.

It's available in 5 retro-console inspired colors – a Super Nintendo-style White, a PlayStation-like Grey (pictured), Black, transparent Black, and a Game Boy Color-inspired transparent Purple.

[Buy on Amazon – Standard Colors](#)

[Buy on Amazon – Transparent Colors](#)

Budi 9 in 1 Cable, Card Reader, and Phone Stand - \$38.99

[Sharukh Mithani]



The Budi is the perfect tech travel companion to slip into your pocket or a small bag. This small device has a ton of features. It can act as a phone stand, includes multiple USB cables and adapters for charging and connecting to your computer, and acts as an SD card and USB device reader. Additionally, it can store multiple SD and MicroSD cards, making it a great gift for photographers and videographers.

A lite model is also available with fewer card slots for only \$22.99. Both models are available on Amazon.

[Buy on Amazon – Standard Model](#)

[Buy on Amazon – Lite Model](#)



Polar Bears





Boomslang



Ember Smart Mug 2 (10oz) - \$99.95+

[Sharukh Mithani]



The Ember Smart Mug 2 is the perfect gift for the coffee or tea addict in your life. This mug keeps your drink perfectly hot at your preferred temperature (120 F -145 F, configurable by an optional App) for up to 1.5 hours on a full charge. Additionally, the included charging base can be used to keep your drink warm all day.

The ceramic model is available in Black, White, and a special (RED). A metallic model is also available in Copper, Gold, Rose Gold, and Stainless Steel.

[Buy on Amazon - Ceramic](#)

[Buy on Amazon – Metallic](#)

Anker Nano Pro - \$39.95

[Samuel Wiggins]



Most people stick with whatever OEM charger comes with their device which is not always the fastest, or the most compact option. Don't discount the benefits of using a premium charger, it can make your life endlessly smoother by reducing the amount of clutter in your bag as well as reducing the time you spend charging your device—my recommendation is the 40W Anker Nano Pro. With the Nano Pro you get a 40w charger with two USB C IQ ports for fast charging options on multiple devices. Sleek, fast, and safe; anyone will feel spoiled after using this charger instead of the OEM equivalents.

[Buy on Amazon – Four Color Options](#)



Tsetse Fly



Nothing Ear (Stick) - \$119

[Samuel Wiggins]



Today's options for earbuds can somehow feel both overwhelming and very monotone in design. For a quality set of unique ear buds the Nothing Ear Stick is a fantastic departure from the usual design of earbuds. With clear housing and design elements meant to imitate motherboard designs you get an impressive set of wireless earbuds in a sleek case that is sure to not be lost in the crowd. This is the second earbuds from Nothing and they have been busy tuning their design and fixing some quirks. The ear stick has reduced the case footprint while maintaining the robust features offered with the Ear 1's and for a cheaper price than competitors like Apple or Samsung.

[Buy on Amazon](#)

[Buy Direct](#)

Gaomon Drawing Tablet - \$59.99

[Samuel Wiggins]



Drawing tablets are a terrific way to explore your artistic talents in 2022, it is a way to encourage your mind to play and thankfully gone are the days of needing to buy the most expensive name brand drawing tablet. These days, there are affordable options from many great overseas companies- my go to brand is Gaomon since their tablets tend to be feature rich as well as offering a ton of assorted sizes. You can draw in photoshop or Krita, sculpt with Z-Brush or Blender, or even just take notes in OneNote. I would recommend 10 x 6.25 size if you are having a tough time deciding on which model since at that size it can be portable but gives you plenty of space to work on your projects or take notes.

[Buy From Amazon](#)

Illuminating the Holidays

[Jennifer Lee, DSI AITS]

"It's Christmas morning, you emerge from your room still sleepy and trudge down the hall where, a warm glow shines from the end which is your destination. The sense of wonder and awe at the sight of at the end." This sentence describes something that happens in millions of homes around the world one day a year. Joyeux Noel, Buon Natale, Feliz Navidad – Christmas.



This long running tradition claims its roots from the earliest recorded date of the Yule Log in the 12th century. This pagan tradition was simple, a large log was set aflame to ward of evil. Over the years, Christianity began to include this holiday light tradition into holiday festivities.

While the tradition of lighting trees originated in the 17th century, Queen Victoria popularized the use of lighted trees in the late 19th century. Not long after, the first artificially lighted holiday tree was debuted in 1882 displaying Thomas Edison's newly created electric Christmas tree lights.

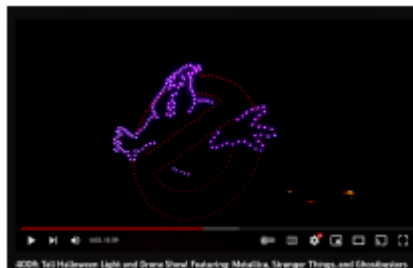
This event kickstarted over a hundred years of continuing improvements, widespread use and even has shifted to include far more than just the tree as a palette for holiday décor. While the practice remained exclusive to those with the means to purchase and display electric lights for a time, eventually the practice was made available to the masses with improved technology and manufacturing processes.



With the growing tradition of tree lighting came a variety of light styles beginning with the now known as 'Retro' style, a familiar sight for people around the world. The large mostly opaque colored bulbs about 4 times the size of modern led bulbs. The 40s brought about the 'Bubble Lights', shaped to echo the long-ago candles attached by clips. The 50s introduced the aluminum tree which required the use of a translucent colored wheel on an angled rotating pedestal due to the conductive nature of the tree materials. Unfortunately, the popularity of this style of tree all but ended string bulbs until around 1966 when the modern day 'mini-lights' entered the market.



More exciting though, is that the use of decorative lighting has gained in popularity in not only the Christmas season, but others as well. The collaboration of human ingenuity, artistry and technology has resulted in the creation entire light shows that are choreographed, timed and even take to the skies. *(short behind the scenes look at the end of first video TS 07:58)



2020 Fall Halloween Light and Drama Show Featuring Mikalika, Stranger Things, and Ghostbusters
Tom BetGeorge YouTube 2022



2021 Fall Christmas Show in 4k
Tom BetGeorge YouTube 2021

Happy Holidays to all, I wish you a safe and wonderful season for you and yours.



Mosquito



Tech at the 2022 World Cup [Derek Boyd, DSI AITS]

The 2022 World Cup in Qatar is introducing new technologies into the world of soccer and beyond. Here are the ways that tech is impacting this year's FIFA World Cup.



This year, fans noticed something curious. Soccer balls were being charged before games. Each soccer ball used in the Qatar World Cup will feature an internal motion sensor, powered by a rechargeable battery. Motion sensor data is sent live to FIFA officials during a game to assist with making offside calls and resolving other disputes. A player is considered offside when they are on

the opponent's side of the field and any part of their body is past the last opponent (excluding the goalie). An offside offense is committed when a player receives a pass from a teammate (or unintentionally from a defender) after having been in an offside position the moment his teammate (or defender) touched the ball.



The motion sensor-equipped ball is just one data point used in the tracking technology. There are also twelve tracking cameras mounted underneath the roof of the stadium. Cameras track ball movement and up to twenty-nine different data points for player movement. This includes all limbs relevant for making offside calls. Tracking data is combined with artificial intelligence

technology to provide automated offside alerts to officials in the video operations room. Taking it a step further, once an offside call is confirmed, the system generates a 3D animation of the players involved in the offside offense (as shown in the image above) and displays it to the stadium.

In addition to helping referees officiate the game, this tracking data also feeds into an [app developed for the players](#). This allows players to analyze their performance after a game with a variety of metrics such as enhanced football data, physical performance, and enhanced football intelligence. Some data points include distance covered at various speeds, number of actions at specific speeds and maximum speed, percentage of ball possession, positional heat maps, etc. All this data is synchronized with actual match footage.

There are also technological advancements regarding the venue itself. One major concern for the tournament in Qatar is the heat. How would they cool an open stadium in the desert? Engineers were able to achieve this by a [system that is simple, but complex in the details](#). Computer simulations of the weather over 30 years were run to determine the cooling needs. 3D-printed models of the stadiums were run through wind tunnels to simulate different air flows. The roof shape was designed to assist with the escape of hot air and retention of cool air. The stadium height and position were considered during construction to maximize natural shade for the attendees and lessen the cooling needs. To lessen the energy requirements, only necessary sections of the stadium are cooled. This is also all powered by massive solar farms.

Every World Cup comes with the opportunity to not only entertain millions of fans, but to also push technological boundaries which can have benefits on and off the field.

 Great White
Shark



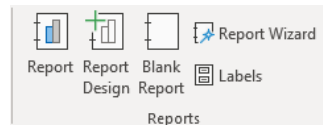
Intro to Access Databases Part III

[Matthew Trammell, DSI AITS]

First off, happy holidays to all! I hope that you have safe travels and get to spend plenty of time with people who are most important to you! And thank you for taking a few moments of your time to read my article. In this article series, I have covered several topics including tables, forms, and queries. Queries are great for selecting and modifying specific data within your table. Forms are perfect for adding new records or updating one record at a time. Tables are essential for storing your data. However, there are times where you may need a count of records, such as planning for computer upgrades? This is one of many cases where Access reports come in handy! Today, I would like to briefly introduce you to Access reports!

Reports are powerful especially due to the Group, Sort, and Total feature. My goal is to create a report grouped by model, totaled by ID, and sorted by department and then by location so that I can plan to upgrade the older model computers. Got it? Great! Just in case, I will break each step down and walk through the process of creating a report. You can create a report based on a table or based on a query. If you have been following along with this article series, you should have an Access database named Computer Inventory with a Computers table and a Skywalker Users query. Open that database or create your own and follow along. I want to create a report based on the entire Computers table.

- 1) Select the Computers table
- 2) Open the Create tab and under the Reports group, click the Report button:

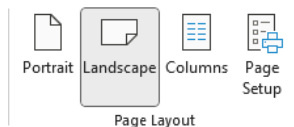


Access will generate a basic report for you and include the four (or more, if you added some computers yourself) records inside our table. The default report view is the layout view. Right off the bat, you may notice that the report is larger than the width of the standard portrait, letter page. Let us fix that!

- 1) Select Page Setup

Report Layout Design Arrange Format Page Setup

- 2) Change the Page Layout to Landscape



ID	Department
1	DSI AITS DSA
2	DSI AITS DSA
3	DSI AITS DSA
4	DSI AITS DSA

Better! But still not right. Now, we want to resize each field's width so that the entire table fits on one standard landscape, letter page. Start with the Department field.

Select any record within the Department field and the entire column is highlighted yellow. Access highlights the selected field orange. See image on left.

Now, move your mouse cursor to the middle, right edge of the selected field. The cross cursor will turn into a left and right arrow. You can now click and drag the mouse

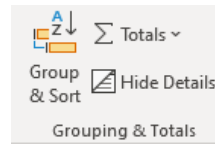
left to reduce the size of the field. Repeat this process for the ID field and each remaining field until the entire table fits on your page. Excellent work! Remember,



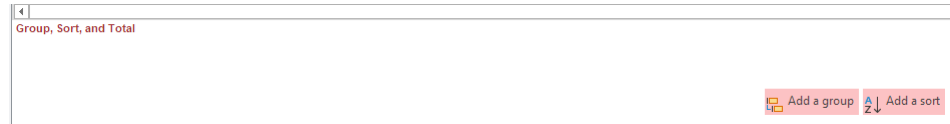
Hippopotamus



that you can always enter Design View for complex customizations. Design View is beyond the scope of this article. From within the Report Layout Design tab, find the Group and Sort tools. If not already present, toggle on Group & Sort from within the Grouping & Totals group:

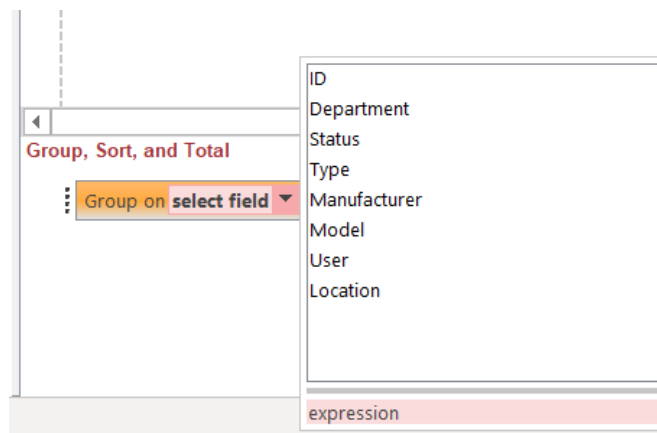


1) Upon selecting Group & Sort, the Group, Sort, and Total window appears:



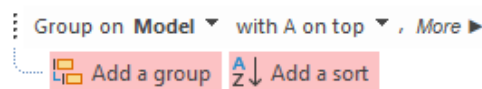
2) Now, click Add a group

The Group on select field will appear and give you a list of fields to choose from:

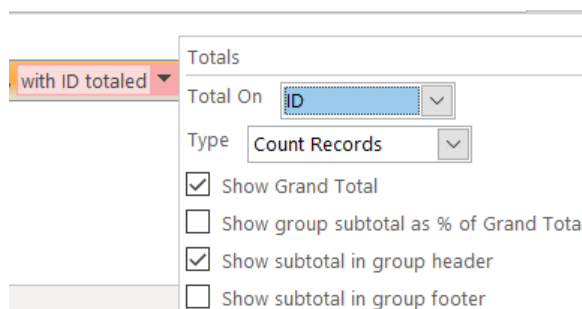


3) Our group is Model. Select the Model field:

Group, Sort, and Total



1) Now click More. Click the drop-down arrow next to *with ID totaled*. Check Show subtotal in group header:

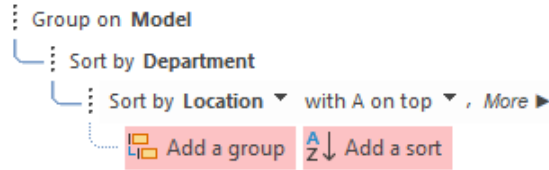


2) Now, I would like to wrap up this report by adding two sorts. Instead of Add a group, click on Add a sort. Add a department sort and a location sort as shown below:

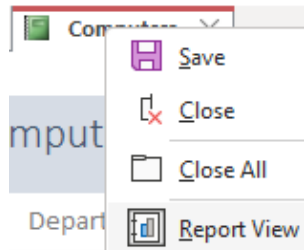




Group, Sort, and Total



- 3) Be sure to save your report! Press CTRL + S on the keyboard or right click on the report name and choose Save
- 4) Right click on report name and choose Report View

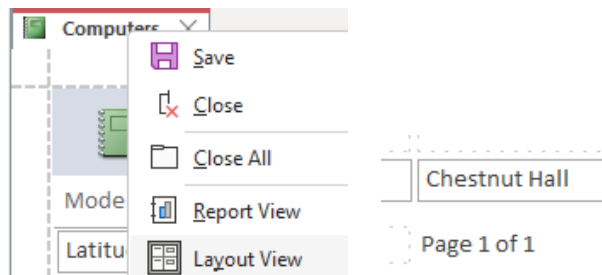


Your report should look something like this:

Computers								Monday, November 28, 2022
								11:05:19 AM
Model	ID	Department	Status	Type	Manufacturer	User	Location	
Latitude E7460	1							
	2	DSI AITS DSA	In Use	Laptop	Dell	Luke Skywalker	Sage Hall	
OptiPlex 7040	2							
	1	DSI AITS DSA	In Use	Desktop	Dell	Matt Trammell	Chestnut Hall	
	3	DSI AITS DSA	In Use	Desktop	Dell	Anakin Skywalker	Sage Hall	
OptiPlex 9020	1							
	4	DSI AITS DSA	In Storage	Desktop	Dell	Matt Trammell	Chestnut Hall	
	4							

Page 1 of 1

The page count is also out of the printing boundary, so I would drag that over to the last field under location. Go back to Layout View by right clicking Computers and make that change:



Thanks for fixing that. That was a minor detail bothering me! Hehe. Because we are interested in the counts, let us zoom in on the totals and look at them a bit more closely. See figure below. Our numbers are: 1 Latitude E7460 laptop, 2 OptiPlex 7040 desktops, and 1 OptiPlex 9020 desktop. Our grand total is four computers.

 **Ascaris
Worm**



Computers		
Model	ID	Depar
Latitude E7460	1	
	2	DSI AI
OptiPlex 7040	2	
	1	DSI AI
	3	DSI AI
OptiPlex 9020	1	
	4	DSI AI
	4	

I agree that the default method of including the total under the ID field is a bit confusing. Granted, it is also confusing that my auto ID numbers happened to be 1, 2, 3, and 4 for the computer IDs. Typically, I would use an ID number between 5-7 alphanumeric digits dependent on if it is a UNT number or a Dell Tag. This formatting is something that I would consider diving deeper into and changing using Design View. Perhaps the model total should appear directly below the model's name? Another feature that I would add is a field with the warranty end date or days out of warranty count. This would require updating the table design. Right now, I must look at the model's name and decide if that model is out of date or not. We, in IT support, do have a good mental picture of which models are good or bad, however; my numbers would be that much clearer if I included a warranty end date or days out of warranty count to someone outside of IT. Now, imagine if I had 1,000 computers spread out amongst 20 locations! How much more useful would this report be?

Keep in mind that this is just a brief introduction to what you can do with reports. You can have Access prompt you for a department name and generate a report for a specific department or location. And there are several formatting options to make your reports more readable. I hope that you enjoyed this article series and found its information useful to you. Now, you are armed with some knowledge to go out and create some Access databases. Good luck!

Until next time!

How I Built an AI Model to Improve the Traffic Problems in Denton

[Patrick Kennedy, DSI AITS]

Growing up I always imagined that working with artificial intelligence and machine learning was something that was solely the business of elite scientists and math wizards far beyond what I would be able to achieve, and it wasn't until more recently that I discovered otherwise. I'm set to graduate with my MBA in a few weeks, but I almost wasn't able to get an elective needed to make that happen this semester, as there were very few options available, and I was desperately trying to get into the Artificial Intelligence in Business course (especially after taking an excellent course in data mining in the previous semester). Thankfully, I managed to get through a waiting list of over 100 other students, and I couldn't be happier with how the course turned out. I quickly found that while it still took a lot of thinking and tinkering, it's exactly the kind of monkeying about that I enjoy, and there are excellent tools available that put AI and ML capabilities in the hands of anyone with internet access and a desire to learn. While it isn't quite the level of AI that I grew up seeing, such as Cortana from Halo or the Synthetics from Alien, it is still fascinating to explore the possibilities it gives us.

We were asked to look for a potential use of AI in business so that a project proposal could be created. I decided that I wanted to tackle the issues surrounding vehicle traffic at inefficiently managed traffic lights; vehicles contribute to poor air quality in Denton, Texas by idling for long periods of time while waiting at lights, and they then emit further emissions when they to accelerate back up to speed once the light phase turns green. While traffic lights have gotten better over the years, I believed that there could be further optimizations that would not only help the city of Denton but improve our own lives as well. Reducing how often you have to stop and accelerate back up to the speed limit means reducing the wear and tear on our vehicles and creating a more pleasant driving experience. But in order to understand how to approach this problem effectively, I had to first understand how traffic signaling works (don't worry, I've done all the research, so that means no homework for you).



Black Mamba

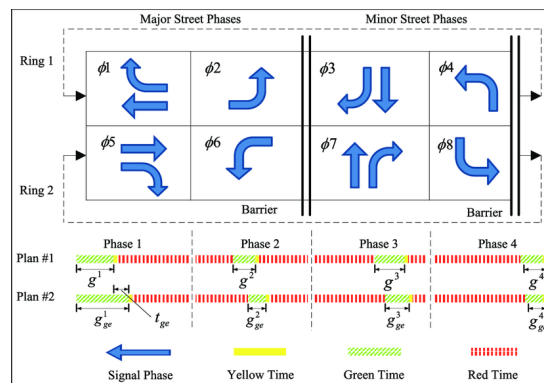


Figure 1 - Ring and Barrier Diagram

Most traffic lights operate using what is known as a Ring and Barrier diagram (shown above). Each light has a set of actions that it can perform to manage the flow of traffic using red (stop and do not proceed through the intersection), green (proceed through the intersection), and yellow lights (warning of a phase change and indicating that vehicles must clear the intersection). Imagine a vertical bar moving across the Ring and Barrier diagram from left to right: it can only display signal phase actions that are predetermined to be safe (i.e. no straight-through green lights on perpendicular streets simultaneously), and we can't change those actions. What we can change, however, is the timing of those phases, shown as Plan #1 and Plan #2 in the aforementioned diagram. The yellow phase will remain a set value (I chose three seconds for my model), and the timing of the green phase determines the red phase timings for the other lights (and real-world lights usually include around a second or so in-between signal phases where all lights are red to clear the intersection). Therefore, the decision was made to build an AI model that

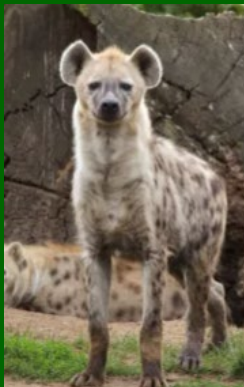
can analyze the flow of traffic and determine what the optimal green phase timing should be at each light to optimize the flow of traffic through the light, which helped simplify the problem a little. My personal approach when prototyping something is to cut it down to the core functionalities to test the basic idea before adding complexity, as this lets me understand the structuring without stressing about adding all of the features in the first go, which you will see more of as we go along.



Figure 2 - BlueCity AI LiDAR sensor and example data



Hyenas



The next thing we need to know is how to sense the presence of vehicles at the intersections. Thankfully, BlueCity AI has a solution using simple-to-install 360° LiDAR sensors that can be placed at each intersection. The LiDAR sensors build point cloud data at the intersection that is then processed by their classification algorithms to determine the number of cars and their positioning, their movement, type of vehicle, pedestrian movement, and more. This data can be called using their API and passed to our model to get the data necessary for our model to understand patterns and make decisions based on that. Being that it is using point cloud data instead of optical image recognition, privacy concerns are much less of an issue, and safety data is provided as well (such as near misses and collisions). BlueCity also offers a solution that uses this data to integrate with traffic controllers and modify phase timing to achieve the same goal, but I wanted to explore this problem myself to find my own solution to better understand AI tools, despite the fact that it would have been adequate to just propose this as a solution and be done with it. Besides, who needs sleep when you can overcommit to a grad school project full of stress and wonder?

So once my sanity had left the building, it was time to figure out what model to use. There are a LOT of really useful AI and ML models we could have attempted, but I really wanted to use reinforcement learning, as it was something I felt would fit the problem and give me an opportunity to learn more about implementing it. The specific model I chose was Q-Learning, an off-policy reinforcement learning algorithm. This algorithm works like other reinforcement learning algorithms that use the Markov Decision Process.

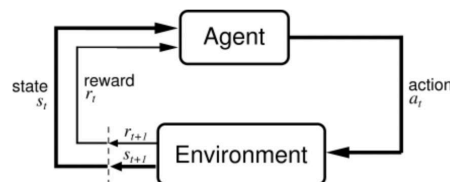


Figure 3 - Markov Decision Process

The quick and easy explanation is that the Markov Decision Process operates using an agent that performs an action that affects the environment, and depending on

the state of that environment, a reward or penalty is given for the agent to learn from. Think of it like a dog: if the dog performs the intended action, such as sitting when told, you give them a treat, and they make the association that it is good to perform that action to get their reward. Conversely, if the dog relieves themselves on the carpet or chews up your new shoes, you scold them to build a negative association with those actions. This simple idea poses a problem, however, as the reward being equal across all actions can lead to poor learning behaviors if the environment is perhaps stochastic or the results are deterministic, as the model needs to be optimized to suit the problem. To solve this issue, we need to install a few adjustable knobs in our dog's brain to tune how it learns, so it's time for Cyberdog.



Figure 4 - Rex, a good boy and Cyberdog from Fallout: New Vegas

This is done by tweaking a few key parameters in the algorithm, and Q-Learning gives us that ability. The algorithm is laid out below in Figure 5, and while it looks complicated at first glance, it's fairly simple once you explore it a bit more. The algorithm is a mathematical expression of the process outlined above, but it gives us those tweaks we need to perform the Markov Decision Process in a way that suits our problem.

$$Q^{new}(s_t, a_t) \leftarrow \underbrace{Q(s_t, a_t)}_{\text{current value}} + \underbrace{\alpha}_{\text{learning rate}} \cdot \left(\underbrace{r_t}_{\text{reward}} + \underbrace{\gamma}_{\text{discount factor}} \cdot \underbrace{\max_a Q(s_{t+1}, a)}_{\text{estimate of optimal future value}} - \underbrace{Q(s_t, a_t)}_{\text{current value}} \right)$$

temporal difference
new value (temporal difference target)

Figure 5 - The Q-Learning Algorithm

We won't be able to go super in depth, as I'm trying to avoid starting my career as a novelist, but what is important to know here is the learning rate and discount factor, as they affect how the algorithm values the reward value. The learning rate determines how much the algorithm values historical data. A value of zero will only look at historical data when making a decision, and a value of one will completely disregard old data. The discount factor determines how important future rewards are. If the value is zero, the model only is concerned with immediate rewards, but a value close to one will make it look for more long-term rewards (setting it to one or higher leads to errors and infinite environments when there is no terminal state, so we typically start low and increase to accelerate the learning). Adjusting these values requires iterative testing to understand how they affect the model, but typically a constant learning rate such as 0.1 is used and adjusted after testing. Given the somewhat stochastic nature of traffic flow, we want to make sure that the parameters reflect that. Identical phase timings across two different simulations could produce drastically different results, so tuning the parameters to learn slower would benefit us here. The model's exploration is also able to be changed using the exploration rate. When choosing an action, the model will determine if it is more valuable to choose an action to seek a reward, or to randomly choose an action and see what happens. This is useful early on when little to no precedent has been set. In order build this model in a Python environment (I used a Jupyter notebook), we can use OpenAI's Gym toolkit, as it has plenty of tools such as Q-Learning (as well as sample environments for learning) built right in.

 **Brazilian Wandering Spider**



But what good is this model without a simulation it can play with? For that, I leveraged my student email account to gain access to AnyLogic's education version to build a traffic simulation of an intersection (or two) that I know all too well: West and East University and their intersections with North Elm St and North Locust St. I used traffic data from the Texas Department of Transport to populate the simulation with the intent of simulating one hour of rush hour traffic (given that we do not currently have access to real-world data from BlueCity AI yet). The logic shown in Figure 6 shows a source at each street feeding into a probability distribution block to determine a route for the vehicle to travel through the model. The traffic lights are simulated with base timings of 30 seconds of green phase for East/West travel, and 15 seconds for North/South travel (with the intention of being changed by the model).

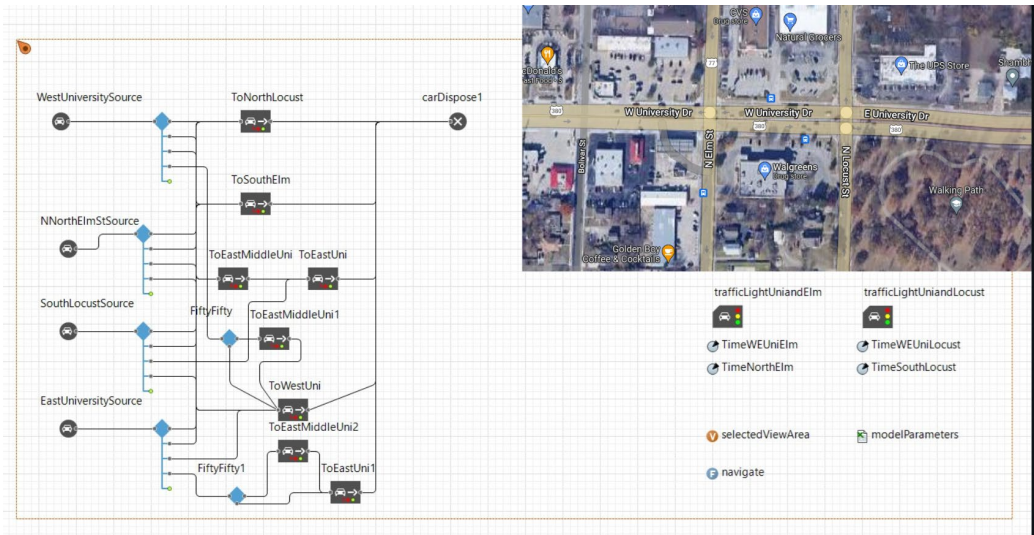


Figure 6 - AnyLogic traffic logic and the intersection in question

The time each vehicle spends in the model while trying to navigate through traffic to reach their destination is monitored, and the mean time spent in the system by the cars is passed to the model, as this is the target metric (since individual queue lengths and time spent in those queues are not available yet). If the vehicles spend less time in the system, they are spending less time waiting at lights, that is less time spent polluting and thus a reward is given. If the mean time increases, the model knows that its decisions are worsening the problem. Figure 7 shows the action sets that the model has available to it in order to try and improve the model: raising and lowering the green phase timing of each light by 1 second. Keep in mind that this is a very simple prototype (with numerous flaws) to demonstrate the potential viability of the idea. Further work would only serve to improve its ability to simulate and improve its reasoning as more granular data and decision-making capabilities are made available to it.

 Dogs





Cape Buffalo



```
if action == 0:
    global TimeWEUniElm
    TimeWEUniElm+=1
    sheet.range("B2").value = TimeWEUniElm
elif action == 1:
    global TimeWEUniLocust
    TimeWEUniLocust+=1
    sheet.range("B3").value = TimeWEUniLocust
elif action == 2:
    global TimeSouthLocust
    TimeSouthLocust+=1
    sheet.range("B4").value = TimeSouthLocust
elif action == 3:
    global TimeNorthElm
    TimeNorthElm+=1
    sheet.range("B5").value = TimeNorthElm
elif action == 4:
    TimeWEUniElm-=1
    sheet.range("B2").value = TimeWEUniElm
elif action == 5:
    TimeWEUniLocust-=1
    sheet.range("B3").value = TimeWEUniLocust
elif action == 6:
    TimeSouthLocust-=1
    sheet.range("B4").value = TimeSouthLocust
elif action == 7:
    TimeNorthElm-=1
    sheet.range("B5").value = TimeNorthElm
```

Figure 7 - The model's available action sets

The simulation will run, pass the target value to the model, the results will be compared, a reward of +1 or -1 assigned, and the Q-table will be updated. The model then chooses a new action and passes that decision to the simulation to test out that new parameter and calculate the target value. As you can imagine, this loop needs to happen quite a few times... hundreds of times. One of my biggest issues has been fully automating this process to run for 400+ iterations, so I'm still learning about the behavior of this model as I watch it learn the simulation and make sure my automation doesn't break. Which it does. Often. But what would experimentation be without soul-crushing problems that you can overcome at 4:00AM to prove what a big brain you have?

```
# Update Q-table for Q(s,a)
# update Q table. This is the algorithm written all L337 and python-y
q_table[state, action] = (1 - learning_rate) * q_table[state, action] + \
    learning_rate * (reward + discount_rate * np.max(q_table[new_state,:]))
# set current state to new state
state = new_state
#adds new reward to rewards
rewards_current_episode += reward
```

Figure 8 - Q-Learning algorithm expressed in Python form

Figure 9 shows the simulation in action, albeit in a static image, unfortunately. It's incredibly fun to sit and watch it work, but you'll have to do with a picture for now. On the right is a histogram for the `timeinSystem` variable (which is, of course, the time each vehicle spends in the system) with the mean value being represented in difficult-to-read orange below the graph and as a vertical orange bar on the graph itself. You can also see the timings of the green light phases on the bottom right. This is an image from an early iteration, so the model has only made one change thus far. As it goes on, you see the numbers change more and more, and it feels great to see the mean time in system decrease over time.



Honey Bees

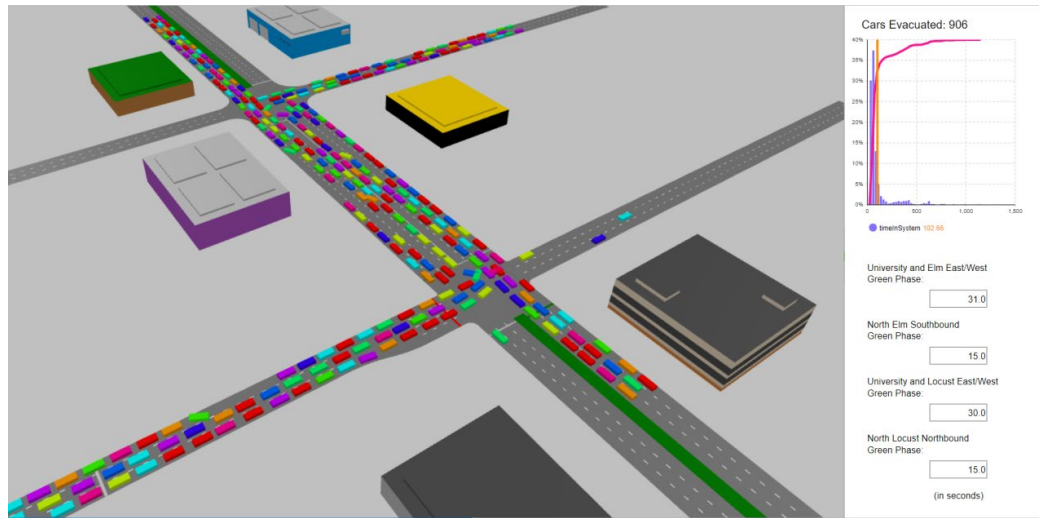


Figure 9 - Traffic simulation that manages to capture how bad we are at driving in Denton

So now that we've explored this a bit better, what can we take away from it? I struggled quite a bit to fit this all in an article without going down 50 different rabbit holes, but the point of the matter is that AI is just plain cool, and it's more accessible than ever. Furthermore, it enables us to take problems that frustrate us (like me getting uncomfortably warm on my motorcycle in the summer at this intersection while I try to get home from work), and gain insights and potential solutions that would feel far more unachievable without these tools being available. One time I used various behavior metrics to build an equation that would let me predict your college GPA, and another time I built a classification model to classify images and provide descriptions using Google Cloud Platform. The possibilities are exciting when you start to learn how to approach problems and when the use of AI or ML can help. If you'd like to learn how practical uses of AI from people who know how to explain things better than I can, I highly recommend checking out the labs that Google has crafted at <https://www.cloudskillsboost.google/> for interactive learning experiences using GCP. They offer little labs that grant you temporary GCP credentials to quickly spin up a Workbench or try out an API agent that lets you play with a specific function without having to go the Python route. Regardless, I'm having a lot of fun playing with the model that I've constructed, and I hope that I've at least exposed how AI can be used to see real-world problems in a more constructive way (instead of a harvest-all-your-data-and-give-you-ads kind of way).

Jamf Protect

[Alexandra Martinez, DSI AITS]

Recently I had the opportunity to attend a training course on one of many products/tools used on campus to manage the apple devices, which is JAMF. One of these courses that I chose to attend was about Jamf Protect. The course provides a greater understanding of how to secure macOS endpoints through the combination of Jamf Pro and Jamf Protect. Throughout this course, I learned so much about Jamf Protect, and about Apple build-in security platform.

So, what is Jamf Protect?

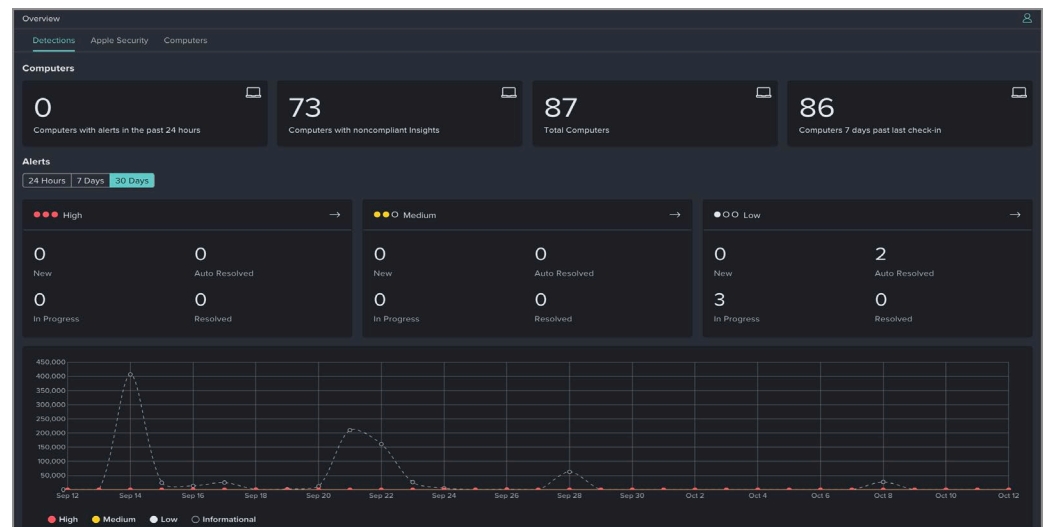
Jamf Protect is an enterprise endpoint security solution for the Mac. With Jamf Protect, IT administrators can create custom detections that protect computers with real-time monitoring for suspicious and unwanted activities, while measuring computers against the Center for Internet Security (CIS) benchmarks with security insights. Jamf Protect runs without using kernel extensions to support continuous macOS updates and preserve the Apple user experience.

How does Jamf Protect Work?

Jamf Protect amplifies core Apple security features with better preventions, stronger controls, and broader visibility and remediation capabilities. By aligning with the endpoint security framework in macOS, Jamf Protect supports the latest Apple software and hardware on the day of release —including Monterey and Apple Silicon— allowing IT administrators to upgrade devices on their schedule, not Jamf.

Jamf Protect Dashboards

Once the setting up and deploying Jamf Protect, IT administration can log into Jamf Protect web application where useful data is display. On the Dashboard Overview IT Administrators can view Detections, Apple Security and Computers.

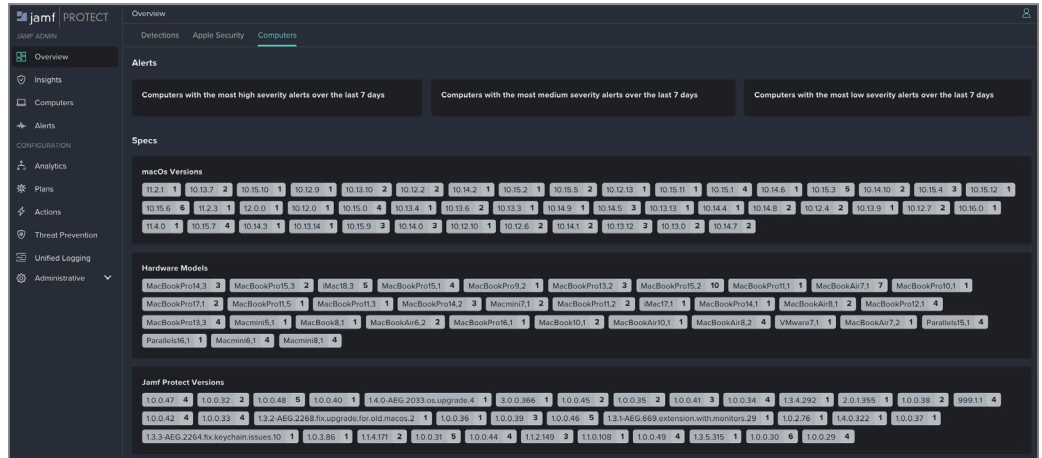


On the left column with Jamf Protect, IT Administrators can view alerts, configure analytics, plans, action, threat prevention, etc.





Bull Sharks



Jamf Protect Insights

Insights are additional data that is collected from computers and report to administrators. On the insights page IT Administrators can view and filter insights by category, CIS level, and status. The following are insight categories:

- Authorization—Monitors macOS settings related to passwords, keychain, and authentication
- Updates—Monitors software and application update settings to ensure the most recent versions are installed
- Users—Monitors the settings and usage of the login window and guest accounts.
- Preferences—Monitors macOS System Preferences to ensure common data sharing and settings are disabled
- Networking—Monitors Wi-Fi and server settings
- Auditing—Monitors security audit settings to ensure they are enabled
- Jamf—Monitors macOS security tool updates and miscellaneous security recommendations from Jamf.

Jamf Protect Plans

Plans are the security configurations that are deploy to computers as configurations profiles on the Jamf Pro side. Once a plan is created, the plan configuration profile can be downloaded from Jamf Protect tenet and deploy. IT admin can also pair a plan with an action configuration, configure threat preventions, add exceptions sets, etc. A plan configuration profile includes the following payloads:

- Applications & Custom Settings— Includes plan settings, analytics, action configuration
- Privacy Preferences Policy Control (PPPC)— Grants Jamf Protect full disk access.
- System Extension—Safelists the Jamf Protect system extension on computers macOS 10.15 or later.
- Certificates— Deploys Root CA Certificate, Certificate Request Identity, WebSocket Authorizer Key

Jamf Protect Analytics

Is where IT administrators can view built-in or create rules that detect threats or unwanted behavior. Analytic action also determines how a detection is reported to administrators. All analytics include the following setting:

- Analytic Description—Metadata that identifies and explains the function of the analytic



- Analytic Severity—Defines the seriousness of impact of the analytic
- Analytic Filter—Defines the processes that an analytic monitor by using configurable event types and predicate logic
- Analytic Actions—Defines what action Jamf Protect takes if a specific analytics' predicate logic returns a value of "True". Actions include the creation of an alert. For more information, see Configuring an Action Configuration.
- (Optional) Analytic Context Items—Defines additional conditions that an analytic evaluates in addition to an analytics' core predicate logic
- (Optional) Snapshot Files—Defines a specific file to monitor for changes

A useful feature of an analytic action is enabling the "Add to Jamf Pro Smart Group," which populates an extension attribute in Jamf Pro. That extension attribute can then be used to create a smart group in Jamf Pro, and gives IT administrators the option to create an end user alert dialog script and policy when a threat is detected.

Analytics > Analytic Info

Summary [Edit Analytic](#)

Update Analytic [Save](#)

Add to Jamf Pro Smart Group

Identifier This value must match a pre-configured Jamf Pro extension attribute.

Analytic

Severity

High [Reset to original severity](#)

Settings : Computer Management

← **Extension Attribute Templates**

Jamf Protect - Last Insights Check-in

Jamf Protect - Plan Hash

Jamf Protect - Plan ID

Jamf Protect - Smart Groups

Jamf Protect - Tenant

Jamf Protect - Threat Prevention Version



Kissing Bugs



Jamf Protect Threat Prevention

Jamf Protect uses an extensive database of known macOS malware signatures and certificates to monitor computers and block automatically block threats. Along with Jamf Protect database, IT administrators can setup Custom Prevent List to block processes by defining signing or hash information.

Keep in Mind

IT administrators do need to keep in mind a few things with Jamf Protect. Like setting for Jamf Protect Plan cannot be edited within Jamf Pro. If Jamf Protect agent is deployed without a plan configuration, the computer will not check into Jamf Protect and the agent will also not monitor for threats successfully. Insight reports are individually enabled or disable. Even though an insight is disabled during each check-in Jamf Protect will still collect data. It just won't display or report it on the Jamf Protect website. Unlike built-in analytics, Custom Prevent List items are not quarantined when blocked.

Resources:

[MITRE ATT&CK](#)

[Jamf Protect Documentation](#)

[Jamf Establishing Compliance Baselines](#)

[Apple OS - CIS Benchmark](#)

[Apple Platform Security](#)

Faster Internet for Rural America [Christopher Horiates, DSI AITS]

The saying that things move a little slower out in the country is true and it when it comes to internet it is very true. When my wife and I bought our first home almost 8 years ago, it was a brand-new home. The price was right, the location was good, and the size was right for our growing family. One thing that we did sacrifice on was the internet. We live out in Ponder, just 12 miles from UNT. While our home was new, we were on the old infrastructure of Ponder, and just 5 doors down Fiber was pulled. For the last 8 years I have been on DSL, with a 25MB down and 2 MB up. Going from the previous internet at our apartment in Denton, to the internet at UNT, let me tell DSL is very slow and limits what you can do.

Of late when trying to download games on Xbox it can take upwards of 10 plus hours depending on the size. During that time streaming services and such also suffer. We at first had a limited data plan on our cell phones and we had issues where videos and photos were so slow to upload on home Wi-Fi that our entire home internet would come to a crawl. I have a few IoT and smart devices at home and for the most part they work. Our security cameras are better now with the upgraded router my ISP sent me, but still for it being 2022 this is very old and slow technology. I was at one point told by my ISP that based off the number of devices I have connected I need faster internet service, to which I said OK, what's available now? Upon looking their reply was oh, you have the fastest we offer at your location.

Fast forward to just a few months ago and we started getting knocks on our door from a person selling faster internet. Signs started popping over the neighborhood in yards saying Open Infra coming here. What was this company? Who are they and where are they from? I, like most door-to-door salespeople, ignored him and wanted nothing thinking this was like a Solar Panel type selling thing. You buy in and get stuck for years on end with payments. Doing some internet searching I found the usual complaints about companies one would find from the typical unsatisfied customers.

Digging into it some more and calling Ponder City Hall the company seemed very legit. They are based out of Sweden and are making a push into rural cities outside of where large companies like ATT, Spectrum, Comcast, and such don't have a presence and have not pulled to the newer growing areas like a Ponder. They are officed in the area for a starting point to get a footprint.

So, I finally decided to sign up. Here is how this company works, and while I don't yet have a connection as they are finishing up the pulling of fiber, it's a change from what most people in large cities are used too when it comes to internet.

Open Infra pulls all the infrastructure into areas where currently there could be limited fiber, no fiber, or very slow connections like DSL/Satellite. There is lots of work being done with digging all around our neighborhood in the name of progress. From there you get a dedicated fiber pull into your home. The difference with Open Infra and other ISP's is other ISP's have Fiber but could pull a copper wire up to your home, in my case I have pure fiber into my home.

Now the name Open Infra is "Open Infrastructure" and how that works in like deregulated power (if you are outside of Denton). I get to shop a list of providers that are allowed on the fiber so I can renew with the one I selected to start off with or change it up after a year if another company has a better deal at that time. Only thing that changes would be my router, but the fiber pulled into my home is not touched. Even my neighbors down the street who have Fiber are opting for this service too. Starting off I went with a 500MB down and 500 MB up for \$55 a month, I was paying \$68 for my DSL and that price included the router for both. So not only will my speeds greatly increase, but I also save money. Going forward it might not always be that cheap, but my speeds make up for it. They even offer an 8GB up and down for \$250 if I wanted to go all out, it would be pointless but bragging rights for sure!



Wolves



Hopefully the service is great, and I have no issues. I'm finally over some of the concerns I had, and I must admit their customer service up till this point has been great. Getting my fiber pulled and correcting the wrong router I was given at first was surprisingly easy and hopefully a sign of things to come with stable fast internet. They are making quick work and I was told I would be connected by end of the year. Things in 2023 are looking up and the days of waiting on things to load and not being able to stream movies and such while the kids are online hopefully behind us. Worst case if things don't work out is I can get back on DSL, as that's not going away, by just cancelling the service after a year. I'm sure things will be fine and as this company hopefully grows into more areas around here the days of slow internet will be behind us.



**Saw Scaled
Viper**



Solution to last newsletter's brainteaser

Before my birth I had a name, but soon as I was born I changed the same; and when I am laid within the tomb, I shall my father's name assume. I change my name three days together, yet live but one in any weather. Who am I?

Answer - Today