



AITS Newsletter

AUGUST 2022

Time

[Abraham John, Asst VP, DSI AITS]

My fluff article this time may seem a bit rambling but perhaps it speaks to the passage of time that brings us to the start of a new academic year with excitement and anticipation in the air!

"All we have to decide is what to do with the time that is given to us" J.R.R. Tolkien

"They say time is the fire in which we burn. Right now, Captain, my time is running out. We leave so many things unfinished in our lives. I know you understand." Star Trek Generations - Soran

On the surface both these quotes seem easy to grasp except that they both have one of the most elusive of words: **time!** What is time? On the surface it is a measure of the passing of our days. But that is too simple! We do all things in time. In that sense it is truly "the fire in which we burn". Our lives are bookended by the moment time begins for us and the moment time ends for us. In between these bookends are all the events, experiences, loves, happiness, loss, achievements, joys, pain, and best of all to get a glimpse of eternity through the eyes of future generations.

We measure time with the passing of days. At the end of our days the reflection is always about how we spent our time. It is not possible to avoid activities that are an utter waste of time and if we view time as the currency of our lives, this is the equivalent of burning money! Examples of time spent in a perfect manner for me is the time I have spent and spend with my wife, daughters, grandson, and in service that makes life better for people and the world around me. At the other end of the spectrum examples of complete waste of the time is the time we spend doing things that are nonsensical even in the miniscule scheme of things. I am sure each of us can think of many such activities that are part of our daily lives. I will refrain from naming any nonsensical things on the off-chance I may offend the purveyors of these useless activities 😊. All the activities that waste time, in my experience, are things we have to do but that do not add any real value and are things we do not want to do. But waste is as part of life I suppose. In our frame of reference, we are engulfed in time and know nothing else and even though it is a cliché to say so, time is the most valuable commodity in our lives.

The word eternity also refers to time but, in a way, time has no meaning there since eternity implies time does not flow in any way that would make sense to us within our time-constrained universe. To be certain all the things that we in our current state of hustle and bustle will fade away and I believe the things that we do in a time constrained universe that **matter** i.e., fall within the non-useless category are what will remain even in a universe ruled by the laws of eternity.

But on to more mundane considerations of time. How do machines measure time? Computers have a "real-time clock" -- a special hardware device that has a quartz crystal on the motherboard that maintains the time. This is powered by a small



Enjoy this brain teaser ☺

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?



Einstein's theory of relativity states that the closer one is to the Earth, the slower time goes.

battery even when the computer is turned off. It is always powered, even when you shut your computer off. Also, the motherboard has a small battery that is used to power the clock device even when you disconnect your computer from power. The battery is capable of providing power for a few weeks to the clock chip. This helps the computer keep track of the time even when your computer is shut off. If you take out the clock battery in addition to removing the main battery if there is one and disconnecting the power cable, then the computer will lose track of time. You will have to enter the time and date when you restart the computer.

Calculations of time can be found in every aspect of our lives. Let us playfully skip through date and time using PowerShell and to see what we can do with date and time in PowerShell.

```
PS C:\Users\Abraham> Get-Date
Wednesday, August 31, 2022 8:10:32 AM
```

```
PS C:\Users\Abraham> (Get-Date).AddDays(5)
Monday, September 5, 2022 8:11:54 AM
```

In the above commands the use of Get-Date cmdlet displays the current date and time. Get-Date cmdlet returns an object and can be stored in a variable. There are methods associated with the Get-Date object and an example of one is "AddDays(n)". Similar to AddDays there are AddHours, AddSeconds, AddMinutes, IsDaylightSavingsTime and other methods available within the DateTime object that allow operations on the date/time value. The value specified in the AddDays and other similar methods can be a negative value to get to a date/time that is before the current date/time. The DateTime object also has granular property value and that allows use of specific values in the DateTime object instead of the full date/time value. For example, to show the day of the week for a specific date/time the cmdlet would be: **(Get-Date).DayOfWeek**.

To see all the methods and properties of the Get-Date object pipe the Get-Date object to get Get-Member cmdlet: **Get-Date | Get-Member**

```
PS C:\Users\Abraham> Get-Date | get-member
TypeName: System.DateTime
Name MemberType Definition
----
Add Method datetime Add(TimeSpan value)
AddDays Method datetime.AddDays(double value)
AddHours Method datetime.AddHours(double value)
AddMilliseconds Method datetime.AddMilliseconds(double value)
AddMinutes Method datetime.AddMinutes(double value)
AddMonths Method datetime.AddMonths(int months)
AddSeconds Method datetime.AddSeconds(double value)
AddTicks Method datetime.AddTicks(long value)
AddYears Method datetime.AddYears(int value)
CompareTo Method int CompareTo(System.Object value), int CompareTo(datetime value), int IComparable.CompareTo(System.Object obj), int IComparable.CompareTo(System.Object value), bool Equals(datetime value), bool Equals(datetime value), bool Equals(datetime other)
GetDateFormats Method string[] GetDateFormats(), string[] GetDateFormats(System.IFormatProvider provider), string[] GetDateFormats(char format)
GetHashCode Method int GetHashCode()
GetObjectData Method void IConvertible.GetObjectData(System.Runtime.Serialization.SerializationInfo info, System.Runtime.Serialization.StreamingContext context)
GetType Method System.Type GetType(), System.Type GetTypeCode(), System.TypeCode IConvertible.GetTypeCode()
IsDaylightSavingTime Method bool IsDaylightSavingTime()
Subtract Method datetime Subtract(datetime value), datetime Subtract(TimeSpan value)
ToBinary Method long ToBinary()
ToBoolean Method bool IConvertible.ToBoolean(System.IFormatProvider provider)
ToByte Method byte IConvertible.ToByte(System.IFormatProvider provider)
ToChar Method char IConvertible.ToChar(System.IFormatProvider provider)
DateTime Method datetime IConvertible.ToDateTime(System.IFormatProvider provider)
ToDecimal Method decimal IConvertible.ToDecimal(System.IFormatProvider provider)
ToDouble Method double IConvertible.ToDouble(System.IFormatProvider provider)
ToFileTime Method long ToFileTime()
ToFileTimeUtc Method long ToFileTimeUtc()
ToInt16 Method int IConvertible.ToInt16(System.IFormatProvider provider)
ToInt32 Method int IConvertible.ToInt32(System.IFormatProvider provider)
ToInt64 Method long IConvertible.ToInt64(System.IFormatProvider provider)
ToLocalTime Method datetime ToLocalTime()
ToLongDateString Method string ToLongDateString()
ToLongTimeString Method string ToLongTimeString()
ToOADate Method double ToOADate()
ToOleDate Method byte IConvertible.ToOleDate(System.IFormatProvider provider)
ToShortDateString Method string ToShortDateString()
ToShortTimeString Method string ToShortTimeString()
ToSingle Method float IConvertible.ToSingle(System.IFormatProvider provider)
ToString Method string ToString(), string ToString(string format), string ToString(System.IFormatProvider provider), string ToString(string format, System.IFormatProvider provider)
ToUInt16 Method uint16 IConvertible.ToUInt16(System.IFormatProvider provider)
ToUInt32 Method uint32 IConvertible.ToUInt32(System.IFormatProvider provider)
ToUInt64 Method uint64 IConvertible.ToUInt64(System.IFormatProvider provider)
ToUniversalTime Method datetime ToUniversalTime()
DisplayHint NoteProperty DisplayHintType DisplayHint=DateTime
Date Property int Date {get;}
Day Property int Day {get;}
DayOfWeek Property System.DayOfWeek DayOfWeek {get;}
DayOfYear Property int DayOfYear {get;}
Hour Property int Hour {get;}
Kind Property System.DateTimeKind Kind {get;}
Millisecond Property int Millisecond {get;}
Minute Property int Minute {get;}
Month Property int Month {get;}
Second Property int Second {get;}
Ticks Property long Ticks {get;}
TimeOfDay Property timespan TimeOfDay {get;}
Year Property int Year {get;}
DateTime ScriptProperty System.Object DateTime {get-if (($? Set-StrictMode -Version 1; $this.DisplayHint) -neq "Date")...
```

Just as an aside Windows uses a 64-bit value to represent the slices of 100 nanosecond intervals that have gone by since midnight January 1, 1601 A.D. Coordinated Universal Time (UTC) and it uses this value to record when a file is created, accessed or modified.

A short example of displaying current time in local and UTC form using C++ is shown next.

```

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

#include <iostream>
#include <ctime>

using namespace std;

int main() {
    time_t currenttime = time(0);
    char *xcurrentdatetime = ctime(&currenttime);

    cout << "The local date/time is: " << xcurrentdatetime << endl;

    tm *utctime = gmtime(&currenttime);
    char *utcdatetime = asctime(utctime);
    cout << "The date/time in UTC is:" << utcdatetime << endl;
}

```

```
The local date/time is: Wed Aug 31 14:42:55 2022
```

```
The date/time in UTC is:Wed Aug 31 19:42:55 2022
```

Using time functions as you can see is readily available in many languages and is always an interesting portion in any system from a point of development. If you get an opportunity, take a few minutes to “play” with date/time functions and date/time arithmetic 😊.



Prior to the invention of atomic clocks, a second was measured as 9,192,631,770 oscillations of a caesium.

Emulation and the Preservation of Videogames

[Michael Hamilton]

People tend to look back on their lives with nostalgia. We all have things that are important to us on levels that may be hard for others to understand, typically important life events, people we care about, and places. I find myself most nostalgic for the TV, movies, and, especially, videogames that I discovered as a child.

As a child of the late 1990s and early 2000s, my first videogame experiences were on consoles like the Nintendo 64 and the original PlayStation, where I inherited my taste in games from my father. It wasn't until I graduated from high school and started working, that I went back and played the "classics". At some point, I gravitated towards role-playing games and all the sub-genres within. After watching some gameplay of a 2006 Game Boy Advance game titled Mother 3, I decided that I wanted to try it out myself. Surely it wouldn't be too hard to come by a copy on eBay or my local second-hand game store. At least that's what I thought. When I started researching to find the game, I quickly discovered that Mother 3 had never been officially released outside of Japan due to its release being late in the Game Boy Advance's lifespan and Nintendo shifting focus to the already established Nintendo DS which had released globally in 2004. It turned out that the videos I watched had been recorded on a Game Boy Advance emulator that used an unofficial English fan translation of the game's text. At the time this was a dead end for me because I was concerned about the legality and whether it could run on my computer. Better not to risk it. Besides, I was sure they would release it internationally eventually, right? Well, as of 2022, they still have not.

Emulation is the use of software to emulate the hardware of another device. Companies like Nintendo utilize emulation to make their classic games available on the latest consoles via services like Nintendo Switch Online, while others continue to make their games accessible with game collections, such as Bandai Namco's Namco Museum. Despite publishers' best attempts, emulators remain legal due to a precedent set by Bleem! Vs Sony which protected emulators under fair use. The illegal aspect of emulation is the act of downloading and sharing the games themselves, i.e., the ROMs, computer files which contain copies of the data from a read-only memory chip (ROM).

In the same way people rip movies and share them online, emulation becomes illegal when you receive a copy you did not purchase via official channels. Sharing ROMs is unambiguously illegal. If you already own a legitimate physical copy of a game, then you may be covered by fair use. However, fair use is not an ironclad rule. This legal gray area means that, while you probably won't go to court for emulating, you won't have any legal precedents to back you up, and fair use may not convince a judge if you do. Fair use becomes a fuzzy defense for emulation once you start talking about emulation as a tool for people who already own physical copies of the game.

The most vocal defenses for emulation are the accessibility of consoles and games, and the discussion of who actually gets hurt by emulating titles. Official releases of games like Mother 3 are only available with Japanese text. Yes, you could buy a used Japanese copy and play it legally on a Game Boy Advance console. However, the game has been out of production for almost two decades and it only sold about 400,000 copies. Publishers would not see any revenue from this sale, and they have yet to indicate any plans for an official translation despite constant requests by fans.

There is a term formerly used by Disney to refer to its policy of suspending sales of movies on home video after a period of time, the "Disney Vault". Companies could argue that they are taking the Disney Vault approach to their games and that they have plans to rerelease their older games but are building up demand. While the legality remains in question, emulation has proven itself a great tool for fan and



**Planch time
is the smallest
standard of
scientific
measurement of
time.**



According to Einstein "the distinction between past and present and future is only an illusion, however persistent."

publisher alike. Emulation has allowed many people to experience games that we normally would never have access to, like the before mentioned Mother 3.

The Trails franchise is a series of interconnected role-playing games by the Japanese development team Nihon Falcom. The games are direct sequels to each other with an intertwining narrative, and one of the latest titles, Trails of Cold Steel IV, directly references characters and events from all previous titles. Think: Avengers: Endgame. The first game in the series was released in 2004 in Japan with an international release in 2011. The series currently has 12 mainline titles with 7 already translated. However, when the games were being officially translated, an entire saga of games were skipped in favor of translating the newer games as the 3D titles would be easier to market in the West. This left international Trails fans without a chance to experience two of what are considered to be some of the best games in the series.

Enter Geofront, a group of fans who utilized emulation to create English translation patches for both games allowing international fans to experience them. To put into perspective the amount of work that goes into these fan translations, the scripts of the two games Geofront worked on, Trails from Zero and Trails to Azure, are 1.3 million and 1.5 million Japanese characters long which puts both of them around the 1-million-word mark for English translations. The entirety of The Lord of the Rings, including The Hobbit, add up to just over 570,000 words. The team has always made it clear that they are fans of the series and always strongly urged people to support the official release, saying they would take down their webpage if Falcom had ever requested them to. On June 25, 2021, NIS America, the official localization team for the Trails series, announced the official release for the two games and that they would be working with the Geofront team and using their fan translation as the basis for the official translation.

While services like Xbox Game Pass and Nintendo Switch Online have laid the groundwork for a continued form of game preservation, the services are nowhere close to providing access to the full catalogs of the supported consoles. Additionally, we are seeing closures of digital marketplaces for consoles as recent as the Wii U and the Nintendo 3DS, with these marketplaces slated for closure in March 2023, taking with them a multitude of exclusives and ports that have yet to be made available elsewhere. These concerns have led to institutions - like The Video Game History Foundation and the Museum of Art and Digital Entertainment - to search for legal pathways to preserve games, including transferring game files from CDs to hard drives, which legally dictates that said games are not allowed to leave the museum.

These organizations believe that videogames are a part of culture and that we should have the tools and resources to study them, where companies generally have a strong economic motivation to preserve their assets themselves. While there does not appear to be a clear answer on how to properly preserve games in a way that would please both sides, we live in a digital age where we have the means to preserve the medium. Though there are many hurdles, and titles have already been lost, emulation appears to be one path on the road to preservation for the titles that can still be saved.

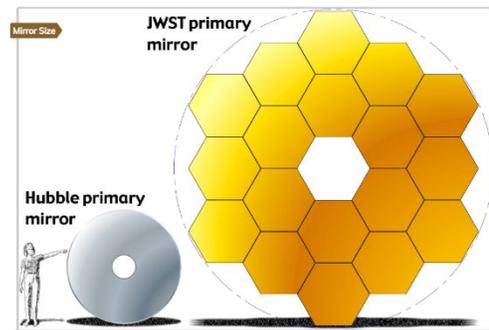
Webb Telescope

[Christopher Horiates]

Since 1990 the Hubble Telescope has provided us a look into our Universe. It has provided some very beautiful photos of the beginnings of stars, far away galaxies and cosmic dust. It in ways answered many questions but also brought about more. Initially it had a rough start as the optics needed to be corrected after it deployed, and our Astronauts were up to the challenge. Once the mirror was corrected images of Deep Space came back to Earth and the views were spectacular. With time Hubble has continued to perform and provide us looks and views into the furthest areas of Universe we have not yet to explore.

Fast forward to today and we have new piece of technology that will open our eyes and minds to the deepest unseen parts of our Universe. The James Webb Space Telescope should be sending back its first images in July of 2022. By the time you read this article we just might have answered the question is there life out there! NASA prefers to call this a successor to Hubble, not a replacement. Hubble uses optical and infrared, Webb will use infrared and its mirror to do so is much bigger.

Not only the Webb be larger than the Hubble, but it also orbits much further away than Hubble. Hubble orbits the earth at 570km, the Moon is 384,400km away, so it lives between the Earth and the Moon. Webb will be 1.5 million km away and is orbiting the Sun and stays stationary in its position to Earth while doing so. This allows for a sun shield to keep it cool which is optimal for infrared viewing. Being this far out will also make it not accessible for servicing by our current space shuttles so if anything goes wrong or breaks it will be costly and time consuming to repair if we are even able too. Of course, if it's anything like Voyager, which to this day still after 40 years of space travel is still working, I am confident Webb will be just fine.



Webb will have an approximately 6.5 meter diameter primary mirror, which would give it a significantly larger collecting area than the mirrors available on the current generation of space telescopes. Hubble's mirror is a much smaller 2.4 meters in diameter and its corresponding collecting area is 4.5 m², giving Webb around 6.25 times (see calculation) more collecting area! Webb will have significantly larger field of view than the NICMOS camera on Hubble (covering more than ~15 times the area) and significantly better spatial resolution than is available with the infrared Spitzer Space Telescope.



Hubble's visible and infrared views of the Monkey Head Nebula. Credit: NASA and ESA
Acknowledgment: the Hubble Heritage Team (STScI/AURA), and J. Hester

According to NASA, if you assume the Big Bang started everything over 13 billion years ago, Webb will be able to see "baby galaxies" vs Hubble seeing "toddler galaxies". This means that looking back into the Universe as it expands, we will be able to see the first signs of light after the Dark Age. This will be truly amazing and never seen before. The questions this might answer or the new ones it will pose will be something that will be

discussed and taught for generations.



The strontium atomic clock is the most accurate clock ever built.

Space Elevators

[James Taylor]

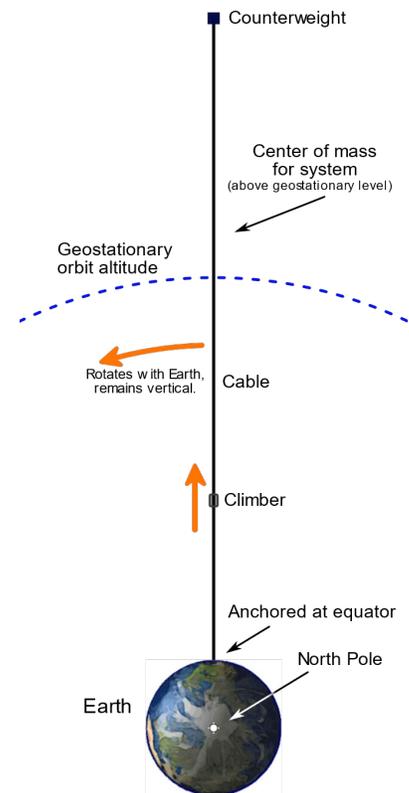
With the recent release of the amazing images captured by the James Webb Telescope, there has been a marked increase in the public's interest in the exploration of space. We can now see images of nearby nebulae and galaxies with unprecedented clarity and detail. Such sights fire the imagination of all who see them and naturally lead us to think about humanity's efforts to travel to space and explore our own solar system. However, getting into space is dangerous, difficult, and expensive. The Space Shuttle orbiter needed nearly 720,000 kg of liquid fuel and 500,000 kg of solid fuel to reach space. It's a problem international space agencies have been struggling with for a long time and with the advent of space tourism, it's something that even private corporations are thinking about. However, traditional rocket launches also emit a massive amount of greenhouse gases into the Earth's atmosphere, making travel into space an environmental problem as well. So, what is the solution?

As improbable as it may sound at first, an elevator may be our best alternative to launching rockets. One might imagine an immensely tall elevator shaft stretching into the atmosphere, bearing an elevator car full of astronauts to an awaiting space vehicle. However, a space elevator would work much differently, as no structure massive enough to reach into outer space could possibly bear its own weight. Instead, imagine a very large cable that is anchored to the Earth's surface, and stretching through our atmosphere and far into space where it terminates at a massive counterweight. A vehicle attached to the cable would carry cargo and passengers from the ground to their destination in outer space without the need to be propelled by an explosive rocket.

Done correctly, such a system would result in the cable being held up under tension and remaining in the same location in orbit above the Earth. At geostationary orbit (GEO), the time it takes an object to orbit the Earth is the same length of time it takes our planet to rotate on its axis. In effect, such an object would always remain in the same spot in the sky to the perspective of observers on the ground. This type of orbit is already used by navigational and communications satellites. The terminal counterweight for our hypothetical space elevator would be located some distance beyond the GEO. This arrangement would create a situation where there is a greater gravitational force on the cable below the GEO and a greater centrifugal force on the cable above the GEO. These two competing forces are what would keep the cable taut and stationary.

There are still many problems to be solved before such a structure could be constructed. Such an undertaking would necessarily have to be an international effort and would require a great deal of political and financial cooperation. However, the material of which the cable would be made presents our greatest hurdle at the moment. We are not yet capable of producing materials strong enough to make a space elevator possible. However, there is speculation that advances in materials science in the near future could lead to a practical design. Right now, the most promising lead seems to lie with macro-scale single crystal graphene, according to the International Space Elevator Consortium.

Space Elevator



Despite that we have been taught, a day is not a full 24 hours. It is actually 23 hours 56 minutes, and 4.2 seconds.

Constructing a space elevator has the potential to be a universal good for all humanity and would represent one of mankind's greatest achievements. We may be closer than we think to the time in which such a thing is possible, and the start of the project will almost certainly begin within our lifetimes. Though there are many other stumbling blocks along the way, solving the problem of safely and efficiently getting into space will very likely usher in a new golden age of space travel and exploration for our species.



It takes 24 hours from sunrise to sunrise because each day the Earth moves further in its orbit around the sun lengthening the day.

How to Check if Your PC is Eligible to Upgrade to Windows 11

[Patrick Kennedy]



While upgrading to Windows 10 was a fairly straightforward process with reasonably simple hardware requirements, the upgrade to Windows 11 involves a somewhat stricter set of compatibility requirements thanks to Microsoft’s requirement that all Windows 11 PCs be equipped with a Trusted Platform Module (TPM) version 2.0 chip. While this forces the obsolescence of perfectly useable (albeit a bit older) hardware, the purpose of this TPM 2.0 module is to provide a hardware-based dedicated cryptoprocessor to handle cryptographic keys for various security-related tasks. This results in a more secure system, but the fact that it is a hardware-based feature means that the system that a user is attempting to install Windows 11 on must have this hardware onboard and provisioned. Being that it isn’t immediately obvious whether a system is equipped with this chip, Microsoft has provided a list of compatible processors for both AMD and Intel-based PCs via the following links:

AMD Processors:

<https://docs.microsoft.com/en-us/windows-hardware/design/minimum/supported/windows-11-supported-amd-processors>

Intel Processors:

<https://docs.microsoft.com/en-us/windows-hardware/design/minimum/supported/windows-11-supported-intel-processors>

Additionally, the full system requirements are listed below:

| | | | |
|-----------------|---|--|--|
| Processor | 1 gigahertz (GHz) or faster with 2 or more cores on a compatible 64-bit processor or System on a Chip (SoC) | Graphics card | DirectX 12 compatible graphics / WDDM 2.x |
| Memory | 4 GB RAM | Display | >9" with HD Resolution (720p) |
| Storage | 64 GB or larger storage device | Internet connection | Microsoft account and internet connectivity required for setup for Windows 11 Home |
| System firmware | UEFI, Secure Boot capable | Certain features require specific hardware, see detailed system requirements . | |
| TPM | Trusted Platform Module (TPM) version 2.0 | | |

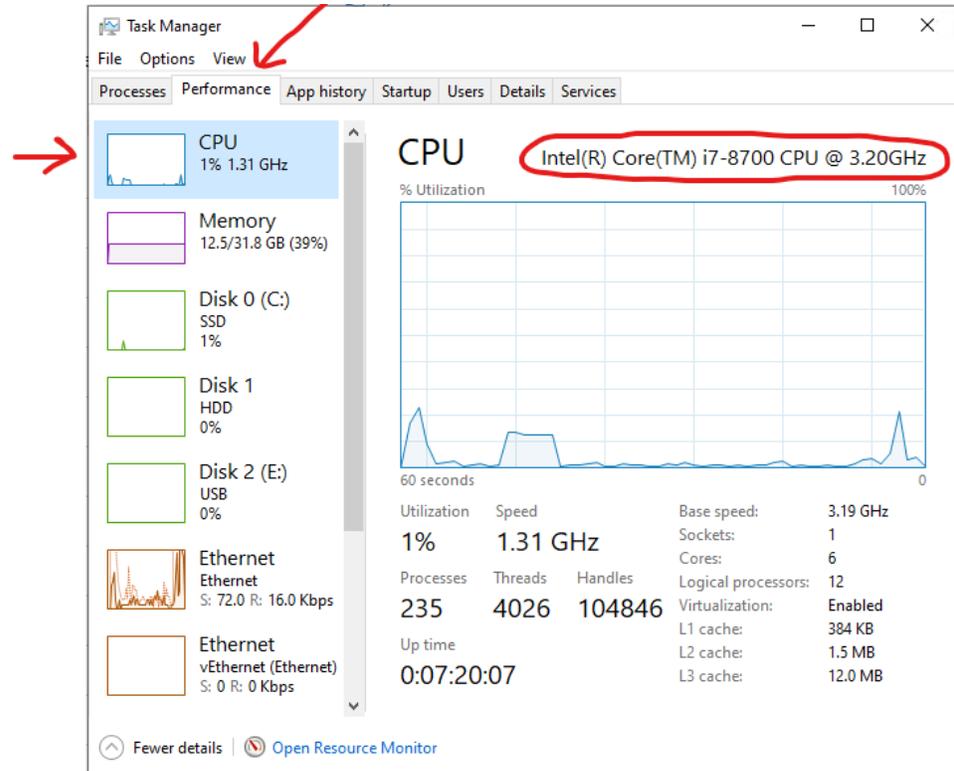


A 4.4 billion year old crystal, a zircon, is the oldest known object on Earth.

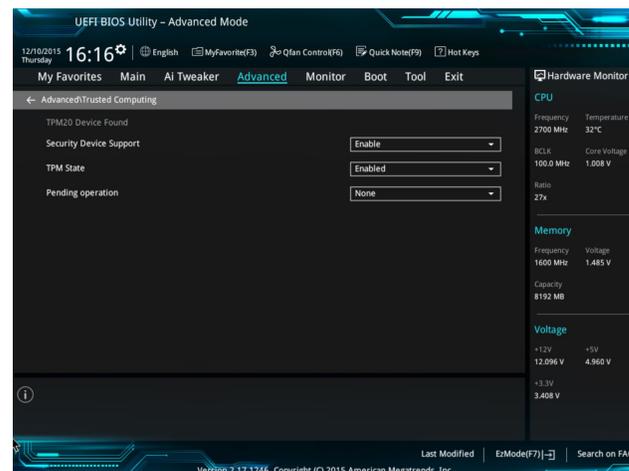


Until the 19th century towns would set their clocks by the local noon.

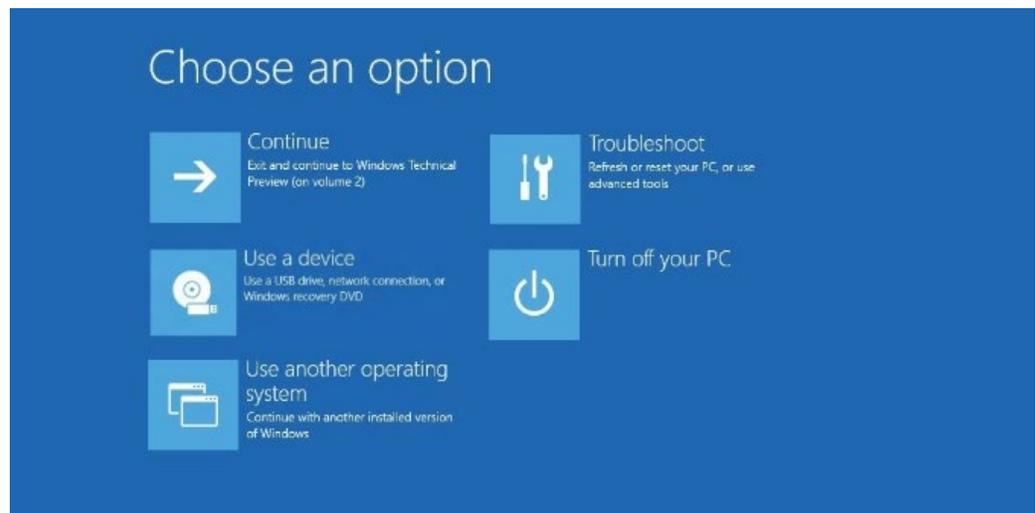
If you are unsure what processor your system is equipped with, fear not! Checking your processor is as easy as opening Task Manager (CTRL+SHIFT+ESC) on your Windows 10 PC and selecting the "Performance" tab followed by the CPU section of the navigation panel. Here you will see the model name of your CPU on the upper right. From here, you can also see information such as your system storage, how much system memory your PC is equipped with, and even what graphics processor unit (GPU) is installed.



If your CPU is not listed on Microsoft's compatibility list, you will be unable to install Windows 11 and get security updates. If your CPU is listed, the next step would be to verify that the TPM is provisioned. This is done by entering your BIOS and enabling the TPM if it is not already enabled by default. Often manufacturers will have different BIOS layouts and nomenclature unique to their own products, so it is best to do an internet search for your brand of motherboard to see where the setting is located. If you are unsure what brand of motherboard you have, it is very likely that the brand's logo will be displayed on the splash screen that shows up when the computer is booted up, but before it enters the Windows environment. The image below is an example of what the TPM settings in your BIOS may look like.



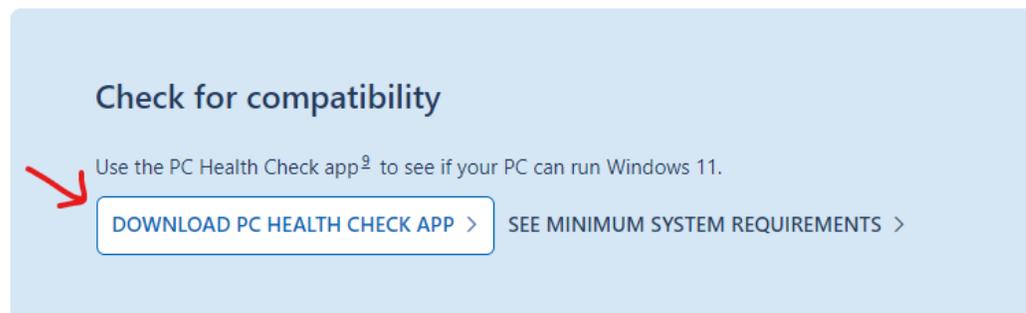
In order to enter the BIOS, the easiest way is to open up the settings in your existing Windows 10 installation by clicking on the Start Menu, then going to Settings > Update & Security > Recovery > Restart Now. When the computer restarts, you will be presented with the Windows recovery menu. From here, go to Troubleshoot > Advanced Options > UEFI Firmware Settings > Restart. This should force your PC to boot into the BIOS menu.



If your CPU is not listed on Microsoft's compatibility list, you will be unable to install Windows 11 and get security updates. If your CPU is listed, the next step would be to verify that the TPM is provisioned. This is done by entering your BIOS and enabling the TPM if it is not already enabled by default. Often manufacturers will have different BIOS layouts and nomenclature unique to their own products, so it is best to do an internet search for your brand of motherboard to see where the setting is located. If you are unsure what brand of motherboard you have, it is very likely that the brand's logo will be displayed on the splash screen that shows up when the computer is booted.

If you would like a simple way to check compatibility, Microsoft also offers a PC Health Check application that will check for Windows 11 compatibility at the bottom of the page linked below:

<https://www.microsoft.com/en-us/windows/windows-11?r=1>



For instructions regarding the operation of this software, please see the link below:

<https://answers.microsoft.com/en-us/windows/forum/all/how-to-check-if-your-computer-or-device-is-windows/79e3db5f-5dc5-430a-94c5-8d4dfe3b053d>

Once compatibility is verified, you may proceed with the installation of Windows 11. This can be achieved by clicking on the Start Menu, then going to Settings > Update & Security > Check for Updates. If your system is indeed compatible, you should see something similar to the image below. Please note that in some cases, it may

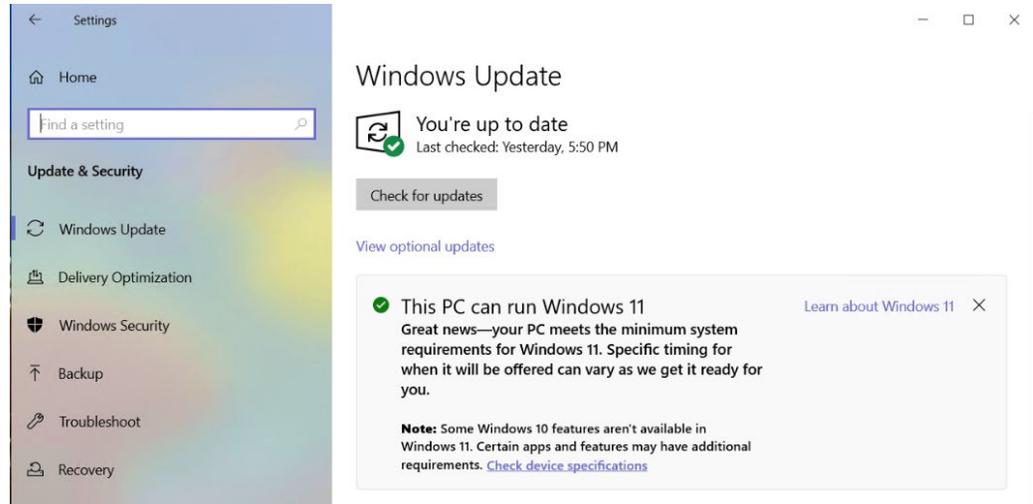


It takes time for light to reach us, and as a result, everything we see is in the past.



**On the planet
Mercury, a single
day is two Earth
years long.**

take 24 hours or more for the operating system to allow the download of Windows 11 after verifying compatibility.



For more detailed instructions regarding the installation of Windows 11, please visit the link below.

<https://answers.microsoft.com/en-us/windows/forum/all/how-to-upgrade-from-windows-10-to-windows-11/fba31ff3-3d77-40db-9726-b1be540fb3b3>

Best of luck!

Intro to Access Databases Part II [Matthew Trammell]

Hello there! In my last article, I introduced you to Access tables and forms. If you have not done so, please check out our April 2022 DSI AITS Newsletter, page 19 for my Intro to Access Databases Part I article. Great! If you have already read my previous article, eagerly awaiting the arrival of Part II, thank you! For those of you that have not... well... I have a quick review for you!

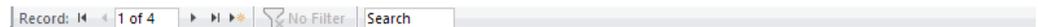
Access has at least four main components – tables, forms, queries, and reports. Tables store data in **fields** (columns) and **records** (rows). Forms let you collect, or **input** data. They also are perfect for viewing data stored in the tables. Our creatively named database, “ComputerInventory.aacdb”, has a creatively named table called “Computers”. It looks like so:

| ID | Department | Status | Type | Manufacturer | Model | User | Location |
|----|--------------|------------|---------|--------------|----------------|------------------|---------------|
| 1 | DSI AITS DSA | In Use | Desktop | Dell | OptiPlex 7040 | Matt Trammell | Chestnut Hall |
| 2 | DSI AITS DSA | In Use | Laptop | Dell | Latitude E7460 | Luke Skywalker | Sage Hall |
| 3 | DSI AITS DSA | In Use | Desktop | Dell | OptiPlex 7040 | Anakin Skywalker | Sage Hall |
| 4 | DSI AITS DSA | In Storage | Desktop | Dell | OptiPlex 9020 | Matt Trammell | Chestnut Hall |

We also created a Form named “Enter or View Computers”. It is a simple, but effective form that looks like this:

The screenshot shows the 'Enter or View Computers' form. The form has a title bar 'Enter or View Computers' and a header 'Computers'. The fields are: ID (text box with '1'), Department (text box with 'DSI AITS DSA'), Status (dropdown menu with 'In Use'), Type (text box with 'Desktop'), Manufacturer (text box with 'Dell'), Model (text box with 'OptiPlex 7040'), User (text box with 'Matt Trammell'), and Location (text box with 'Chestnut Hall').

Forms also have a helpful navigational bar to move between records, add new records, and even search for records!



Great and now we are all caught up! So, I recently updated the main form of our UNT DSI AITS Inventory database. I wanted to share its new look for some form design inspiration. To make more advanced form customizations, you will want to spend time in Design View. To open Design View, right click the forms name and choose Design View. For bonus points, try updating the look of the “Computers” form.

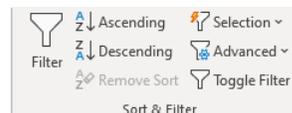


Researchers agree that we get more pleasure from overestimating time than underestimating.



The old adage "time filed when you are having fun" is not true. In fact time seems to pass more slowly.

Now, back to our Computer Inventory database project! Before introducing queries, I want to cover filtering within a form. This is both a helpful feature and a very good introduction to queries. Filtering is essentially a basic select query. It allows you to focus on a select group of records. For example, if I wanted to focus on desktops only, I would left click on the Type field within our form. Then, I would click the filter button, the large funnel button as pictured below:



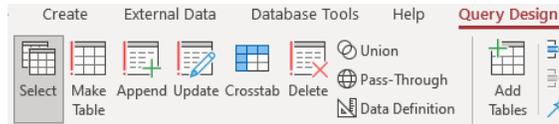
Once I click Filter, a drop down with a list of choices for Type appears (see the left image). My current choices for Type are Select All, Blanks, Desktop, and Laptop. If I happened to have records with other Types, Access would display those Types here as well. I can choose to filter additional fields by left-clicking those fields and apply more filters until I am happy with the resultant group of records. Lastly, I find filtering useful to verify that the data in fields is correct. For example, suppose that I made a typo in the Type field and put Dekstop

instead of Desktop for a few records. I can simply use filtering to find all the dekstop in the table and fix my mistake(s). Alright, let us move on to learn about Access queries.



The Earth's rotation is slowing, making the 24 hour day slightly off. To compensate a second is added periodically. The most recent one took place Dec 31, 2016.

There are several types of queries within Access: select, make table, append, update, crosstab, delete, union, and pass-through.

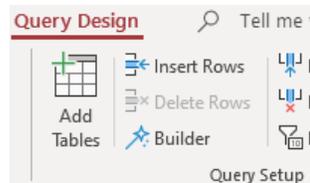


For the purposes of this article, I will demonstrate the select query. For help with select queries, any of the other queries, or for any other Access help you can consult the Access help and learning website: <https://support.microsoft.com/en-us/access>.

Let us move forward and create our select query. A select query is essentially us asking our database a question. First click Create. Then click Query Design of the Queries group:



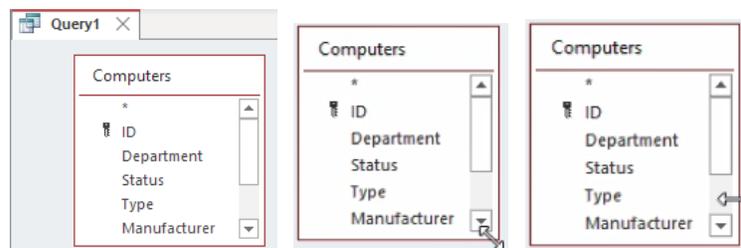
Next, we need to add the table to query information from. If the Add Tables pane is not already displayed, click the Add Tables button under Query Setup:



The Computers Table should show up under Add Tables. If not, double check to ensure that your Access database has a Computers Table. Double left-click on Computers Table to add the table to your query.



If all went well, the Computers Table will show up in your query with the fields expanded. You can resize the table by moving the mouse to the border of the rectangle. Once the cursor changes into an arrow, you can resize the table to your heart's content – or simply use the scroll bar to view all the field names.



Now that we have our table imported into the query, what do we want to know about our list of computers? How about we ask, "Which computers are owned by a Skywalker?" Great! Now, what fields would we like to see? I will choose ID, Type, Model, and User. Because our question is not about status or location, I will



There are
31,556,926
seconds in a
year.

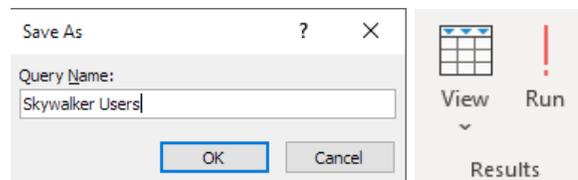
not add these fields. Alternatively, we could add all fields and uncheck the Show Checkbox for each field that we do not want to display. There are many ways to choose the fields that you want in your query. You can use the Field drop-down menu. Or double left-click the field name within the table. I like to use the mouse, so I will double left-click. Go ahead and do that for ID, Type, Model, and User. Your query should now look like this:

| | | | | |
|-----------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Field: | ID | Type | Model | User |
| Table: | Computers | Computers | Computers | Computers |
| Sort: | | | | |
| Show: | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Criteria: | | | | |
| or: | | | | |

Third, we need some criteria. If we do not add any criteria, our query will pull up all computers in the database and this would not help us answer our question. For examples of query criteria, you can consult: <https://support.microsoft.com/en-us/office/examples-of-query-criteria-3197228c-8684-4552-ac03-aba746fb29d8/>. For our question, I want to pull up all users whose name contains Skywalker. So, my criteria for User would be **Like *Skywalker***.

| | | | | |
|-----------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Field: | ID | Type | Model | User |
| Table: | Computers | Computers | Computers | Computers |
| Sort: | | | | |
| Show: | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Criteria: | | | | Like **Skywalker** |
| or: | | | | |

Our select query is complete. Let us first save our query. Click the Save icon in the top left of the Access window or CTRL+S. The Save As dialog will pop up. For Query Name, type **Skywalker Users** and click OK. Now, click Run within the Results group to execute the query:



And here is our query below:

| ID | Type | Model | User |
|----|---------|----------------|------------------|
| 2 | Laptop | Latitude E7460 | Luke Skywalker |
| 3 | Desktop | OptiPlex 7040 | Anakin Skywalker |
| * | (New) | | |

Congratulations! You have successfully created and ran a select query. As I mentioned, Access has other queries to run. I do not have time to go into much detail, but I will try to highlight a few. The make table query creates a new table based upon queried data. The append query adds new records to an existing table. The update query updates multiple fields of existing records. Finally, the delete query removes selected records from the table. Keep in mind though – when you work with queries other than select, it is **possible to lose data** in your table. So **back up your table!** Simply select the table to back up. Right click. Copy. Right click once more and click Paste! As for the crosstab, union, and pass-through queries, I do not have much experience in implementing those queries. I would need to consult the Access help and learning website myself!

The More Things Stay the Same? [Frank Oliver]

Gone are the days where the only food you could get delivered to your home was pizza. Now-a-days you can have anything from McDonald's to Outback Steak House delivered to your home. Heck you can now have groceries delivered to your door. The options are virtually unlimited. Pop quiz: What was the very first food delivery service in the world? (Insert Jeopardy music) ... times up! World Wide Waiter. This service began in 1995, now known as Waiter.com. The delivery service operated in San Francisco Bay area. Mind blown! 1995! Think back to what you were doing at that time. There's your fun fact of the week. You can amaze your friends and drop that nugget in casual conversations. But let's face it these services really exploded over the past 2-3 years, largely due of the global pandemic. Using these services are really convenient but they come with very familiar problems.

Just like in the stone age of only pizza delivery, customer complaints are mostly the same. When things don't go exactly as planned who do you contact if things go wrong... who does the customer blame? I'll only be referring to multi-restaurant delivery websites/apps, i.e., Grubhub, Doordash, UberEats and so-on and so-on. Almost too many to keep up with. Let's run through the most common problems that are associated with these platforms.



3. Side Dish missing or incorrect. 21.4%

The aggravation of discovering that instead of fries you receive brussels sprouts. Kids are disappointed and refuse to eat brussels sprouts.

2. Unacceptably Late. 27.5%

Your order is set to arrive at 7:30 pm but doesn't arrive until 8:30 pm. And chances are when it does arrive it's...

1. Wrong Temperature 28.4%

Of all the complaints this has to be the most frustrating. Cold food is hot or hot food is cold!



 The sun is estimated to be around five billion years old.



**In 1930,
Joseph Stalin
abolished
weekends in
Soviet Russia to
improve
productivity.**

Surprise, surprise. Well not really. These are largely the same complaints customers have had for decades. Data from Zion & Zion's research team found that problems with these multi-restaurant delivery apps have complaints an average of 24.4% of the time. That's extremely high. Imagine a restaurant only had a 75% satisfaction rate. That place wouldn't last very long... Anyway, back to delivery apps. In the past customers would contact the restaurant directly to complain. The difference is unlike in the past, customers are conflicted about who to voice their complaints too. It's fairly easy to report these problems but who do you contact to get the best results. Most people call the restaurant directly (40.3%) compared to (31.4%) that submit a complaint on the multi-restaurant app. Digging into the numbers provide a little more insight on who people point the finger at when certain things go wrong:

Restaurants get the majority of the blame when items are missing 50.7%. While website/apps will receive most complaints about late deliveries 36.9%. Seems about right.

Who should you contact if something goes wrong? Well... It depends on the situation. If you receive the wrong order/missing items, call the restaurant. They most likely gave the wrong bag to the driver. However, if your food is the wrong temperature contact the delivery app directly. But no matter what your problem is (cold food, missing items, wrong order) you should always submit a complaint through the app too, yes even if you call the restaurant. Regardless of what the problem was. The app providers will often offer you some type of incentive and adjust your payment. The restaurant owners and app providers have communication mechanisms in place to fix the issue. Whether that means better quality control on orders or reprimanding the drivers. But don't delay. You should do this once you noticed the mistake. Some apps have time limits on reporting. As an example, Ubereats is 48 hours.

As in the old days there are things you can do to minimize the chances of receiving substandard service. According to Owner.com you should do the following:

- Order early! To prevent most delays and mistakes. The key is to submit your order before rush hours. Plan ahead if you know you'll be ordering food.
- Order healthy before you're starving. This goes hand and hand with ordering early. Similar to the notion that you should never grocery shop when you're hungry. This will also reduce to number of items that you order. Which can save you money.
- Leave clear delivery directions. Things like call me in the event of late delivery, knock on door don't ring doorbell or door is located around back of complex. This will set out clear guidelines for the driver.
- Prep your house. LIGHTING LIGHTING LIGHTING! Ensure the walk way is clear. Drivers aren't there to practice their parkour skills. Make it as easy as possible for the driver to find your location. Turn the porch light on. Put pets inside.



- Always Tip? Drivers are providing a service that you don't want to do. Stormy or hot weather, no matter they'll be there. Show your appreciation by putting in a few extra bucks. And who knows, maybe that driver will remember you and put a little extra effort on your next order.

The process is far more advanced. The options are endless. Gone are the days of delivery radius (well mostly). And while all of this is true nothing has changed fundamentally from the days of pizza only delivery service. The same types of mistakes are made and you should use the same tried and true methods to limit the chances of mistakes on your order. It doesn't matter if you're a regular multi-restaurant delivery app user or just a novice these are some things you should keep in mind.



The bowhead whale is one of the longest living mammals on Earth. The oldest bowhead whale is at least 211 years old.

The Unnerving Truth Behind Wikipedia [Austin Hord]

When it comes to the topic of Wikipedia, most of us will readily agree that it is an excellent source of information. Where this agreement usually ends, however, is in regards to the integrity and certainty of the information due to its open-source nature. Whereas some are convinced that Wikipedia provides more precise information than most primary school's textbooks, others maintain the position that the information should be taken with a grain of salt and that there is a chance of it being inaccurate.

Before we can blame Wikipedia for providing us with false information, we must first understand what open-source is, and how it can become a double-edged sword. If I wanted to, without knowing any information about the topic at all, I could anonymously edit the Wikipedia page on NASA's mission, "Dynamics Explorer" and ultimately put it in a state of disarray packed full of erroneous information. Chances are, anyone that is naive about the topic, wouldn't recognize the misleading facts – especially if the changes are inconspicuous. Granted I don't have the motivation to do something so malevolent; perhaps some bored vandal might.

Another interesting fact I found, which is a complete waste of time on Wikipedia's part, is that anytime someone edits a Wikipedia page anonymously, the IP address (which in laymen's terms, contains location information, but most notably is associated with the given or perceived internet service provider) is automatically saved and essentially takes the place of a username. Which, as I mentioned earlier, is a worthless means of change management. Anyone can drive down to their local Starbucks, connect their laptop to the free wifi, and go on an endless vandalizing editing rampage of Wikipedia articles and nobody would ever know who it was. Another way vandals may guarantee anonymity online while conducting these vandalizing acts is to use a VPN, which stands for Virtual Private Network. It masks your IP address to something entirely different, not associated with any person in any way at all. All of this leads one to question the validity and lack of credentials Wikipedia authors may have.

It is worth mentioning, however, that according to Wikipedia's about page, if an article is deemed as being a controversial topic, which would naturally provoke higher chances of vandalism, the editor must be given administrator rights before being granted editing privileges of the main page. Which sheds a little bit of light on potential vandalism cases. But considering permanently blocked and request to edit pages only consist of a small percentage of Wikipedia, there are a lot of editable pages readily available for the next anonymous vandal to take advantage of.

For someone to become a Wikipedia administrator, they first must prove themselves worthy of such a position by conducting hundreds, if not thousands, of accurate edits. To accomplish this, potential future administrators should expand on stubs and try to build accurate articles to set themselves up for a successful request for adminship. After the tireless hours spent editing, the candidate has the ability to nominate themselves as a potential Wikipedia administrator. Upon being accepted as a nominee, the candidate undergoes various interviews and questionnaires from fellow editors and administrators. Bureaucrats will discuss their thoughts about a potential adminship and determine whether or not they want to provide a promotion. At least for controversial topics, Wikipedia is sensitive to lending some credibility to the authoring of articles.

With accuracy in question, it is no wonder that many academic-minded groups frown upon citing it. An article published by The Guardian states that "Most universities and academics distrust the service, my department's "Essential Guide for Students" leaves no room for ambiguity, warning us: "Never cite Wikipedia." Which supports my assertion that Wikipedia articles lack a certain level of accuracy.

While content accuracy with Wikipedia could be in question, you can't discount the volume of information that is readily available on the internet. At the time of writing this, according to Wikipedia's statistics page, which can not be edited by anyone, there



The hummingbird's heart beats as fast as 1,260 beats per minute.



The original Roman calendar is believed to have been invented by Romulus, the first king of Rome around 753 BCE.

are 6,534,360 English Wikipedia articles. There is no other service available that can make that kind of claim. In 2014, a German-based group called PediaPress tried raising enough money to build a print copy of all of Wikipedia, which in my opinion would be a hilarious waste of resources. In an attempt to help visualize just how much that would entail I found an article published by NPR, that provides some interesting facts, "One thousand volumes, 1,200 pages each — more than one million pages in all — about 80 meters of shelf space." – AKA 263 feet.

Another indisputable fact about Wikipedia is the rapid pace at which information is published. During a recent conversation with my family the topic of encyclopedias came up and (insert – back in my day meme) I was informed that they had a volume of encyclopedias that were only updated annually. However, Wikipedia is currently updated hundreds of times by the second. A compelling quote I found in an article from The Guardian states, "The end of Britannica printing its encyclopedia is really just a footnote in the great story of online access to knowledge" meaning the internet allows the information to be readily accessible instantaneously to anyone at any time. It is the closest thing to meeting the informational demands expected by society today.

In today's day and age, Wikipedia is available on any electronic device with internet access. A far cry from the archaic visit to the library or vast expenditure of cash to access a volume of encyclopedias. Wikipedia outpaces publishing information that historically had been the realm of periodicals and newspapers. Wikipedia has been a natural evolution of the written word from paper, to the ever-so-expanding cloud.

In examining the value of Wikipedia for students' use, I've determined that there are many pros accompanied by just as many cons. There is no question about the volume of information readily available via Wikipedia. However, there is a question as to the validity of the content. The days of hard copy, printed material seem to be numbered, and Wikipedia is but a signpost on that highway. In today's digital age a student carries a cell phone that allows access to Wikipedia and all the information that it contains – it's hard to argue that there's no benefit to that. You can only hope that they aren't naive enough to believe every single detail without question.

[Printing Wikipedia Would Take 1 Million Pages. But That's Sort Of The Point : All Tech Considered : NPR](#)

[Encyclopedia Britannica in the age of Wikipedia | Reference and languages books | The Guardian](#)

[Should university students use Wikipedia? | Students | The Guardian](#)

AI Art [Derek Boyd]

A Shiba Inu dog wearing a beret and black turtleneck. A strawberry frog. These are just a couple of examples of text descriptions being fed into an artificial intelligence system that can produce incredibly realistic and detailed images. The two most notable systems are OpenAI's DALL-E 2 and Google's Imagen. These specific AI systems are not widely available to the public, but open source projects, such as Craiyon, have emerged which let the public play around with a less sophisticated version of the AI image generator. Companies have also tried to capitalize on this technology and create commercialized artistic tools, such as Wombo.

DALL-E 2 was developed using OpenAI's third generation Generative Pre-trained Transformer (GPT-3). GPT-3 is a neural networking machine learning model with over 175 billion machine learning parameters. One of the main functions of GPT-3 is natural language processing. Which means it generates realistic human language. This can be difficult for machines, which do not understand the nuances and complexities of language and human speech. GPT-3 is used for many tasks: creating articles, poetry, chatbots, AI-generated images, and more. The model was trained using a vast quantity of internet data/text to determine patterns. This means that this AI system is not constantly learning but is pre-trained. This can lead to issues such as machine learning bias.

Machine learning bias is when an algorithm produces a systematically prejudiced result. GPT-3 was trained on internet text, so it has a propensity for biases such as gender bias, racial bias, depicting western stereotypes, and gender stereotypes. OpenAI and Google are trying to address this by placing safeguards on their systems. These safeguards intend to filter out any images or text that may be inappropriate or harmful. For example, there are no images of public figures or realistic images of people on DALL-E 2 or Imagen's project pages. There is also some concern that AI-generated art could replace the work of human artists and designers. However, the view on this is mixed. Some artists see AI image generation as just a new tool to help with artistic projects. It could be used to help visualize projects better at the beginning stages or throughout the process.

These are interesting times for computer science and art alike. Hopefully, the future of this application of AI will be beneficial to society and not become a detriment. Many of the pitfalls are known, so special care can be taken. Science progresses much like art progresses, by building on new discoveries and inventions. It will be exciting to see where it develops from here.



In the Roman calendar winter was not assigned to any month. This made the entire year 304 days long with 61 days unaccounted for in the winter.

Technology of the Pandemic

[Jennifer Lee]

Pandemic. Pandemic never changes. Ok, so that is not so much a truth when it comes to innovation on the fly and long term. When adversity struck in the form of COVID-19 we were all faced with an 'evolve or die' situation. Fortunately, evolution came in the form of innovation in the technology present in our society daily. Some of these innovations came in the form of completely new types of tech, while others were a wider acceptance of already existing ones.

Virtual healthcare. A phrase that is almost an oxymoron, became a necessity to so many on every level of care. So much so that pre-pandemic most health insurance companies did not consider it a reimbursable expense. Now the reverse is true in most cases.

Teleconferencing became the new way to work. Now it is widespread practice among a multitude of businesses, including at UNT. An absolute last resort option for meetings that need to be had. Online education for organizations other than colleges and universities is also a change that is likely to stay in place for the near future. Now many schools across the world provide the option for online classes as a permanent option for all age ranges.

Innovation and invention. Some of these are small like hands-free door handles, that little key shaped thing to push buttons on a keyring along with a multitude. Then there are the ones that in the not-so-distant past lived strictly in the imagination or on the screen. Robot delivery vehicles of all types and sizes became something of reality. Then there are the more healthcare focused technologies utilizing the IoT in ways came about because hands-off was the new norm. Technologies like TytoCare, a system that allows remote physical examination of patients. So many more and likely to come.

As all situations have positive and negative effects, so have the events of the past few years. This article lists only a surface amount of them. In a society that is so often consumed with the negative, I challenge you to take time to search out the positive.



The Julian calendar, which was proposed by Julius Caesar, was based on the Earth's rotations around the sun.

Online Privacy and Threat Modeling

[Jacob Flores]

Security and Privacy

We often hear about the importance of cybersecurity - but what about privacy? One might ask: "Why should I care about privacy? I'm not a criminal and have nothing to hide." Though security and privacy are related, they are distinct from each other. For instance, it is not a secret what one does in a department store dressing room after closing the door, but they may still close the door as a privacy measure.

You could think of privacy as controlling what information is shared with others where security deals with how information is protected. They can intersect when dealing with situations such as data breaches. When an online platform fails to secure the personal information you provided, you may feel differently about the information you provide them, or others, in the future.

Financial institutions securing your financial data is particularly important, but your personal data can have similar financial significance. The Bureau of Justice Statistics (bjs.ojp.gov) reported that 68% of cybertheft victims sustain a loss of \$10,000 or more. Cybertheft does not always involve stealing from a victim's bank accounts - rather, criminals use their personal information to open new accounts and rack up charges.

Similarly, ex-burglars have revealed modern-day tactics: cyberstalk victims' social media for patterns on when they are not home and what valuables may be found. Your photos may include geolocation, partial addresses, assets in your home, and even clues on when you are at work or on vacation away from your home.

Threat Modeling

If these details have you even slightly concerned, it is worth considering some action to protect yourself. But before scouring the depths of the internet for what to do, ask yourself a question: what aspects of privacy are important to you?

Enter "threat modeling:" an action plan catered to what you find valuable. Your privacy needs may differ from the President's needs, or even your neighbor's needs, and designing a threat model for yourself should save you much time and effort. Aiming for espionage-level privacy is difficult to achieve and maintain, and may be a waste of your time, so it is best to aim for an attainable balance between convenience and privacy.

The Electronic Frontier Foundation (eff.org) has a straightforward writeup to help you think about the things you find valuable, identify the threats against them, assess the risk, and how much trouble you are willing to go through to prevent trouble.

I find the following table from Techlore (techlore.tech) helpful as it incorporates security, privacy, and anonymity in a tidy package. Simply enter an importance value of 1-3, with 3 being the most important, along with a brief explanation so you remember why that value was chosen should you review your threat model in the future. Understand that the higher the value, the more resources you will need to invest to achieve that goal. Below is an example for John Doe.



A Julian year is 365 days and 12 months with an extra day added to February once every four years.



A normal February is 28 days and a leap year 29 but a few times in history February 30 has been a real day.

| | People | Companies | Governments |
|-----------|--|---|--|
| Security | Physical security is important for my family safety 3 | I require strong security from companies 3 | I generally trust my information to stay safe 1 |
| Privacy | I have a small & trusted community 1 | I will sacrifice some privacy if the services are worth it 2 | I don't see much gain in remaining private from my government 1 |
| Anonymity | I have little fear when it comes to anonymity 1 | Anonymity from companies is important when possible 2 | This is not something I value 1 |

You may even consider making two tables: one with your goals and one with values for where you feel you are now. This may make it easier to identify what to address first. Similarly, you may find you are currently investing too much effort into something you don't value as much.

Your Action Plan

With a baseline understanding of what you find valuable, you can take appropriate steps toward increasing your privacy and security. Not all solutions are technology based. First, and foremost, decide what you are okay with sharing. If you don't provide personal details to people or companies, then there's little to be secured.

In the above example, John Doe requires companies have strong security and is comfortable providing some personal data if the service is worth it. Since anonymity is also relatively important, John may consider using a pseudonym for some services, perhaps those that may have no visibility to friends or colleagues such as cloud storage or business rewards programs.

Second, compartmentalizing your activity can boost both privacy and security. For instance, use different email addresses for your financial or health-related services separate from your more casual online services, such as social media. If a social media service suffers a data breach, the email address associated with your financial and health data isn't exposed and thus less likely to be targeted as a result.

The same could be done with banking. Let's say you buy and sell items online and use a popular online payment service that requires you associate a bank account. You might set up a separate banking account solely for use with that service so that your primary account is not [as] impacted by a data breach or rogue employee.

Lastly, consider using technologies that help you accomplish the goal of your threat model. TheNewOil (thenewoil.org) and Techlore (techlore.tech) cover technologies that help combat "unconscious surveillance" - online surveillance to which you technically consent but may not have considered the unforeseen threats.

Do not be disheartened during your research! "Perfect privacy" is an unattainable utopia. Rather, be encouraged - for each step forward means you've put yourself in a better position, possibly mitigating even one nefarious act against you.

Color Psychology: How Do Colors in Marketing Influence People? [Alexandra Martinez]

Color has long been known to powerfully appeal to our visual senses, and it is regularly used as a marketing strategy. Numerous studies have revealed that specific colors have their own impacts on consumers, with some stimulating the brain in ways that either encourage enthusiasm or tranquility. This makes it simple for businesses and well-known brands to sway their target audience by picking the ideal color scheme.

According to studies, color may boost brand recognition which is directly related to customer confidence by 80%, with an average of 85% of active shoppers citing color as a major factor in their shopping decisions.



Consumer Purchases

According to color psychology, different colors can have a variety of impacts, ranging from elevating our spirits to inciting dread. But may the hue of the goods you buy ever reveal anything about your character? Could, for instance, the color of the car you choose have any bearing on your underlying personality traits or peculiarities?

Your choice of colors when making purchases may reveal something about the kind of image you're attempting to convey. From the clothes you wear to the car you drive; color preferences can occasionally convey how we want other people to see us. The colors we choose to wear can also be influenced by other aspects like age and gender.

Of course, factors like cost, availability, and other practical considerations frequently have an impact on the colors we choose. Additionally, people's preferences for colors might alter over time.

When a person is younger, they could choose bolder, more attention-grabbing colors, but as they age, they might find themselves drawn to more subdued hues. Although the buyer's personality can have a significant impact on color choice, customers are also greatly swayed by elements like price and availability.



In 2011 the population reference bureau estimated 250 babies are born around the world every minute.

In the end, one's needs can determine how color is used in marketing and business. Even though colors may have distinct cultural connotations, savvy product branding will account for this and use the color's known psychological drawbacks to draw in customers.



The number of births per minute is approximately half the number of deaths in the same time frame: 105 people die per hour or about 2 per second.

X-Ray: Student Health and Wellness Center [Jonathan Hons]

Did you know our Student Health and Wellness Center in Chestnut Hall has an X-Ray suite for capturing x-ray studies when one of our medical providers orders for a student patient? Students can even bring in an order from their primary care provider, have their x-rays taken, and leave with the images on a CD. Having this x-ray suite helps the SHWC provide quality health care to UNT students in a timely fashion.

There are three parts to the entire x-ray system. There is the actual x-ray equipment (i.e., the table, x-ray arm and "gun"), the acquisition station, and the picture archiving and communication system, or PACS, that stores the x-ray images. Another piece of the puzzle the SHWC uses, since we don't have a radiologist on staff, is a virtual private network (VPN) tunneling device that sends the x-ray images to a contracted radiologist who over-reads—professionally reviews the images--and provides a diagnosis report back to the SHWC.



Figure 1: X-Ray table and arm

The acquisition station consists of a Computed Radiography (CR) machine and some phosphorus image plates, or cassettes. The phosphor image cassettes are placed in the x-ray table, and when the X-Ray Tech presses a button, the patient is hit with a small dose of radiation that excites and traps electrons in the cassette. Then, the cassette is removed from the table and placed in the CR machine. The CR uses a laser to return the trapped electrons in the cassette to their previous state, letting off violet light. That violet light is captured by a photomultiplier tube to interpret the light and convert it to an electric signal that is digitized into a matrix, creating the x-ray image. From there, the x-ray image gets transferred to the PACS system.



Lightning
hits the Earth at
a rate of **6,000**
strikes per
minute.



**By the time
you turn 70, your
heart will have
beat 2.5 billion
times.**



Figure 2: CR Acquisition station and phosphor image cassettes

CR machines replaced good old film radiography, and now the SHWC is working on replacing their CR machine with a DR machine, or Digital Radiography machine. Digital radiography uses digital cassette plates to capture the images. The digital cassettes are placed in the table like the older phosphor image cassettes were. But instead of taking the digital plates out and placing them in the CR machine, the x-ray images are sent from the digital plates to the DR machine wirelessly. Not only are you not moving cassettes from table to machine anymore, but the digital plates also require a much smaller dose of radiation to create an image.

The CR/DR machine then sends the x-ray image study to the PACS servers. The x-ray tech and medical providers at the SHWC can view the x-ray image studies on the PACS to get an idea of what may be the patient's problem. Then the x-ray tech sends the study to the radiologist via the VPN to make the final call on the diagnosis and write a report, which they then send back to the SHWC usually in a day or two. When the diagnosis report comes back to the SHWC, it is routed to the medical provider to review, then the medical provider discusses the report and treatment with the patient.

If you would like to read more about X-rays and radiation dosages, you can visit the links below.

- [US Department of Health & Human Services website about X-rays](#)
- [X-ray radiation dosage levels from RadiologyInfo.org](#)

Solution to last newsletter's brainteaser

How can numbers 10, 0, 22, and 12 be logically combined into an equation, using each number only once??

Answer - $(22-12) - 10 = 0$