



“WHICH BUILDING SHOULD WE CUT POWER TO NEXT?”

How’s the term treating you, dearest **mathNEWS** reader?

Well, I hope it’s going well. Because, personally, I feel like I’ve been trampled by an army of geese... repeatedly. Every morning it gets harder and harder to fight that inner voice asking for just five more minutes in bed. And I don’t even have a class that it’s that early in the morning. (I’m free from 8:30am lectures!) I don’t know what’s going on, sometimes it feels like I’m more tired after and not before I go to sleep. None of it makes sense.

Also, my motivation for attending my afternoon classes is at a catastrophic low. 1pm? That’s prime nap time. I mean, I don’t actually nap then, but I do need a serious study break because the sleepiness is too much. My current survival strategy is typing up my notes in light mode, hoping that the blinding glare of my laptop’s screen shocks my last remaining brain cell into action. That’s how I’m getting to score some participation points in English and extracting something (anything) from the lectures.

Things are only getting more intense too. Lately, it’s been one test after the other, on top of my weekly assignments and endless literary readings. Oh, and I just survived my first major English essay of the term. I think it’s far from my best work due to the small amount of time I spent on it, but at least I had fun. It forced me to understand the text (*Paradise Lost!*) on a much deeper level than from simply reading it or writing the weekly discussion posts. And, of course, nothing beats the feeling of being done and finally, *finally*, closing all the tabs I had open at 1am.

Working on this essay also meant I didn’t have any time to write something new for this issue. But thankfully, while I was drowning in my assignment to-do list, our brilliant team of writers came through with another banger of an issue. In the upcoming pages, you’ll find:

- *DELTARUNE*’s newest release appreciation articles
- Queer media recs
- Train-planning hot takes
- UW Game Jam updates

Happy reading!

classified
Editor, **mathNEWS**

disgracED
Editor, **mathNEWS**

ANDOIII	The smokestack building? I dunno
USMAN!	DC; encourages its habitants to go outside and take a shower
MOLASSES	laurier. it’s not like they were using it anyway
APHF	Cut power to South Campus Hall to bring it in line with North, East, and West Campus Halls
MEOW	meow
SEXY_SOFTWARE_BABE	My apartment, seeing as most of the appliances are broken anyway
↑←↑→↓→	STC, again
0.423	White House
DOLLAR STORE PERSON	M4
AMIRDADP	M4
AMIRDADP 2.0	PAC during convocation
AMIRDADP 3.0	DC while they’re trying to transfer the data from servers in DC to M4
MYSTERIOUS INDIVIDUAL	[redacted]
NOTOH	OPT when people are doing eye surgery
SNOWDOZER	Pizza Nova
GAYA	mc
THE AMERICAN	the cambridge campus
WASNTMii	All Renison Buildings, they’ve had it too good for too long
DICK SMITHERS	The top secret lab in QNC that contains all of the most advanced and devious research
SEASONEDSLACKER	PAC during my convocation
LARS NOOTBAAR	The power outage factory building (POFB)
CLASSIFIED	MC, as a reminder for students to go touch grass
BEFUDDLED	mathNEWS office. Let me out of here
DISGRACED	M9 and the tower of babel

ARTICLE OF THE ISSUE

Congratulations to **mathNEWS** landmark tournament: san francisco . versus watch dogs 2 by molasses for winning (another) Article Of The Issue. Come pick up your prize, a \$25 Conestoga Mall gift card, in MC 3030, which is unfortunately not in Watch Dogs 2, nor is it in San Francisco.

When is the conclave to elect new **mathNEWS** Editors?

GRACE FENG, **mathNEWS** EDITOR FOR SPRING 2025
ALONG WITH OWEN GALLAGHER, SARA NAYAR, AWAB QURESHI, AND ISABELA SOUZA

mathASKS 158.3

FEATURING POSTDOC PAWEL SARKOWICZ

NO PUN INDENTED: WERE YOU IN SPAIN DURING THE OUTAGE?

I was not. I was in Spain a couple weeks before the outage, but I missed it. Obviously, it's a pretty terrible thing, lots of people's days (and probably weeks, months, and maybe lives) were ruined. I've got some friends in Spain who said that the whole town was just having drinks on patios, having a good time. Obviously, the same can't be said for places like Madrid, where it was a lot more stressful. A part of me wishes I got to experience that—being powerless in a foreign country seems like an experience.

mathNEWS ARCHIVIST: IN mathNEWS 156.2 AND 157.1 YOUR STUDENTS QUOTED YOU INTRODUCING YOURSELF AS MORE HANDSOME THAN MATT KENNEDY. HOW DOES MATT FEEL ABOUT THIS? DOES HE KNOW? HAVE YOU MATHEMATICALLY PROVEN THIS? CAN YOU?

He is aware. How he feels about it? Who knows, he's probably jealous. The mathematical proof is: my age $<$ his age. However, I'm on the precipice of 30, so I'll be old too soon. He is better at math than me though! In all seriousness, Matt is a good guy and I'm happy to have had him as a mentor in some capacity.

CLASSIFIED: WHAT'S THE COOLEST THING YOU'VE LEARNED OUTSIDE YOUR MAIN RESEARCH AREA?

Probably Gödel's incompleteness theorem: more or less, there are mathematical statements that can't be proven. This, at least, is a decent TL;DR; there are obviously technicalities under the rug. It's pretty wild. There is also a notion of "continuous logic" which is pretty cool.

PMATH ENJOYER: HOW DID YOU GET INTERESTED IN OPERATOR ALGEBRAS?

I did a USRA term here at Waterloo back when I was an undergrad. I was super into tensor products after taking a noncommutative rings course with Jason Bell, and then Laurent Marcoux had me studying nuclear C^* -algebras (which have a relation to tensor products) during my USRA term. Sort of just fell in love with the subject from there. I've probably thought about C^* -algebras at least once a day, more or less, since then. Obviously you can't "see" a C^* -algebra, but to quote a friend of mine, they are "aesthetically pleasing." Whatever this means, I agree.

TIRED STUDENT: WERE THERE ANY CLASSES OR TOPICS YOU HATED AT FIRST BUT ENDED UP LOVING?

Linear algebra and analysis. I couldn't even multiply matrices at some point... These are more or less what I do full-time now though. They just didn't click at first, but I'm stubborn and I just kept at it. I'm still keeping at it.

LEAH: HOW DOES BEING A POSTDOC COMPARE TO GRAD SCHOOL?

It really does depend where you did grad school and where you've got a postdoc. I don't mind sharing my experience. The pay is slightly better—but let's not get ahead of ourselves, it still ain't great (especially considering the cost of living in Canada right now). Otherwise, the freedom you have is nice, and people are willing to put their trust in you. It is sort of a sweet spot—you've "learned" how to do research at this point, you can teach and take part in certain aspects of graduate education, and you're temporary enough that you can't sit on any serious committees. Not that serving on committees is bad, but more responsibility can be stressful, and this leaves time for other things.

A similarity would be that you still constantly feel defeated and compare yourself to your peers. At least this has been my experience. I doubt I'm the only one.

CLASSIFIED: WHAT'S A HILL YOU'RE WILLING TO DIE ON?

Mt. Everest. I hear it's a pretty big hill. Mt. Fuji seems alright too and my experience with Mt. Fuji will probably kill me anyway. I hiked up it last summer in a t-shirt and I didn't wear sunscreen. I think I will be prone to skin cancer in the next couple of years.

Jokes aside, here is a controversial thing that I won't budge on: I am not obligated to vote (not that I'll never vote; I have in the past and I might in the future). I know that many many people have a problem with this, but it is a hill I'm willing to die on. I get the choosing the "lesser of two (or three or so on) evils" approach, but to me voting means giving my voice to someone. If you have something good to offer (I'm convinced everybody does) but we can't agree on basic principles, then you still don't get my voice. So, if everyone sucks, I'm not going to vote. People should be more radical if they want actual change. (As a first step: BDS, contact MPs, sometimes just walking out is a statement on its own, protests, etc.)

🧐: WHAT'S A HOBBY THAT KEEPS YOU SANE?

Probably a mix of two things: the first is reading. I think it's important to learn a bit of philosophy and history (probably anything that isn't math might help keep me sane though). It's sort of a new thing—for someone about to turn 30, I've read an embarrassing amount in my life (non-math anyway—for better or for worse, I've read plenty of math). The second is just good ol' exercise. I've gotten a bit into calisthenics, and I enjoy climbing.

I've also recently sunk my teeth into fountain pens. They're pretty cool, and not a bad tool to have if you're writing (or scribbling terrible math notes) all the time.

CLASSIFIED: WHAT'S SOMETHING YOU WISH YOU KNEW BEFORE STARTING RESEARCH IN MATH?

How to do math research. I wish I could know how to do math research even now. It's hard. Sometimes nothing makes sense and you're just banging your head against a metaphorical wall. There is hardly ever a clear-cut way to solving a problem, or even what your problem is sometimes. I'm usually convinced that the last time I proved something will just be the last time I prove something, ever. The only thing one can do is keep trying.

COFFEE ADDICT: WHAT'S THE BEST COFFEE ON CAMPUS?

The most convenient coffee. Let's be real, most campus coffee sucks—and if you've ever had really good coffee (thank you to my brother for giving me this experience), there's just no hope of matching that on campus. So you may as well just go for the most convenient thing.

Side note: I quit drinking coffee about two to three months ago after over twelve years of having something like three or four coffees a day. I still feel empty inside... Decade plus long habits die hard...

UNLUCKY: WHAT'S THE LUCKIEST THING THAT'S EVER HAPPENED TO YOU?

Getting to spend the last thirteen years with my wonderful dog, Bella. She's still kicking, but she's having a harder time in her old age. I even dedicated my PhD thesis to her.

QUESTIONS ABOUT THE CANON OF THE ATLA WATERLOO FAN FICTION

Dear author of the Waterloo ATLA fanfic,

- How much of the show has happened by the time your work begins? Where are the characters in their arcs? If Aang and Katara are already together, presumably we're towards the end of the show? But it doesn't seem like Azula is insane yet?
- For reading week do the Water Tribe people go back to the South Pole? Are there flights there or do they have to ride bison?
- Do the four nations even exist? Is Canada a fifth nation or is Waterloo a nationless city-state style thing?
- Does the modern scientific understanding of the periodic table apply to bending? Are there iodine benders? Arsenic benders? Ununoctium benders?

Yours questionably,

aphf

NO ONE KNOWS HOW TO MAKE A GOOD MINECRAFT PARKOUR MAP

As you might know, everything in *Minecraft* happens in time intervals of “ticks.” There are twenty ticks in a second, so the tightest possible timing for a button press is a single tick, 0.05 seconds. This is tight, but compared to frame-perfect inputs in 60fps games, it's three times wider, so it should in theory be decently lenient. Which it is, but only sometimes. If you have a good visual cue, you can generally hit the “tick timing” with 100% accuracy. However, if you don't have a visual cue, you have to sort of guess. The trouble begins here, because inputs are only checked at the start of each tick. So if you hit inputs in perfect fifty millisecond intervals, you could in theory always do the tick timing correctly, but no human can do that. And if you're just a little bit off the timing, then there's a small chance that you fail the timing just based on where the starts of the ticks are in relation to your inputs. So often you will find yourself failing tick timings through what seems like no fault of your own.

The unfortunate downside to having a long tick length is that movement changes drastically based on the timing of your inputs. In many cases, it can be the difference between landing or missing a jump. Many of the older parkour maps which were very hard were littered with tick timings that felt very unfair, since you would be failing a jump even though it felt like you did the inputs correctly.¹ But we don't have to deal with these annoying tick timings, because there's another way to increase difficulty in parkour: turning. It is a skill to be honed, but you can create maps which are much more fun by having your jumps be turn-based instead of timing-based. Every jump will still probably have some timing, but there are ways to mitigate the aspect of luck when you design it. For instance, you can make the timings far apart to give the player adequate time to react to visual cues.

Okay, so tell me, why the fuck do most of the new hard maps I see people make, contain so many fucking tick timings? It's known to be annoying. It's the lowest, least interesting form of difficulty in gameplay. So why do people still do it? It's not rocket science to create more enjoyable jumps. You can't be telling me that people actually enjoy failing tick timings over and over, just running at the wall until they break through. When you design gameplay, can people maybe set aside the difficulty aspect for a moment and make it actually fucking fun to play?

hyperlynx

1. There are ways to get around forced tick timings most of the time, but they generally take longer to execute and interrupt the flow of the gameplay, so it ends up not being much fun anyway

DEFINING MYSELF, AS A PERSON

As some of you may know, I was diagnosed with ADHD inattentive-type around the beginning of 2021. Fewer of you will know that I also got diagnosed with Autism Spectrum Disorder (ASD) back in April of this year. Ever since then, I've been grappling with my own self-concept and trying to figure out who I really am, if you were to strip everything else away.

This is not a new struggle for me; I've been trying to figure out who I am to some extent for my entire life, and have consciously asked myself this question without an answer for years now. I have a half-written article sitting in my drafts folder right now that I started a couple of days after receiving the 16 page document, that I refer to as my version of The Autism Docs™®, that describes so many aspects of what I thought to be my personality better than I ever could. I won't be publishing that draft, as it is too focused on specific events, while neglecting the greater picture. In some ways though, that draft is rather similar to this one, trying to tease apart which experiences in my life were just me, which ones were because of how my brain is structured differently, and which ones were because of coping mechanisms I developed in response to how I experience the world.

I know that in reality these are not entirely separate groupings into which experiences can be neatly categorized. There's far too much gray area between the three for any distinct event to be completely explained by just one of these. Unfortunately, some part of me has yet to accept that fact, and continues to ruminate and incessantly attempt to categorize despite my best efforts to put the whole topic to rest. I suspect this probably has something to do with the black and white thinking that is typical for autistic people, and this is further confirmed by this being one of the autistic traits that was focused on in my report specifically.

Usually, this would be relatively harmless. Somewhat arbitrarily categorizing past events in my own life, just in my own head? Doesn't really seem like the kind of thing that is particularly harmful. A side effect of this process, however, is that I have begun to question who I actually am as a person. This, as you may expect, has not had a particularly beneficial effect on my self-concept. The more I examine my past interactions and behaviours, the more my sense of self evaporates into dust as I realize that I can explain more or less all of them as direct results of being a woman with autism and ADHD.

As an example, take how I react to plans changing at the last minute, or even just the day of. For the longest time, I couldn't comprehend the extreme level of stress this would cause me, especially seeing as I myself am chronically late to things and frequently cancel last minute to just stay home instead. With the insight given to me through The Autism Docs™®, I can now explain that this is because the change in routine, even if a large majority of that routine is what others would consider "doing nothing," still feels incredibly disruptive to me. This had even gotten to the point where I started to develop two main ways to manage this stress. The first was more reasonable, asking people to let me know as soon as possible

if plans were being made or changed, ideally at least 24 hours in advance. The second was less reasonable, as I started to lie about having headaches to the point of preferring to stay in a dark room for a couple hours straight rather than going out to whatever the event was for even just one hour.

Okay, so let's try to categorize this example. Strict adherence to routines and intense reactions when they are changed was described as a characteristic of ASD in The Autism Docs™®, so that falls into brain structure differences. The off-handed mention of being chronically late to things fits also fits into this category, but due to inattentive ADHD brain structure. Asking people to let me know in advance of any changes or additions to plans is not a characteristic of ADHD or ASD affecting my brain structure, but it sure does fall into the category of developed coping mechanisms! My second method of managing stress falls more into the gray area between these two categories, as it is a coping mechanism, but it seems to partially be derived from sensory overload stress, which is also described in The Autism Docs™®.

So everything left over once those two categories have been dealt with must be me, right? Something core to my personality, perhaps? So what's left in this example, then?

...

Nothing? The only thing really left is that the majority of my interrupted routine in this example is "doing nothing" from other people's perspectives. This, as you can probably tell, is not very helpful when it comes to attempting to describe my personality. Maybe it helps others to dismiss me as "lazy" or "not trying hard enough." Good for them! That's still not very helpful for my own self-concept though, as that's just how I appear externally, and doesn't describe anything intrinsic.

Okay, maybe it was just a bad example. Maybe I just need to examine other occurrences. Except here's the core of the issue: this happens with every single event, action, experience, and repeated process I examine from my past that I can think of. And I'm left wondering, if every aspect of my existence can be described as a result of my brain structure and learned responses, then who am I? Am I defined entirely by choosing one coping strategy over another? I feel like there's more to me, but if I can only describe myself through this, then can I really say that's the case?

I don't know yet.

And that is what truly terrifies me.

Sexy_Software_Babe



MY FAVOURITE GAMES FROM THE UW SPRING 2025 GAME JAM

Another term, another University of Waterloo Game Jam! The Game Jam is a game development sprint where students come together to make a game from scratch in a mere 72 hours. (If you've ever done a hackathon, it's a lot like that.)

The theme of the jam was *Stay Fresh*, and people interpreted that in many wildly different ways. Some people made games about staying socially relevant, others made games about defeating stinky anime fans, and many more made games about cooking using ingredients before they go bad. And, of course, one group ignored the theme altogether and just made something in Roblox.

As I write this, it's the Monday after the Jam, and I'm totally wiped. I don't have time to write a good article, so instead, I'm going to tell you all about my favourite jam games I played when it was all over.

HORSE HEARSE

I am extremely biased, because I am one of the developers of this game, but I think it's really good! It's about a horse hearse driver who needs to deliver dead horses to the glue factory before the bodies rot (ie: the bodies need to *stay fresh*). It's played from an isometric perspective, with the steering wheel and phone in the corner of your vision, as you (the horse) are looking at your GPS instead of the road. Reckless driving is encouraged. It's poorly balanced and way too difficult, sorry about that!

A GAME ABOUT BEING MOIST

This is a deceptively simple 2D platformer with really good pixel art. You play as a little water blob which needs to make it to the end of the level without totally evaporating (ie: you need to *stay full of freshwater*). I kept thinking "there's nothing else they can do with these mechanics" and every time I was wrong. There's a lot of really nice polish, too: a nice menu, level select, slide transitions to and from the levels, etc. Those special touches tend to be left behind in the mad rush to finish most jam games, so they're very appreciated here. I only wish the character controls weren't so slippery—but maybe that's intentional given that you're playing a drop of water?

SUPER AWESOME FRESH MILLENNIAL BURGER

The advice I always give people when they start jam games is this: "keep it simple." Players won't want to understand complicated mechanics, and you won't have time to properly implement them anyways. I'm happy this developer ignored me. This is a Balatro-like deck builder based on creating burgers which will score a minimum amount of points. It's funny to put ingredients like "Cookie" and "Tiny Horse" on your burger, but the real genius of this game is that you need to make 3 different burgers in a row using the same deck, so you need to make sure you have enough points left in your

deck to make each burger pass, but you also want to get *over* the limit on certain burgers because that gets you money to get more cards. Threading that needle is really compelling, and really helps this game *stay fresh*. (Okay fine, that one was a stretch.)

WITCH, WASH, WEPEAT

Remarkably ambitious for a jam game, this game is about exploring a gigantic 3D Unreal Engine map to collect various pieces of clothing to wash so they can *stay fresh*. The platforming is pretty precise and finicky, but it's also the only jam game I've played so far you can bunnyhop in, which makes it the best-controlling game in the jam by default. I am in awe of the developers' bravery for including an online multiplayer feature in this game, even if it doesn't work.

BILLIONAIRE GLADIATOR

Ever wanted to see your most hated billionaire's net worth go to zero? This simple clicker game lets you indulge that deep-rooted fantasy. It's great to watch iconic characters such as "Elon Musk" and "Mark Zuckerberg" fail to *stay fresh* (if the word *fresh* in this case actually meant *financially solvent*). Also, it was made directly in Javascript and not in a game engine, which I'm always impressed by.

Whoops, looks like it's ten minutes before the **mathNEWS** article deadline and I have yet to submit! Looks like I won't be able to describe all of my favorite games. There are a ton more jam games you might want to try (26 in total!), so I really encourage you to check out the [itch.io](https://itch.io/jam/uw-gdc-game-jam-spring-2025/entries) page here: <https://itch.io/jam/uw-gdc-game-jam-spring-2025/entries>



WHAT'S THE DIFFERENCE BETWEEN ENGINEERING AND RESEARCH?

Engineering is applying what you know, research is learning about things you don't know. Engineering might involve using a hash map because it's good enough for the problem. Research might involve enumerating different design tradeoffs and usage patterns of a hash map to try and model all problems/solutions.

Most jobs have both engineering and research aspects. You may need to research how to “future-proof” a system (the definition of which is yours to research). Then you need to engineer your proposed solution into a project. Your job title mainly *suggests* what your main job is supposed to be. Especially in startups, you'll find that you wear many hats, and are expected to engineer solutions end-to-end anyways. If it wasn't for keyword-chasing, all of my internships might as well have been called “software engineer intern.”

Engineers tend to make more money than researchers. To give an example, math professors at UW earn as much as a FAANG new grad (around \$200K), even though many of them have the skill to reach L7. This is because engineers are closer to the money (ie. paying customers), have a higher chance of success (since you're mostly doing integration), and yet get the credit for what's really library functionality. By contrast, nothing is guaranteed in research. Many researchers spend years on projects that are later deemed “not viable,” and it's not because they're not smart—it's because the problems they're working on are just that hard. I would argue that most interesting research ideas out there are completely intractable to most people (think of all the negative results in AI research). So we end up in this paradox where you can be the smartest researcher in the world, and Wall Street still thinks you provide less value than a senior FAANG engineer.

So why do research at all?

- Personal development: Despite taking as many hard CS courses as I could during undergrad, I felt that I only understood the concepts at a surface level. It turns out that people develop at different rates and are destined for different roles. If you're someone who has great academics but struggles to keep up in the industry, this could be a sign you need to spend some time doing research.
- Working with smart people: What would you give up to work in the same team as some of the big names you look up to? It's not a given, but being surrounded by really smart people will accelerate your growth.
- Working on the things you want to work on: You may think you can learn and enhance your skills while working, but in practice this is very hard to do. Simply put, you just run out of stamina and time by the end of the day. Sure, web dev can pay just as much as specialist jobs, but it's better to work on the things you actually want to work on.

Rather than seeing engineering and research as polar opposites, I consider the two skills to be complementary to each other. Engineering helps focus your attention to “quickly getting things working first,” which helps give you more time to work on the interesting stuff. Research enables you to work systematically on problems when your current understanding fails you. Two sides of a coin which combine to make a well-rounded piece.

SaltOverflow

WHAT MY EDITOR NAME SHOULD HAVE BEEN

Call me alias gracED the way I've been killing it.

Does this mean I'm doing a great job? Or a terrible one? Who knows! Also I'm stuck in MC but I will soon be freed (graduation).

disgracED

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UW'S BASTION OF ERUDITE THOUGHT SINCE 1973

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POLISHING OFF MY COMPLAINT LIST

All my articles are complaints but I am running out of things to complain about. This is probably a good thing since it means I am not accumulating more than one thing to complain about every two weeks. I actually haven't added anything to my complaint list in quite a while. I must have less hate in my heart than I did in previous years. Those who know me in person may find that surprising because I still have a lot of hate in my heart.

Everything that is left on my complaint list is either not a big enough thing to write a whole article about or I just don't feel that passionate about it. For that reason, I am just going to put a few small complaints in this article to get them all off my list and then I will have to figure out a real thing to write for the next issue.

First off is subscription services. This can basically be generalized to corporate greed. Some things make sense as subscription services. I think music streaming is good, although it absolutely fucks creators out of the money they would have been making. Back when Netflix came out it was also great. Nowadays, we have a hundred streaming services that all have different stuff. Not even like one show is on service A and the other show is on service B, in some cases it's different seasons of the *same* show on different platforms, because fuck you. AND now we have ads on the streaming services. Remind me why this is better than cable. It's no longer ad free, it's no longer cheap, since you have to pay for several services to get what you want, and as such, it's no longer all in one place. The only benefit is that you can watch it on your phone while in class.

We're also starting to see subscription models for video games which I hate. Why do you want me to keep paying money to play the same game? I get that it costs money to run servers but that cost is miniscule compared to what it costs to just buy a game. Let me just buy it and own it.

Companies are just making a subscription plan for some shit that is not needed but they try and tell you that you need it, like AllTrails Premium. They're also adding subscription fees to things to make them seem like a better deal just so you sign up and subsequently forget you're paying for a subscription. What the hell even is Uber One?

This brings me to my next topic. If you get food delivered you are a lazy bitch. Food should only be delivered if the restaurant making it does their own delivery. Ordering a DQ blizzard for delivery is criminal. I used to work there and people would be paying like \$12 for one ice cream because they were getting it delivered. If you are getting food, at least earn it by going out to collect it. Food delivery as an industry severely underpays its workers and just allows everyone to get lazier. Don't even get me started on people who get groceries delivered. I hope the Instacart guy gets you the grossest brownest bananas in the store. Go get your own groceries.

Getting food delivered is too easy. I assume anyone who regularly uses food delivery apps must be rich because I would spend so much money on food if I used those. It almost doubles the cost of your meal and takes all the effort out of getting it, so there's no reason for you to stop and think, "Is this really worth it?" Waterloo students will really do anything to not touch grass I guess.

This one is pretty niche and irrelevant, but I used to have an app on the Google Play Store that was totally plagiarized from a web game I discovered in grade seven, but that is not relevant to this story. At some point, I was told in an email that due to some changes to some policies on the Play Store, that my app was unlisted until it became compliant. I decided I didn't want to fix my app, so I tried to just delete the app from my developer profile. I could not. For some reason known only to God and the people at Google (same thing), in order to remove my app, it had to first be listed on the store properly, meaning I had to make it compliant with the new rules. I couldn't be bothered, so I just left it. I tried to delete my account, I tried reaching out to support, but it was impossible to delete anything until this app was fixed.

This only was resolved recently when they overhauled the developer console entirely and said they were deleting any accounts that didn't migrate. They gave me a choice of a few deadlines to pick when I would have migrated by, so I picked the earliest one and then continued to do nothing. My account is now gone, but damn it took like eight years or something to delete that app.

Last complaint, and I'm running out of space. CBC has the rights to show playoff NHL games on TV for free. They used to also stream the games online, but at some point, I think Rogers and Sportsnet realized that their agreement with CBC didn't cover streaming, so now, if you want to watch playoff hockey and don't have cable or satellite television, you have to subscribe to Sportsnet.

Fuck you Rogers you greedy bastards. I reached out to my MP to try and get a law passed that forced them to give the streaming rights back to CBC but I live in a Conservative riding so he said there was nothing he could do.

In conclusion, the capitalist machine keeps moving, and the Rogers office in Calgary¹ has a lot of breakable windows.

Yamnuska

1. <https://maps.app.goo.gl/gUvfmAP2fhQN2tr7A>



RANKING SONGS FOR NO PARTICULAR REASON

NOTHING TO SEE HERE

F.O.D. BY GREEN DAY — 9/10

If you're looking for a song to dump all of your anger and hatred for one person into, lemme tell you, this is it. From a lyrical perspective, it's repetitive for a Green Day song. However, it still tells a story, of one finally being done with someone who wasn't truthful. There's also the line, "Let's nuke the bridge we torched 2000 times before," implying that the original relationship was already shaky at best. From an instrumental perspective, we have the acoustic half, detailing the past, and the electric half, telling us the point of the song. It's healing, scream-singing this song, and I recommend it highly.

THAT SONG BY BIG WRECK — 8/10

The first verse is something I want to make a music video on. It's about the aftermath of losing someone, and can be about grief or break ups or drift-aparts; whatever causes a rift between you and them. The reason for the 8 is because of the second half of the song causing me absolute misery listening to it, despite me not caring for the lyrics. The instrumental composition makes me feel like a divorced white dad with an old car, which is to say it's a banger.

SPARKS BY COLDPLAY — 9/10

Emotional damage. That's it, send tweet. The first verse is for when you let someone go but you can never find it in you to fully hate them because despite everything? You kinda wish them the best, just as long as it's far from you. And with social media and photographs, no one's ever really *gone*, you just can't quite reach them. Now the second verse... that's for a different **mathNEWS** article methinks. The lovgirl in me really likes this song, and Coldplay is cool.

BIRDS DON'T SING BY TV GIRL — 10/10

Not my favourite TV Girl song BUT for the lyrics and my life right now to be syncing up like Bluetooth? Yeah. Banger. And while all TV Girl beats are so amazing, giving a modernized touch to very very old songs, this one feels really soothing. Now the lines "As far as I'm concerned, we could've had a good time, so | If you walk out that door in disgust | I guess there's nothing more to discuss" in relation to my life could come from both sides and *that's* why it's a 10/10; One party is too sensitive, the other not enough, and both have their reasons to walk and stay away. Absolute cinema.

ENOUGH FOR YOU BY OLIVIA RODRIGO — 7/10

I had a dream with you and I, and while I don't remember much, I remember hearing you say that the only reason why I was talking to you was to get your validation. Oop—

Now, while validation seeking in large doses isn't recommended (you shouldn't change for one person, Olivia), if you don't feel cared about in a relationship (platonic or

otherwise), I believe that you should bring it up. HOWEVER, if the other person makes you *beg* for your needs to be met AND the needs are reasonable but they're making it seem like you're asking for Elon's net worth, while MIND YOU, you're doing this, that, and the third for them??? Put the fries in the bag, they don't like or respect you. One thing I know is that being made to feel like you are insignificant by anyone is a reflection on them, and Olivia deserved better.

As did I, but they made their choices.

Now, for a purely musical standpoint? I like my songs to have some form of drums and electric guitar. While it's soothing and reflects the lyrics quite well, I don't vibe with it the way I usually do.

Anyways, decent song, better album.

Mantis

N REASONS WHY YOU SHOULD RANK ZOHRA MAMDANI IN THE 2025 NEW YORK CITY DEMOCRATIC MAYORAL PRIMARY

- <https://x.com/ZohranKMamdani/status/1930938578781020183>
- Publicly-owned grocery stores is such an incredibly communist idea it actually sounds good?
- Holy shit Finnicizing New York City? Baby baskets with essential goods and resources for new parents
- Free buses :)¹
- Stopping the rent going up will stop rent from going up? No way
- His team knocked on more doors in one day than Eric Adams won by in 2021
- He emotes so much with his shoulders²
- This one's for my grandparents: He has JFREJ's³ endorsement
- Also he's literally hot

RapidEyeMovement

1. <https://www.instagram.com/p/DKMkNGuOR26>

2. <https://x.com/ZohranKMamdani/status/1932228713761906937>

3. <https://www.jfrej.org/about>

THERE'S SOMETHING SPECIAL ABOUT DELTARUNE

OR HOW I LEARNED TO STOP WORRYING AND LOVE THE ORIGINAL STARWALKER

Major spoilers for UNDERTALE, DELTARUNE chapters one and two, and minor spoilers for DELTARUNE chapters three and four.

I remember, back in middle school, a friend telling me about this new funny RPG with skeletons or something. He had high praise for it and I was bored, so I started playing. At one point, a flower crashed my game, and I thought it was a glitch, so I rebooted it, and nearly fell out of my chair when a jumpscare appeared in the normal intro. I wouldn't finish it without someone else beside me after. The ending concluded with a simple thing: after all of that, a hug from one of the characters, and that broke me. I rarely cry at media, but I was drowning in tears at that moment. And the powerful thing about it: there was barely any dialogue, no dramatic music, a black background. The simplest moment conceivable. How is the game's creator able to play with our feelings in this way, and what can we learn from it?

The first chapter of *DELTARUNE*, a spiritual successor to *UNDERTALE* by the same creator, was released in 2018, and just last week, the third and fourth chapters (out of seven!) have finally come out. The excitement and popularity of new chapter drops probably diminishes just a little with each one, but that's not the point: Toby weaves his story, taking as much time as needed, and with these new chapters, reveals something extraordinary brewing at its core.

DELTARUNE is not like most other RPGs. Ask anyone who's played it so far, and they'll struggle to name another game that makes you *feel* as much as this. And it's... strange, because in many ways, it's remarkably normal. You play as a kid with a couple friends (one magical) stumbling upon some portals to alternate worlds, who discover their destiny is to seal these portals and bring balance to dark and light. Standard fantasy buildungsroman. And most of the first chapter feels just like that. Yes, the gameplay is decently fun, it's definitely polished, but it's just an adventure game! And then something starts to happen.

After your first set of adventures, your magical friend gives you and your other companion a couple rooms in their magic castle, a place he tells you is supposed to be "an escape from what's happening out there." And you begin to realize that applies to your real life too. Not from the wildest and most absurd parts of your adventures, but from miniscule, little interactions that *you* got to choose throughout the game so far—like recruiting enemies to your town instead of using violence, or telling your magical friend your character enjoys spending time with them and that it isn't weird, and pushing your reindeer friend to finally start (kind of???) showing her feelings to your dinosaur friend—everyone you interact with doesn't just feel like an NPC, there as a means to an end, but as the ends themselves, as tangible personalities with complicated stories that could have gone many ways.

And once *that* is solidified, the game is ready to play with those established sympathies. We discover that the our character

is their own personality, with separate intentions, which we are actually taking over and treating as a vessel; when the character's independence is introduced, it's presented more like a possession, a simple case of an evil demon taking over our character. But we see this alternate-player's *humanity* come out when we lose control of them again in chapter 4; they pour themselves a glass of chocolate milk, and improvise on the piano, which you may listen to for a good ten minutes if you so desire. (Another wonderful detail: this performance is not a perfect, practiced recording, but is full of flaws and tiny mistakes.) Thus, we begin to wonder whether our intentions or our character's intentions are the correct ones, and where they align.

And we double down on establishing the importance and independence of the rest of the cast: we get paragraphs upon paragraphs of dialogue between our reindeer and dinosaur friends, alone, not suddenly falling in mad love and admitting their feelings out of nowhere to get the story moving, but instead, just the most normal, human (uh, monster?), conversations between two clueless teenagers who seem to like each other but can't properly articulate their feelings. Love and friendship are not simplified and quantized in the real worlds of this game, despite the outlandish nature of the adventures, and that is incredibly important today, where more and more people are getting the wrong ideas about socialization—old and young both—from media that can't be bothered to portray it correctly.

And that is the essence of what *UNDERTALE* and *DELTARUNE* do different. It understands our relationships are about the little moments, and nobody is the center of attention, even the protagonist. So many great games, RPGs included, are tons of fun, and might even have some great characters and decent dialogue, but still feel profoundly... alone. You *KNOW* you are special in these worlds, and the others are useful pawns at most. But that power is diminished here; you are forced to acknowledge that you don't even have full control over the very entity you're supposed to pilot. The characters act with their own intentions in *DELTARUNE*; just see the chapter 3 minigames where your friends will wander off on their own and make their own decisions, even choosing different answers in quizzes when they don't believe you. Aggressively fighting against this will result in unpleasant consequences, resulting in disturbing scenes where characters are traumatized or permanently harmed, which the game does not forget and will remind you of frequently. Media which makes you feel included, and not excluded, is what a society with so much hurt and rejection needs.

That's not nearly everything, but I hope that serves as an adequate introduction to why *DELTARUNE* is different. To learn more, play it, and challenge yourself: challenge yourself to *feel*.

epic_waterman

THREE OF THE COOLEST THINGS I'VE LEARNT/READ FROM NON-MATH CLASSES

1. ENGL 251: LITERARY THEORY AND CRITICISM — SHKLOVSKY'S 'THE RESURRECTION OF THE WORD'

Viktor Schklovsky was a literary theorist, associated with Russian Formalism. He wrote *The Resurrection of The Word*, an essay about how we use words, how poets use words, and the concept of defamiliarization. He makes the claim that modern language is 'dead,' or 'automized,' and we use the corpses of words as tools to convey meaning. This allows us to communicate effectively, but we lose the excitement and sensation of the word. He went on to say that it is a poet's job to 'resurrect the word' using a tool called defamiliarization. Defamiliarization uses tropes and schemes, such as unusual syntax or rhetorical devices, in ways that make language unfamiliar, thus forcing the reader to stop and think. This makes language fresh and exciting again, forcing the reader to use their sense of imagination rather than relying on past recognition and dry understanding. An example of defamiliarization is in the poem *The Tyger* by William Blake. The line "Tyger Tyger, burning bright, / In the forests of the night;" features defamiliarization by imagining a tiger as burning (fire, light, danger?), allowing the reader to feel the poet's intent and firing up their imagination.

2. ENGL 208B: SCIENCE FICTION — NEUROMANCER

Neuromancer is an award-winning novel by William Gibson published in 1984. Never has a book struck me with both its style and its vision. It tells the story of a hacker named Case, who lives in a dystopian 'Night City.' He's offered a myserious and risky job to try and hack an artificial intelligence. This book defined the cyberpunk genre, and it had an incredible impact on all of sci-fi. This was the first book to describe a cyberspace, coining the term 'the matrix' to describe an immersive virtual world that one 'jacks' into using a biological port. It predicts virtual reality, global internet, and artificial intelligence years before those concepts became widespread. Because it predates our modern understanding, the whole book is written in made-up jargon. This makes the book incredibly stylized, but also dense and difficult to understand. All in all, I've yet to read anything that compares to *Neuromancer*, and I'd highly recommend it to any fan of science fiction — if you're willing to work for it.

3. MEDVL 105: INTRODUCTION TO MEDIEVAL STUDIES — DENDROCHRONOLOGY

Dendrochronology is the study of dating tree rings. It sounds simple, and a little niche, but I cannot overstate its impact. In some regions, historians have been able to trace tree-ring data over the past 14,000 years! Any well-preserved piece of wood found can be exactly dated by comparing the rings to these reference sets of tree-ring data. This technique is incredibly reliable and useful for dating, used in cases such as dating the year a wood house was built (even if it was over 1,000

years ago!), or when there was a interruption to new construction, such as during the Black Death. Analyzing tree rings can also give insight into ecological events, climate, specific cold years, and years with high cosmic radiation. In some villages, they laid boards of wood over the main roads to provide a layer of support over the mud, called corduroy roads. Using dendrochronology, modern historians can determine what years those villages were active, just by looking at the rings in the wood. Interestingly, a corduroy road was unearthed here in Waterloo in 2016 underneath King Street. This is just one dating method, other examples include carbon dating, epigraphy (the study of inscriptions), and numismatics (the study of coins).



Honorable mention goes to **GER 101: Elementary German 1**, "supergeil" music video, <https://www.youtube.com/watch?v=YmjBn1R6EF0&pp=0gcJCdgAo7VqN5tD>

Aspiro

EDITORS WERE WONDERING HOW MANY DELTARUNE ARTICLES WERE GOING TO BE IN THIS ISSUE

Jokes on them



Delta prune

aphf

CSC FLASH

BROUGHT TO YOU BY SPERM RACING

Service Update: Thanks to our amazing syscom team, we are happy to announce that cloud is back up and running rahhh... apart from some Kubernetes functions that are yet to be up. We've been getting a lot of traffic recently which is amazing, but means things might not be as fast as they once were. Stay tuned for next week as we play "will CSC cloud be fixed or will there be more excuses" 😊

Prof Talks: Stay tuned for prof talks to learn about cool CS topics (manifest that 4.0). We will have two talks, one on June 10th at 5:00pm by Frances Shi, and one on June 23rd by Tavernes Barnes. There will be food, drinks, professors, and fellow CS enthusiasts! Check out our Instagram to learn more.

Trivia: Remember, CSC trivia night is making its grand return on July 18th (potentially)! Join us for a night of fun with fun CSC questions, yummy food, and great prizes! Please come and try not to sweat too hard, but it's okay if you do.

Olympics: Are you a badminton tryhard? Want to destroy fellow CSC members and have fun in the process? Join CSC Olympics, and win fun prizes while gaining aura while destroying your friends at friendly competition. Stay tuned for updates!

Merch: As always, we've got CSC merch for sale. Head over to cscclub.ca/merch to check out everything we have in stock. From tote bags to Codey lambda calculus T-shirts, there's cool merch for every CSC member!

Office: Pop by the CSC office to hang out with us while enjoying great beverages like Celcius (official beverage sponsor of CS all-nighters) for \$2 in MC 3036, as well as Fanta (to help your fantastic midterms coming up), and Fuze (so you can fuze together some more brain cells). Come on down and drink like a true code monkey. We have 100k in prizes.

Spurhacks: Apply to Canada's **largest** hackathon, happening in Waterloo on June 20th to 22nd. Join 2k+ hackers to win 100k+ in prizes, hack and pitch for 48 hours, and enjoy free food and workshops! Apply today at spurhacks.com

CSC Shenanigans:

Quote 1:

We should pay to get siracha a lap dance

JERRY ZHU (SPERM RACING AMBASSADOR)

Quote 2:

Yeah everyone pitch in

MENCY YANG (EA LEAD)

Poem of the Biweekly:

Siracha made me
Write this at 3am and
I am sleep deprived

JERRY

APPLY TO SPURHACKS CANADA'S LARGEST HACKATHON
RAHHHH

BALLERINA CAPPUCINA ASSASSINO

ct dalek

RANKING 5N DISCORD GAMES

WORDLE — 10/10

It's on discord now... and it pings you everyday so you won't forget. I'd love to hate on it but wordle brings a small spark of joy in the mundane that is life. Plus you get to see your friends guesses and watch them struggle with simple words and guess the hardest words in two tries.

DAILY SUDOKU TOGETHER — 1/10

There is nothing together about this game. It's just everyone plays their own games separately and the app will ping you everyday which is annoying. Here's the kicker, there's a daily limit and they only give you like one free sudoku board per day. I hate it. At this point just play on any sudoku website and it's infinitely better.

PHYSICS BALL — 4/10

It's like that game we all played on our phones as a kid where you shoot balls up to break blocks with a certain amount of health and collect more balls. This is that but in reverse, you shoot the balls from above and they bounce around and fall down hitting the blocks. It's ok to waste some time but nothing to write home about.

Catboy Supremacy

PROCRASTINATION

This article was submitted 1 minute before the deadline.

Whole Number Haver

AN OLD MAN'S TIPS FOR CS ASSIGNMENTS

As I near the end of my stint at Waterloo, for the first time, I find myself in a term without coding assignments. Initially, this lead me to believe that this would make the term better, since I would have to work less. But, as I sit here in Mac lab, surrounded by people discussing CS assignments, next to friends complaining about CS assignments, I cannot but miss them.

In the age of AI code editors and the omniscient ChatGPT, I'm not sure how the young-uns of today do assignments. Nevertheless I figured I would compile my tips for doing them at the risk that this will turn into incomprehensible rambling as I recall the days of my youth.

Without further ado, my tips:

First, you need to wait for an auspicious time. Starting an assignment at the wrong time is a disastrous endeavour and an assignment started in this manner is doomed for failure. Even if you end up passing the assignment, you will carry the regrets of having completed it sub-optimally to the grave and risk endangering your other deadlines with your poor organization. Thus, choosing the right time to start the assignment is paramount.

Here are common cases where the naive might cave to starting their assignment:

1. you flick open the instruction pdf and find that it's six pages long, about six more than you expected
2. a friend tells you that this assignment is hard
3. a second friend tells you that this assignment is doomed and they might drop the course
4. you walk into class and hear everyone talking about the assignment describing it with various synonyms of hard: doomed, cooked, etc.
5. the professor makes an announcement saying please don't leave this assignment to the last minute

Events like those described above are sirens seeking to draw you away from the righteous path and destroy you. Instead, use the above list as more of a checklist, each of these is an auspicious sign, signalling that the right time to start the assignment is near.

So when is the right time? The golden period of assignment completion?

Well, the answer is that you'll know when it's right. When you start your assignment, it must not come from a place of fear or peer pressure. It must come from a deep primal feeling of hopelessness within you, similar to what an ancient ancestor would have felt when attempting to outrun a lion on the savanna. Assignments started from this spiritual place are destined for an optimal completion time and even if you end up failing, know that it would not have been better had you started earlier. Sure, you might have finished, but at what cost?

Now, reading this you might be thinking, wow this article was a complete waste of time, I should've done my assignment instead of reading this junk. My answer to you is that I have simply been occupying you until... now. Now, is the time when you should start. Had you started it two minutes ago when you started this article, your world would've crashed and burned. But, now, it's all alright, go forth, you're welcome.

Further tips forthcoming.

John S. Street

MOVIES ON PLANES

I hate flying. I hate uncomfortable seats, I hate heights, I hate being watched by everyone when I queue for the washroom, and I hate delays. All of these experiences are ample on airplanes. Not to mention I've had two planes bounce on the tarmac in the last year.

However, I love movies on planes. They fill a specific need in my life. I'll see a trailer, think "wow, I should watch that," and then life would happen. The movie would go unwatched for months, then when I would see it on streaming and say, "hey, we should watch this," everyone had already seen it.

Too much interest to not feel like I am missing out. Too little interest to actually spend the two or three hours to watch the movie. Every day I fight the urge to look up the Wikipedia summary and be done with it. Many plots have been lost that way.

But airplanes offer a sacred time, in which I have nothing better to do and the movies are at immediate eye level. What am I going to do, read the book I brought or something?

In two flights. Blackberry. A Real Pain. Conclave. Boom, done!

War of the Rohirrim. Bang. Didn't stand a chance.

So when WestJet emailed me that there would be no inflight entertainment on my return flight, Mickey 17 breathed a sigh of relief. I'll be flying to Winnipeg in November, so it better enjoy the time it has left on earth.

Lars Nootbaar

WHYYYYY

somehow the only time my brain is actually silent is when i sit down to write a **mathNEWS** article, but never quiet when i actually need it to be (like trying to sleep)

Sexy_Software_Babe

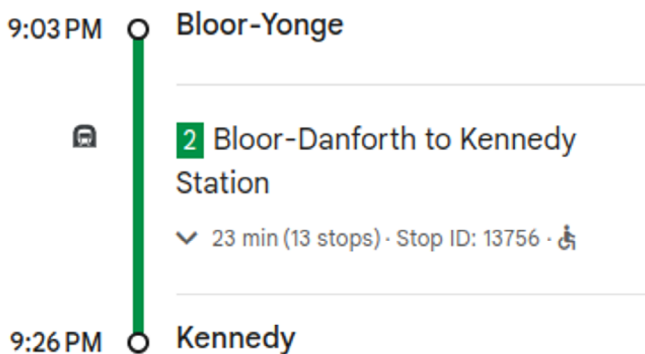
A CASE FOR EXPRESS TRAINS

(AT LEAST IN FUTURE TRANSIT PLANNING)

Consider, as a Toronto resident, if you want to go from one place to another, what is your go-to mode of transportation? If you happen to be rich enough to have a place by the subway, chances are you will take the subway for parts or the whole journey.

Where would you typically go? If let us say, you are simply going to your closest grocery store, most likely you won't need to take any form of public transit at all. You'd be on foot, or a bike. (Or god forbid, a car.) Alternatively, you are a student going to school. Well, in that case, you could be taking the subway for a couple of stops, but most likely you'd be on a bus or a tram instead. (Since the subway probably doesn't take you directly to your school.)

Alternatively, you could be going further. Perhaps from your home in Scarborough near Kennedy Station to work downtown, say, near Bloor-Yonge Station downtown. As a loyal and honest Line 2 rider, you spend 23 minutes, 13-stop, one-way each day for your daily commute, like an average Scarborough man does.



YOUR TRIP HOME, PRESUMABLY.

Perhaps you'd spend your daydreaming about what your next vacation in Cancun might look like or reading an e-book you downloaded because no internet :(Or maybe you start wondering, what could the TTC have done better, if they had planned better?

And plan better they definitely could have. What they could have done would have been some third/fourth tracks in between some stations for overtaking. Well, it turns out it could have reduced your traveling time. Why might that be? Let us introduce a novel concept—express trains! (Woah, mindblowing, amirite?) Let us take a look at the maths.

Suppose we have our model of t, n, x being our parameters of t minute frequency, $2n$ minutes between each stop (bear with me here), and x stops you intend to travel. We have our normal model be $E(t, n, x) = \frac{t}{2} + 2nx$ minutes. Let us assume, for peak hour, we say that $t = 3, n = 1, x = 16, E(t, n, x) = 33.5$ minutes.

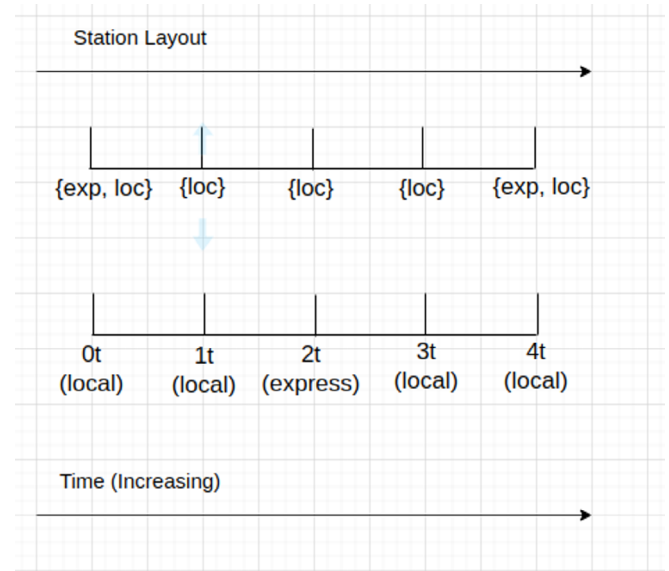


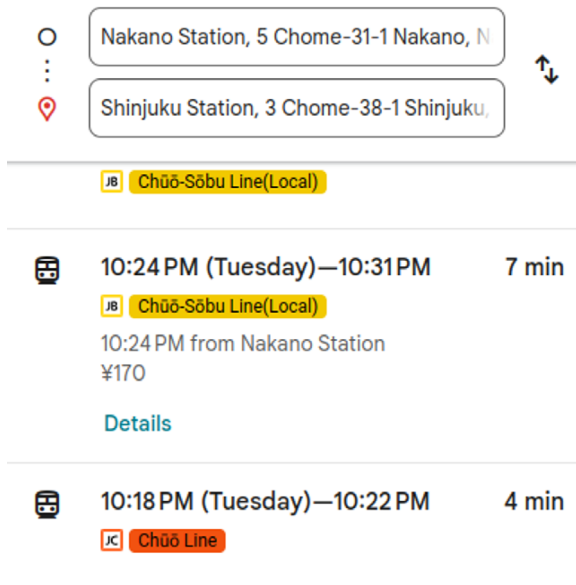
DIAGRAM FOR TRAIN FREQUENCY AND STOP STRUCTURE.

Let us assume then, that an alternate model that includes express trains is to run. Let the train sequence be (local, local, express, local, local...) in that there are four local trains between each express train. Additionally, the express train only stops at every fourth stop.

We first argue that express trains are twice as fast as normal trains. That is, your express train takes on average n minutes per stop (or skipped) since it does not stop or slow down at 3 out of 4 stops. We argue this is a valid assumption. We estimate that for a trip between two stops (say, Broadview to Chester⁴), we note that the time spent between the two stops is around 90 seconds, of which about 30–40 seconds is spent at speed, and the rest on acceleration, deceleration, platform time, etc. For four stops, this is 360 seconds. So, safe to say, should we arrange for a four-stop express, we estimate for a 30-second speed limit at each stop interval, we would have $30 \cdot 3 + 90 = 180$ seconds. Similarly, this can be backed by the following schedule in Tokyo. (Nakano to Shinjuku, skipping two stops in between, express (Chuo) takes four minutes on average, local (Chuo-Sobu) takes seven minutes.

This blackBOX was here all along, I swear.

A mathNEWS EDITOR WITH NOTHING TO HIDE



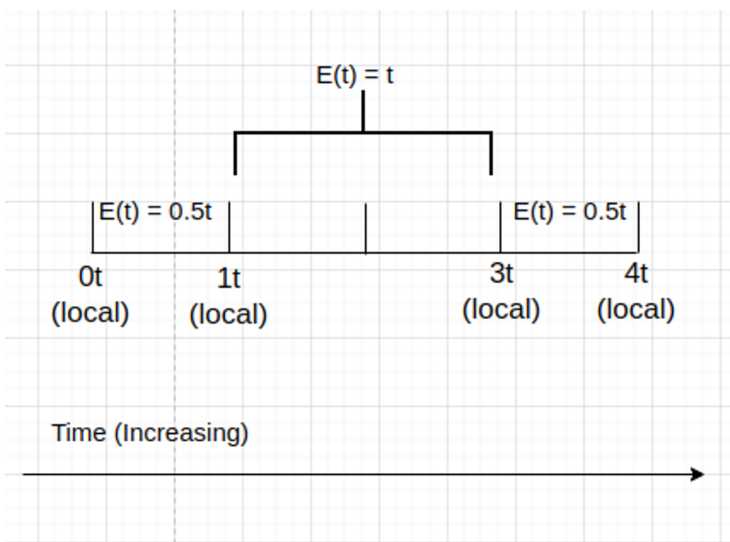
COMPARISON FOR LOCAL TO EXPRESS TRAINS ON NAKANO TO SHINJUKU STATION INTERVAL.)



ILLUSTRATION OF WORST CASE TRIP.

We consider the following worst-case scenario, where you begin and end your trip both at station two stops away from the “express stops.” You intend to take the local train for two stops to the express stop, then wait for the express train, and then hop on another local train for your last two stops. What might your expected time look like?

$E(t, n, x) = \frac{3t}{4} + 4 \cdot 2n + 2t + t + (n - 4)x$. We note that for $t = 3, n = 1, x = 16$, $E(t, n, x) = 31.25$ minutes.



EXPECTED VALUE CALCULATION FOR FIRST LOCAL TRAIN WAIT TIME.

Now, before you yell out “Well how does this math work?” Let me explain. We consider the expected time on the worst-case journey you could have. We explain term by term here. We take the expected $\frac{3t}{4} = t\frac{1}{2} + \frac{t}{2}\frac{1}{2}$ for your first local train, assuming local and express do not run together. You take a total of $2n \cdot 2$ minutes for the two local stops. (Doubled for the last trip too.) Then, you are expected to wait $2t$ for your express train (convince yourself, left as exercise). And once you get off your express train, you are always t minutes away from a local train. And finally, you traveled a total of $x - 4$ stops on the express.

Note that even in the expected worst case, when the trip is at length, we are trading waiting time for speed on the express. Considering the travel pattern that most people tend to take subways for longer, we can see how this is beneficial for most, even if at the expense of short-range commuters (minimal difference too, since expected to increase by $0.25t$ average waiting time). It gets even better if we consider that express trains tend to stop at termini, where most people are to get on and off for transfers. People could also plan their departure or arrival so that they wait less. Thus, the expected time people need could be significantly less.

Of course, it is too late now for TTC subways, since there aren’t enough third tracks for passing and facilitating such express trains. However, I argue that should there be future projects that span further to the suburbs (like Scarborough) or span longer than 25km (Line 2 is 26.2 km long, with 7.8km in construction²), the capacity for express trains should be included.

RobbotC

1. www.youtube.com/watch?v=WE8N3F6XJys&t=1764s

2. en.wikipedia.org/wiki/Line_2_Bloor%E2%80%93Danforth

N REASONS WHY YOU SHOULD TAKE A WEEK-LONG VACATION TO ISTANBUL IN THE MIDDLE OF THE TERM

- yay cats!
- you and your (formerly long-distance) boyfriend may or not break up right before the long-distance was supposed to end as a direct result of said trip
- assignments may or may not pile up as you return, leading you to finish your CS 341 assignment less than two hours before the due date
- you can expand your worldview!

headphones97

profQUOTES

AMATH 231: JOE WEST

- “ Remember, don't pay attention to what I write... or to what I say... pay attention to what I meant to have written or say.

BU 375: MICHAEL BLAIR

- “ I could grade your exams really fast and at low cost. You know how? Random number generator.

- “ You don't need to know what a logarithm is or how to calculate it, just where it is on the calculator.

BU 491: FRANCIS OLATOYE

- “ You mentioned that Trump is using this as a...trump card. A play on words, eh?

- “ How many of you think they are going from Trans and trying to cement their trans identity? *[Points to a student]* I know what you're thinking, [name], wipe that look off your face. You guys' minds are so dirty. That was a joke, guys. I don't want to get in trouble.

CO 342: MARTIN PEI

- “ Is it really hot in here or is it just me?
- “ We [just] talked about graphs... well, we've been talking about graphs for a long time.
- “ I'm supposed to be talking about non-Euclidean geometry for one class and I have no idea what to say.
- “ I have allergies right now so these may or may not be actual tears.
- “ Do you like this proof? Of course you do, because you like every proof in this class!
- “ If you remember your linear algebra, you can sleep for the next five minutes and you'll be OK.
- “ ...unless I delete this midterm...

- “ *[Writes $\sum \dim(C')$]* What is this? It's a dim sum.

- “ *[Writes “sum” in light grey]* What is this? It's a dim sum.

- “ I tried to scare people away with Assignment 1. It didn't work.

CO 446: PETER NELSON

- “ You probably haven't heard of him because he is no longer a research mathematician... He has a yacht though.

CO 471: LEVENT TUNCEL

- “ *Student:* Do you want a cookie?
Professor: Look at me, do you think I've ever said no to that question?

- “ *Student:* Can I have a bonus mark?
Professor: You already have a bonus mark in my heart. Unfortunately, my heart doesn't sync with Learn.

CS 100: DAVE TOMPKINS

- “ And really, 12 lines isn't that special. *[Changes from 12 lines to 24 lines.]*

- “ But next week we'll make it sexy. You'll all be wanting to smash it.

CS 240E: EDWARD LEE

- “ I'm told that π is not a real number... some people in this department told me it's 3.

- “ We can merge my favourite two languages together: English and Japanese. To form, anime or something.

- “ *[This is a]* degenerate tree... and that is in the technical sense, not the internet sense.

- “ Call this node, this node's granddaddy... yeah, that's a technical term.

- “ There are fates worse than being sent to the Arts faculty. At least you get to touch grass in the Arts faculty. At least you aren't a real engineer.

- “ I'm not referring to the Software Engineers. I mean a real engineer. A real smelly engineer.

- “ Perfectly size-balanced—as Thanos intended so.

- “ *Professor:* Is 3 less than $10/3$?
Student: I don't know!
Professor: Well, on a good day, 3 is $9/3$.
Student: Today is not a good day.

- “ This is your ideal tree, the one your mom told you to worry about.

CS 247: ROSS EVAN

- “ I'm a PhD student... so I'm a fucking nerd.

- “ Imagine you achieve every Waterloo student's dream. And it's not getting that Cali co-op or going on their first date. It's getting hit by a car.

“ I’m going to write a symbol. Don’t be alarmed. Now, this means summation.

“ Only make friends if they can do something for you.

“ They didn’t drain all the toxicity out of my blood at the hospital, there’s still some left.

“ Ok, nevermind, I can be bass boosted. Epic!

“ People on TikTok use this term “unalived.” I’m trying to get it reworked for people to say they had their destructor run instead.

“ The main goal of all my lectures is to get out of there without throwing up.

“ A bit of C++ syntax which is weird and stupid...

CS 486: YUNTIAN DENG

“ *[Checking the clock with great surprise]* We are actually... on time?

“ *[Does a long calculation on the board]* *[Clicks to the next slide and sees that the answers match]* That’s pretty amazing. I actually did it right.

CS 489: SHANE MCINTOSH

“ Ask ProfGPT. Don’t ask ChatGPT.

ECE 252: ANDREW MORTON

“ What does WC stand for? *[Student answers word count]*. Right! And if you’re British it stands for water closet.

ENGL 251: SHELLEY HULAN

“ It’s very wasp-inefficient.

“ I’m sorry but technology will not slain me!

“ I see the limitations of PowerPoint...

MUSIC 140: SIMON WOOD

“ This was driven by middle class whites who—not to put too fine a point on it—were racist.

“ The Allies have defeated Nazi Germany, and everything was great for about 45 minutes.

“ Rent a Porsche with a manual transmission, find a windy road, and you’re gonna say, “Man, this is as good as it gets. Not even the birth of my children is going to beat this.”

“ “You ain’t ever caught a rabbit, and you ain’t no friend of mine.” What the hell does that even mean?

“ White people like words. That’s the lesson.

MATH 245: BLAKE MADILL

“ *[Composing linear operators]* U of T? Gross. T of U.

PMATH 351: BLAKE MADILL

“ 9:30 is getting earlier and earlier this summer.

“ What do I mean by “stare at it?” Realizing two sets are equal by looking at them really hard.

“ Don’t think. Blindly proceed.

“ I don’t know what you’re talking about. I don’t even think we have a 352.

“ Alright my rowdy and faithful few, let’s get started. Everyone else will arrive in 10 minutes.

“ We call it an isometric isomorphism, affectionately known as an “iso iso.”

“ That is, coming from the greatness of the greatest lower bound.

PMATH 464: XUEMIAO CHEN

“ Was this lecture confusing? *[Several people nod and say yes.]* Good!

DID YOU KNOW ANY ARTICLE SMALL ENOUGH TO BE USED AS FILLER IS BASICALLY AUTO-ACCEPTED?



Second delta prune

mathNEWS LANDMARK TOURNAMENT: SAN FRANCISCO VERSUS WATCH DOGS 2

In 2016, Ubisoft released *Watch Dogs 2*, a video game set in the San Francisco Bay Area, featuring a minigame called *ScoutX*. In the game, players take pictures of famous landmarks from real life that have been represented in-game.

Are they better in-game? I endeavoured to find out.

THE GOLDEN GATE BRIDGE



Let's start with the most iconic landmark. Hot take: the Golden Gate Bridge is not that impressive unless you're standing on it. It's cool, but can regular visitors climb the towers? Can we graffiti its heights? Can we get pictures of it without accidentally stumbling into nudist beaches?

Marcus Holloway can. I cannot. *Watch Dogs 2* does it better.

Best clothed beaches: *Watch Dogs 2*

LOMBARD STREET



Watch Dogs 2 wins again. Marcus Holloway has a quadcopter, a third-person point of view, and a distinct lack of physical pain preceptors; combined, they make the experience of the city's second-crookedest street far more enjoyable. When you're on it in person, it's really just "Oh Fuck Another 27% Incline." You can't see the curves; you're too close to the ground to really see much of anything. What you need to get the most out of Lombard Street is a third-person camera, but how are you supposed to do that? You're not Marcus.

Best visibility: *Watch Dogs 2*



PEACE PAGODA

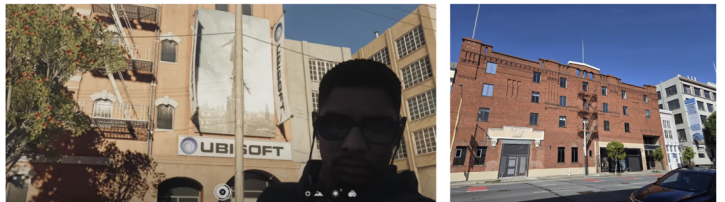


It was under construction.

Shoutout to the poetry night I went to near here with a bunch of total strangers. Thanks for not serial killing me xoxo.

Best accessibility: *Watch Dogs 2*

UBISOFT SAN FRANCISCO



Ubisoft decided to self-insert their local office into *Watch Dogs 2*, even making it the setpiece for a mission.

In real life, it's been closed for six months. The only hint it was ever there is the "UBISOFT" imprint where the main door's sign used to be.

Best state of the games industry: *Watch Dogs 2*

COIT TOWER



Every time I see this tower, I think "wow it's the tower from *Watch Dogs 2*." For that matter, the entire northwest of the city is reasonably 1:1 with *Watch Dogs 2*. It's really impressive that they built San Francisco to match *Watch Dogs 2* so well; I do

love the source material though, which means *Watch Dogs 2* wins again.

Best original concept: *Watch Dogs 2*

FISHERMAN'S WHARF CRAB STATUE



There was no way I was going to notice this if it wasn't in *Watch Dogs 2*. *Watch Dogs 2* places a *Maman*-sized crab sculpture at the front entrance to the city's most touristy pier; a steel monument of epic proportions. In reality, the crab statue does exist! It is however much smaller than in *Watch Dogs 2*. Definitely recommend visiting this one in *Watch Dogs 2*.

Best evolutionary final form: *Watch Dogs 2*

RANDOM FISHNET LEGS IN HAIGHT-ASHBURY



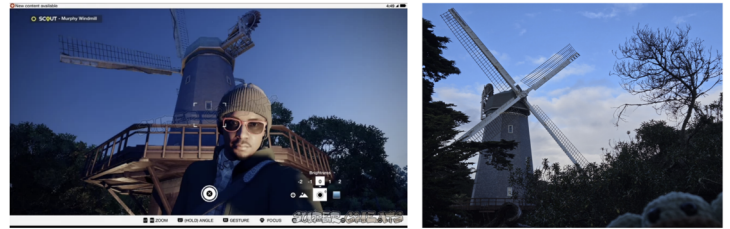
"holy shit, the fishnet legs from *Watch Dogs 2* are *real*???" — me a couple weeks ago

To be clear, not all *ScoutX* locations are. Some have since been deconstructed, like the shoe garden, and some are just made up to showcase the overall culture, like particular murals or shops. To discover that there is in fact a pair of massive fishnet-wearing legs coming out of a second-story window for some reason? Insane. Massive credit to *Watch Dogs 2* for drawing my eyes to this one.

Best fish: *Watch Dogs 2*

mathNEWS

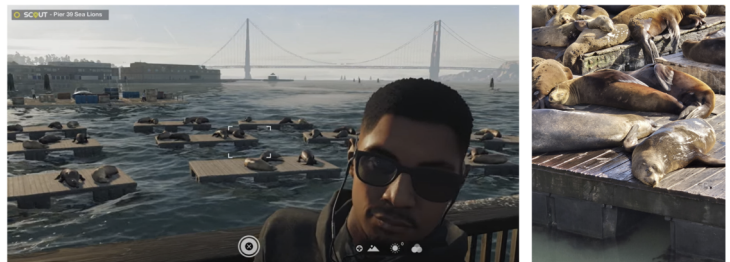
MURPHY WINDMILL



Look I'm not sure there's much value in visiting this one in either representation, but I really wouldn't have bothered to see it if it weren't "the windmill from *Watch Dogs 2*."

Best?? wind???: *Watch Dogs 2*

PIER 39 SEA LIONS



I really thought this was another funny thing they'd made up to illustrate culture. In *Watch Dogs 2*, you can visit a plethora of sea lions, hanging out on floating pallets just outside Pier 39. Video games are allowed to have creatures permanently in one part of the map; it's not like the player expects things to be perfect.

it's real. they just do that. What are they doing here??? Why is permanent habitat a bunch of wooden pallets??? Are they stupid??

Consider though that seeing them IRL requires you fly to San Francisco, whereas in *Watch Dogs 2*, you can do it from Waterloo.

Best glitches for price: *Watch Dogs 2*

PALACE OF FINE ARTS



While *Watch Dogs 2* includes the Palace of Fine Arts, it does nothing to convey the sheer scale of this remnant gateway into the 1915 World's Fair. The real-life structure is 49 metres

tall, but I can't imagine the *Watch Dogs 2* version to be any more than twenty. It lacks the majesty, the weight, the impossibility of such an intricate stone palace in the United States of America, built and maintained *without profit incentive*.

I'm not saying San Francisco did it better though. Walking through it, I felt an incredible *deja vu*. I hadn't been here before, but I'd fought for the Grand Army of the Republic in *Star Wars: Battlefront II* countless times, battling droids through the streets of Theed, capital city of Naboo. What's Theed based on? This very structure. Clearly, *Star Wars: Battlefront II* did it best.

Best Naboo: *Watch Dogs 2* et al.

SUTRO TOWER



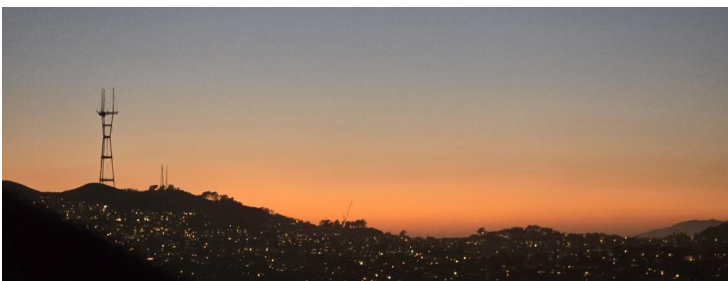
To *Watch Dogs 2*'s credit, they get the shape of Sutro Tower pretty dead-on.

They miss the spirit. At the poetry night I didn't get serial killed at, someone referred to Sutro Tower only as "The Structure." It needed no other introduction. Walking around San Francisco, Sutro Tower is almost always there. Look to the skechers steeple at 22nd and Mission (**mathNEWS** 158.1): you'll find Sutro Tower watches above.

A man quoted in *Civilization VI* states that "a man on a horse is spiritually, as well as physically, bigger than a man on foot;" I wonder if the same applies to Sutro Tower. It's not on a horse, but it *is* on a mountain. It's functionally equivalent. It makes it something more.

It may only be a tower on a hill, but I know he will keep us safe.

Best effort: *Watch Dogs 2*



molasses

POSSIBLY THE BEST SANDWICH I HAVE EVER EATEN

OR, A PRETTY GOOD SANDWICH RECIPE

It's so good that I'm making another one tomorrow. You have to try this.

Ingredients

- Bread
- Cheese (any combination of cheddar, havarti, gruyere, and monterey jack)
- Bacon (cooked)
- Jalapeño peppers, sliced
- Tomato, sliced
- Onion, sliced
- Red pepper flakes
- Garlic powder
- Butter and/or kewpie mayonnaise, the latter of which I've found to be surprisingly good for grilled cheese and the like

Directions

1. It's a melt: Put the ingredients between the bread slices, apply butter and/or mayonnaise to both sides, and cook in a pan for a few minutes on each side (pro tip: put a tiny bit of water in the pan after flipping and then immediately put on a lid, so that the steam melts the cheese more).
2. Consume (optional, you can also just look at it).

yalevoylian

HAS ANYONE TRIED TO MAKE FRIENDS WITH A PROF?

After completed JAPAN 101R, I really liked the tutorial prof sooooo much that I sent her hand-written letters to show my appreciation. She tried to reach me for a talk right after final exam, but I just handed it in half an hour earlier and she couldn't get me... I tried to reach out to her after but I'm really not sure about the appropriate relationship between us.

So this term after I came back to school from co-op, I sent her an email invitation to meet and she replied!! Looking forward to hang out with her ;)

AKEIJIN

THE SPRING GAME JAM

WHAT A GAME JAM LOOKS LIKE AND YOU SHOULD TOTALLY DO ONE IT'S VERY FUN

THURSDAY

After deciding upon the game idea, Jason throws me and his team in a Discord chat to flesh out the details. Over a three hour call, we make a slew of important decisions surrounding the game's visual style, soundtrack, and core loop.

FRIDAY

I set up the codebase's structure, largely based around my existing tooling. After wasting valuable time making petty future maintenance decisions, I ditch them to spend the evening with a friend as they send a slew of assets in need of feedback.

SATURDAY

I get up at 1 PM, and it's time to LOCK IN because I'm not going to finish in time otherwise. After brushing my teeth and showering (I have standards), I make my way to the jam space and spend the next several hours scrambling together core systems, UIs, and building the map with their assets.

After the venue's power goes out and I no longer have internet, I go home to my warm, cushy bed.

SUNDAY

And instead of sleeping, I GET BACK ON THAT COMPUTER BABY!!! There are only so many hours left, and I still have the entire round loop and gameplay to create. So I decide to afford myself five hours, instead of the usual nine.

Now it's 5 AM, and I've made it so far without any caffeine. It's a sign. A sign to buy two Monster Energy cans from Farah Foods. I fix networking, fix cross-platform, write out the rest of that base core loop, polish up that map, and whatever else I simply forgot to write in my commit log.

It's now 9 AM, so I fix myself up and make my way over to Socratica. By now, the fatigue is getting to me. So surrounded by hard-working people, I lay my head down on my friend's coat, and I have myself a nice little nap.

After thirty minutes, I wake up, top up my caffeine levels, and get back to work. After adding music and narration, Socratica ends and I make my way back to the jam venue.

With three hours to go, I desperately finish up the rest of the core gameplay: handling edge cases, polishing things, and forcing ChatGPT at gunpoint to write a convex hull algorithm for me.

I finish with minutes to spare, check out other people's games, go out for dinner, and enjoy the best sleep of my life. Game jams are awesome. You should totally try it. 👍👍👍👍

the american

SILKSONG NEWS

According to Team Cherry, it will be released BEFORE the holidays this year!

Surely nothing will go wrong!

Team Berry

POKER GAME



Poor guy was dealt a prune

aphf

You could be playing Sonic 3 & Knuckles right now, but instead, you're reading mathNEWS.

That's the best compliment I've gotten all week.

A mathNEWS EDITOR WHO REALLY LIKES SONIC 3 & KNUCKLES

WHEN COUP GOES MISSING FROM THE GRAD LOUNGE...

A mathNEWS TURING TEST

"Someone has blundered methinks," I mutter to myself like an old man with gout after one more futile search. The shelves before me are stacked with board games upon board game that has probably not seen the light of day in the last year. Dust, bored out of its mind, has found adequate housing in some of the boxes. Of that I have no doubts.

Out of the three games in the Grad Lounge that I actually *know* how to play, Coup is the one I suck at the most. If I win, it's either because someone let me in, or because someone has blundered greatly. But I always jump at the chance to play. Lying to friends and strangers alike is an art form that I'm always willing to invest more time into.

Of course, to get better at the game, one must first be in possession of the game. And this brings me to my current predicament: the reason why I find myself pacing in circles, muttering under my breath like an old man with gout. Someone has blundered. Someone has not put Coup back where it belongs—*on the shelves in the lounge!*

We need to talk about the art of putting things shelves. Shelves hold things. Sometimes, shelves hold many things. If the shelf is sub-par, it might crap out its contents onto the floor as its ass cracks open under the weight. But if you are inclined to be thematically consistent, then shelves can hold one type of thing. As do the shelves in the CS grad lounge. Each shelf holds one type of game, and these games can—if you are feeling especially fancy—be moved from the medium strategy shelf to the four-player shelf. If that doesn't do it

for you, perhaps you can move Catan to the shelf that holds the mystery games. And if rebelliousness runs in your veins, maybe you can leave the games on the table *next to the shelves*.

But, and here, I entreat my readers to pay attention, the recurring theme is that the games go in the shelves! Now, I already hear the objections from the disinclined. "This is a distasteful and draconian practice. Let the games ooze all over the floor like a pus! Who needs order and rules? Why should our spirits be chained to wooden planks with square holes in them?"

Let me tell you why in excruciating detail. Over the past hour, I have had to adopt positions, in my quest to locate Coup, that could be described as questionable. Certainly, I could have done without pressing my face to the floor in case a misguided soul might have dropped it. Quite possibly, I would have given a pass to the experience of posing as a camel on the floor. Most assuredly, I would have declined the opportunity to emulate a kangaroo as I scanned the topmost shelves for my quarry.

I have suffered in my endeavour to locate Coup. All I wanted was to be able to lie without guilt, to steal without a Captain, and to bend a friend's trust without a blink. Sadly, I have been denied the opportunity to exercise these rather noble intentions. Coup has gone missing from the grad lounge. It is a sad day.

eternal_peace

MY TOP 10 OF THE 238 MOVIES I REMEMBER WATCHING SINCE STARTING UNIVERSITY

Count of Monte Cristo (2002)

The best slow burn in cinema since The Shawshank Redemption.

Fantastic Mr. Fox (2009)

A story that deserves a small, permanent place in everyone's mind.

Forrest Gump (1994)

A laid back viewing experience that leaves absolutely nothing to be desired.

The Dark Knight (2008)

Has repeatedly been voted the greatest movie of all time; currently 3rd on IMDB.

The Incredibles (2004)

Incredible.

Unbroken (2014)

An intense true story about survival against literally all of the odds.

Knives Out (2019)

It's impossible to peel yourself away from the TV if someone puts this on.

Apollo 13 (1995)

If Minecraft hard mode were a true story, this would be it.

RRR (2022)

Assuming you and your friends have a lot of energy, this is the best movie. Ever.

no pun indented

MC/DC BRIDGE X M3/MC BRIDGE EROTICA (3/4) BUT IT'S ALL BRIDGE EUPHEMISMS

WHY AM I DOING THIS

Unlatching his plush jambs from M3's crown, DC concurred with "Of course, M." He moved his head back to level with M3's soft face as he corrected his posture, still kneeling.

"Do you want me to take these off, or—" he said, gesturing to his bright red boxers and his rising drawbridge.

"No, I'll do it, just let me tease you first." M3 muttered, stroking DC's beam with one hand like a pet, as the other held firmly onto his quivering hip. As M3's hand reached the base of DC's pier, it ventured down to his pile cap and lightly gripped it, setting off a muffled moan from him. Her fingers veered up the pier again to his cap sill that she smoothly traced around before continuing to pet his bridge.

M3 stared lovingly into DC's elvish eyes as she wondered "Do you like this so far, D?"

"Yes," he sighed, "but I want more of you. Give me more. And be firm."

M3 complied as her moving steel hand raised up to DC's waistband. Both of her hands gripped DC's boxers and took them down, revealing DC's bridge standing almost straight up, uncaged by its former cloth prison. M3 ogled for a second at its average yet commanding size, with paint lines running lucidly from the rosy cap down to his hairy pier cap. She watched thin liquid slowly stream down it, glossing it like a rainy road.

She started off with a light drive as she dragged her steel beam from his bushes lining the street up to his cap, covering her fingertip with thin, clear fluid. With confidence blaring from her batting eyes, she put her pointer to her opened jambs and started to suck on her fingernail. She stuck the wet tip of her finger into her tunnel while staring at DC's face, mouth slightly ajar and eyebrows raised. His eyes were fixated on her top phalange bobbing up and down like a crane in her mouth and her satisfied face staring seductively back at him.

"Trust me, D, you're in good hands," M3 whispered.

Shen then took out her finger, glanced downwards to DC's rod and seized onto it. She slowly bobbed her hand up and down the road, lubricating the whole street when her hand twisted down to the base. DC could soon feel her ten beams gripped on him and slipping across his tender deck, causing him to grin mercilessly. M3 was happy too, given all she wanted was to make her best friend over the moon, and damn right did she know what he liked. Every now and again, she'd rub his cap with her free thumb at the top and DC would tilt his head back slightly and groan behind gritted teeth. When his rolling eyes weren't facing the orange sky, he would stare intently at M3's lightly bobbing arches.

"Let me touch your arches, please. They're so fucking hot." DC rasped.

"How about you touch my lips too?" M3 muttered, her face floating towards DC. She grabbed onto his faded silver locks and caught his jambs hook, line and sinker as their lips meshed together, all while M3 continued stroking DC's bridge up and down. They cycled through waves of short pecks as her thumb and pointer formed a bobbing screw around his rod of steel.

DC started to lightly cup M3's left arch as she lightly introduced the cap of her tongue to DC's frame. In response, DC widened his tunnel and allowed M3's tongue to sink deeper into DC's crevice. M3 took this invitation to both flick the inside of DC's jamb and his pier cap every now and again. As she let go from their tender embrace, he gasped for air and M3 as he could feel his whole body tremble for her. Even after a few seconds, he was parched and needed her desperately.

Panting, she managed to breathe out "God, I love feeling all your forces get stronger for me, so get tense for me, baby" before sticking her lips onto his like brick and mortar. DC briefly stacked his tongue atop M3's before tracing her bottom jamb to the rhythm of her hand, now firmly yet quickly cupping his bridge. He bit onto the side of his own lip as he could feel his pipe bound to burst soon.

Soon enough, M3 backed away from DC's body and heaved a sigh. She followed it up with "Do you want to take this further? Because I do, I want to feel your bridge body so bad right now." Ecstatically, DC responded "Yes, yes, of course," as he backed away a bit, drawing in deep breaths and falling onto his right side so he could push the shorts off his kneecaps and onto the clouds.

M3 lifted her torso from the steps using her forearms, creating a bridge. Then she swiftly pulled down her shorts with her left hand, letting the satin slide down to her joints, then drop to her feet. The same thing was done to her brick red briefs before kicking both items off her ankles, leaving M3 fully exposed to the cold breeze and to DC's view.

DC grabbed M3's bottoms with his right hand and threw them to the side, landing on the polished banister so he could kneel again in front of M3.

"Can I have one last kiss before I'm in your tunnel?" DC asked.

"Of course. Also, call me your little babygirder."

"Okay, babygirder, I'll show you how to come."

RANKING MARVEL PHASES BY QUEER VIBES AND PERSONAL BIAS

STUCK ON STUCKY

i was recently introduced to something called the marveldle (like wordle, but better, with ugly design) and promptly turned into an addict. never in my life have i thought so much about the broader marvel cinematic universe and all its parts. however, marvel does not like to be gay on main at all, even if the people behind its projects put work and heart and time into the stories they tell. because it's pride month i will now acknowledge bits that matter to me in a very brief overview, fueled specifically and only by the things i care about. disclaimer i am not world's biggest marvel fan or even a notable one, i just wanted pizza.

the official list, in ascending order:

6. phase six—fantastic four: first steps, spider-man: brand new day, avengers: doomsday + secret wars

- i want it to be queer, and not a dumpster fire. one would think that's a simple demand or two, but it's a list of four (4) movies, and the russos lost me, and some days you'll find me quaking in my boots for what's to come. welcome back spider-man.

5. phase one—iron man, the incredible hulk, iron man 2, thor, captain america: the first avenger, the avengers

- the start of it all. let's be honest, i don't think of these films much. but something sinister haunts the original captain america trilogy in a way that is quiet and creeping and waiting for its chance to deck you in the face. which, good. also it's not quiet at all, steve and bucky are like founding fathers on the internet.

4. phase four—black widow, shang-chi and the legend of the ten rings, eternal, spider-man: no way home, doctor strange in the multiverse of madness, thor: love and thunder, black panther: wakanda forever

- my ex-kind-of-almost-something-and-not-nothing was very, very obsessed with wanda maximoff in doctor strange 2. i think that means something so i'm adding this as a point and leaving it up to you
- eternal has gay people in a blink and you'll miss it and you can definitely censor it if you tried type of way, but also it has definitely had an impact on queer people. this sample size is two, and the effect was enormous. how marginalized groups love a found family.
- black widow. okay film, great ideas that i think could've been really nice in the mcu. to go with this, black panther 2 is a smash hit in my home, so, close enough. gets a mention.
- valkyrie, canonically bisexual, kisses the back of a woman's hand and winks at her before jumping off

a balcony. or something like that, i might've blacked out. but it stayed with me. she is also i think, referred to as king of asgard (point shared with endgame, even higher on this list) which really does things for me in a gender non-conforming way. no notes, endless flowers.

3. phase two—iron man 3, thor: the dark world, captain america: the winter soldier, guardians of the galaxy, avengers: age of ultron, ant-man

- friends, family, and the voices in my head, captain america 2 is a great movie. everybody knows this. everybody should also know this is the closest we get to the love story for the ages. i think about certain tropes and concepts played out from the film very often, and it has inspired me in ways i probably can't even conceptualize. james buchanan barnes is a gay man. maybe we just weren't ready for the truth.
- i have been told gotg also feels gay. maybe it's because of the soundtrack, or maybe i'm just out of the loop. still worth telling you, because queer voices deserve to be heard and **mathNEWS** should support them.
- captain america. the winter soldier. there is a scene where bucky remembers steve more than he remembers himself, and so steve tells him who he used to be while getting beat up by the man. this is repaid two years later when a villain calls him james and our fav ex-assassin says, stubbornly, that his name is bucky. steve watches all of this with his heartbreak on his sleeve.

2. phase five—ant-man and the wasp: quantumania, guardians of the galaxy vol. 3, the marvels, deadpool & wolverine, captain america: brave new world, thunderbolts*

- oh, my new avengers. everybody in that group is gay as hell. in a quiet corner of my heart, yelena belova is aroace TO ME. and found family to the max, imagine loving somebody so hard they learn to rely on you and it saves the world.
- sambucky cameo in captain america. ignore the credit scene in thunderbolts.
- i skipped a lot of these, which is frankly hilarious for the weight i'm holding it to, but i read once that the car fight scene in d&w was an analogy for gay sex. i don't argue with people who know more than me.
- the marvels was something. but carol danvers is a lesbian, valkyrie came in briefly and kissed her cheek while wearing a suit, and that's really all i need to see the light. somebody behind the scenes knew what they were doing. carol was also, of

course, in love with maria rambeau, i'm not erasing history. let women have fun movies.

1. phase three—captain america: civil war, doctor strange, guardians of the galaxy vol. 2, spider-man: homecoming, thor: ragnarok, black panther, ant-man and the wasp, captain marvel, avengers: infinity war + endgame, spider-man: far from home

- people do also like steve and tony. everyone wins in this phase. plus the avengers movies do what you need them to do (shove everyone into a room together while you take the parts you like and run). found family again, if weaker because of the scale. but it's there and i see it.
- in one scene from civil war, bucky laughs as he recites memories about steve in the fondest, most exhausted tone i've ever heard. nobody's doing it like them. nobody will ever do it like them ever again.

it was once said that getting queerbaited by marvel is like losing chess to a dog but more embarrassing. i think losing each game means holding onto the hope that one day we can win. and i think queer people should keep telling the stories that need to be shared, because somewhere out there, there is in fact an audience for it. it's pride month, and i don't like writing things that feel vulnerable, but man. am i glad queer pieces of media exist. and if they don't, know that i will project so hard that the world will see things my way, one way or another. fanfiction exists!

big a

THE WATERLODYSEY!

Hello **mathNEWS** readers! Are you perhaps a theatre nerd? A fan of Greek mythology? Or just looking for something interesting going on on campus? Well, look no further than the engineering society's spring play, *The Waterlodysey!* It is a musical with entirely original music that combines elements of Homer's *The Odyssey*, *Epic: the Musical*, and the well-known chaos of the engineering faculty. Shows are happening in the **Theatre of the Arts** in the **Modern Languages building** on **July 18th and 19th**! I, someone who is definitely not a cast member and definitely not biased teehee wink wink, promise you'll have a good time!

wicked



OH BROTHER, THIS (PARTICULAR) GUY STINKS

THIS IS THE EYE OF THE HURRICANE

Presenting: a rant for [you know who you are]

I've spent hours of my life sobbing about who I am. Most recently, it's because you reminded me that people don't see me as human. I get it, I'm weird and off-putting, and I've made peace with that. It's just that you, someone I thought I could trust, someone I called friend, doesn't see me as human. You don't see that as each of your playful jabs about who I compare to drive nails into my hands and feet, crucified for all to see just what a freak I am. Thanks, *friend*.

I've spent hours of my life in front of a screen, designing and creating things the world doesn't deserve to see. There's a fine line between madness and art, precision and chaos, and I walk it down, stare at it as if it were nothing but an insect under my gaze. I possess power, my mouse and keyboard and monitors mere tools aiding me in my life's purpose. You brush off what I show you, and suddenly, I don't want to tell you anything again. Thanks, *friend*.

I've spent hours of my life gaming. It started with my sister and I playing an old fashion game on a device long forgotten. Minecraft with my brother on the Xbox 360. 2000 hours of Destiny 2—some say that's 2000 too many; I say I gained brothers in arms and, once upon a time, a family. And the high seas where we'd plunder gold was always home for a pirate crew of three. I taught my best friend the game you showed me, friend. I even play games that I'm not at all good at, just to be in the company of those I hold dear. You made me beg for us to play together, as if I have no one else to hang out with when just this week I've literally been dragged away from talking to friends by other friends. They don't call me a social butterfly for nothing! But you, you make me feel like I'm needy for actually wanting your company. Thanks, *friend*.

I've spent hours of my life, wishing for someone like you. Someone I don't feel like I'm bothering with my me-ness. Someone I can send memes to. Someone I can talk to about anything, someone who understands me. Someone who I feel safe with. I find pieces of that in my loved ones, such that I don't need you, but the convenience of one source is efficient. You have made it quite clear that you do not want to show any of those qualities to me. As such, you are no longer welcome in my life. Thanks, *friend*.

You have often said that I expect too much from you. That I am too much for you. You were right. I shouldn't expect quality from trash, and if I'm too much for you, I'd encourage you to find less. Have a great rest of your existence; I know I will because you won't be a part of it. Thanks, *friend*.

N QUEER ARTISTS & QUEER MEDIA IN NO PARTICULAR ORDER (IT'S A LOT OF GIRL KISSERS)

happy gay month! this month, you're either gay or lying :D

MUSIC (BOTH ARTISTS AND SPECIFIC SONGS)

- Mickey Darling
- Chappell Roan
- Girl in Red
- Sasha Allen
- Dodie
- mxmtoon
- Phoebe Bridgers
- Clairo
- Conan Gray
- Hayley Kiyoko
- Little Miss Perfect — Write Out Loud
- The Village — Wrabel
- Lady Gaga
- Lorde
- Cavetown

MOVIES

- Bottoms (RUBY CRUZ I LOVE)
- The original Fear Street trilogy (NOT Prom Queen, super disappointing that I didn't get to see girls kissing)
- But I'm a Cheerleader
- Crush
- The Half of It
- Umbrella Academy
- The Rocky Horror Picture Show
- The Eternals

SHOWS

- Dead Boy Detectives
- Agatha All Along
- XO, Kitty
- The Ultimatum: Queer Love
- Heartstopper
- I Am Not Okay With This
- Brooklyn 99
- Arcane
- The Haunting of Bly Manor
- Glee
- Queer Eye
- High School Musical: The Musical: The Series

BOOKS

- The Scorpion Rules (Erin Bow) — very little romance in this book but it was my absolute FAV when i was younger and i never knew why then i reread it years later, got to the fade to black wlw sex scene and went OH
- Cinderella is Dead (Kalyann Bayron)

- I Kissed Alice (Anna Birch)
- One Last Stop (Casey McQuiston)
- Cool for the Summer (Dahlia Adler)
- Crier's War & Iron Heart (Nina Varela)
- Hani and Ishu's Guide to Fake Dating (Adiba Jaigirdar)

OTHER

- mathNEWS
- The Disney short "Out"
- Tim Drake (DC)

THINGS I CAN'T PERSONALLY RECOMMEND BUT THE GAYS AROUND ME CAN

- The Owl House
- She-Ra and the Princesses of Power
- Steven Universe
- Adventure Time
- Young Royals
- Kipo and the Age of Wonderbeasts
- Avatar: Legend of Korra
- The Dragon Prince
- Harley Quinn
- The Legend of Vox Machina
- Willow (i want to watch (RUBY CRUZ) but disney hates the gays)
- Pose
- The Last of Us (big a says video game gayer than show)
- Grey's Anatomy
- The Mitchells vs. the Machines
- Nimona (film & book)
- The Seven Husbands of Evelyn Hugo
- Red, White & Royal Blue (film & book)
- Richard Siken
- The Girl from the Sea (Molly Ostertag)
- Chloe Moriondo
- Mitski
- King Princess
- Muna
- Lucy Dacus
- Boyfriend — Dove Cameron
- Troye Sivan
- The Crane Wives
- Village People
- Gigi Perez
- Kevin Atwater
- Leith Ross
- Ethel Cain
- Adrianne Lenker
- Orville Peck

HOW TO BE A PERFORMATIVE MALE MANIPULATOR

YOU WILL GET LOTS OF WOMEN

- Overdress at casual hangouts with friends
- Share your Spotify Wrapped with random women
- Call mainstream artists obscure and underground
- Pretend to be an academic boy genius
- Drink matcha
- Tell girls you drink matcha
- Have a little bit of feminine pizzazz
- Tell girls about how enlightened you are for embracing your femininity
- Read feminist literature in cafés
- Exclusively call movies films
- Be obsessed with Letterboxd
- Wear headphones around your neck all day
- Buy \$12 coffee from hipster coffee shops
- Moustache
- Call gentrified parts of the city “vintage” and “cultured”
- Call the actual cultured parts of the city “run down” and “ghetto”
- “I don’t understand how people can listen to rap”
- Change your personality slightly to match every woman’s you meet
- Wear a tote bag with an indie band’s logo on it
- Unhealthy obsession with Japan and sometimes South Korea
- Own vinyl, but no record player
- Wear round glasses, even if you don’t have a prescription
- Tell women about your “trauma”
- Tell people you like Jazz, but can’t think of any Jazz musicians
- Begin talking about how hard women have it when one walks into the room

Usman!

EVERY mathNEWS WRITER'S POETIC FALLBACK

Obligatory
haiku article for za
(pizza, not zaza)

abs(Jester)

SEVEN WAYS TO NEVER BE LATE AGAIN

Sure, you could start getting ready earlier or aim to get there early, but let’s be honest, you won’t. Our brains are great at telling ourselves that we have more time to watch just one more reel or TikTok. Here are some real tips to actually get where you’re going on time.

1. **Speeding:** Is it a crime? Only if you’re caught. (For legal reasons this is a joke and we bear no legal responsibility if you get your license revoked.)
2. **Sprinting:** Just outrun the bus to get to the next stop before it does. If you’re a noob and can’t outrun traffic, you can still catch the next bus and start running when you get off at your stop.
3. **Cycling:** A bike is a great way to get around fast without a car. It can even be faster than taking the bus depending on how direct your route is and how fast you can bike. If you don’t have a bike, you can usually steal one from some kid nearby.
4. **Camping:** You can never be late if you never left. Set up camp at work, school, or anywhere else.
5. **You’re not late because time isn’t real:** Time is a social construct. Make sure to argue this any time someone comments on your punctuality.
6. **Time travel:** Simple fix to being late. Just time travel back as far as you need to be on time.
7. **Become undead:** Be it sleeping in or being slow from exhaustion, 99% of lateness is due to the average human’s need for sleep (source: trust me bro). Just become undead and you won’t need to sleep anymore.

I_am_speed

PROD NIGHT ARTICLE

Yeah so it turns out CSC isn’t the only one being targeted.
WHO THE **** SIGNED UP PMC FOR A ****HUB ACCOUNT.

[REDACTED]

Once, we got pizza with
a charcoal-infused crust
for Production Night.

Just the once, though.

A mathNEWS PIZZA CONNOISSEUR

FIELD TRIP

gridCOMMENT 158.3

hello students,

i've been playing Bracket City by The Atlantic for a while now, and i really have to say, it is a LOT of fun. thus, i am once again making **mathNEWS** a victim of my personal interests and cruciverbal experiments by making the themed clues some of my favourite Bracket City facts from recently. if you complete this **gridWORD** way too fast (i think this one might have the highest black:white cell ratio in the recent history of the **gridWORD**, and there is also an obese amount of three-letter words), you should go play Bracket City. this is not a sponsored post, i just really love Bracket City.

last time, i asked you what YouTuber you would be. you said:

- *hyperlynx*: blackpenredpen
- *the Math Tutoring Center*: 3Blue1Brown

both of you guys have fantastic taste, but i love 3Blue1Brown more, so i am gonna have to give it to the Math Tutoring Center, even though it infuriates me to type "Center" instead of "Centre." please pick up your prize at mc 3030, **mathNEWS** office!!

this issue's **gridQUESTION** is: what is your favourite wikipedia page? please submit your completed **gridWORD**, **gridQUESTION** answer, and a pseudonym to mathnews@gmail.com OR the **mathNEWS** office (mc 3030) by 6 pm on monday jun 23 for the chance to win..... a prize?????????///

Warm regards,

spaghettiiinhalers

ACROSS

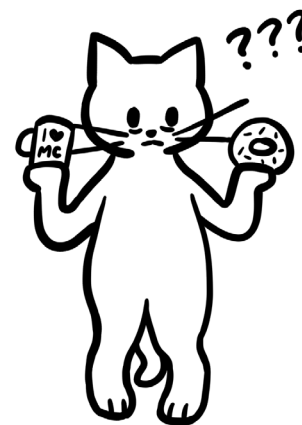
1. Dr ___ Vandertramp
4. Klimt's "___ und Leben"
7. Support system?
10. Delivery aboard the delivery aboard the USS Barbero in 1959*
11. Chemical suffix
12. Records
14. Killer whale
15. Money dispenser
16. Tan
17. Sore
18. Islet
19. Squeaked (out)
20. Lacquered metalware
21. Special ___
22. Feels relieved, in a way?
23. Ritual heaps
25. Assessment version, maybe
27. Concept embodying yin and yang
29. Easy New York Times puzzles, for short
31. Plead
34. 585 BC prediction that ended a war*
39. Do penance
40. Pork place
41. Hunger Games setting
42. Cowboys quarterback Prescott
44. Sculptor Jean
45. Steeple
47. Fetal development sites
50. Hair donation destination
51. With 37-Down, infamous Canadian-born female outlaw*

55. Tonic's partner
56. Canadian voyageur with a stomach window*
59. Oodles
60. Boost
61. Lagerlöf's "The Wonderful Adventures of ___"
62. Tasseled cap
63. Western tribe
64. Uno, ___, tres

DOWN

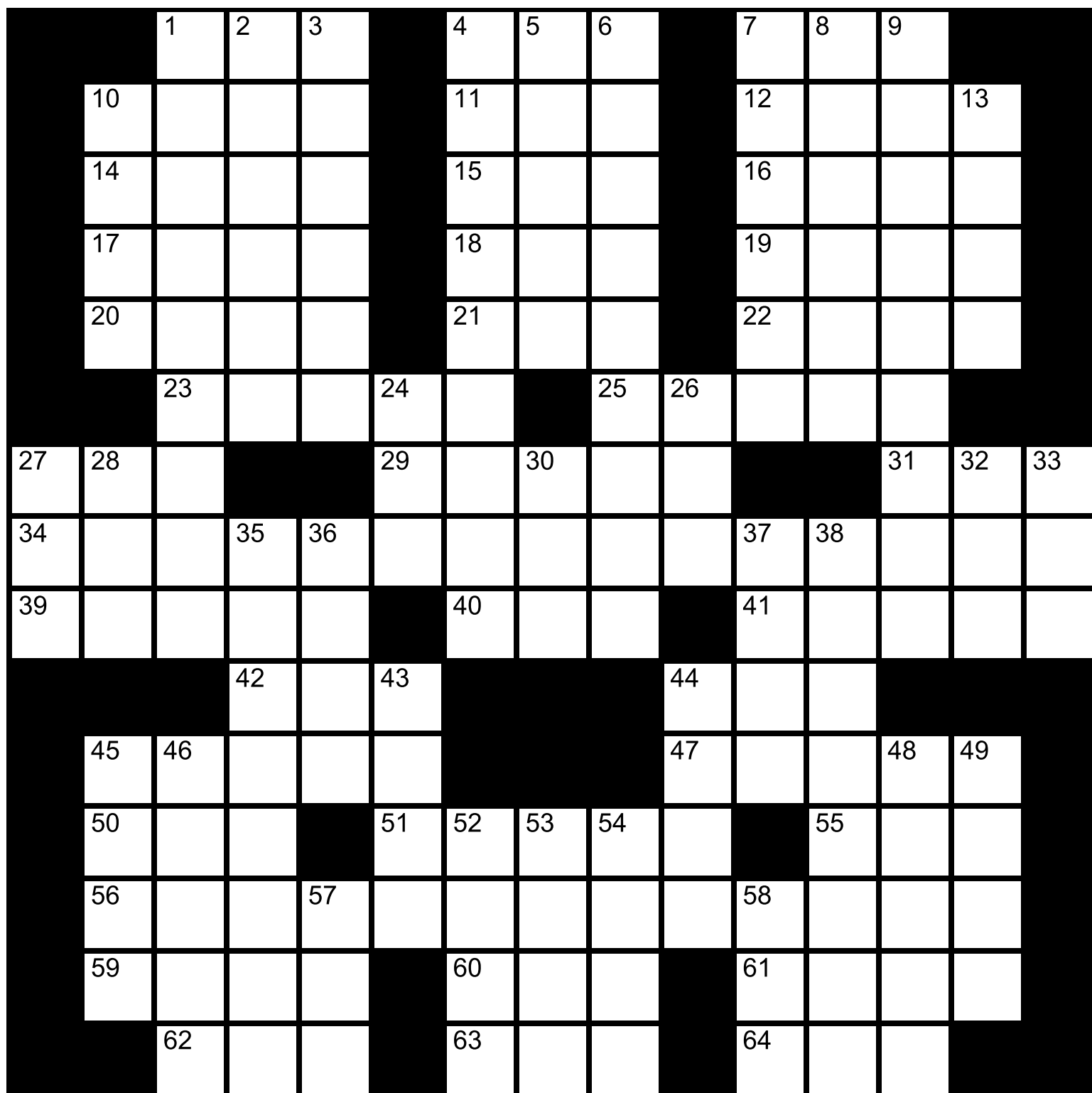
1. Aquatic Blindman's Bluff
2. Sparing no expense
3. Buffy, to vampires
4. Pot covers, to Brits
5. Ready
6. Clear things up
7. Censorship sounds
8. Delivery aboard the USS Barbero in 1959*
9. Pleasant
10. Water under the bridge
13. Lather
24. What paramedics may provide
26. "C'___ la vie!"
27. Mad Hatter's drink
28. Pretend
30. "I" in computer science, maybe
32. Night of poetry
33. UW Group for graduate students
35. Une personne qui est anciennement originaire d'un pays
36. Orchard item
37. See 51-Across*

38. Musical run
43. Visored cap
44. "___ Lang Syne"
45. Paddled, as a dog might
46. Middle Eastern rice dish
48. Iranian money
49. Lodges
52. Brother of Jacob
53. Somewhat
54. Rollercoaster, maybe
57. Cartesian letters
58. Furthermore



Drop your **gridWORD** solutions off at MC 3030. And yes, we do award points for creativity.

A PERPETUALLY BORED **mathNEWS** EDITOR



I wrote for mathNEWS → I get free pizza

A mathNEWS EDITOR WITH SOMETHING TO PROVE

lookAHEAD

SUN JUNE 15	MON JUNE 16	TUE JUNE 17	WED JUNE 18	THU JUNE 19	FRI JUNE 20	SAT JUNE 21
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Father's day		Cycle 2 posting 1 postings close	Cycle 2 posting 2 postings open	Juneteenth	Tuition and fee refund deadline—50% Cycle 2 interview period begins	National Indigenous Peoples Day
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SUN JUNE 22	MON JUNE 23	TUE JUNE 24	WED JUNE 25	THU JUNE 26	FRI JUNE 27	SAT JUNE 28
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	mathNEWS 158.4 production night 6:30 PM, QNC 1502 First day of CUMC 2025	Cycle 2 posting 2 postings close	Global Beatles Day		mathNEWS 158.4 releases Last day of CUMC 2025	
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LAST ISSUE'S gridSOLUTION

1	P	2	H	3	D		4	O	5	T	6	T		7	L	8	S	9	D		10	P	11	A	12	S
13	L		I	E			14	C	H	A		15	L	I	C	E		16	A	S	P					
17	O	F	F				18	C	A	R	E	F	U	L			19	U	S	A						
20	P	I	T		21	P	U	T	P	A	T	P	E		22	T	P	O	T							
				23	O	R	C	S						24	W	E	R	E								
25	G	A	R		I	S	H			28	F	I	L	B	E	R	T	S								
32	A	L	A							33	L	O	I	R	E											
34	B	E	N		35	B	A	N	37	B	U	N	B	O	N		39	B	I	41	N					
				42	E	B	O	O	K							43	E	R	E							
44	S	E	N	D	A	W	A	Y			47	D	U	L	L	E	D									
50	A	L	O	E						51	S	A	N	E												
52	W	O	T	W		53	U	54	T	55	W	A	T	W	E	T		57	W	58	I	59	T			
60	S	P	A			61	G	R	E	N	A	D	A				62	O	D	E						
63	E	E	R			64	L	E	N	T	I	L	S				65	R	E	M						
66	T	R	Y			67	Y	E	T		68	N	E	E			69	N	A	P						

WOMEN OF WATERLOO

Join us on **Thursday, June 26th from 5:30 to 7:00pm** in the **DC Fishbowl** for an evening of socializing in honour of Pride! Test your knowledge with Pride trivia, express yourself through art activities, and enjoy free pizza with wonderful company. This event welcomes women+ undergraduate students, graduate students, post-docs, and faculty from all Waterloo faculties. Sign up now at: www.ticketfi.com/event/6355/s25-women-of-waterloo!
Or via the QR code to the right:

WiM Committee



Silksong tomorrow guys!

A mathNEWS EDITOR DESCENDING INTO SILKSANITY