



Preliminary report on Core reform provokes opinions from students, faculty

Town hall meeting indicates agreement on philosophies but concerns about implementation

By Tina Ding
STAFF WRITER

On Thursday, December 11th, students filed into Beckman Auditorium to voice their opinions on the changes proposed to Core. The debates at the town hall meeting demonstrated the need to continue working on the implementation since the Caltech community overall agrees with the philosophies of the new core, yet is divided in its implementation.

According to Mike Brown, Core Curriculum Task Force (CCTF) co-chair, the purpose of presenting this proposal was to gauge the level of consent on the philosophies. "If no one agreed with the philosophies, we were going to stop our efforts," said Brown.

The new core preliminary report introduces drastic core course changes in every science, based on six philosophies: introducing multiple paths through Core to account for varied backgrounds and inclinations of incoming students; decreasing lecture size; renormalizing science requirements, so that students are trained more equally across the sciences; emphasize critical writing skills; emphasize algorithms; and emphasize data analysis.

The new Core proposal was presented to the Faculty Board a month ago, to the entire faculty on Monday, December, 7, and to the students on Tuesday, December 8. At the town hall meeting, some students seemed concerned about the philosophies of multiple paths, renormalization, and critical writing skills.

The most controversial topics, however, were not the philosophies. CCTF's preliminary report also laid down a "strawman core implementation", an explicit

algorithm class, programming class, and design lab were mostly supported by the students.

Many opinions voiced at the town hall surprised the CCTF. Faculty not in the math department strongly supported the elimination of Ma1a, for example, but students at the town hall were largely against the elimination of the proof-based math course.

Philosophy

The current core provides all

Brown.

Furthermore, according to Niles Pierce, another member of the committee, Core also needs to represent modern science and address cutting edge knowledge. This is the reason for the addition of algorithm and build/design labs.

While the only paths offered in the current core are analytical and practical physics and math, the new core introduces paths (more than two) for every science including math. "The current

based on general opinions and re-evaluation. The voting process will separate the central broad changes, such as the multiple paths and seminar classes, from specific controversial topics such as elimination of second term pass/fail.

"What we don't want is faculty voting 'No' on the proposal because of one element they highly dislike," said Brown. The changes are expected to be final by the end of this school year, and to be implemented in fall 2011.

The CCTF was formed by the Faculty Board under Chair Judy Campbell in July 2008, as a result of the Caltech Student Experience and Student Affairs Report which underlined high discontent in student life and learning. The Student Experience Report also addressed the Caltech Syndrome, the condition of unhappiness and dissatisfaction with Caltech that many students experience here. Caltech students rate Caltech much lower in exit polls than do graduates from other universities, e.g. MIT and Stanford. The formation of the CCTF served to re-evaluate the Core and propose changes that will improve the condition.

The last CCTF's main tweak to Core was implemented 10 years ago, with the introduction of Bi1.

Implementation details will be discussed in detail in a future issue.

"Student support will make a big difference in whether this proposal lives or dies.

-- Mike Brown, Chair of Core Curriculum Task Force

description of a revised Core that follows the philosophies espoused above. Most student discussion seems to center on the specifics of the strawman core implementation.

During the town hall meeting, amongst all the questions addressed, the most popular and controversial topics were the elimination of Ma1a, elimination of pass/fail second term, change in Physics, changes in Humanities, and multiple paths. Based on an informal vote at the end of the town hall meeting, the introduction of freshmen seminar,

Caltech undergraduates with a common academic foundation, heavily weighted in math and physics (5 terms), and not as heavily in chemistry (2), biology (1), and menu (1). According to the report, the new core emphasizes "content and breadth", with the goal of allowing students from different backgrounds to pursue different paths that suit their interest.

"Right now, students coming to Caltech are so diverse in their backgrounds whereas it was not true fifty years ago, when the students were monolithic," said

Core pretends to be in-depth but is very much superficial exposure to many things," said Brown. At the town hall meeting, he addressed this concern. "As faculty we are a little worried that students that graduate have been exposed to lots of concepts but don't understand them, and that's actually worse," said Brown.

Although the students' opinions matter, faculty votes ultimately will decide the future of the Core. The process to finalizing the Core is uncertain, according to Brown, but the Committee will likely modify the proposal

MIT: The New Caltech East School of the Humanities

By Margaret Tse
STAFF WRITER

Early Monday morning, an elaborate attempt to revive the time-honored tradition of pranks (or 'hacks' for those who prefer the MIT term) failed to completely take flight. The attempt, meant to rechristen MIT as the Caltech East School of the Humanities, Caltech's investment in education for the artsy, was stopped by the MIT police.

Planning for this prank began during the summer, when our beloved Assistant Vice President for Campus Life, Tom Mannion, called a meeting of all present Caltech students interested in reestablishing Caltech's reputation for pranking. Among the myriad plans cooked up by the thirty-odd students who attended, one idea in particular stood out: the transformation of MIT into a separate Caltech campus

dedicated to the humanities. From those thirty-some students, a smaller number decided to follow through with the scheme.

What followed involved nearly six months of careful planning, several weeks of practice in the dead of night, and a good tree and a half of paper. Throughout the term, more members were added to the Caltech prank team to include representatives from six of the houses. The help of members from every class along with a couple of Caltech alums were required to bring the prank into completion. Unfortunately, when the prank was aborted, many aspects of the plan were left unrevealed.

From its very infancy, the prank demanded several huge banners spread throughout MIT's campus. A company was contacted to create two enormous banners. One which read, "Welcome to Caltech East, School of the Humanities" was to be hung on Massachusetts

Avenue to greet MIT students returning from the Thanksgiving holiday. The other banner, a huge red sold sign, was to be hung in Killian Court. To add insult to injury, members of the team designed a way to attach the banners so that they could be set up within a minute and yet would be difficult to detach without the use of a cherry picker or rappelling down the side of the building. In addition, the students also created a number of smaller banners to be hung normally throughout Lobby 7. Unfortunately, despite several weeks of practice on Caltech



east.caltech.edu

buildings, Killian Court, having been designed 'by 8-year-olds-with Legos and crayons' (quoted from esteemed Professor Wetzle Prätzle by the faux MIT Tech), resisted attempts to raise the 'sold' banner and so was left as

was before the team was forced to stop.

In case the banners weren't enough to catch the eye of the average MIT student, plans were

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An Open Letter to the Core Curriculum Task Force

By Daniel Rowlands
CLASS OF 2009

My name is Daniel Rowlands. I am a recent alum, having graduated this last spring with a major in chemistry and minor in history. During my time at Tech, I thought about Core a lot because I felt it was one of the more important parts of the Caltech experience. I also served as a student representative on the Core Curriculum Steering Committee during my junior year. Since a copy of the Core Curriculum Task Force's preliminary report was sent to me on Monday, I've been thinking about it and discussing it with a number of alums and current students, and I've concluded that I have some things I would like to say in reply.

Since I'm now a grad student at MIT, I can't make it to the official presentation on Thursday to comment in person, so I'm addressing this letter to the Task Force and to the student body in general, in case anyone thinks the points I make in it add to the discussion.

As the report notes, there are a number of possible philosophies of Core. One view, the one I personally hold, is that Core exists to provide a common--and rigorous--background in science as a whole, but especially in

those fields that are particularly fundamental and basic. Specifically, this means that Core should focus heavily on covering math and physics as rigorously and deeply as possible, while also trying to give everyone some background in other topics that are important to many fields of science. Exactly what these topics are is debatable, but I think that chemistry, biology, and engineering / applications are commonly things people think are useful.

I will call this view "traditional Core".

Another view that seems common, and seems to be reflected by some of the changes suggested by the Task Force, is that while depth may be good, breadth is more important. Since the number of courses that can be devoted to core is obviously limited, some people feel that it is more important to give people more background in as many topics as possible (more biology, more engineering, more information and geoplanetary science) than to focus on an in-depth background in math and physics or any other particular field. I will call this view "broad Core".

I am not going to try to argue over which philosophy is a universally better way to educate scientists and engineers for the simple reason that I don't think anyone--not me, not the Task Force, not the Faculty Board, not Richard Feynman's ghost--really knows which one is universally best. I don't even think that it's reasonable to claim that there is one that is best for all students. Both of them have advantages, after all. A "traditional Core" ensures that, no matter what their major, all

Tech undergrads will have a fairly deep education in the two fields that are the most fundamental to other topics in science and engineering. Certainly, if one has to pick only one or two fields to cover deeply in Core, physics

Other schools have similar requirements for their science and engineering majors. If we imitate them, it is unlikely that we will spectacularly improve on their implementation, and we will be sacrificing our fairly unique approach to the education of scientists and engineers.

and math are more likely to be useful to biologists and geologists than biology and geology are to be useful to mathematicians and physicists. On the other hand, this depth is obtained at the expense of covering other fields, and students educated with a "traditional Core" will find that they don't have as broad a background in as many fields as those educated with a "broad Core". Which type of core is more useful for a student probably depends on their individual talents and interests, and on what sort of work they will be doing after they graduate.

Many, perhaps most, programs at Caltech are among the top five or six in the world. There are a few other schools, especially MIT, but also places like Cambridge, Harvard, and Berkeley, with which we share the situation of being one of the best places to study most fields of science and engineering. Among these schools, there are, unsurprisingly, a number of different philosophies of how to best educate young scientists and engineers. Specifically, MIT's "General Institute Requirements" are similar to some of the proposals for a "broad core", although they are even less physics-and-math

focused than the Task Force's report. Both MIT's very broad GIRs and Caltech's current "traditional Core" seem to work decently well--after all both MIT and Caltech continue to produce top-notch graduates in many of the same fields.

Given that there's more than one idea of how to best train scientists, and that the question of which is best is unanswered and may not even have a simple and universal answer, doesn't it follow that the five or so best places at doing so ought to try to do so in different ways?

This ensures that among the next generation of scientists and engineers, there are people who have been trained at the best schools *in different ways*. If the "broad core" and "traditional core" approaches have different advantages, it is presumably best to increase the size of science's educational "gene pool" by including people trained in both ways. Students coming from a "broad Core" background will be more "well-rounded" in terms of having broader knowledge of more fields, but even they will probably need to do some background reading before tackling a project in a field far outside their majors. Students from a "traditional Core" background will have to do more background reading to obtain the same breadth, but they will have a different set of tools in their problem-solving toolkit.

Because math and physics are so sequential, it is particularly hard to learn to use them to approach a particular problem without spending a lot of time learning background topics--the topics that "traditional Core"

prepares Techers with. By teaching a "traditional Core", Tech prepares us to be familiar with a set of tools that graduates of schools without a "traditional Core" philosophy are unlikely to have the time or energy to pick up later in life.

MIT already has the general goals of "broad core" in their General Institute Requirements. Other schools have similar requirements for their science and engineering majors. If we imitate them, it is unlikely that we will spectacularly improve on their implementation, and we will be sacrificing our fairly unique approach to the education of scientists and engineers. Caltech, due to its experience in doing so, and its past willingness to and reputation for doing so, is in a better position than any other top school to use the "traditional core" method. If we abandon it, no one else is likely to pick it up, at least not as well as we've been doing it. And if we move towards the ways things are done elsewhere, we are contributing less, since we're doing the same thing as someone else, and probably not doing it much better than them.

I am not advocating refusing to change Core at all. There are some classes that do not work as well as they could, and a complete refusal to consider whether we could be doing better would prevent us from improving things. However, I encourage everyone involved in the process to keep in mind the value of the traditional philosophy that all Caltech graduates should have a deep and rigorous education in physics and math. Not only because physics and math are important--though they are--but because this provides for a particular type of scientific education that no other school does as well as us, and that ought not be allowed to disappear completely.

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Reconsider the Interpretation of Core's Goals

By Daniil Kitchaev
UNDERGRADUATE

While the broad philosophical goals stated in the core report are representative of the opinions on campus, the committee's interpretation of these goals is not correct. The new core report does have many good recommendations, namely the new programming and algorithms requirements, and the frosh seminar; however, there are some very fundamental issues with the recommended changes to the existing core classes. The proposal makes two incorrect assumptions: it assumes that students in their frosh year know what exactly courses are best for them, and that rigorous, difficult classes in particular fields should only be taken by students majoring in those discipline--essentially taking the rigour out of core requirements.

First, I am referring to the "tracks" path proposed for most of the frosh classes. While philosophically the concept of "tracks" approaches the ideal of a personal, one-on-one education, it is not implementable in any way that will not essentially be "easy" and "hard" versions of the same class, especially at the introductory level of core. Students

not interested in the subject will inevitably take the "easy" version of the class, creating a situation similar to that of the current Bi1--a class full of people who are not willing to put any effort into the class and end up getting very little, if anything, out of it. The final outcome of this scenario is that students end up getting a quality education only in the fields they were interested in coming into Caltech, defeating the entire "breadth" purpose of core. While arguably requiring everyone to take the same "hard" version of the class has the same effect, mixing students interested in a particular subject with those who initially may not like it, especially in Caltech's collaborative environment creates a much more positive atmosphere for the class in general. Furthermore, in response to the common objection to this proposal is that such mixing makes it very difficult for students lacking background knowledge to do well in the class--I believe that by designing the curriculum of the class to be on the level of incoming students and allowing advanced students to take reasonable placement exams this problem can be solved for the majority of undergraduates.

The second part of the proposal that I strongly disagree with is the

change in the math and physics core to be less rigorous. While I am certain that Ma1a is one of the most complained about classes at Caltech, it teaches material that is absolutely essential and levels the incoming frosh regardless of their backgrounds. I came to Caltech not ever having done a single rigorous proof and, while Ma1a was very difficult at first, it was definitely the only core class that taught me how to think in a new way as opposed to just teaching me facts. In essence, it was the only course that I could not have learned by myself, from the a textbook. Furthermore, the way of thinking that Ma1a introduces--precise and abstract--is absolutely essential to understanding abstract concepts in other courses, possibly in completely unrelated disciplines. It is absolutely essential that frosh core include a class that emphasises proofs and analysis, hopefully in combination with material that most students would have been exposed to in the past--here, single-variable calculus seems to be the optimal candidate, which gives us the current Ma1a.

Much more concretely, given that some students come to Caltech without a strong background in calculus, having the first term of math core be multivariable

calculus is absurd.

Overall, as the committee very clearly states, its goal was to completely restructure core to reflect the complaints of alumni and recommendations of the student faculty conference/student experience trip last year. However, the majority of the complaints about core stem from the implementation of specific classes, not its overall structure. It is not reasonable to model core, which is unique to Caltech, after other universities--they don't have a core, and that is not necessarily a good thing. Caltech is able to offer a uniquely interdisciplinary education only by forcing all of its undergraduates to take rigorous classes in the core sciences, and reducing the sometimes harsh demands of the current core curriculum can only lead to Caltech losing its historic identity and reputation.

PRANK, FROM PAGE 1

made to completely redecorate the Infinite Corridor. A Caltech East logo was designed that nestled the figures in the MIT seal within the Caltech flame. Members covered offices in the Infinite Corridor with a sampling of labels such as “Steven ‘Chuck’ Frautschi’s Office of Shoe Design”, “Defense Against the Dark Arts, Kip S.Thorne”, and “Department of Literary Fiction, Tom Apostol.” Flyers reminding MIT students of the CaltechEast’s Surf Club next meeting and the opening of the ‘Science is Hard’ Science Help center remain undistributed. To top it all off, members placed floor mats emblazoned with the CaltechEast logo throughout the Infinite Corridor.

To accentuate the cosmetic remodeling, reworked copies of MIT’s “The Tech” were distributed to newspaper stands

throughout the campus. In true Caltech fashion, the newspapers were created in one 21 hour sitting the night before they were sent to the press. This seven page caricature details the purchase of MIT and the changes that new CaltechEast students would expect as members of a school for humanities. The paper also includes the address for a website <http://east.caltech.edu> dedicated to informing former MIT students of Caltech’s newest acquisition. In addition to the webpage, the Tech also posted a phone number that would redirect any queries to several waiting Caltech students. As a finishing touch, the team used Google AdWords to create a sponsored link whenever anyone searched for certain phrases pertaining to CaltechEast.

With all the deliberation put into the prank, it seems a small wonder that the execution did not go as planned. However, let it not

be said that the team did not do its best to avoid detection. Before the night of the prank, attempts were made to catalogue the movement of MIT staff and students. Unfortunately, since MIT is indeed an institute of technology, there are students up at all hours and their messes are taken care of by cleaning staff that patrol the infinite corridor at all times of the day. Considering that there is a body of MIT students dedicated to cleaning up other students’ pranks, the team only had a small window of time to set everything up. Unfortunately, while the team did consider and successfully evade militant MIT students (the only students present simply ignored the signs), they did not consider that the MIT cleaning crew would be the polar opposite of Caltech’s.

According to the team, MIT’s cleaning staff was suspicious from the start, even though the team

made sure to put up posters and signs that did not have anything to do with Caltech. The instant one of the smaller banners fell, the staff fell upon the team like hawks. Despite attempts to reason with them, MIT’s cleaning crew called the MIT police, who arrived just as the welcome banner over Massachusetts Avenue was almost set up (the sold sign in Killian Court was left abandoned as there were architectural difficulties to overcome). Thanks to some quick negotiation, the team managed to convince the police not to arrest all the present Caltech students, but the team was still forced to remove everything that they had set up.

While this particular undertaking did not reach its full manifestation, it will hopefully be the first of many pranks to come. For those of you now inspired and interested in the venerable art of pranking, it is now up to you

to pick up the torch (the newly instituted Prank Club might enjoy your help). Though we fell short of relegating MIT to its proper humanities-preaching place, we have still sent MIT a reminder of pranking days of yore. We may have rekindled our pranking spirit, but it all falls short if our favorite adversary has forgotten its role. Its up to you to keep the raft afloat, MIT.

Many thanks to the CaltechEast Prank Team: Peggy Allen, Anthony Chong, Perrin Considine, John Forbes, Raymond Jimenez, Megan Larisch, Rebecca Lawler, Sebastian Mata, Julian Panetta, Eugeniu Plamadeala, Alex Rasmussen, Nicholas Rosa, Isaac Sheff, Stefan Skoog, Will Steinhardt, Jordan Theriot, Ryan Thorngren, and Heather Widgren

Core Reform is Commendable

By Priyam Patel
UNDERGRADUATE

When Mike Brown presented the philosophy behind the core restructuring, I felt that he did a good job showing concern for the students. While we students will not directly influence the final verdict, it is important that the faculty take into consideration our comments and opinions, and Mike Brown knows this. There’s still a lot of dissent milling about, but is there really any basis for it? Particularly I am thinking about reactions to some of the

latter comments and questions following the presentation. A lot of questions were too specific to be relevant at this stage of the process. As he pointed out, there will be a long implementation process, and that’s when the kinks will need to be worked out. Granted, it’s important to point out any major implementation issues for the faculty to carefully consider. But there’s no need to harp on some of the more minor changes and lose sight of the big picture. And, of course, not everyone will agree with the proposal, especially this early on

in the process. But there is no reason to be so ready to shoot down an idea. It’s far too early to say with confidence whether it’s a good idea or not. And even if this plan gets axed, open and constructive discussion will lead to a better alternative. Brown cares enough to hear us out. We should, at the very least, keep an open mind to his ideas and offer succinct and constructive criticism. We should do our part in improving education at Caltech.

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Ask the Frosh

Has anyone ever noticed that the lewis dot structure of AsO looks like a giraffe?

There was disagreement among The Frosh as to whether or not it looked like a giraffe, and not being the experts on chemistry ourselves, we decided to contact someone with more knowledgeable than us. According to Professor Nathan S. Lewis, "Using VSEPR theory, and taking the stomach of a giraffe as the central atom I conclude that the steric number of a giraffe is 5 (if one doesn't include the tail). Therefore giraffes should be in the trigonal bipyramidal geometry. So the answer to your insightful question is clearly no, AsO does not look like a giraffe!" While we can see why you may have been confused, we were persuaded by Professor Lewis's response, and must agree with him. Nice try!

Frosh Note: Oooh! A Shakespearean sonnet!

I talked to some of the frosh the other day. They really made me feel way past my prime, For everything that I to them would say They did not recognize as from their time. They didn't know of Pinky and the Brain Or Animaniacs and Duck Tales too, And Tiny Toons, they wanted it explained. The whole ordeal, it made me feel so blue. Of Captain Planet they had only heard, And Mortal Kombat they had never played. The conversation got to be absurd. I felt like my whole past had been betrayed. My question now, my frosh, you can review:

Please won't you watch the games and shows I knew?

The frosh regret to inform Our dear Shakespeare-loving reader, That while she may feel misunderstood, She is, in fact, old.

Our TV days were better spent:

"Dora the Explorer," "Blues Clues," and "Teletubbies" graced our screens. Our computer games were worthwhile Fun, educational. "Where in the World is Carmen Sandiego?" was apparently a TV show in your time.

If you truly want to understand the frosh, Or want them to understand you, Perhaps you should consider watching these shows of a younger generation, Or just not be so old.

But, not just sit around and watch TV did we, but learn the meaning true of being a child! Advantage took we of the serene subtleties that simplistic life offered us And regrets? We have none. When we were young, we went exploring among

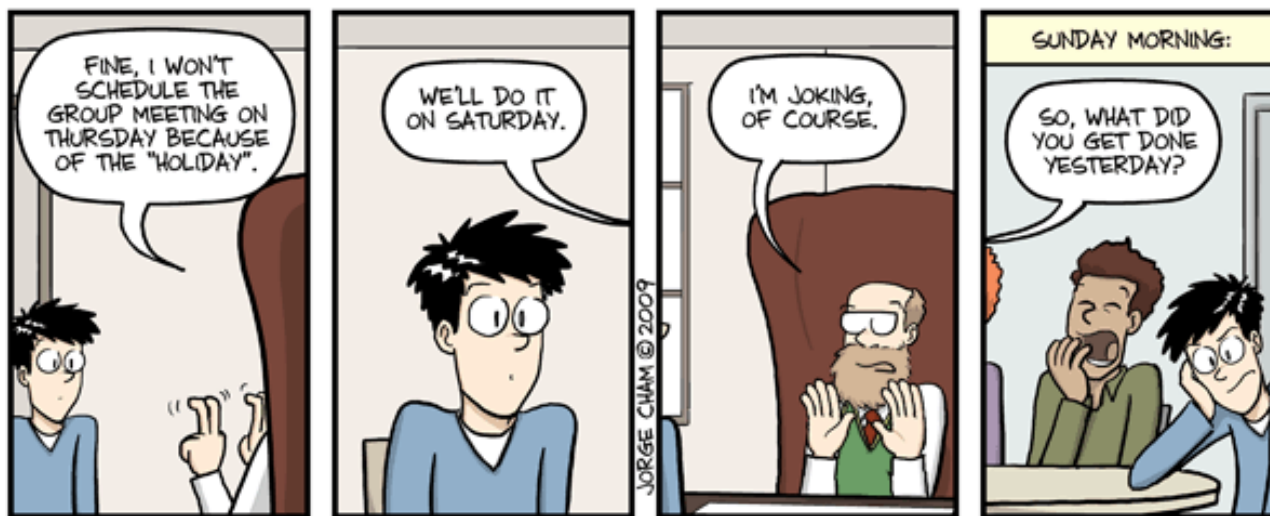
the meadows and the backwoods and the flowers and the trees of springtime!

We built model airplanes and did arts and crafts. We threaded thousands upon thousands of lanyards and folded origami crane after origami crane. We learned to sew and to cook and to frolic through playgrounds even when school wasn't in session.

Letter after letter after letter We wrote to Santa. Waiting And waiting And waiting For the magical pony in our minds to become a reality.

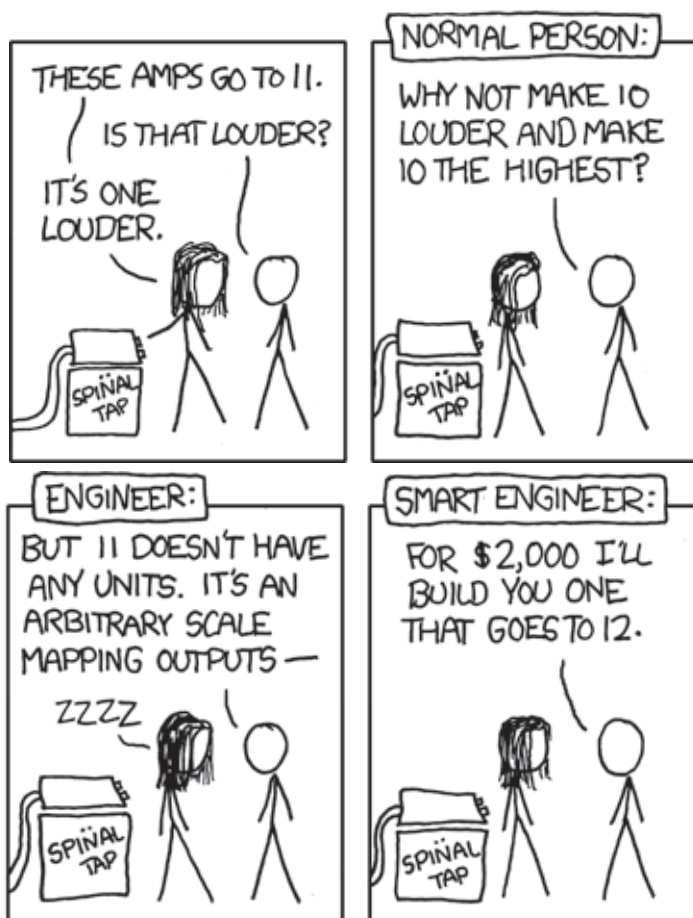
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