News from Computer Science and Engineering

βETA

Free as in speech and our awesome BBQs.

OPINION

Why you should learn Haskell

Picking the right language for new software development is an important decision. Many overlook it, sticking to their One-True-Language of choice, often C/C++, Java, Python, the list goes on. Haskell is almost never considered. Yet it is a very powerful language with many benefits. So great are these benefits that even if you don't use Haskell as a main development language, its still worth learning the language, as doing so will make you a better programmer. I will do my best to summarise Haskells strengths.

State is weakness

Haskell is stateless. Every function, indeed every snippet of code exists in isolation from every other snippet. It would seem initially that this would make the language useless. It would seem vital to have within a language a concrete object that preserves the current state of your program. Yet, in Haskell you don't have this. Instead you write a program by considering how data flows from one function to another. This approach helps to enforce each snippet of code has no side effects. Rest assured, you can still deal with stateful action such as I/O. Haskell does not exist entirely in a bubble, but it forces you to understand how you deal with state in all its forms.

Strong typing is amazing

Many of you would have experienced arcane errors where the compiler/intepreter has decided to be your 'friend', and silently casted a variable to a type when you didn't expect it to. Silent casting is one of the many paths to madness. Haskell though is strongly typed. As a result, it can not only predict what types a function takes and returns, it will inform you if you used a function incorrectly and attempt to resolve the issue without you having to do anything. All the benefits of static typing without the tiresome legwork of deliberately specifying exactly what you need and when.

Parallelism is easy

Haskell, due to its lack of state means that most (if not all) functions can be trivially parallelised. There is no need to worry about how threads interact. No need for semaphores or locks because you don't worry about state. This means that sequential code can be replaced with a parallel alternative without major modification. Infact the code for a single thread is almost identical to the code required to run on multiple cores, even data centre level processing. Not many languages can say the same thing.

A language as lazy as you are

Haskell uses lazy evaluation. That is, it will only evaluate a function at the last possible moment. This concept is both a boon and a curse. You can do some really cool things like have infinite lists. Performance wise you can get great speed increases as Haskell simply ignores any code it doesn't need to evaluate. However, estimation of CPU and performance is difficult without profiling.

Error handling, you're doing it right

Haskell provides stateless and strongly typed error handling, which should be no surprise. You don't have exceptions, which just results in Pokémon code where you "Gotta catch 'em All!". Instead with the Maybe type you actually specify situations where you may not get what you need and have the compiler check the cases for you there and then.
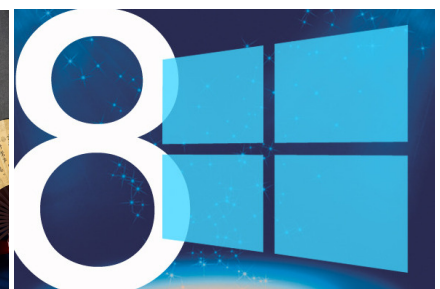
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OPINION

Why you should learn Haskell - contd.

Where more exception-like pass-the-error-up-the-chain error handling is needed, the Either type encapsulates the error meaning that again, you can rely on the compiler to make sure that you do the right thing with your error handling.

Large functions are a no go

While you may be confident in your ivory towers of state and loops, Haskell peasants cannot rely on giant functions for their programs. Simply put, it is really darn hard to have the long and complex functions that are commonly found in C or Java programs due to how Haskell is structured. You are forced to break your functions into smaller pieces. This not only enforces readability but can have wonderous effects on code reuse due to having lots of little blocks of code at your disposal. As with everything Haskell, there is a way around this with the liberal use of Do blocks but be warned, they hide the complexity of what you are actually doing.

Currying is not only for stews

Currying in Haskell lets you do very powerful things. The most common of which is partial function application. That is, in Haskell you can have a function that takes n parameters. You can then call it, but only specify 1...m parameters (where m<n). Then you can pass this 'partially applied function' to something else, and have it specify some or all of the remaining parameters. And you can do this all without coding multiple versions of the same functions, or worry about function pointers, as you would have to in languages like C or Java. You get huge amounts of code reuse and flexibility.

For example, lets define function f to take 3 integers. That is,

```
f(x,y,z)
```

You could then set a variable

```
variable = f(1)
```

That is a partial version of f, where x = 1, but y and z are not specified. You could even write a function g, which takes a parameter that is a partially applied function. For example:

```
g(v) = v(3,4)
and call g by
g(f(1))
```

Is your mind blow yet? However, don't try this in C; your compiler will kick up a nasty fit.

Monads

I have specifically not given this a silly title as Monads are really important. Monads are confusing, strange and really, really powerful. They were initially put in place to allow pure (non state based) functions to interact with the scary outside world. As mentioned before, Haskell does not evaluate functions in the order which they are defined. They are evaluated in the order they are required, which is problematic for things that have state like I/O. I/O not only needs state, but guaranteed sequential execution. This is where Monads come in. They provide a data type which forces sequential execution, but also allows other functions to execute in their own category. They give state where it is needed while keep functions stateless. If that didnt also blow your mind, go back and read the sentence again. Monads are incredibly powerful, but more amazingly, are not built into the compiler. They are just data types that have been predefined in the Prelude library (which is one of the most commonly used Haskell Libraries).

Ready to delve into the deep end?

Now that I've waxed rhetoric on its magnificence, I hope you will be interested into looking at Haskell. You can find a free book (as in non-pirate) for Haskell called "Learn you a Haskell for Great Good" which should be your port of call as a beginner (http://learnyouahaskell.com/chapters).
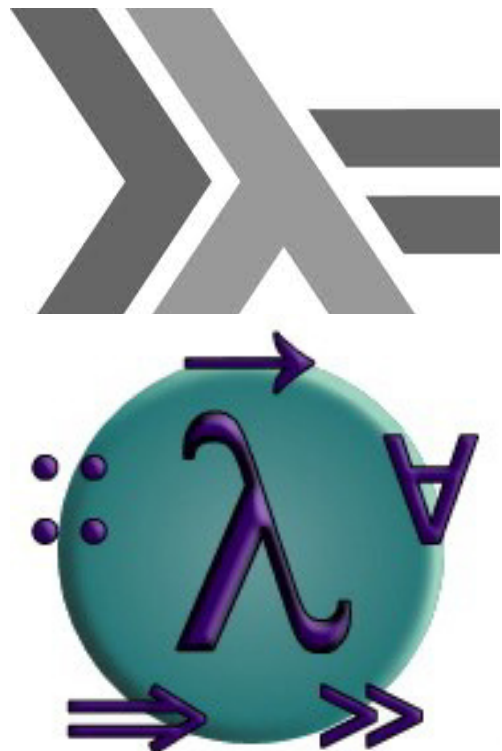
TL;DR: Haskell is amazing. Because you don't have to worry about memory allocation or array management, you can write quicksort in just six lines of Haskell, like so:

```
quicksort :: [a] -> [a]
quicksort [] = []
quicksort (p:xs) = (quicksort lesser) ++ [p] ++
                   (quicksort greater)
      where
           lesser = filter (< p) xs
           greater = filter (>=p) xs
```

So you should definitely try it out!

NATHAN SMYTH

EMPLOYERS

Q and A with withIT™ .net.au

A New Opportunity

A couple of days ago I conducted an interview with Tamas Ridly - the managing director of **withIT.net.au** *- about his company and his mission. Our discussion was as follows:*

Q: What is withIT.net.au?
A: It is a new company that specialises in software engineer training that prepares young professionals on how to manage their work flow in a working environment.

Q: What is withIT doing at UNSW?
A: The company is providing software engineering training services for undergraduate or graduate UNSW students. The training is a simulated enterprise environment with multiple tools to be used on a day to day basis while still progressing with the project's tasks. Those tools are meant to help not only the managers, but also the engineers to schedule and document their time while improving efficiency by providing a comfortable development environment.

In university, students are not forced to use several tools on a daily basis and still keep their attention and focus on the real target. This means that they are usually unable to handle these pressures while working. We are aiming to address that particular issue.

Q: Why is it different from any courses offered in university?
A: Participants are working on a project which contains a set of tasks and not only on one assignment. There are two groups formed during the initial setup of the project: one group is the developer team and the other one is the product owner team.

Q: What are those groups doing?
A: The product owner team is responsible for defining the requirements and conducting ongoing tests while the project runs. The developer team is going to implement the software that will follow a set of changing requirements as well as maintain and bug fix the resulting software.

Q: Is that a special setup for software development?
A: Yes, it is called agile software development methodology. The requirements are flexible with this approach and can adapt to the progress of the entire development process. The product owners can see early implementation results that allows them to include new ideas for the development and also refine and fix rough edges.

In general the agile methodology delivers more reliable and stable software on time because the software defects and functional anomalies are detected right after the implementation. This huge advantage makes it quite different from the waterfall methodology where the testing phase begins only after the full implementation has finished and tons of defects has to be rectified within a short time.

Q: What is the ideal headcount for the training?
A: Ideally we would have a total of 10 participants per training

session, with a mixture of software engineers/developers and business analysts. However the training works only with software engineers as some of them can then play the role of the product owner. It does not work with just business analysts as they would be unsuitable to reach the ultimate aim, which is to implement a working software.

Q: Why do you think students need to go through this kind of training?
A: I have worked as a software engineer for over ten years, during which I have hired many graduate students for enterprise projects. I found that a recurring issue for me was the necessity to train new colleagues on how to multitask and to how ask each other for help to work as a team.

The current education system is very good at training individual problem solving skills and and teaching students to individually resolve given tasks. I believe this will need to change in the near future as most employed software engineers will be working in cooperative teams and solving problems in teams. It is undoubtedly a more effective and faster way of implementing a new system. The training at **withIT.net.au** is a first step towards this approach.

On the other hand our company will also be approaching employers in the IT sector and offer them our talent bank. The talent bank is our collection of high achievers from the **withIT.net.au** training that we will be keeping up to date. This means our long term goal is to build a working relationship with employers and provide specific trainings and contacts for job seekers to make them feel comfortable and productive in their roles once they are hired.

Q: How can students get more information about the training?
A: I will run a workshop on the 10th of April at UNSW and everyone is welcome to participate. I plan to play a game which should help students to understand the main intention of the gap training. More information about what is expected of the students will be provided as well.

Q: Where can students apply for the training?
A: They can do it online on our website **withIT.net.au**. The upcoming training is a C++ backend development and will last about a month long. I'm looking forward to meeting a few smart guys and working together!

Further details about the workshop will be included on the upcoming events page on the back of Beta.

Wen Di Lim and Tamas Ridly
- managing director of withIT.net.au

CSE Society & Events

Message in a Bottle - First Year Camp

Once upon a time, in a land far away....

...there was a magical gathering of cartoon characters*. For hidden within a forest paradise, at the end of a misty not-so-yellow not-so-brick dirt road was a camp site known only as "Camp Wombaroo". Held within this camp was a weekend retreat that only those afflicted by the curse of the anti-social beast could attend. During that mystical weekend, the magical Gods of CSESoc would unite the accursed and smite their anti-social demons together. What follows is the account of one character from this magical weekend.

Day One.

I have been kidnapped. Whisked away from my safe, cosy, and dark basement to a place that can only be described as a primitive, technology-free hellhole. Trees, grass, dirt, sun, sky and wide open pastures, things I've only heard of in fairy tales, confront me wherever I turn. I may not survive this.

It seems my abduction was not unique. I was crammed into a room with 120 others, where our overlords thought it "fun" that we be forced to introduce ourselves to one another. It was as if they knew my aversion to, well people, and were actively trying to torment me.

At least we are fed. Dinner was infact quite devoid poison. With ice cream included, it could almost be described as tasty.

This evening activity of trivia was far from trivial. Once again our overlords thought it "fun" to force us into teams with more strange people, only to barrage us with meaningless questions and a game that can only be described of as a concoction of Chinese Whispers and Charades. However, I did discover that if I laughed and acted as if I was having the "fun" they expected of me, it made them less interested in tormenting me more. Perhaps if I keep up this charade, I will secure an early release.

Our masters seek to assimilate us more. They "unveiled" the so-called CSESoc Camp T-Shirt for 2013. Then took our photo to forever immortalize our torment on Facebook.

Reprieve finally came in the early hours of the morning, but not after a round of "classical-good-aussie-culture-fun" sitting around a campfire and melting marshmallows. It's like I'm in a bad movie.

Day Two.

What creatures choose to be awake at this god-forsaken hour? Our masters of course. Not content by requiring consciousness at 8am, their method of invoking it with vuvuzelas is nothing short of cruel. Not even breakfast of bacon can make this hour sane.

I scarcely know what to think. Did I just enjoy myself? Was my last forced group, not a collection of people, but a "team" of "more-than-just-acquaintances"? There I was, once again in a tiny room, this time to be an architect of my very own Leaning Tower of Pisa constructed from newspaper. Yet by the end my "team" had constructed the tallest palace - one fit for a king. I had been a pirate, dueling on the high-seas with paper swords. I had been a pilot flying experimental aircraft. I even released a real laugh as our "masters" cheated with their tower, supporting it from the air vent of the same, now less prison-like, room I found myself in just hours before.

This afternoon I completed a noble quest - to rebuild my childhood friend SpongeBob Squarepants. I scavenged for parts in a wild adventure. I traversed scorching minefield deserts. Discovered the lost babies of chocolate chickens. Solved mind-bewildering puzzles. I even suffered a sports injury in a fight with a broom (who was a more challenging opponent than it sounds). I carried the burden of my brethren as they fell under the weight of melted chocolate, or could no longer outrun the creepy blue smurf. This epic conquest was ultimately surmounted in deep, philosophical questions such as 'What should I glue where?', 'His tie isn't big enough' and 'WHY ARE THESE GOOGLY EYES SO DAMN SMALL?'.

Tonight there came forth such a gathering of magical cartoon characters, the likes of which have never been seen before. There was Mulan from China. Ash and Pikachu from Pallet Town. *(Editors note, this list goes on for a while)* ...The Little Mermaid from the depths of the freshest ocean. All took part in an evening full of dancing and singing that was, dare I say it, fun. We were even provided magical drinks spiced with the magical elixir ethanol. After many of these potions and much fun, I find it hard to write, so I shall retire this blog for the evening.

Day Three.

I can hardly believe myself as I write this. But as I look around the campsite in the late morning hours, I see a sea of faces to which I could attach the word "friend". I feel almost sad to leave. Have I banished some anti-social demon that has plagued my life? I even happily partook in a final improvised Karaoke session in a vain attempt to portray the evidence of a weekend well spent by returning to civilisation with a croaky voice.

Perhaps something truly magical did happen here afterall.

Editors Note: The following note was found scribbled on some paper during the final cleanup.
Thank you camp leaders for a truly awesome weekend which we will never forget. We lost our voices amongst screaming out the fun. The time and effort you put into this event is not unnoticed, and your aim to unite us succeeded. We all have definitely met quite a few more people we would probably have never talked to otherwise. We took away a lot of experiences and lessons from the camp activities you have provided us. We will always wear your camp T-Shirts with pride and nostalgia. We will always be thankful! Stay fresh!

* By magical cartoon characters we actually mean CSE students in cunning disguises.

Oliver Tan and Lucas Pickup

First Year Camp - Photos

Challenging the broom!

Let's play the cup game.

Me casa is not su casa.

Hey there sailor.

Pika...chus?

It's a smurf fest!

7 people 7 legs.

Besties for life.

Do you even hoop lift?

The cake was awesome.

Sponged together.

Thank you everyone for coming to camp and cooperating with us, it was an amazing weekend!

Opinion

You know what really gets my bits in a bunch?

Windows 8

Congratulations Microsoft, you have successfully served up yet another fresh bowl of frustration and agony to your loving consumers. It seems like the once "King of Silicon Valley" is forever in an alternating dance of producing beautiful operating systems such as XP or Windows 7, and gut wrenching piles of rubbish like Windows ME or Vista. Now the latest and "greatest" addition to the latter group, Windows 8, has arrived.

The quality of Windows 8 is all thanks to Microsoft's ever so bold attempt at "innovation". I think they misunderstand the term. Dear Microsoft, "innovating" doesn't mean making as many changes as possible for the sake of being different. I mean, they took away the start button! What is arguably the most iconic and recognisable part of the whole operating system - the goto, sure-fire place for a confused computer user to find what they're looking for - the start button was removed. Only to be replaced by an interface which truly offends me on a personal level.

"Metro UI" is one of the most ridiculous things I've ever had to use in my life, and there's a very simple reason as to why. They put an interface designed for a tablet onto a desktop computer. The big fat buttons that chubby little fingers can't miss, plus all the swishy scrolly magic you could possibly desire on a touch device, has been slapped onto a desktop operating system. Since just about every single desktop computer you'll ever encounter is most definitely not wielding a touch screen, you can bet that Windows 8 is going to be a complete and utter mess to use on any desktop computer that has been graced by an "upgrade". Using a touch interface with a mouse is not just frustrating, it's infuriating.

But wait, things get better. "Desktop mode", which is about as close to a traditional windows experience as you're going to get, works completely differently from "Metro mode". It's like two OS's in one! For example, Chrome in Desktop Mode looks normal. Launch Chrome in Metro mode and you get it's grotesquely obese cousin. The address bar and tabs become fatter, presumably so that those chubby little fingers can always hit the right target. Even when you're using a mouse, all that precious screen real estate is gone. That's absolutely ridiculous.

Did Microsoft really expect everyone to suddenly switch to using touch screens overnight? How would that even work for the average desktop computer user? Without having god-like Schwarzenegger shoulders, you're going to get severe shoulder pain waving your arms around a touch screen all day. Why is there no interface for Windows 8 designed for desktop computers? I'm simply at a loss as to how Windows 8 got past any form of Quality Assurance.

TL;DR: Using Windows 8 is about as fun as diving into a pool of angry piranhas on cocaine.

LUKE TSEKOURAS

News in Brief

Get Your Chrome On
Google Chromebooks have finally arrived in Australia. Prices start at $199 for a base model, going up to $550 for one equipped with a 3G radio inside. Chromebooks run Google's very own Chrome OS, which is basically the Chrome browser and a very simple file system. Does this make the Chromebook a $200 web browser?

No Juice
UNSW experienced a power outage, blacking-out the entire lower campus. For 1 hour, staff and students were evacuated from all buildings while they were inspected, just as everyone was getting amped up about their day.

Hidden Safety
In response to the above, UNSW distributed new Emergency Flip Charts, including procedures of what to do in a blackout. The new charts, which can no longer be hung, take up so much desk space in "flip-chart mode" that they have already found their place on a shelf buried under a pile of papers. I feel much safer now. In an emergency I can just look up the chart... oh wait.

Multi 21
They say nobody likes a sore loser, but try telling that to Australia's Mark Webber. The 2013 Malaysian Grand Prix will be remembered more by the controversy it caused than the racing that happened. With only 10 laps to go, Webber's team mate Sebastian Vettel ignored team orders to stay put and overtook Webber for the race win, causing Webber to blow up furiously after the race. Now if only Webber had some sort of vitamin sponsorship to help relieve stress...

Travelling Light
Air Samoa have recently become the first airline to implement a "pay as you weigh" system. Overweight passengers will be charged more for their seats. Passengers have to input their own weight and the weight of their bags when checking in, and are weighed again at the airport. Air Samoa have been quiet on whether or not there will be heavy consequences for lying about your weight.
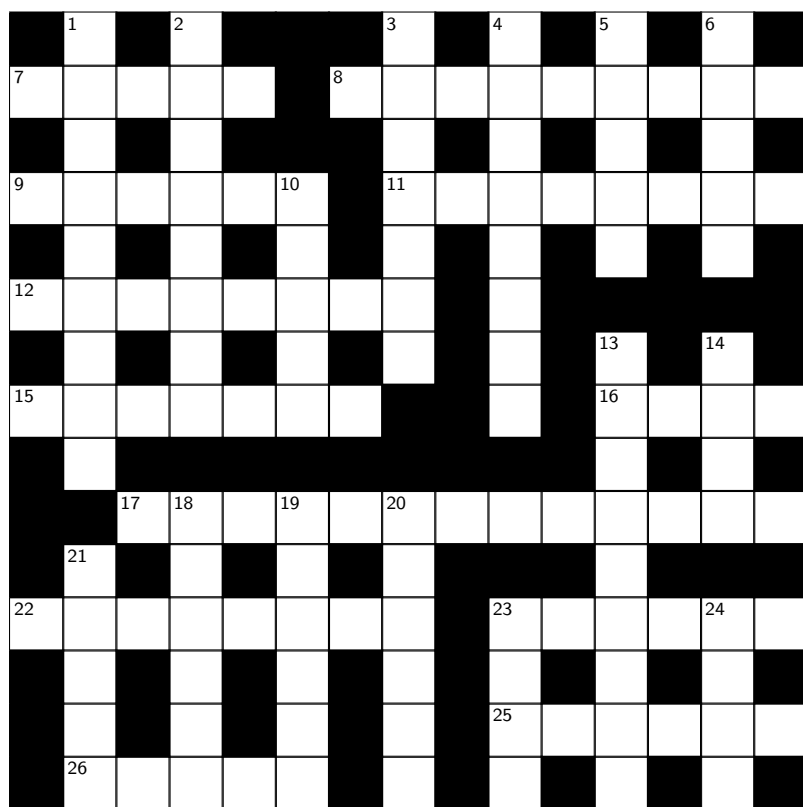
The Latest Nail Fashion
Researchers at the National Taiwan University in Taipei have the solution for stubby fingered smartphone users - a screen on your fingernail. The NailDisplay prototype is currently a one-inch OLED screen attached to a ring you wear on your thumb. Engineers working on it are hoping that it will one day be able to coat fingernails in organic light-emitting materials and wireless beam content directly to the nail itself. Finally, a functional purpose for nail polish.

PATRICK CHUNG

ENTERTAINMENT

Crossword

Down

1. Favoured kind of game for CSE students (5,4)
2. Common in the film and games sectors, a request to do, prevent or change something
3. Movies (and pizza!) are cheaper on this day
4. Online magazine on games, movies and everything in between
5. Latest in the Super Smash Bros. series
6. See 7. Across
10. God game spent developing organisms
13. Common profession in RPGs
14. Price for most movies and games to a CSE student
18. Movie - Ocean's _____
19. With 21. Down, themes of this crossword
20. See 25. Across
21. See 19. Down
23. V for Vendetta's titular protagonist was defined by this
24. TV Show Award

OSWYN BRENT

Last week's solution:

W	E	N	D	I	L	I	M		
	R		Y		O		A	D	A
	L		N		G		T		
J	A	V	A		O		L	U	A
	N		M				A		
	G		I		C	O	B	O	L
P			C		O				A
E	O	F		S	C	R	I	P	T
R				O		D		E	
L	O	V	E	L	A	C	E		X

Across

7. With 6. Down, Late famous film critic
8. What every youtube channel wants you to do
9. Nature-oriented RPG class (pl.)
11. Sci-fi double triology of films
12. Resource management tabletop game
15. Made minor changes
16. With 23. Across, actor in Perks of Being a Wallflower
17. Recent musical made movie (3,10)
22. A message no gamer ever wants to see (4,4)
23. See 16. Across
25. With 20. Down, Famous children's TV show (6,6)
26. What Hugh Jackman unfortunately does in 17. Across

ENTERTAINMENT

Overheard

In the socs office:
"Everyone knows the plural of anecdote is data."

Guy 1: "I'll love you forever."
Guy 2: "In a gay way?"
Guy 1: "In a gay way."

"We're a democracy in the same way that North Korea is a democracy."

Discoveries at Camp:
"How many engineers does it take to get a man out of a morph suit with a stuck zip? Five. Enough said."

Camp Leader 1: "I'm worried about people overhearing our plans from the window."
Camp Leader 2: "I wouldn't worry about that window, I had to climb over a fence and almost break a leg when I tried to do it during my first year camp."

Camp Leader 1: "When I used to live in the northern territory there were moths thiiiiiiiiiiis big."
Camp Leader 2: "That's not a moth. That's a bird."

ENTERTAINMENT

Puzzlers

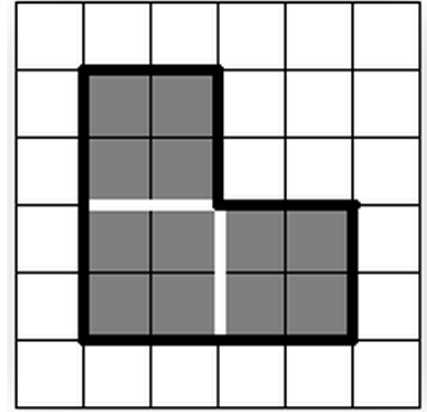Congratulations to those people in the k17 basement who almost got last week's puzzlers right!

1. In a world without internet... Alice wants to send a snail-mail package to Bob. She's paranoid and doesn't trust the postal service, so she makes a metal box which she can fit with a padlock. She plans to send this box to Bob, padlock attached... But Bob doesn't have the key, and she can't post the key to him, she doesn't trust the postal service. Bob has his own padlock and key, but he says he won't send Alice his unlocked padlock in case it gets locked in transit. How can they communicate securely?

2. The letters B, J, T, D, and M can each be added to the start of the same five-letter word, to create legitimate six-letter words. What is the five-letter word?

3. What mathematical symbol can you put between 2 and 3 to make a number greater than 2 but less than 3?

4. Luke is having a party! He invited three friends, and baked a cake shaped like an L. He plans to cut the cake along the white lines, so they all get slices of equal shape and size. After baking the cake, Luke realises he has forgotten a piece for himself! How can he cut the cake into four pieces of the same shape and size?

Email your solutions to:
beta.puzzles@cse.unsw.edu.au

EWAN SCOTT

CSE Society & Events

Upcoming Events

CSESoc Weekly BBQ
Every Monday, 12:30pm - 1:30pm
Physics Lawn
FREE FOOD! Same time, same location, we will be there no matter rain or shine.

WithIT Workshop
Wednesda, April10th, 2pm
Seminar Room
The managing directory of withIT.net.au is coming to UNSW and he will deliver a workshop about the importance of gap training for university students. WithIT is dedicated to expanding the software engineering skills of IT professionals. Bring your laptops!

CSERevue Hack to the Future Screening and Curry
Thursday, April 11th, 6:30 pm
K17 Seminar Room
$5 for arc members, $6 otherwise
Come along to see the fantastic 2011 show Hack to the Future, and enjoy some yummy curry made by well-being! The chicken curry will cost $5, and changes for dietary requirements are available. Please RSVP by emailing Simon at wellbeing.head@cserevue.com.au by Sunday the 7th April.

GameDevSoc L.A.G Night
Friday, April 12th, 2pm - 8pm
Roundhouse
$5 for Game Dev Soc & ARC Members, $10 for Non-ARC Members
Hey guys! Who's ready to GAME?
So the wonderful people at Game Dev Soc are organising a huge gaming party, but not just any gaming party! A huge fiesta of consoles, online games, board games and even party games. From Age of Empires to Counterstrike, Need For Speed to Super Smash Bros Brawl, hell even Super Mario on the NES to UNO!! All provided at this event. Not enough? More of a competitive type? Well we're in collaboration with StarSoc!, A very keen society on holding a mini competition with prizes!

StarSoc competition: Fast, Round robin competition. No registration required, just BE THERE AT 4pm! Lots of prizes and shirt giveaways.

CSESOC SOCIAL HEAD

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