# Open:UK Ezime

### ... for everyone







Welcome to the Second OpenUK Kids Camp, #openkidscamp if you are on social media. It's wonderful to be able to share our 2021 content with you and I hope that it will help you in your introduction to open technology, learning digital skills, and meeting some of the characters and organisations from our open source world.

We are a diverse and eclectic group supporting the development of a sustainable future for everyone and are particularly pleased to be introducing the concept of sustainability to you this year. The UK is hosting COP26 in Glasgow and OpenUK is pleased to be a part of that.

Open source software is something we began to learn about in the first camp last year. This year we are going to have a deeper dive into what it means, to learn about some of the best known open source software, and people and to build an understanding of what exactly it means.

We are going to do that by theming each Episode - made up of a Lesson and an Ezine - on one of the 10 points or definitions that make up the Open Source Definition. You'll see a lot more of that as we work through the course and I am really pleased to share with you that Open Source is.... For everyone.

So please, have fun with it.



**Amanda** CEO, OpenUK





### The importance of Digital Inclusion - Celebrating difference and welcoming all.

Have you ever felt like an outsider and struggled to fit in? Do you want to be able to help your friends, family, and fellow coursemates feel more comfortable with who they are? If so, this column will teach you more about how to do that. We call it Belonging.

Throughout the ezines, I will be writing about things we have all experienced, and how we can learn to celebrate our differences and be more understanding of each other. Belonging is about making everyone feel welcome and wanted.

This is something we all want, and need, to be happy and healthy. I will also give you some examples of how being different is great and show you that we all have something amazing to offer the world.

In reading my columns, you will learn how to make a change in society and make a positive difference to the people you meet.

That's a powerful thing -

### watch this space!





# Sustainability



### What is Sustainability

Our planet gives us the air we breathe, the food we eat, the water we drink, and the materials and energy to build and use houses, cars, phones, laptops, clothes and pretty much everything else in our everyday lives. But these

natural resources are limited, so once they are used up or ruined, they are gone forever.

Sustainability is about making sure that people interact with the environment in a way that there will always be enough natural resources left for future generations to live on. But sustainability is not just about the environment, it's also about the wellbeing and equality of all people, independent of their gender, of where they come from or what they look like.

And we have a problem. In fact, we have many problems: gender, ethnic and financial inequality. Climate change. Air pollution. Dirty oceans.

While it may not look like it, these problems are all connected. Let's see how.

It starts with how countries and companies define success in our current economic model. For a country, success is measured by how many more goods and services were produced over the previous year. This is known as Gross Domestic Product (GDP). For a company, success is measured by how much more profit it earned over the previous year. How do you grow GDP and profit every year? By convincing people to buy more and more stuff all the time. We see that everywhere we look - while we watch YouTube, while we scroll through Instagram, Tik Tok and Snapchat - how many times do we see an advert or people in our stream trying to convince us to buy something new?

This fixation on constant growth is putting our planet's natural resources at risk. We're producing more and more every year, using up energy and resources to do so, and creating more waste, more pollution, climate change and loss of biodiversity in the process. At the same time, it's also increasing inequality between people. Just imagine this - in the UK just over 1% of the population owns a quarter of all the wealth in the country and that's increasing, while at the same time, one of every three children lives in poverty. Does that sound fair?

So ultimately, sustainability is about putting the wellbeing of all people and the planet first, ahead of economic growth.

### **Keep Coding!**

**Cristian** Chief Sustainability Officer, OpenUK

### **Please Miss Boal**



### The langauge of creativity!

Computing Scientists use their creativity every day to invent new ideas - perhaps Maria Klawe summed it up best when she said "Coding is today's language of creativity. All our children deserve a chance to become creators instead of consumers of computer science." So let's continue our journey to become coders.

In this program, we reviewed lots of the previous concepts such as loops, selection, events, and functions. Programmers need to review the skills that they learn all of the time to make sure that they remember the basic concepts as well as keeping themselves updated with the new developments that are happening.

The new development that we came across today is the rotation (°) roll block. The micro:bit has a part called the accelerometer that can check how it is moving. When you use this block the micro:bit returns a value for the side-to-side angle movement to the program. This value can be between -180 or 180.

Now that you have created the program that spins a ball to play music, how will you creatively alter this program using the new developments that you discovered today?

### Keep Coding!

**Pam** Computer Science Lead, OpenUK

### Open Source People



#### Meeting the world!

For me, programming is like solving puzzles, combined with the satisfaction of creating something out of thin air! Choosing software as a career and getting paid to do something I enjoyed was an easy choice.

I'm now Chief Open Source Officer for Isovalent, where we build open source software that connects cloud computers into efficient, secure networks. I also have a leadership role with the Cloud Native Computing Foundation which you will hear from in Ezine 9. This foundation coordinates the efforts of literally hundreds of thousands of people and hundreds of companies who work together on the software that turns millions of computers into what we call "the Cloud".

Although quite often I'll be working solo at a keyboard, a lot of the time I'm doing that I'm interacting with other people. In regular software, these are usually colleagues from the same company but in open source they'll also be people from other organisations, often from all over the world. Companies work together on joint open source software projects to avoid spending time and energy writing their own more-or-less duplicate versions of something. Joining forces also tends to raise the quality of the resulting code.

This international collaboration means I've been lucky enough to travel to all sorts of interesting places for work - in the year before the pandemic I visited the US, Korea, Israel, Australia, and several European countries, often going to conferences to present on and discuss technical ideas with interested people. Working on open source cloud software, I've played a part in connecting millions of people to each other, and to goods and services, across the internet. And on a personal level, it has given me the chance to make friendships with people from all around the globe.

Liz

Liz is an Open UK Ambassador, and the winner of the Open UK Individual Award 2020. She is Chief Open Source Officer at Isovalent, and the chair of the CNCF's Technical Oversight Committee.

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### Industry The OSI

The Open Source Initiative (OSI) was founded in 1998 as a global non-profit organisation to help businesses learn how to embrace the collaborative open development processes that were already being used by hobbyists and academics.

At the time, one of the main barriers to participation in open source software was a solid understanding of open source licenses, and a trustworthy organisation to support new open source adopters and developers.

The OSI assembled -- and still maintains -- a formal list of good faith, usable open source licences and is the steward of the Open Source Definition you are learning about in this course.

The OSI continues to set the tone for the open source ecosystem, by advocating for open source friendly policies, carefully examining new licences, and acting as a clearing-house for best open source practices for software developers and the lawyers and business community who work in open source. Other activities it undertakes include education and outreach, weighing in on important relevant court cases, and acting as an incubator for key open source infrastructure.

Please find us online to learn more; www.opensource.com



### **Open Data**

#### What is data?

From early cave paintings to selfies on our phones, data has been around for centuries. Data is facts, numbers, words, pictures – or even just a list of your favourite things – collected together for reference or analysis. Each day on Earth, we generate a massive 500 million tweets, 95 million Instagram posts, 65 billion WhatsApp messages, 210 million Snapchat snaps, and 720,000 hours of new content is added on YouTube. It's all data. Phew.

Data can be very personal, such as your medical records, or something you feel less connected to, like electricity prices. People have different attitudes about how personal data about them is shared – how would you feel about a medicine company using your medical history to create new treatments? Would you think it was an invasion of your privacy or a good way to help scientists advance their research?

Data's value might be limited if it's stored in one person's files, or within the walls of a company. If scientists around the world kept Covid-19 research to themselves, countries would not have been able to learn from each other, and Covid-19 vaccines could have taken much longer to develop. When data is shared between organisations, cities, and countries, it can often increase its value to society and our planet's sustainability.

Open Data Institute

BIG CALL!

open data institute

### Learn with Lowena



#### In the begining...

I started getting interested in technology when I was 13. I was a member of my school's code club at the time (well, technically, I was the only member) and my teacher approached me with a competition called "AstroPi".

AstroPi involved creating an MP3 player using the python coding language and a Raspberry Pi (a small, credit-card sized computer). It looked like fun and a bit of a challenge so I poured over this book called "Python Programming for the Absolute Beginner". I worked away for weeks until I finally finished building my MP3 player.

I ended up winning in my age category and having my MP3 player tested on the ISS by Major Tim Peake. I don't think I've ever been prouder! And that's how I began, and I think my takeaway from this is: take chances. Take every opportunity that comes your way, even if you're not perfectly qualified right now, because you can always learn.

**LOWERA** Student, Cambridge Univeristy

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## NASA



### **Community-building**

One of the keys to open source software is building a strong community of diverse participants. In twenty years' time, do you want to be the person maintaining the software that you wrote long ago? Or, would you rather have a new set of energy, interest, and innovation, building out the thing you helped to create? Perhaps you'll have switched careers, or moved into another area of the same business, and your "child", the piece of open source software that you helped to create and maintain all those years ago, will be in the hands of able caretakers: growing and helping new communities and use cases as others nurture it.

This is the goal of open source community building. You recruit, invigorate, pass down the baton, and empower the next generation of maintainers to tend the piece of open source software that you helped to create. Without any one of these steps, you risk being the person that's left with the beautiful piece of art you created, but with very few people around you to help to maintain it, possibly only you.

Instead, take the initiative, empower others, get them interested in your software, help promote shared leadership and you'll find that your software project will grow and thrive... and so will you!

Chief Technology and Innovation Officer, NASA Jet PropulsioLaboratory Hi. I'm Phippy!



Once upon a time there was an app named Phippy. And she was a simple app. She was written in PHP and had just one page. She lived on a hosting provider and she shared her environment with scary other apps that she didn't know and didn't care to associate with. She wished she had her own environment: just her and a webserver she could call home.

An app has an environment that it relies upon to run. For a PHP app, that environment might include a webserver, a readable file system, and the PHP engine itself.

One day, a kindly whale came along. He suggested that little Phippy might be happier living

in a container. And so the app moved. And the container was nice, but... It was a little bit like having a fancy living room floating in the middle of the ocean.

A container provides an isolated environment in which an app, together with its environment, can run. But those isolated containers often need to be managed and connected to the external world. Shared file systems, networking, scheduling, load balancing, and distribution are all challenges.

The whale shrugged his shoulders. "Sorry, kid," he said, and disappeared beneath the ocean's surface. But before Phippy could even begin to despair, a captain appeared on the horizon,

piloting a gigantic ship. The ship was made of dozens of rafts all lashed together, but from the outside, it looked like one giant ship. "Hello there, friend PHP app. My name is Captain Kube". "Nice to make your acquaintance" said the wise old captain.

"Kubernetes" is the Greek word for a ship's captain. We get the words Cybernetic and Gubernatorial from it. The Kubernetes project focuses on building a robust platform for running thousands of containers in production. "I'm Phippy," said the little app. said the Captain as he slapped a name tag on her.

Kubernetes uses labels as "nametags" to identify things. And it can query based on these labels. Labels are open-ended: You can use them to indicate roles, stability, or other important attributes.

Captain Kube suggested that the app might like to move her container to a pod on board the



ship. Phippy happily moved her container inside of the pod aboard Kube's giant ship. It felt like home.

In Kubernetes, a Pod represents a runnable unit of work. Usually, you will run a single container inside of a Pod. But for cases where a few containers are tightly coupled, you may opt to run more than one container inside of the same Pod. Kubernetes takes on the work of connecting your pod to the network and the rest of the Kubernetes environment.

Phippy had some unusual interests. She was really into

genetics and sheep. And so she asked the captain, "What if I want to clone myself... On demand... Any number of times?" "That's easy," said the captain. And he introduced her to the replication controllers. **To be continued...** 



### Entrepreneur in residence How I got into open source

Hi, I am Matt and I am one of the founders of Jeststack, a company we started in 2015. I remember hearing about a technology called 'Linux' when I was at university, back in the early 2000s. At the time I could not believe that there was an alternative operating system to Microsoft Windows, or that people had donated their time for free to create it! This certainly piqued my interest and thinking that software was a good career to get into. I got a job at a company called Canonical as a sales representative, selling open source software (where I worked with Amanda the ezine editor). I then went on to work at MongoDB - another open source software company.

15 years ago, Canonical, along with Red Hat, were perhaps the two of the most progressive companies in the open source world. Having a sales role at Canonical gave me the best opportunity to learn what software end-users, engineers, developers, or coders and the companies they worked for needed from open source. More often than not, the major driver for them adopting open source was that it solved a challenge that a customer knew they had very quickly and efficiently. Normally it did this for much less cost and hassle than using proprietary closed software.

Once a company has adopted open source software to solve a challenge, they will often need additional support and guarantees around how that software will work. This allows the creators and maintainers of open source software the opportunity to create revenue or monetise features and services in the software. These days we have seen many successful companies built around open source projects.

It became clear to me that open source would develop into becoming the preferred way to develop all software. When I realised this, I decided that if I was to start a business I would build it on a foundation of open source software.

Matt President & Co-Founder, Jetstack Matt Barker

Word game

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# Thanks for reading!

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#### **Instructions: lesson 1**

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