Open:UK EZIMe

The Integrity of the author's source code

S

Sou





2n M

CR,





As the course evolves, so too will your understanding of the world of open source. I love the ezines as they give a deep dive into the people and organisations that make up open source. If you didn't do the course last year then you may enjoy just looking at the course one ezines.

This year we have content from some really well known open source organisations and foundations, like the competition and course sponsor Red Hat, and foundations including The Linux Foundation, Mozilla Foundation, and Eclipse Foundation. We have a lot of foundations in open source software. This is because they are not-for-profit organisations, which host or house open source software projects.

They allow multiple people to contribute both financially and by being part of a community. These contributions allow open source to grow and thrive and create software that is great for the many.

OpenUK is also a not-for-profit organisation. We don't host software, but we support the Open Technology communities - that's open source software, open hardware, and open data in the UK. We create a cohesive voice for those communities and support their work through legal and policy work - trying to ensure that the Government makes the UK open friendly, and through skills training like this course. We are also working to build a GCSE in Open Technology. Maybe one day you would like to take that.

Amanda CEO, OpenUK

Ask Ashleigh



Equality or Fair treatment?

Equality has to do with sameness, for example, wearing the same school uniform shows equality. Fair is different. Fair means everyone gets what they need, based on visible gaps in opportunity. And sometimes people will have different needs because we are unique. Let's imagine you are trying to brush your teeth with a younger sibling. You may be taller than them and can reach the sink, but they might need a step to help them reach. Fairness is providing your younger sibling with the step because they need it to be at the same level as you in order to brush their teeth as well.

At school, it's natural to compare yourself to your classmates but remember, everyone is different and we all need different support to help us achieve our goals. So next time you want to say "that's not fair" stop and think about why it might be fair, be considerate of others' needs, and more aware of your own.

Here are some examples, see if you can point out which ones are fair and what ones are unfair.

- Following rules
- Always going first
- Bragging
- Ignoring others when they are talking
- Respecting differences
- Teasing others
- Taking turns
- Including others



Digital Inclusion Lead, OpenUK





Climate Change and Loss of Biodiversity

The things we do every day, like watching videos on our phones, plugging in devices, driving cars, and warming homes, rely on energy produced by burning fossil fuels such as natural gas, oil, and coal. Burning fossil fuels releases a gas called carbon dioxide (CO2) into the atmosphere, which along with other greenhouse gases, creates a lid on our planet. This traps heat, making the planet's temperature rise. This in turn causes climate change.

Scientists tell us that when our climate changes due to rising temperatures, many things can happen:

Glaciers and polar ice sheets melt, causing rising sea levels that can threaten coastal areas.

Harsher droughts, stronger hurricanes, and shifting winds and ocean currents, which can ruin the biodiversity of our landscapes and seascapes.

Biodiversity is the variety of plant, animal, and micro-organism life that we find around us. Healthy biodiversity means that we have breathable air, drinkable water, more food sources, and less disease. With the rise in temperatures due to climate change, many plants, animals, and microorganisms are becoming extinct.



- 0 - 0 - 0 - 0 - 0 - 0

The COVID-19 pandemic is an example of what can happen - the World Health Organisation (WHO) has said that it was caused by the loss of biodiversity which would have otherwise protected us from wildlifeborn viruses.

There are many things we need to happen to reverse climate change and restore biodiversity:

Stop burning fossil fuels to generate energy, and instead use energy from renewable sources such as wind, sunlight, or waves.

Stop cutting down trees and polluting our oceans since we need them healthy and plentiful so they can capture carbon, clean our air, and cool our planet's temperature.

Reduce production and consumption of everything: energy, meat, cars, airplanes, fashion. So turn off the lights, eat more veggies, walk and cycle more, and make your clothes last longer.

And let's not forget how critical it is for governments and companies to end their focus on perpetual growth, and instead, focus on prosperity for all people... and the planet. Because if we don't fix the root cause, the rest are just temporary fixes.

^{*} Keep Coding!

Christian Chief Sustainability Officer, OpenUK

Please Miss Boal



Reuse the code!

The idea of being able to use the code that someone else has written seems really appealing as it is far more efficient than starting from scratch. Douglas Crockford is quoted as saying "code reuse is the holy grail of software engineering". The Python standard library and packages allow reuse and help us to achieve this goal.

The Python standard library is a collection of code modules that can be used in a Python program to simplify the program and remove the need to rewrite common commands. They can be used by 'calling/importing' them at the beginning of a script. Random, Math, and Time are three commonly used modules from the Python library.

The program in Lesson 4, uses MicroPython which allows you to run your Python scripts on the micro:bit. MicroPython has been expanded to include a special micro:bit Python module, and other fun features like music, which can be used to easily program the device. The code is created by an international team of open source software developers who choose to allow their code to be reused by other programmers.

Enjoy playing with the speech module from this Lesson and challenge yourself to rewrite the script to say a massive thank you to the open source developers who are helping us to achieve the holy grail of software engineering.

Keep Coding!

Pan Boal Computer Science Lead, OpenUK IT Wind

Open Source Hero



Open community!

What interested me in Open Source is that it is a community that works publicly and transparently to resolve software problems. In Open Source everyone has a voice. Just because you are at the start of your coding journey, does not mean that all you should be doing is asking questions and seeking help. Beginning to get involved is not always easy, as you might feel insecure about your abilities, so it is important to start small.

In my case, I started by making small contributions to the libraries and frameworks of Open Source projects I was already using. This is a good way to begin as you are already familiar with the technology.

Collaborating with people from all around the world who have a similar goal is a great way to learn new skills. You learn not only how to receive feedback, but also how to give feedback to others in a constructive way.

With time, my con idence grew, and I launched my own Open Source projects. For me, this has meant being able to build my own business, attract clients, and have a good work-life balance. In 2020 I founded EddieHub, an Open Source community aimed encouraging and promoting communication, best practices, and technical expertise in an inclusive and welcoming environment.



Industry



A Career in Open Source

The main site where people come together to share code is a community called GitHub. Anyone can download and share code for free, build you profile as a developer and share resources. Look out for 'Awesome lists' (https://github.com/topics/awesome-list) where you can find curated collections on every topic from sites to learn computer programming, Minecraft tips, higher education resources or even where to get free and discounted software for students.

As you learn software development you will want a place to store your work as you go. Everyone over the age of 13 can create a free GitHub account that allows you to store your projects and share them with others. There is a thriving community of developers sharing their first 100 days of coding on GitHub. Check out https://www.100daysofcode.com/ to learn more.

Am active GitHub profile is also a great way to show your passion for computing as you go to University or into employment. To learn more about customising your own GitHub profile to make it as welcoming as possible, see this fantastic article from US based developer Monica Powel:

https://aboutmonica.com/blog/how-to-create-a-github-profilereadme/

GitHub



Open Data

What are algorithms?

An algorithm is a logical step-by-step process to follow to help complete a task or fix a problem. Algorithms are used in computer programs to make them work. For example, algorithms can use satellite imagery data about power plants to provide regular updates on emissions. Governments can then use this information to identify sources of emissions and propose solutions.

Artificial intelligence algorithms, like the ones that recommend what to watch next on YouTube, are made by computers using data in a process called machine learning. Developers of these algorithms have to be careful because data is often biased (it isn't fair in some way, or is in favour of certain viewpoints), only gives a simple view of the world, and can be of poor quality.

Thinking carefully about what data we use, and how we use it, is important when using algorithms to spot trends and make predictions about the environment, or groups of people. But it's even more importanwhen data is used to make decisions about individual people's lives, like it was in 2020 when an algorithm was used to work out exam results.

Open Data Institute

Learn with Lowena



Moving from scratch to python

In lesson 3 we got our first introduction to programming with Python instead of using blocks in the Makecode editor as we did in Camp one and so far in this course and we revisit python in lesson 4.

You've probably noticed how picky Python can be about spelling, capitalisation, punctuation, and indentation. If something's even slightly wrong it can raise an error that might stop your program from running, or cause it to do something you don't expect. So stay vigilant!

Hmm, so my piece of advice this week is to be okay with things going wrong. Never (ever) have I expected my code to run correctly the first time and sometimes it doesn't. Okay, maybe if it was something super simple like a single print statement I would expect it to run, but most of the time an error crops up because I've forgotten something or spelt something wrong and that's ok.

I simply find the line where it says the error is, fix it, run it again (and then inevitably repeat because I've got more things wrong). I don't expect perfection so it never bothers me when things don't turn out perfectly, and I've found that's a good rule to live by.

ARIT

Lowena Student, Cambridge Univeristy Nasa



Innovation

Innovation is at the heart of open source. Innovation means new, fun, and enjoyable, and additionally, possibly it means that it makes life and processes easier by doing things in a new and creative way. Innovation is important in open source projects since it is a tool that helps maintain a healthy community and that drives business interest, competition, and buzz surrounding your project. Innovation sometimes is what causes a user to create a new method or business process that is realized through software. Perhaps reducing the time it takes to complete a task by an order of magnitude, or perhaps providing some new capability that is now necessary in the digital age, innovation captures our mind, body, and spirit, and is realized in open source through software technology.

Keeping your project community's interest is also at the heart of innovation. Contributions and people power come from having a shared interest in creating something new. Innovation can help drive this interest and can inculcate a community around an amazing idea that requires them to come together in a new unforeseen way in your open source effort.



Chief Technology and Innovation Officer, NASA Jet Propulsion Laboratory



Walking further, Zee pointed out a clump of burrows and warrens. While there were plenty of signs that the area was inhabited, neither Phippy nor Zee could see a single movement.



"The Secrets are in here," said Phippy. "but you can't see them without these decoder glasses." Zee took the pair of glasses Phippy offered, slid them on, and blushed. "Oh, my. I think I'm ready to go on now, Aunt Phippy." Zee handed back the glasses, and onward they went.

Secrets are used to store non-public information, such as tokens, certificates, or passwords. Secrets can be attached to Pods

at runtime so that sensitive configuration data can be stored securely in the cluster.

A group of iguanas gathered near a large slingshot along the shore of a pond. An island stood in the center of the water. An iguana threw herself into the slingshot and the other iguanas launched the little beast toward the island.



password

Secrets are Base 64 encoded "at rest" but the data is automatically decoded when attached to a Pod
Secrets can be attached as files or environment variables
Use add-on encryption providers for locking your data

"The Deployments release a group onto the island. Right now, they're trying to get three out there." said Phippy.



At that moment another iguana rocketed into the air but missed the island with a colossal splash in the pond. Phippy said, "If they miss, they just keep trying until they get as many as they need."

A Deployment is a higher-order abstraction that controls deploying and maintaining a set of Pods. Behind the scenes, it uses a ReplicaSet to keep the Pods running, but it offers sophisticated logic for deploying, updating, and scaling a set of Pods within a cluster.

Several stone pillars arose from a grassy knoll and at the top of each sat a vulture. As Zee and Phippy watched, one vulture spread its wings and flapped off into the distance. No sooner had one left than another took its place. Zee asked, "What are they doing?" "Those are DaemonSets," said Phippy, "They make sure to occupy every pillar, rain or shine, day or

night." "I bet that if we added a new pillar, a new bird would land on it faster than you could say 'cube cuddle,'" chuckled Phippy.

DaemonSets provide a way to ensure that a copy of a Pod is running on every node in the cluster. As a cluster grows and shrinks, the DaemonSet spreads these specially labeled Pods across all of the nodes. **To be continued...**



Entreprenetation of the second second

A code repository is a hosted system where developers like you find the source code needed to build your application service. At Jetstack, we work on repositories every day and they are very important to the business.

The code files are generally structured into branches that make up a "master", and this master branch is maintained or managed by the owner of the code repository. This person is also called the maintainer. In general, each code source is called a project. The most well-known and highly used public repository (or repo) is GitHub.

There are a few fundamental things that make a public repository work so well. First, the best repositories are those driven by communities of developers who have a vested interest in keeping the code fully up to date and free of bugs. This means a typical repository can have very many active contributors. The more contributions the code receives, the more useful it is for developers.

Second, each repository will have a maintainer whose job it is to review all the contributed code, test it then accept it for release into the master code branch where it is validated to be used by anyone who wants it.

Third, because of the open nature of contributing code, developers use repositories to share ideas and comment on each other's contributions. Repositories are what make open source code available to any developer. GitHub activities are what the tech industry uses to determine how much open source code there is in the world.

You can sign up and join GitHub now and create your own project, if you meet the minimum age requirement, or when you do!

Matt President & Co-Founder, Jetstack



Word game

7.	C	Н	E	Τ.	E	N	F.	Y	. T	R	Т	Т	Y	С
	_	11				T N	-	-	-				-	-
Z	F	0	М	N	Q	J	A	А	I	P	Η	Ν	T	A
0	Ρ	Ε	Ν	K	I	D	S	С	А	М	Р	S	I	G
Ν	G	I	I	Т	I	Z	I	U	R	Y	A	Р	S	I
0	0	J	Η	L	R	Ν	Ε	E	Ε	С	Q	I	R	V
0	K	Т	0	S	Т	I	Р	М	Η	K	S	R	Ε	E
K	Р	Η	E	Ε	R	0	В	I	A	U	V	A	V	A
G	Y	Ε	R	В	L	Ε	E	U	М	R	Ν	Т	I	W
K	L	Ν	Ν	Ε	0	V	D	М	Т	Ε	G	I	D	A
U	Ε	0	V	U	Ε	0	Ε	A	Ρ	I	S	0	K	Y
Т	Z	Ε	V	М	K	R	K	0	E	Q	0	Ν	R	Ε
Р	D	R	E	Ε	Ν	I	G	N	Ε	L	Y	Ν	Η	P
S	Q	Ν	Y	G	0	L	0	N	Η	С	E	Т	J	М
Т	Т	J	U	I	N	С	L	U	S	I	0	Ν	Q	А
В	Ι	Ν	А	R	Y	Y	С	N	0	Ι	S	I	V	С

ACHIEVEMENT	BINARY	CAMP
CONTRIBUTION	DEVELOPER	DIVERSITY
ENGINEER	EZINE	GIVEAWAY
GLOVE	HELEN	HOLIDAY
INCLUSION	INSPIRATION	INTERNET
LEADERSHIP	NOTEBOOK	OPEN
OPENKIDSCAMP	OPENUK	PROGRAM
SUMMER	TECHNOLOGY	VISION



courtesy of puzzlemaker.discoveryeducation.com

Thanks for reading!

Contibutors

Editorial:

Amanda Brock – Editor @amandabrockUK Georgia Cooke - Creative Director <u>nuwcreative.com</u>

Columnists:

Ashleigh Monagle - Ask Ashleigh Pam Boal - Please Miss Boal Cristian Parrino - Sustainability Eddie Jaoude - Open Source Hero GitHub - Industry Chris Mattaman - NASA Lowena Hull - Learn with Lowena Matt Barker - Entrepreneur in Residence ODI - Open Data https://theodi.org/

CNCF - Kubernetes An Illustrated Guide https://www.cncf.io/phippy/

The characters Phippy, Captain Kube, Goldie, and Zee and the two books are owned by The Linux Foundation, on behalf of the Cloud Native Computing Foundation, and licensed under the Creative Commons Attribution License (CC-BY), which means that you can remix, transform, and build upon the material for any purpose, even commercially. If you use the characters, please include the text "phippy.io" to provide attribution https://phippy.io

All content is contributed by the author and the opinions of the author, and may not represent the opinion of OpenUK. ©OpenUK and licensed in accordance with: https://creativecommons.org/licenses/by/4.0/



The OpenUK glove kit giveaway and Ezine are made possible thanks to the generous support of

Course sponsored by

Red Hat

In kind glove sponsor

OpenUK glove inspired by

Giveaway sponored by









© OpenUK 2020. OpenUK is a not-for-profit company limited by guarantee, company number 11209475, registered at 8 Coldbath Square, London, EC1R 5HL. Contact <u>hello@openuk.uk</u> openuk.uk



Instructions Lesson 4

. ⊂ micro:bit	(\$)
Louries 1 # Add your Python code here E a	Script Name Lesson_4_python
2 from microbit import * 3 import speech 5	
6 7 8 9	
11 12 13 14	
15 16 17 18 19	
20 21 22	
⊂ micro:bit	6
Common Common <td>Script Name Lesson_4_python</td>	Script Name Lesson_4_python
1 # Add your Python code here. E.g. 2 from microbit import * 3 import speech 4 name = ""	
<pre>s nume = 5 speech.say(("Hello "+ name +" from Open U K"), speed=100, pitch=50, throat=190, mouth=190) 8 9</pre>	
10 11 12 13	
14 15 16 17	
19 20 21 22	
⊂ micro:bit	(-)
	Script Name Lesson_4_python
Download Connect Load/Save Open Senal Hep 1 # Add your Python code here. E.g. 2 from microbit import * 3 import speech 4	Â.
<pre>5 name = "" 6 7 speech.say(("Hello "+ name +" from Open U K"), speed=100, pitch=50, throat=190, mouth=190) 8 </pre>	
<pre>9 while True: 10 if accelerometer.was_gesture("shake") == True: 11 speech.say("Sustainability is important", speed=100, pitch=50, throat=190, mouth=190) 12 elif accelerometer.was_gesture("left") == True: 13 speech say("I lova to use the MiniMu Glove" speed=100, pitch=50, throat=100, mouth=100, mouth=10</pre>	902)
<pre>elif accelerometer.was_gesture("right") == True: speech.say("Edit these sentences", speed=100, pitch=50, throat=190, mouth=190) f 17</pre>	
18 19 20 21	
23	Feedback