

# Software Carpentry

## *When you arrive...*

- Please fill in the pre-assessment workshop survey if you haven't already

<https://goo.gl/BJDtWY>

- Go to the shared Etherpad, follow the set up instructions

<http://www.bit.ly/EtherAug17>



RESEARCH  
SOFTWARE  
GROUP

# Software Carpentry

Southampton

August 1-2 2017

Josh Greenhalgh, Steve Crouch, Priyanka Singh, John  
Robinson

***Why are we here?***

# Researchers who write software!



- Confess!
  - Who's main job isn't producing code/software?
  - Who writes software to support research?
  - Who would find it impractical or impossible to do their main job without writing software?

# Ariane 5

- \$7 billion development, \$500 million rocket
- Used Ariane 4 code

**BOOM!**



*Loss of guidance & altitude info*



*64-bit FP converted to  
to 16-bit signed integer*

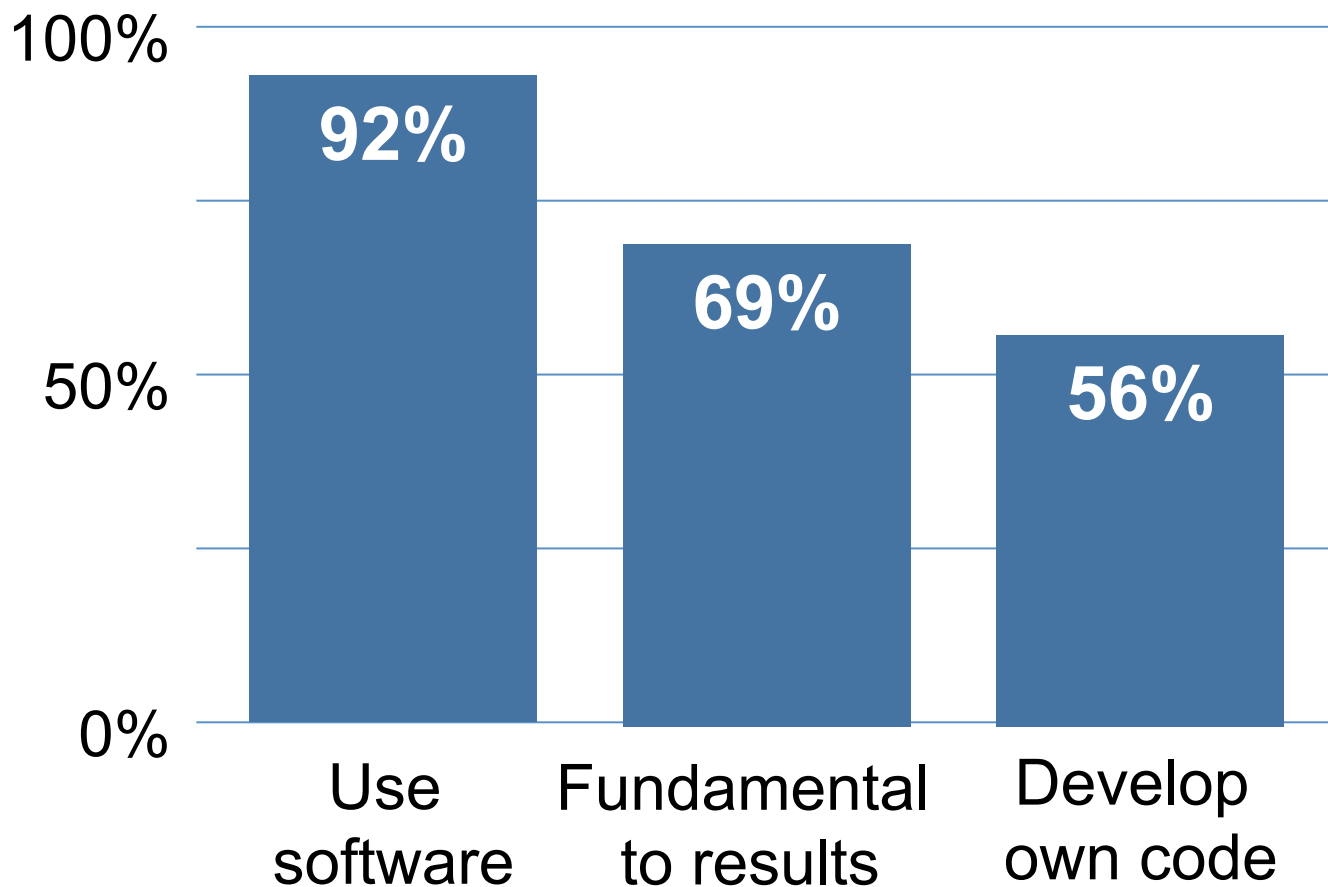


# What's missing?

*“Three orders of magnitude in **machine speed** and three orders of magnitude in **algorithmic speed** add up to six orders of magnitude in solving power. A model that might have taken a year to solve 10 years ago can now solve in less than 30 seconds.”*

– Bob Bixby, review of linear programming solvers from 1987-2002

# We should care about software!



# Housekeeping

- No fire drills today!
- Evacuation route
  - Directly out of main entrance
  - Assemble in paved area, bottom of steps
- Toilets – exit room, around corner on left
- Tea and coffee provided at breaks!



***Who are we?***

# To help you learninate...

- Instructors
  - Josh Greenhalgh\*
  - Steve Crouch
  - Priyanka Singh
  - John Robinson
- Helpers
  - Ryan Pepper\*
  - Alice Harpole+
  - Ian Hawke\*

\* *Next Generation Computational Modelling Group*  
+ *Mathematics*

# Research Software Group

*[www.rsg.soton.ac.uk](http://www.rsg.soton.ac.uk)*

- Based in Electronics and Computer Science
- We help to improve software developed by researchers at Southampton, through:
  - **Direct collaboration:** we provide skilled Research Software Engineers for projects
  - **Software development skills training:** through Software & Data Carpentry workshops
- Led by Simon Hettrick & John Robinson
- Contact
  - [rsg-info@soton.ac.uk](mailto:rsg-info@soton.ac.uk)

# Software Sustainability Institute



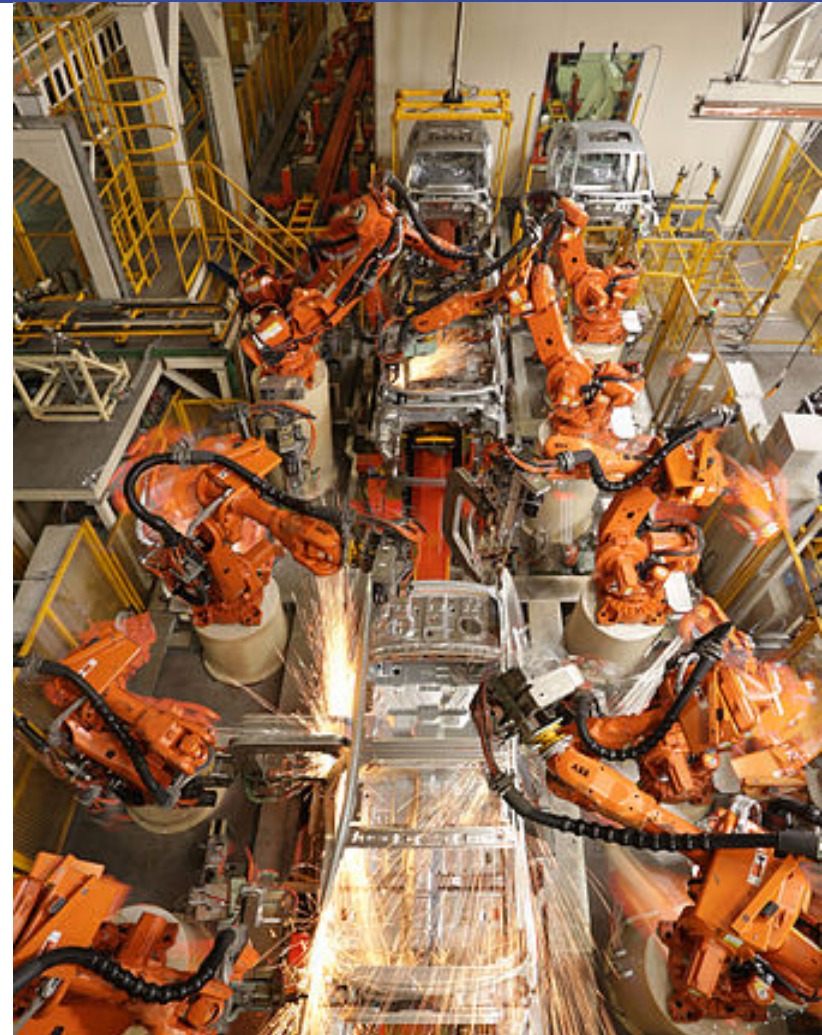
[www.software.ac.uk](http://www.software.ac.uk)

*Cultivate world-class research with software*

***What are we going to learn?***

# Automation

- Bash Shell
- Not just about learning commands
- Learning just a few things can make a huge difference



# Python

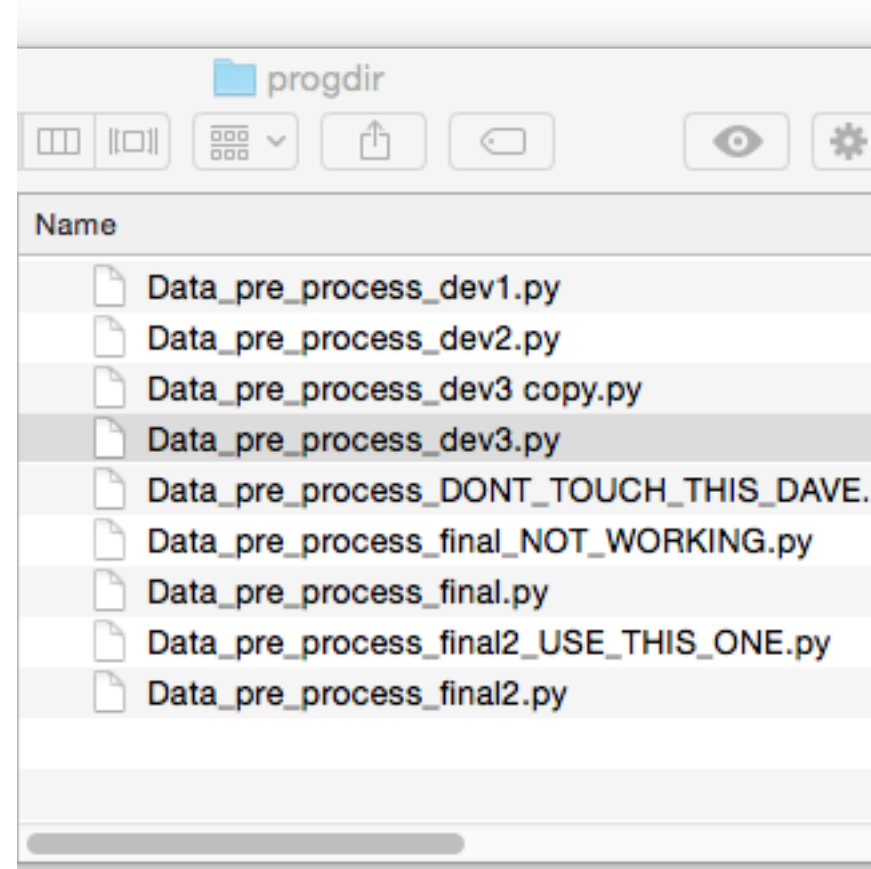
- Beyond syntax...
- How to build programs step-by-step
- Comprehensive, reusable, testable



Image Charles Kenny  
[CC-BY-SA](#)

# Version Control

- Git
- How has this code changed?
- Who made this change?
- Which version of this code was used to generate this result?





# Agenda

10:00-12:30

*(Josh)*

**Automating tasks with the Bash shell**

11:00-11:30 Break

12:30-13:30

Lunch

13:30-16:00

*(Steve)*

**Building programs with Python I**

14:30-15:00 Break

16:00-16:30

Wrap-up

# Agenda

10:00-12:30  
*(Priyanka)*

**Building programs with Python II**

11:00-11:30 Break

12:30-13:30

Lunch

13:30-16:00  
*(John)*

**Version control with Git**

14:30-15:00 Break

16:00-16:30

Wrap-up

***Some final words...***

# Code of Conduct

- <http://software-carpentry.org/conduct/>

## Code of Conduct

Software Carpentry workshops are community events intended for networking and collaboration as well as learning. We value the participation of every member of the scientific community and want all attendees to have an enjoyable and fulfilling experience. Accordingly, all attendees are expected to show respect and courtesy to other attendees throughout the workshop. The same standards of behaviour are expected in Software Carpentry spaces online.

To make clear what is expected, everyone taking part in Software Carpentry events and discussions—instructors, helpers, organizers, and learners—is required to conform to the following Code of Conduct. Organizers will enforce this code throughout events, but you may also contact us directly by email at [admin@software-carpentry.org](mailto:admin@software-carpentry.org). All communication will be treated as confidential.

### *Code of Conduct*

Software Carpentry is dedicated to providing a harassment-free experience for everyone, regardless of gender, sexual orientation, disability, physical appearance, body size, race, nationality, religion, or choice of text editor. We do not tolerate harassment of participants in any form.

1. Harassment includes offensive verbal or written comments related to gender, sexual orientation, disability, physical appearance, body size, race, or religion, sexual images in public spaces, deliberate intimidation, stalking, following, harassing photography or recording, sustained disruption of talks or other events, inappropriate physical contact, and unwelcome sexual attention.
2. All communication should be appropriate for a professional audience including people of many different backgrounds. Sexual language and imagery is not appropriate for any event.
3. Be kind to others. Do not insult or put down other participants.
4. Behave professionally. Remember that harassment and sexist, racist, or exclusionary jokes are not appropriate.

Participants asked to stop any harassing behavior are expected to comply immediately. People violating these rules may be asked to leave the event or be excluded from the online venue at the sole discretion of the organizers, without a refund of any charge that may have been levied.

Thank you for helping make this a welcoming, friendly event for all.

*This code of conduct is a modified version of that used by [PyCon](#), which in turn is forked from a template written by the Ada Initiative and hosted on the [Geek Feminism Wiki](#).*

# Need help?



***Say hi to your neighbours!***

# Need help?



Michael Arrighi

## *Sticky notes*

# Need help?



***Ask the group in Etherpad***  
**<http://bit.ly/EtherAug17>**

***That's all from me...***



***...but for you, just the beginning!***



# Software Carpentry Day 2

## *When you arrive...*

- Please check you can do the following...
- Open the Python interpreter from a terminal, as we did yesterday, e.g.

```
$ python or $ python3
```

- And type at the >>> prompt...

```
>>> import numpy
```

```
>>> import matplotlib
```

- If you encounter any errors, please seek a helper to help you out