**Busting the docker Myth!**

*Would you like to easily share your data and research findings with your team or the community to receive prompt feedback and improve reproducibility?*

A picture containing sky

Description automatically generated

The integrated use of Jupyter Notebooks, docker containers and binder (JNDB) can allow you to do this in a timely manner! No need to spend days and days re-boosting your system and dependencies anymore! Just follow these few steps and you’ll be able to get the ball up and running in a blink of an eye!

The key benefit of Docker is that it allows users to package an application with all of its dependencies into a standardized unit for software development. Unlike virtual machines, containers do not have high overhead and hence enable more efficient usage of the underlying system and resources.

You can think of a Docker’s image like a photo of a specific landscape and a container like everything that is part of the photo and makes it unique. A container includes everything “behind the scene” that makes that image run and can make it run again and again, as that you can recreate the same picture regardless the machine your lunching it from.

1. Get ***docker*** up running on your machine:

• Install on Mac or windows <https://docs.docker.com/docker-for-mac/install/> or <https://docs.docker.com/docker-for-mac/install/>

• Intro to docker: <https://docker-curriculum.com> and Orientation and setup <https://docs.docker.com/get-started/>

• Basic docker commands:

<https://github.com/underworldcode/underworld2/blob/master/docs/cheatsheet/cheatsheet.pdf> and <https://underworld2.readthedocs.io/en/latest/Installation.html>

1. Select your favourite version of ***Underworld2*** images from the docker hub:

•<https://hub.docker.com/r/underworldcode/underworld2/tags?page=1&name=2.5>.

• Launch docker on your terminal; for example, type:

$docker images

$docker pull underworldcode/underworld2: 2.6.0b

$docker run -p 8888:8888 -v $PWD:/workspace underworldcode/underworld2:2.6.0b

• Test that your ipyb script is compatible with the image you’ve selected. To do this: open your uw2 script through the image by copying and pasting the url you were given (e.g  <http://localhost:8888/tree/your> working repo/)

1. Upload the repository you want to share (after you’ve tested it in local) on ***github***.

• N.B avoid uploading heavy data on github, use inline plotting tools instead (e.g. LavaVu, MatplotLib or Plotly)

• Basic shell commands you need to know include:

$git clone <https://github.com//repo-name.git>

$ git remote add origin <https://github.com//repo-name.git>

$ git add --all

$ git commit -m 'a commit'

$ git push -u origin master (from master to local)

$git fetch origin

$ git reset –hard origin/master

$git status

$git pull (update your

• Write a README.txt file to explain the nature of your script and keep your commit history clear and tidy by naming or your commits.

• Write a Docker file, this will allow you to connect your github repository, with the uw2 image and the binder instance.

• For example:

# UW image used:

FROM underworldcode/uw2cylindrical:cylindrical

# Git run my repo:

RUN git clone https://github.com/rsbyrne/demonstration.git

• NB. it does not need the txt extension

A screenshot of a cell phone

Description automatically generatedA screenshot of a cell phone

Description automatically generated

*LEFT: You will fork and clone a repo only****once****. RIGHT: After that, you will update your fork from the central repository by setting it up as a remote and pulling from it with git pull. Source: National Ecological Observatory Network (NEON) & https://www.neonscience.org/git-setup-remote.*

1. ***Binder*** is great for creating a live, interactive environment for your code.

• Go to mybinder.org

• Follow the instructions to create your binder instance. Note that your new binder instance will be kept forever: it will always have the same URL, which you can email to people or put on Facebook or whatever.

• If you update your git repository you’ll need to generate a new binder URL.

1. ***Notebook Viewer*** is a part of the Jupyter ecosystem whose job is to make notebooks look nice.

• Get the URL of the thing you want to see: for example, the URL of your git repository, or the URL of a specific notebook file inside your repository.

• Take the https:// and other stuff off the front of your URL and replace it with nbviewer.jupyter.org • For example:

https://nbviewer.jupyter.org/github/rsbyrne/demonstration/blob/master/MS98\_demo/MS98.ipynb

with nbviewer:

[https://nbviewer.jupyter.org/github/rcarluccio/JNDB\_RC\_2D/blob/master/2D\_PP/2D\_PPsimplified/2D\_PP.ipynb#](https://nbviewer.jupyter.org/github/rcarluccio/JNDB_RC_2D/blob/master/2D_PP/2D_PPsimplified/2D_PP.ipynb)

* If you need one you can create a QR generator by and copying and pasting your desired sharable link.

• For example, <https://www.qr-code-generator.com>

By Roberta Carluccio & Rohan Byrne