

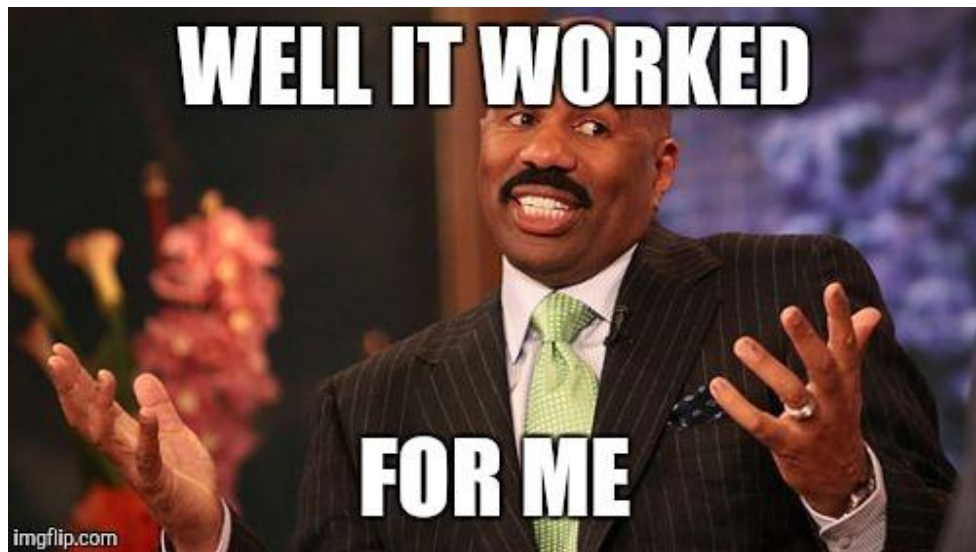


No more 'Works for Me'

Why, When, and How to use Docker with R

Patrick Miller

Twitter: @patr1ck_mil



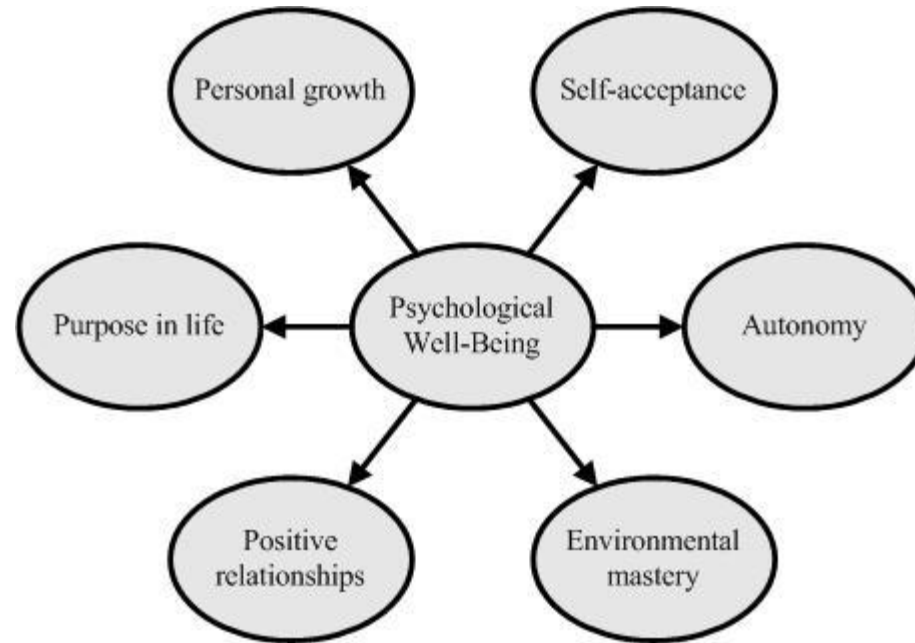


Environment Errors

Things you need aren't there

Things are not where you expect

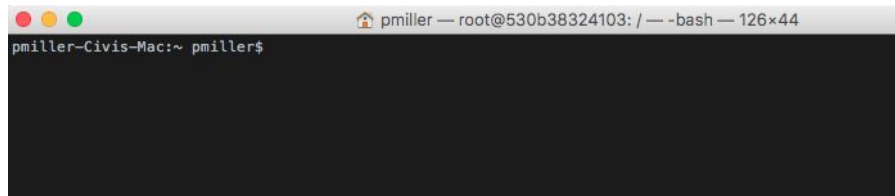
The wrong things are there







The Environments You Live In



A screenshot of a terminal window. The title bar at the top shows three colored window control buttons (red, yellow, green) on the left, and a status bar on the right that reads "pmiller — root@530b38324103: / — -bash — 126x44". The main area of the terminal is black with white text. The first line shows the prompt "pmiller-Civis-Mac:~ pmiller\$".



The Environments You Live In

```
pmiller-Civis-Mac:~ pmiller$  
[pmiller-Civis-Mac:~ pmiller$ R  
R version 3.5.2 (2018-12-20) -- "Eggshell Igloo"  
Copyright (C) 2018 The R Foundation for Statistical Computing  
Platform: x86_64-apple-darwin15.6.0 (64-bit)  
  
R is free software and comes with ABSOLUTELY NO WARRANTY.  
You are welcome to redistribute it under certain conditions.  
Type 'license()' or 'licence()' for distribution details.  
  
Natural language support but running in an English locale  
  
R is a collaborative project with many contributors.  
Type 'contributors()' for more information and  
'citation()' on how to cite R or R packages in publications.  
  
Type 'demo()' for some demos, 'help()' for on-line help, or  
'help.start()' for an HTML browser interface to help.  
Type 'q()' to quit R.  
  
> library(dplyr)  
  
Attaching package: 'dplyr'  
  
The following objects are masked from 'package:stats':  
  
    filter, lag  
  
The following objects are masked from 'package:base':  
  
    intersect, setdiff, setequal, union  
  
>
```

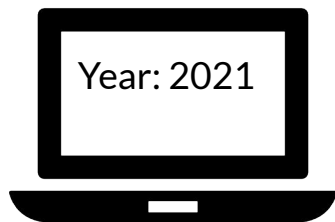


The Environments You Live In

```
pmiller-Civis-Mac:~ pmiller$  
[pmiller-Civis-Mac:~ pmiller$ R  
R version 3.5.2 (2018-12-20) -- "Eggshell Igloo"  
Copyright (C) 2018 The R Foundation for Statistical Computing  
Platform: x86_64-apple-darwin15.6.0 (64-bit)  
  
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Attaching package: 'dplyr'  
  
The following objects are masked from 'package:stats':  
  filter, lag  
  
The following objects are masked from 'package:base':  
  intersect, setdiff, setequal, union  
  
>
```

```
f <- function(x) {  
  x + 1  
}
```


Tricky environments



```
setwd("...")
```

```
install.packages("...")
```

```
brew install ...
```

```
apt-get install ...
```



```
setwd("...")
```

```
install.packages("...")
```

```
brew install ...
```

```
apt-get install ...
```

**Will it work for
Keanu Reeves?**





Tools for managing environments



Tools for managing environments



here::here()

Tools for managing environments



here::here()



R package

Tools for managing environments



here::here()



R package



packrat

Tools for managing environments



here::here()



R package



packrat



Docker



Part 2: Docker Concepts

It's not just for Devops



Docker

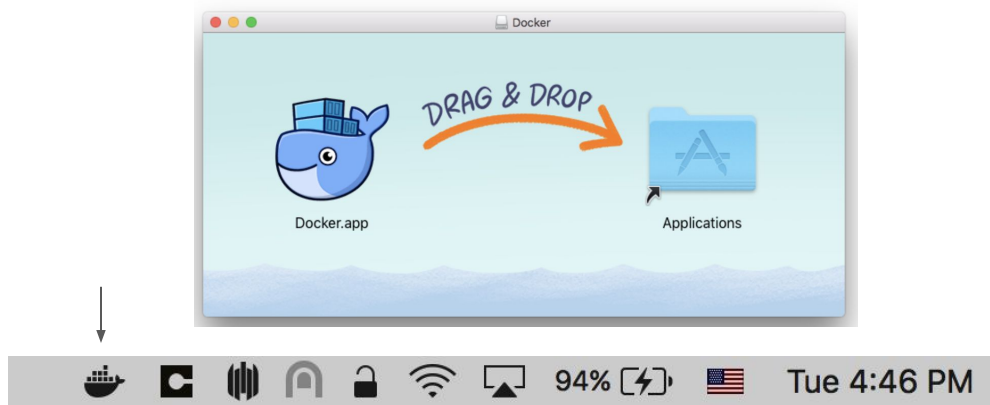
Official: Open source framework for lightweight virtual machines

Unofficial: Command line tool for managing programming environments



Getting started:
Docker for Mac

<https://docs.docker.com/v17.12/docker-for-mac/install/>





Key Docker Concepts

DOCKERFILE

A text file containing instructions to build the environment.





Key Docker Concepts

DOCKERFILE

A text file containing instructions to build the environment.



Image

An environment containing everything needed for your code.





Key Docker Concepts

DOCKERFILE

A text file containing instructions to build the environment.



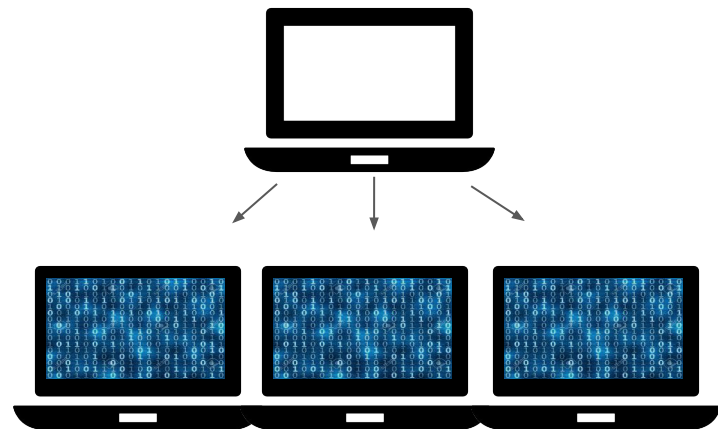
Image

An environment containing everything needed for your code.

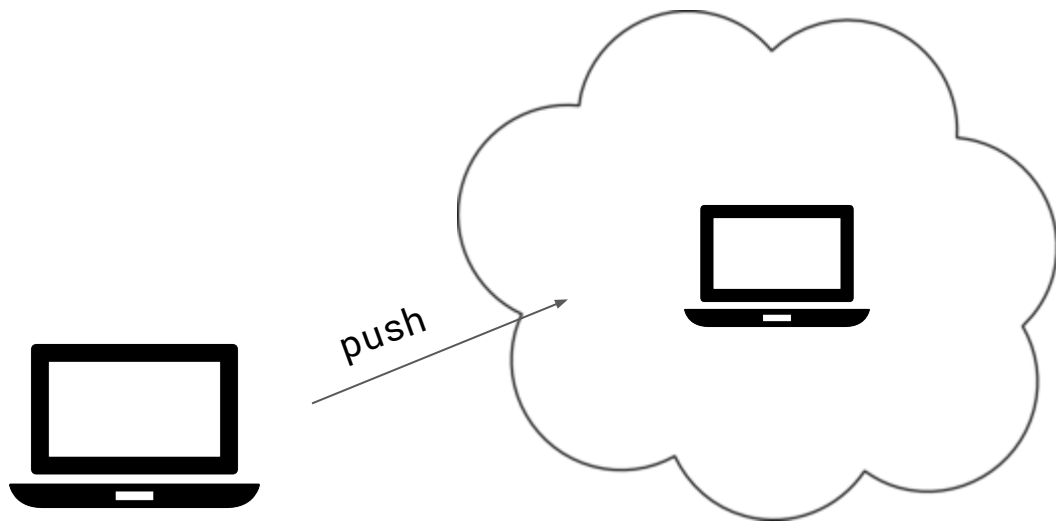


Container

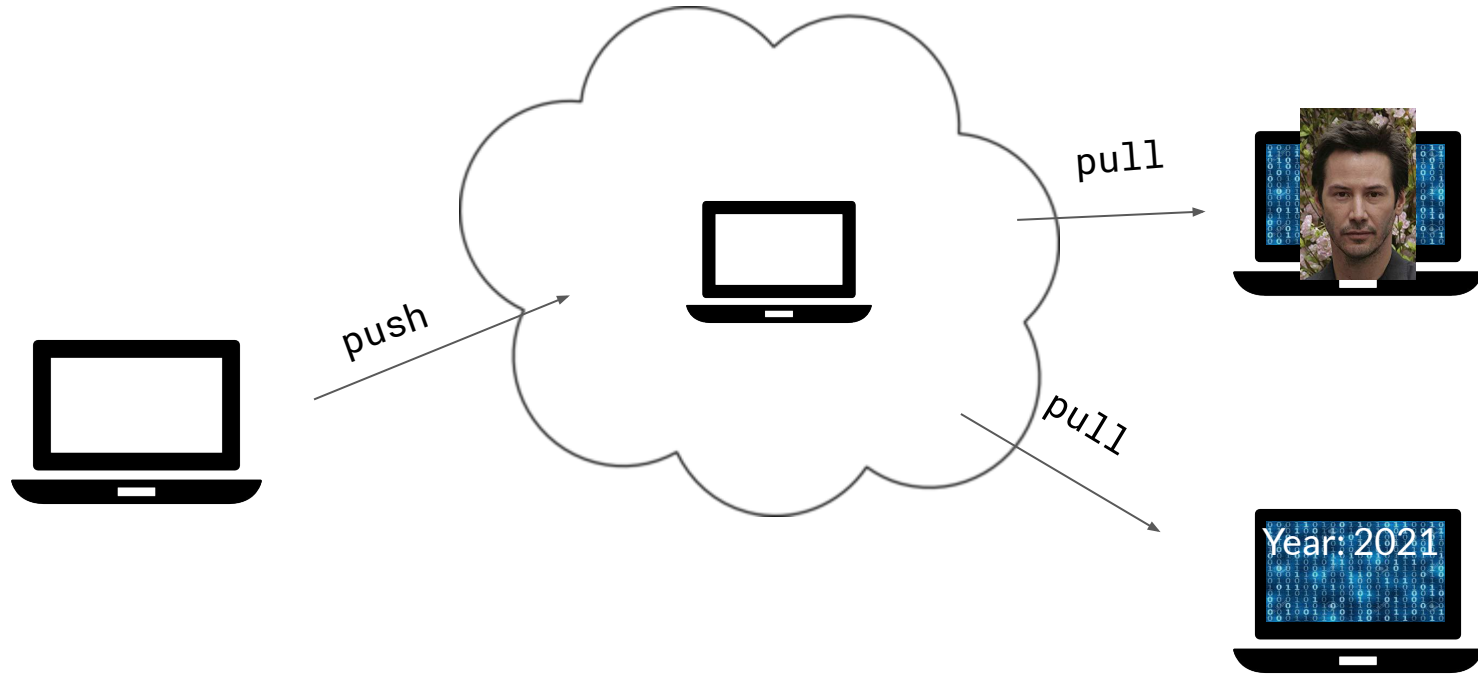
A running instance of an image.



Dockerhub



Dockerhub





Part 3: Building an image



DOCKERFILE



Image





DOCKERFILE

```
FROM rocker/r-ver  
  
RUN apt-get install \  
    system-lib  
  
COPY . /src/code
```

Image





DOCKERFILE

```
FROM rocker/r-ver
```

```
RUN apt-get install \  
    system-lib
```

```
COPY . /src/code
```

Image





DOCKERFILE

```
FROM rocker/r-ver
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Image





DOCKERFILE

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FROM rocker/r-ver  
  
RUN apt-get install \  
    system-lib  
  
COPY . /src/code
```

Image





DOCKERFILE

```
FROM rocker/r-ver  
  
RUN apt-get install \  
    system-lib  
  
COPY . /src/code
```

Image

```
docker build -t my_image .
```



Demo: Building an image





The most important DOCKERFILE line

```
FROM rocker/r-ver:3.5.2
```




The most important DOCKERFILE line

```
FROM rocker/r-ver:3.5.2
```



The most important DOCKERFILE line

```
FROM rocker/r-ver:3.5.2
```



The most important DOCKERFILE line

```
FROM rocker/r-ver:3.5.2
```

Rocker: Useful base images for R



 rocker-org / rocker

 Watch ▾

65

★ Unstar

925

 Fork

224

 Code

 Issues 8

 Pull requests 1

 Projects 0

 Wiki

 Insights

R configurations for Docker <http://hub.docker.com/u/rocker>

AKA: All the hard work you really don't want to repeat yourself



Useful base images: rocker/r-ver

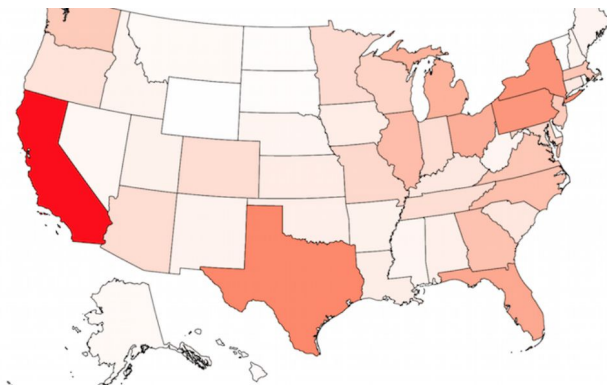




Useful base images: rocker/verse



Useful base images: rocker/geospatial

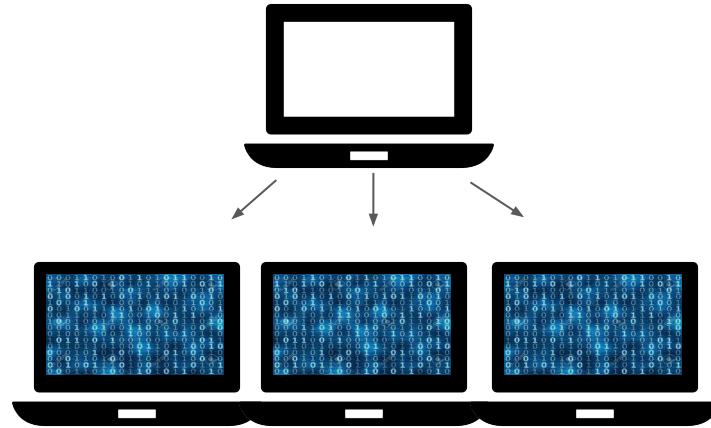




Part 4: Using an image



Container





Container

```
docker run -it my_image /bin/bash
```



Container

```
docker run -it my_image /bin/bash
```



Container

```
docker run -it my_image /bin/bash
```



Container

```
docker run -it my_image /bin/bash
```



Container

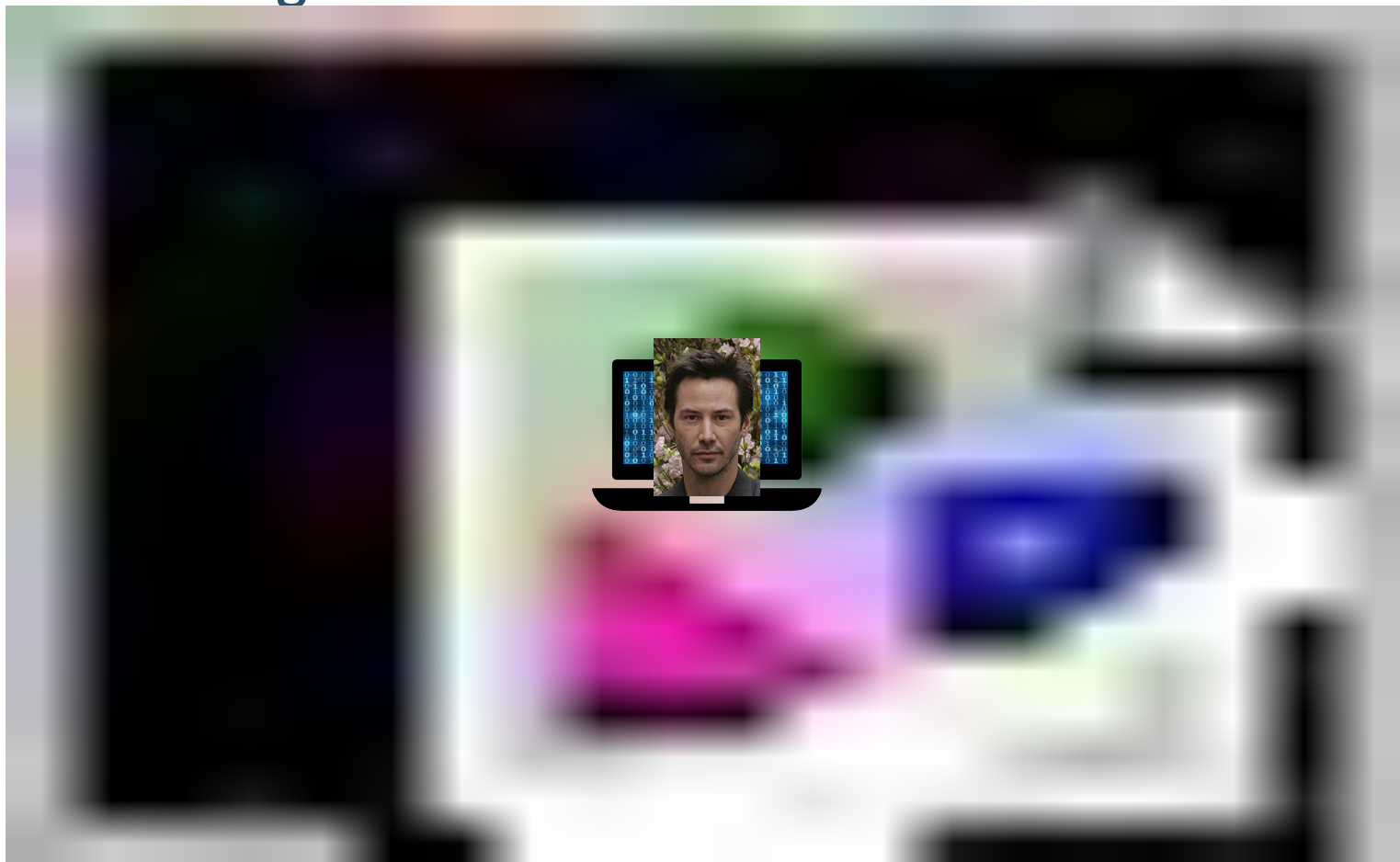
```
docker run -it my_image /bin/bash
```



Demo: Debugging in the Container



Demo: Sharing code with Keanu





Demo: Developing in the Container





Resources

[My Youtube Tutorial](#)

[R OpenSci Docker Tutorial](#)

[Rocker - Wiki](#)

Summary



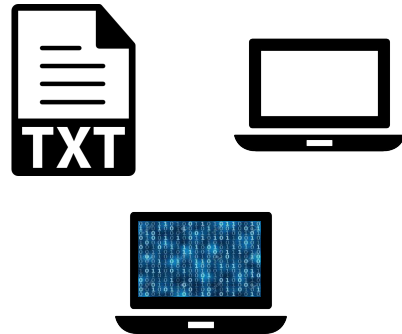
Will it work for
Keanu Reeves?



Docker: Reproducible
environments



It's not just for
Devops





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