Fun Stuff: Cloud Computing
Game Plan

1. What is the cloud?
2. Cloud architectures
3. Virtualization techniques
4. Python on the cloud
5. How to use Dokku
What is the cloud?

Answer: some collection of accessible computers connected to the internet.
Why do we care now?

Answer: lots more users. LOTS more users.
Economies of Scale

Definition: competitive advantage of operating at scale (e.g. Amazon giving compute resource “leftovers”).
Quick Maths:

Amazon is estimated to maintain over 2,000,000 servers.
Philosophy Time:

Is Amazon a consumer goods company or a cloud company?
Virtualization:

Emulating a little computer’s operation system that runs on a bigger computer’s operating system.
Containerization:
Wrapping applications in self-contained boxes. Stack boxes on top of each other and swap boxes accordingly.
Assume we have developed Bibly, a disruptive startup that is changing the world. How do we deploy a scalable app?
Plan 1:
Port forward your router, run the app on your laptop and start accepting traffic through your internet connection.
Plan 2:

Rent a computer in the cloud, copy/paste the source code to the instance and accept.
Plan 3:

Use a Git repository to manage source code. Create a script SSH into the instance and pull the source code.
Plan 4:

Containerize your application. Copy the image to the instance and run the application.
Plan 5:

Set up a Git server on your instance. Push to the instance and write a script to containerize and run the received source code.
Plan 6:
Rent multiple instances. Denote one instance as the master node and distribute traffic between the nodes.
Python on the Cloud:

1. Development
2. Deployment
3. Data Analysis
Introducing: Colab

- Free Jupyter Notebook environment
- Tesla K80 GPU access and lots of RAM
- Keras, PyTorch, Numpy already installed
- Supports all Google Drive features
Introducing: Spark

- Large-scale data processing
- Support in Python to use multiple machines
- Open Sourced by the Apache Foundation
- Industry standard for data processing
Introducing: Dokku

- Container orchestration platform
- Full emulation of Heroku build system
- Docker container support
- Domain name (DNS) support
See you next week!