# Geographic Data Science

## Introduction

Dani Arribas-Bel

# This course

# (Self-)Quiz

- Have you ever used **data** to make decisions in your life?
- Have you ever heard the term "**Data Science**"?
- Have you ever written a line of **computer code**?

# Philosophy

- (Lots of) **methods** and techniques
  - General overview
  - Intuition
  - Very little math
  - Lots of ways to continue on your own
- Emphasis on the **application** and **use**
- Close connection to "**real world**" applications

# Format

Eight blocks with:

- *Concepts*: videos + slides, readings
- *Hands-on*: concepts in (interactive) action
- *Do-It-Yourself*: practical material to do on your own

# Content

- **Blocks A–C**: "big picture" content + computational tools (learning curve)
- **Blocks D–H**: "meat" of the course (lots of concepts packed)
- *Rest of the course*: prepare an awesome Computational Esssay

# Logistics - Website

https://darribas.org/gds_course

ENVS363/563

# Geographic Data Science

Welcome to Geographic Data Science, a course taught by Dr. Dani Arribas-Bel in the Autumn of 2020 at the University of Liverpool.

## Contact


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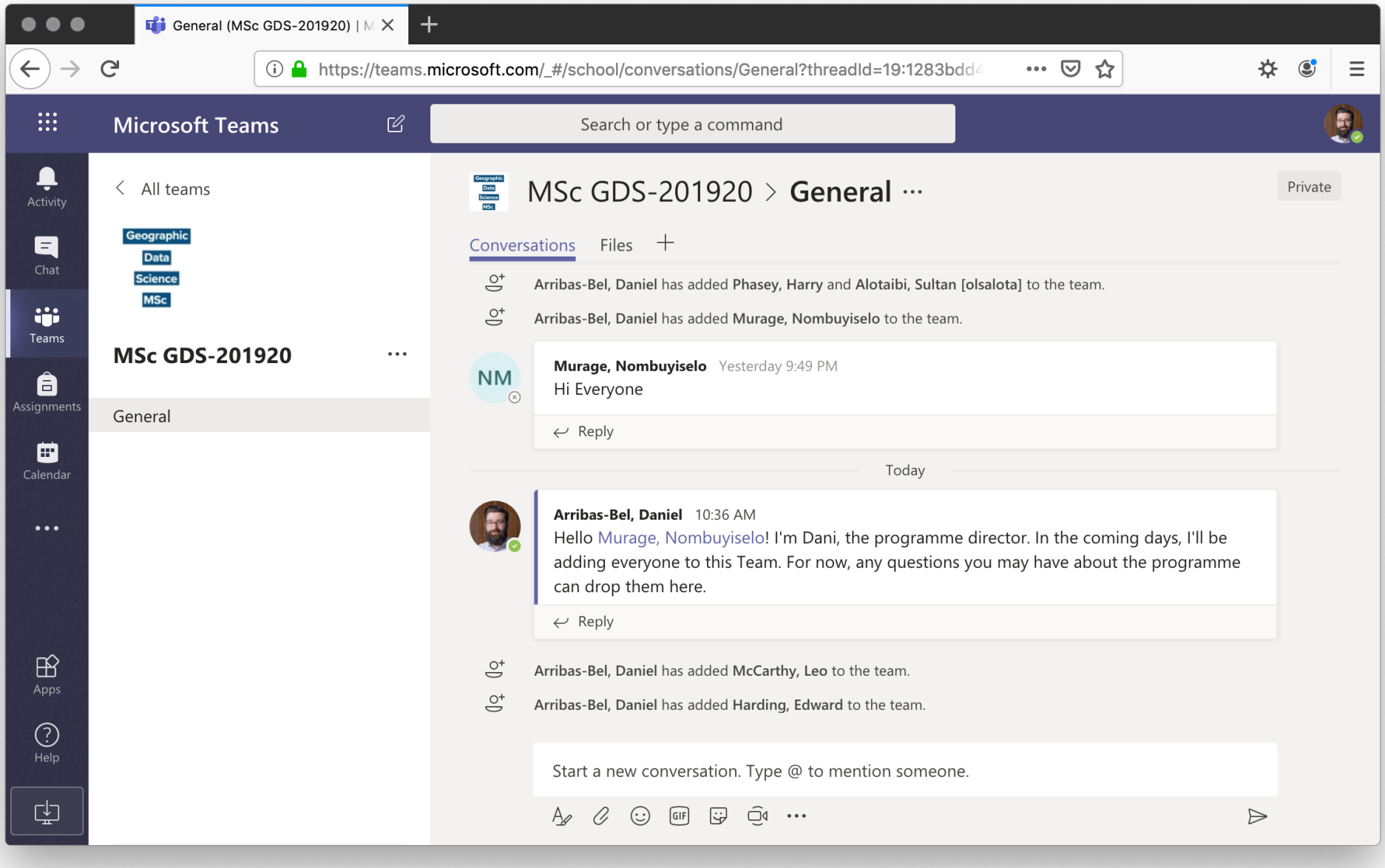
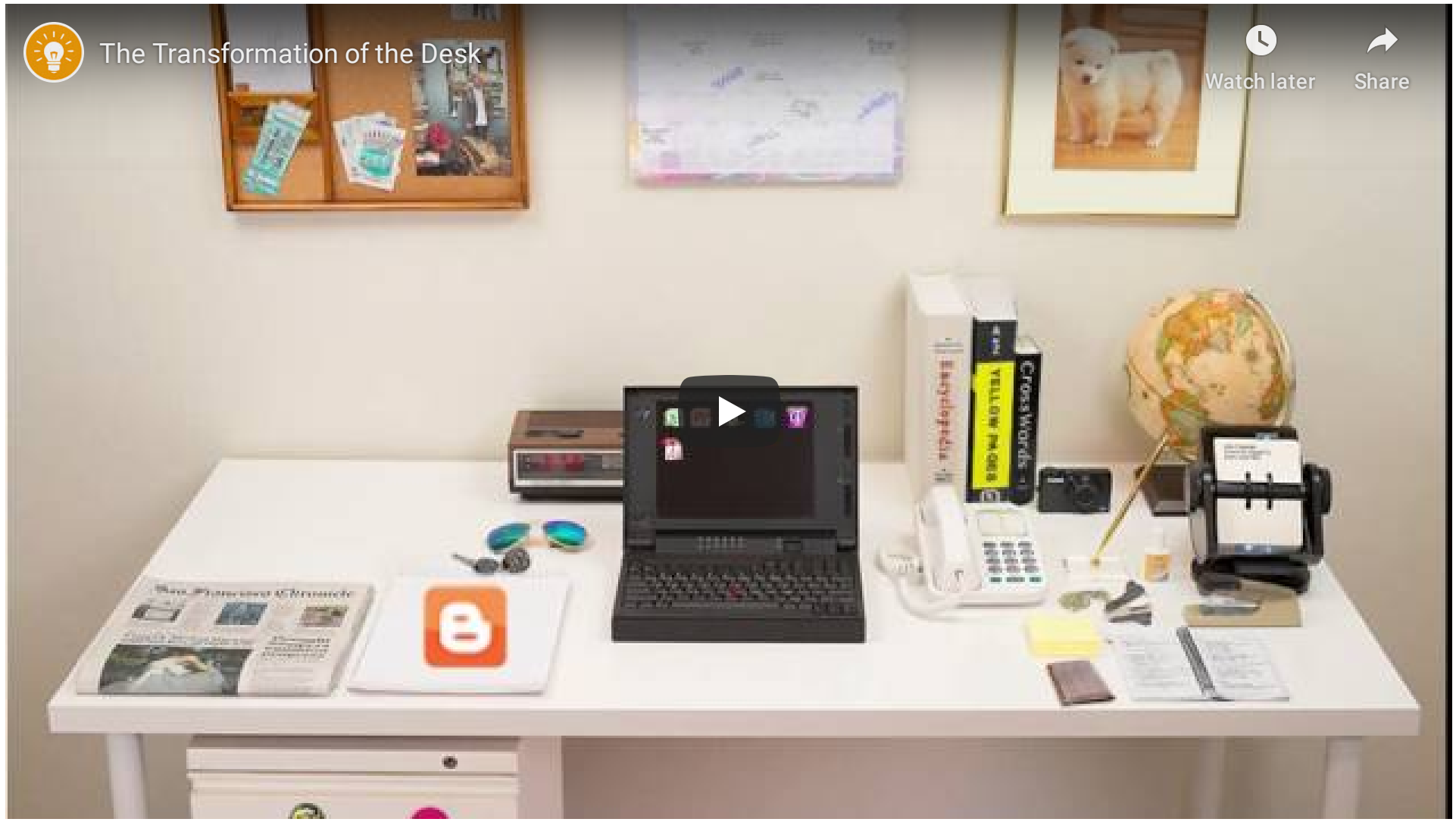
**Note**

A PDF version of this course is

# Logistics – Teams

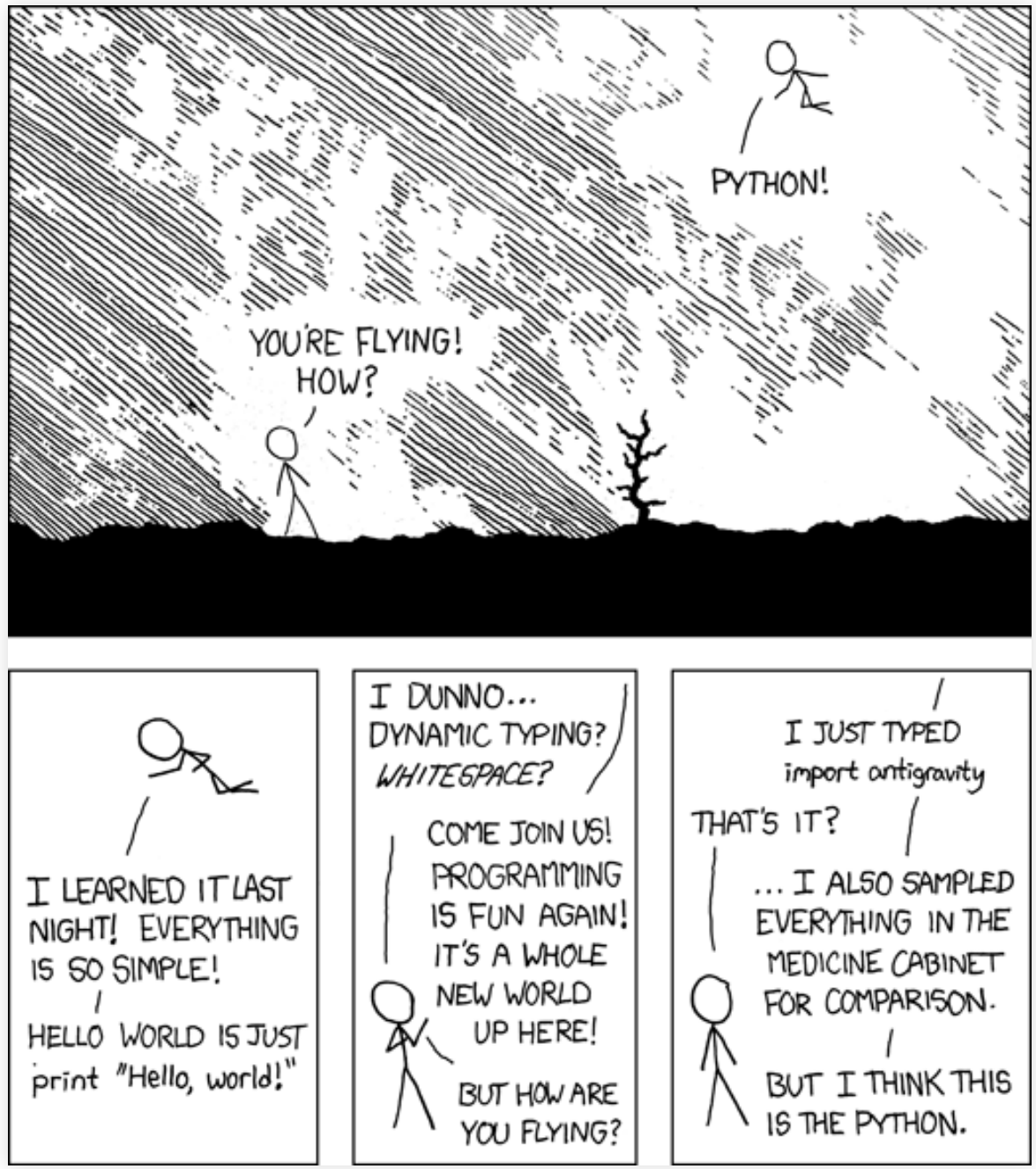


# Code




## Driving Vs automobile engineering

# Python


PYTHON!
YOU'RE FLYING!
HOW?
I LEARNED IT LAST NIGHT! EVERYTHING IS SO SIMPLE!
HELLO WORLD IS JUST print "Hello, world!"
I DUNNO... DYNAMIC TYPING? WHITESPACE?
COME JOIN US! PROGRAMMING IS FUN AGAIN! IT'S A WHOLE NEW WORLD UP HERE!
BUT HOW ARE YOU FLYING?
I JUST TYPED import antigravity
THAT'S IT?
... I ALSO SAMPLED EVERYTHING IN THE MEDICINE CABINET FOR COMPARISON.
BUT I THINK THIS IS THE PYTHON.

# Python

- **General purpose** programming language
- Sweet spot between *"proof-of-concept"* and *"production-ready"*
- Industry standard: **GIS** (Esri, QGIS) and **Data Science** (Google, Facebook, Amazon, Netflix, The New York Times, NASA…)

# Self-directed learning

## Prepare

- This is a **flipped class**: it's like a gym, the "subscription" does not make you fit
- **Bring** questions, comments, feedback, (informed) rants to Teams/labs
- **Teams**, **Teams**, **Teams**
- **Collaborate** (it's **NOT** a zero-sum win!!!)

# More help!!!

This course is much more about "**learning to learn**" and **problem solving** rather than acquiring specific programming tricks or stats wizardry

- Learn to **ask** questions (but don't expect exact answers all the time!!!)
- **Help** others as much as you can (the best way to learn is to teach)
- **Search** heavily on Google + Stack Overflow

# Workflow – Before a Lab

1. Go over the *Concepts* and *Hands-on* sections of a block
2. Get started on the *DIY*
3. Record questions and **post** them on Teams **prior to the lab**

# Workflow - Online Labs

1. Come work on the ***DIY*** sections
2. Live **answers** to questions posted
3. **Support** from demonstrators and module lead

# Assignments

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- Computer tests: W.5 (20%) and W.10 (25%)
- Computational essay (W.12, 50%)
  - Equivalent to 2,500 word
  - Report (*notebook*) with **code**, **figures** (e.g. maps), and **text**
- Discussion board (5%)

**NOTE**: recommendation letters only for great students (**>70**)