

# Developments in Economics Education Conference 2021

Embedding coding and project management skills into the  
economics curriculum:

Reflections from a Python for Economics course

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# Motivation

- Employer surveys highlight the need to broaden skill development in Economics degrees
  - Data analysis and coding; research
  - Application of knowledge; Creativity
  - Project management and collaboration
  - Writing and presentation
- Python is the fastest-growing coding language, with a growing community of economists embracing its use for economics research
  - Free, and with relatively simple syntax
- Growing student interest in coding activities (NSS, student representatives)
- The Python for Economics Week/Weekend supports two priority areas
  - Embedding research practices into the educational experience of economics students
  - Engaging student and alumni communities

# What we did

- Introduced an extra-curricular Python for Economics course introducing students to Python techniques useful for economics research
- Students worked on a project in groups of around 5 with a Coach
  
- **2019-20:** Python for Economics Weekend
  - intensive, in-person entirely synchronous session; two were run, each with around 30 students from all years of study
  
- **2020-21:** Virtual Python for Economics Week
  - online over a week; mix of synchronous (in Zoom) and asynchronous; student collaboration in Teams; around 40 Year 2 and 3 students

# Course design: pre-sessional course and training

- Pre-sessional asynchronous online Introduction to Python course with diagnostic test (Moodle page linking to Dataquest) – no more than 16 hours of effort; threshold mark to participate
- In person support over three weeks to assist students with installation/pre-sessional
- Coaches (largely students with extensive Python knowledge) were required to attend a specially designed training session

# Python for Economics course design

- Synchronous taught content (in person/Zoom) in four blocks: GitHub and version control, data cleaning, analytics, and visualisations
- Students randomly assigned to teams of around 5 and to one of six projects (four applied economics projects and two simulations); choose team name.
- Each team given a reading list, brief description, relevant datasets and a coach; open enough for students to formulate their own research questions
- Some structured milestones for project and check-in meetings
- Objective: group presentation of findings on final day. Certificate upon completion.
- Alumni panel discussion and social

# Python Projects

- Consumer prices, cost of living and inflation
- Gravity model of trade
- Happiness and GDP
- Health and inequality
- Schelling segregation model (simulation)
- Solow growth model (simulation)

# Example: Health and Inequality

OECD figures suggest that the UK has among the highest levels of income inequality in the European Union, as measured by the Gini coefficient. Income inequality brings with it inequalities in opportunity and across other dimensions such as health and education.

In 2019 the Institute for Fiscal Studies with Professor Angus Deaton launched the Deaton Review. A 5-year review into examining income and wealth inequalities, but also differences in health outcomes, political power and economic opportunities in British society and across the world.

The pandemic has exacerbated the inequalities that were already present in society, and brought to light many inequalities such as variation in digital connectivity and access to health care provision.

## Topics covered

- Income inequality
- Covid-19 and health outcomes

## Data sets

- London borough profiles [[Link](#)]
- Cross-country inequalities [[Link](#)]
- England and Wales, Index of multiple deprivation [[Link](#)] plus shape files [[Link](#)]
- UK Covid-19 cases and deaths [[Link](#)]

# Example: Health and Inequality

## Reading list

Atkinson, A. (2015) Inequality: what can be done? LSE International Inequalities Institute. [\[Link\]](#)

Neumayer, E. (2016) Inequalities of Income and Inequalities of Longevity: A Cross-Country Study. [\[Link\]](#)

Neumayer, E. (2017) Regional Inequalities in Premature Mortality in Great Britain. [\[Link\]](#)

## Covid-19 impact

Davenport, A. et al (2020) The geography of the COVID-19 crisis in England. Including datasets [\[Link\]](#)

Deaton, A. (2021) COVID-19 and global income inequality. [\[Link\]](#)

Public Health England (2020) Disparities in the risk and outcomes of COVID-19. [\[Link\]](#)

ONS (2020) Updating ethnic contrasts in deaths involving the coronavirus (COVID-19), England and Wales: deaths occurring 2 March to 28 July 2020. [\[Link\]](#)



# Survey results

- Good mix of beginners and experienced coders; good mix across years of study; good gender balance
- All students were invited to complete a survey upon completion
- Evaluative questions on a Likert scale; opportunity to comment
  
- Pooling across academic years, 71 respondents, with mean responses ranging from 3.8 to 4.4 (out of 5)
- Highest scores attributed to the format of the course, the value of the student coaches and the alumni panel
- 63 students would recommend the course to others (the rest Maybe)

# Survey comments: key strengths

*“The fact that it wasn't too structured so that we were able to do what we want. Also, the fact that we all were able to do different projects was good so that we could learn from each presentation. I appreciated the fact that we had our own coach for each group.”  
(2020)*

*“I loved the fact that it was over a week and that there were coaches on hand to help out. I felt that the coaches were very supportive and Teams was an excellent platform for communication ...one of my favourite weeks of the year so far!” (2021 participant)*

*“The Python for Economics events...made me consider tech and data as a career and I talked about the experience and the group work so much in my interviews. Even now, I am using the data cleaning techniques I learnt from the event every day at my internship!”  
(2020 and 2021)*

# Survey comments: initial challenges

*“Really felt lost in the coding, the jump from the online course to the session was extremely big for me” (2020)*

*“I think maybe having the deadline for the online course closer to the weekend” (2020)*

*“I feel like there was too much content compressed into 2 days. I think a better format would be to hold it over 2 weekends instead.... ” (2020)*

*“I think that additional handouts or materials can be provided prior to the course to introduce 1st-year students to the econometrics knowledge required.” (2020)*

## Survey comments: importance of networking/follow up

*“Please create a Python mailing list! I would love to participate in any coding opportunities over the summer, and if there are Econ research projects including Python I (along with many others) would be delighted to sign up. Thanks again!”  
(2021 participant)*

*“It would be really good to have a continuation of this weekend, based on the skills we have learnt” (2020 participant)*

What would you like to see more of? The overwhelming majority chose:  
*Meet ups, opportunities to discuss code and work on a project*

# Insights

- Components and timing of self-study pre-sessional is key
- Pitch and tone of communications matters – e.g. weekend vs hackathon
- Value added: coding driven by the underlying economic rationale
- Knowledge of econometrics proved important, so restricting to Years 2 and 3 led to more balanced groups and an improved overall student experience
- A week gave more time for review of related literature, reflection and iterations of analysis; more effective project management; led to higher quality presentations
- Value of ‘milestones’ and structure on length/scope of final presentation.
- Virtual model scalable; coaches can oversee multiple teams asynchronously
- Networking, links to employability and follow-up are important.

# What next?

2021-21 and beyond:

- Python training now embedded into the formal Year 1 curriculum for all students, leading up to a piece of group coursework. Pacing more gradual.
- Python for Economics Week available as an extra-curricular in Years 2 and 3 – mix of in person and online

Thank you for your attention!