INTERACTIVE WORKSHEETS AND CODE-ALONGS FOR INTRODUCTORY PYTHON PROGRAMMING

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PYTHON PROGRAMMING (MATH11199)

- MSc course, aimed at students with no previous programming experience

- On completion of this course, the student will be able to:

  - **Design** and **implement** Python programs to solve a range of mathematical problems.

  - Select and use **appropriate libraries** and data structures to perform computational analyses in Python; consult the relevant **documentation**.

  - **Review** a Python program to explain the underlying logic, identify and fix bugs, and suggest improvements to structure and style.

  - **Collaborate** with peers on programming tasks, using **suitable tools**.

  - Use Python to carry out **investigations** on data and extract key insights; **display and discuss results** in a well-presented report.

GUIDING PRINCIPLES IN COURSE DESIGN

- Embed "good practice" and professional workflows into the course (reaping the pedagogical benefits!)

- Help students become confident, independent programmers

- Practice, practice, practice!

THE COURSE MATERIALS

- All course notes are Jupyter notebooks. Every example is runnable and editable.

- The material in the notes is also covered in a video (UD – give students multiple media to engage with the material)

- Exercises all along, solutions released at the end of the week. Practice is key!

CODE-ALONG LECTURES

- 1-hour lecture each week (on Zoom this year, in a theatre next year?)
- Review of the previous week's material through worked examples.
- Instructor starts from zero with a problem to solve.
- Thinking aloud, scribbling, coding, making mistakes, googling things...
- Students participate through Zoom chat.

THOUGHTS FOR NEXT YEAR

- Worksheets seem to work very well!

  - Make them available as HTML

  - Introduce automatic testing for immediate feedback?

- Code-along lecture: how to do this successfully as an interactive flipped lecture in a theatre?