CM1103: Problem Solving with Python

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CM1103

Syllabus & recommended reading

Syllabus

- Fundamental programming concepts in Python
- Algorithms (inc. searching, sorting, recursion)
- Mathematics (mainly discrete mathematics)
- Scientific report writing

Reading

- Think Python! (see Learning Central)
- Discrete Mathematics with Applications, at least Second edition, S.S. Epp. Available from the Trevithick Library short loan section, QA39.2.E7

Skills

Skills that will be practised and developed:

- Programming in Python
- Problem Solving
- Effectively using online and offline API documentation
- Writing scientific reports
- Using the command line to manipulate files and run code

Lectures, labs & tutorials

- See timetable
- Five one hour lectures per week
- One lecture will be an *optional* recap lecture – see email/Learning Central
- Each 2-hour lab session (weeks 5 - 9) is a combination of lecture + exercises
  - Taken by Dr Matt Morgan
  - Each lab covers a range of topics in Python
  - Optional 'advanced' questions
  - One challenge question per week
- One hour weekly maths tutorial/example class (weeks 6 - 10)

Assessment

Summative

- Programming exercise – **40%**
  - Set in Week 9, submit in week 11
- Exam – **60% (2 hours)**

Formative

- Labs $\rightarrow$ Programming exercise coursework
  - weekly questions with solutions
  - one question with "doctests" per week on key concepts (e.g. loops, reading files, …)
- Tutorials, online maths tests: multiple choice, fill in the blanks, etc. $\rightarrow$ Exam

Learning outcomes

On completion of the module a student should be able to:

1. Use Python and common modules to implement simple algorithms expressed in pseudocode, and understand fundamental programming concepts
2. Develop informal algorithms and apply recursion to solve simple problems
3. Informally analyse the efficiency of algorithms and contrast different searching algorithms
4. Understand and apply basic logic, set theory, counting techniques, probability and statistics
5. Write scientific reports describing the analysis of a problem

What you should expect

Last few years feedback

- Too much/too little maths
- Maths is quite difficult; Math requires a lot more practice; Math is a little hard for people didn't study A-Level; More detail on the maths
- Too much/too little Python
- Labs too long/not long enough
- More labs! More labs! More labs! More labs! More labs!
- Python assessments too hard
- I found it hard to grasp the Python syntax in just 2hrs of labs per week
- "Didn't really stop and explain the language itself. You just give us a huge piece of code and tell us what it does."
- *The optional lectures were very helpful.*

What we expect from you

- Attendance
- Questions
- Engagement
- Independent study
- Practice