## COMP1730/COMP6730
Programming for Scientists

Final exam revision

## From the very first lecture ...

* As a scientist or engineer, you need to understand how software works, and (most probably) extend it with additional features:
  – to understand algorithms and their computer implementation
  – to interpret and explain the results produced by these
  – to debug programs (find and correct errors)
  – to modify existing programs to solve your (unique) problem
* Main focus of the course has been on developing your **computational thinking** skills (we see this as teaching you "how to fish" instead of "providing you with the fish")
* From now on, we hope you will be able to approach computationally a novel problem by saying, "Hey, I can just write a program to solve that..."

## Course contents (recap)

**1st half**:

* Functional decomposition
* Types, expressions, statements
* Branching (`if`, `else`, etc.)
* Iteration (`while` & `for` loops)
* Sequences (`list`, `tuple`, `str`)
* Code quality
* Debugging & testing
* Data analysis & visualisation

**2nd half**:

* NumPy arrays
* Files, Input/Output
* Dictionaries and sets
* Namespaces, scope, recursion
* Time complexity, big-O notation
* Exception handling
* Dynamic programming
* Modules, command-line parsing
* Python for genomics and classes (*not assessed in the exam*)
* Special topic: CSE (*not assessed in the exam*)

## Final exam date, time, location

* Date: Tuesday, 14th, November, 2023
* Time: 15 minutes reading time + 3 hours writing time (incl. uploading files to Wattle and **checking uploaded files**)
  – COMP1730: 9:00am - 12:15pm
  – COMP6730: 2:00pm -  5:15pm
* Location: CSIT and Hanna Neumann computer labs

## Final exam logistics

* You **MUST** show your **student ID card** (or any other ID card) at the beginning of the exam so that your identity can be validated
* Exam will be performed on the computer labs
* Check (e.g., *during week 12 lab*) that you are able to login into the lab computers with your ANU credentials!
* **We will NOT consider your inability to login into the lab computers as a reason to extend your exam beyond the established 3 hours**
* Exam will be posted on Wattle in due time
* Submission of your responses (Python and text files) will be carried out also through Wattle (in the same way as assignments and homeworks)

## Final exam logistics (continued)

* Lab computers environment will include:
  – Spyder
  – PyCharm
  – VSCodium + MS Python and Jupyter extensions (ONLY)
  – Anaconda (Python interpreter + vast array of python libraries)
* You **WILL NOT** be able to install your own VSCodium extensions
* Students with special exam arrangements (e.g., in EAP) will have extended time and special conditions

## Final exam format

**Final exam worths 60% of your final mark**

Exercises (**24%**):
* Improving code quality (6%)
* Testing (6%)
* Debugging (6%)
* Time complexity (6%)

Programming problems (**36%**):
* Problem 1 (9%)
* Problem 2 (9%)
* Problem 3 (9%)
* Problem 4 (9%)

See Lab 10 specification for examples of practice exam exercises and programming problems

## Permitted materials

* Calculator (non-programmable)
* Course slides. For convenience, you might print them out if you like, but they CANNOT be annotated
* One A4 page with your own notes on both sides
* Restricted Internet access. Web sites allowed:
  – `http://cs.anu.edu.au/courses/COMP1730/`
  – `https://wattlecourses.anu.edu.au/`
  – `https://www.pythontutor.com`
  – `https://docs.python.org`
  – `https://numpy.org`
  – `https://matplotlib.org`
  – `https://comp.anu.edu.au/`
  – `https://cs.anu.edu.au`
  – `https://codebench.cecs.anu.edu.au/`
* All PDFs linked from the course website (e.g., Downey's and Sundnes's book) will also be available

## Support before and during exam

- ★ **Before the exam**: drop-in labs and CSSA study event
  - – Tue 7 Nov 12:30 - 2:30pm. Marie Reay 5.02 (also online)
  - – Mon 13 Nov 3-5pm. Marie Reay 5.02 (also online)
  - – CSSA study event Thu 9 Nov, 5:30-8:30pm. Hancock West (only in person)
- ★ **Before the exam**: conveners consulting hours (see course webpage, communication, for details)
- ★ Although exam is centrally invigilated, teaching staff will be available **during the exam** to answer technical questions about the exam

## Cheating, plagiarism and misconduct

The exam is individual!

- ★ Any sign of collaborations or suspicious behaviour will be investigated
- ★ If you are found with academic misconduct, not only we apply mark penalty, but the record will also be retained at the University
- ★ Repeated offence may be documented in your transcript!

## Questions?

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