PHAS3459
Scientific programming using object-oriented languages

Ben Waugh & Simon Jolly

Aims Of This Course

- Introduce object-oriented (OO) programming in the context of physics data handling and analysis.
- Give sufficient programming expertise to be useful in lab work and projects.
- We will use the Java programming language, but the concepts can be carried over to C++ and other languages.

Assumed Prior Knowledge

- Essential
  - Basic computer skills:
    - Logging on.
    - Using Windows applications.
    - Using a web browser.
  - Some previous programming experience
  - Knowledge of basic programming concepts
    - Variable manipulation: `y = m * x + c`.
    - Control statements: `for` loops, etc.
- Advantageous
  - Prior experience of procedural programming:
    - Python, Matlab, Mathematica, C, Fortran, Basic, VBA.
    - Data types: `integer`, `real`.
  - Experience of using an Integrated Development Environment (IDE):
    - We will be using Eclipse.

Course Format

- Two ½-day sessions per week split across various Public Cluster Rooms:
  - Group 1:
    - Monday **14:00** to 17:00 (**not 13:30** as in timetable): 1–19 Torrington Place 113 (65 PCs).
    - Friday **10:00** to 13:00 (**not 09:00** as in timetable): 25 Gordon Street 105 (45 PCs) (Cruciform B1.15A Friday 20th October).
  - Group 2:
    - Wednesday **10:00** to 13:00 (**not 09:00** as in timetable): 1–19 Torrington Place 113 (65 PCs).
    - Thursday **10:00** to 13:00 (**not 09:00** as in timetable): Foster Court B29 (58 PCs) (Cruciform B1.15A Thursday 12th October).
  - No sessions in reading week (6th to 10th November)
- No formal lectures, but we will normally give a short talk.
- Course notes are available from the course web page
  - http://moodle.ucl.ac.uk/course/view.php?id=16413
- Read and understand the notes. Try the examples. Do the exercises.
- Talk to each other, but do your own work…
- Ask for help!
- Post questions, answers and comments to the "Java Forum" on the course web page.

Assessment

- No exam at the end of the year, but you have to work hard this term!
- Coursework:
  - 25% of final mark.
  - Exercises for modules 1–6 and 8–9.
  - Answers to be uploaded via Moodle: **upload by 12:00** on day of deadline!
  - Final mark based on best 7 of 8 sets of exercises.
- Mid-term exam:
  - 25% of final mark.
  - Group 1: 25 Gordon Street 105, **Friday 17th November 09:45**.
  - Group 2: Foster Court B29, **Thursday 16th November 09:45**.
  - Multiple choice + programming exercise (modules 1–5).
- Final exam:
  - 50% of final mark.
  - Currently scheduled for: **Wednesday 17th January 13:00** (backup date Wednesday 24th January): we will confirm date once we have the room finalised.
  - Programming exercise (modules 1–7).
- Exams are “open book” (but plagiarism is severely penalised).
- Read the exam information on the course Moodle page.

Course Personnel

- Lecturers:
  - Dr Ben Waugh
    - D11, Physics Building
  - Dr Simon Jolly
    - D12, Physics Building
  - Available for advice outside course sessions, but best to e-mail first.
  - Always use UCL email for correspondence about the course…
- Demonstrators:
- Group 1:
  - Tim Scanlon
  - Chathu Kumarasinghe
  - Gareth Jones
  - Ben Davidson
  - Filipe Abdalla
  - Laurent Kelleter
  - Matthieu Hentz
  - Nicolas Angelides
- Group 2:
  - Gavin Hesketh
  - Alex Martyniuk
  - Louie Corpe
  - Luke Davis
  - Umit Utku
  - Alexandre Morgan
  - Martin Rey

Further Information

- See the course Moodle page:
  - http://moodle.ucl.ac.uk/course/view.php?id=16413
- Course notes are available there in 3 formats:
  - HTML web pages for viewing online.
  - PDF for viewing offline.
  - EPub for viewing offline with laptop/tablet/smartphone e-reader.
  - Let us know which is the best!
- Read the pages on exams and coursework. Past papers are available for all mid-term and final exams.
- Look at the "Java Resources" page for other sources of information about Java:
  - Many text books on the market…
  - … but text books aren't always the best way to go: either too basic or too specialised.
  - Lots of web pages, including those from Sun, the originator of Java:
    - Tutorials.
    - Especially useful is the "Javadoc" API documentation.
- The "Java Resources" page also contains information about setting up Eclipse on a personal machine.