LLP109 - Digital Application Development

- *Introduction to* ***Python*** and ***C***

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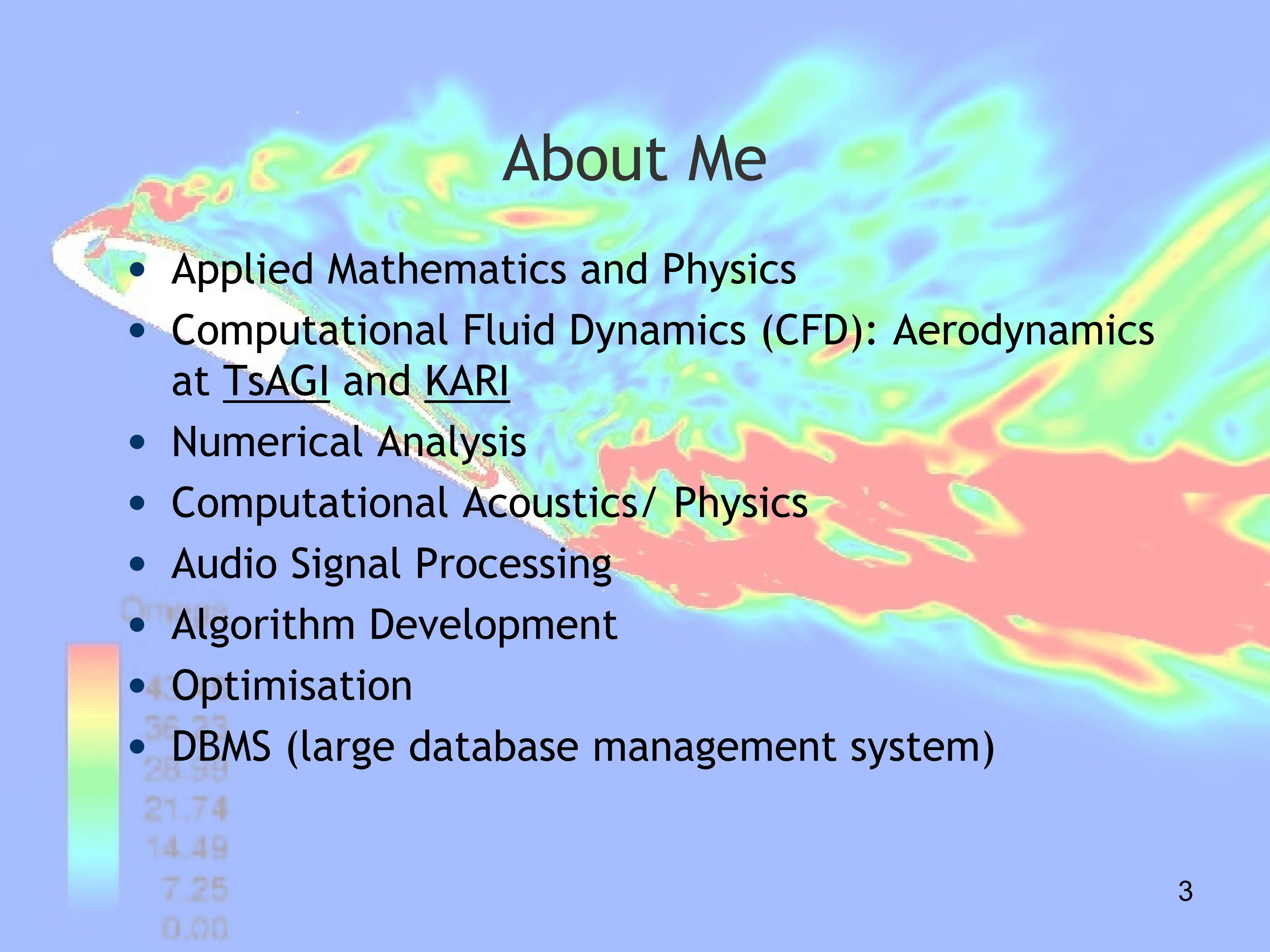
Pre-session



About Me

- Applied Mathematics and Physics
- Computational Fluid Dynamics (CFD): Aerodynamics at TsAGI and KARI
- Numerical Analysis
- Computational Acoustics/ Physics
- Audio Signal Processing
- Algorithm Development
- Optimisation
- DBMS (large database management system)

a method for **problem-solving**

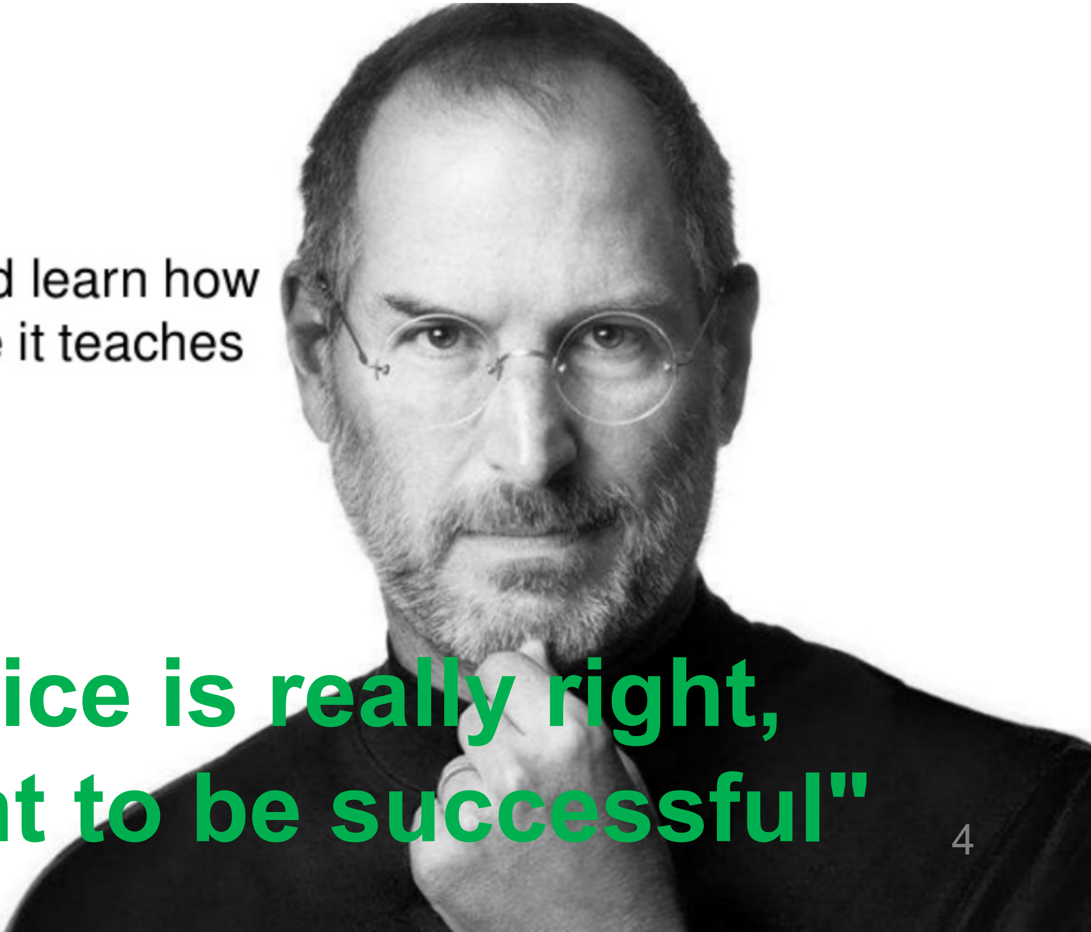
Logical / Systematic / Algorithmic

Way of Thinking,

as a Professional in a Digital Age

Everybody in this country should learn how to program a computer because it teaches you how to think.

Steve Jobs



"Your choice is really right, if you want to be successful"

Will you master Python and C in this module?

No, you won’t.

- Each specific area, such as web, database, 3D modelling, numerical analysis, communication, audio, and video, requires different skills. You are not required to master all the skills before getting the job.
- Fundamental knowledge and experience.
- Learn **good habits in coding**, technical **understanding**, and professional **attitude.**
- “It's **hard for everybody**. The key to success is **sticking with** it.”
- **Python** and **C** are just tools. We will **use them as tools**.

“We are all equal in this module and go all together.”

Programming languages employers want...

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Studying a computer science course or a related degree? The topics and modules that are taught across computer science degrees, as well as how they are taught, are
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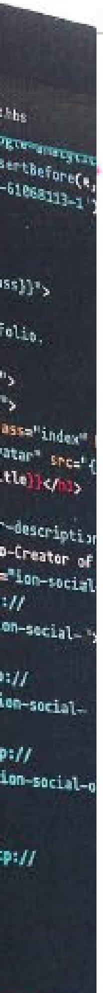

...and how you learn them

You can develop your knowledge of coding languages in a number of ways. If you want to learn a language from scratch, try out one of the many free courses and resources available online, on websites such as Coursera, Codecademy, or FutureLearn. A technology recruiter at MI5 advises, 'There are free online coding courses and YouTube channels that can take you from "zero to hero" in a matter of weeks. Think of a project you want to create or build, and just do it!'

Even if you are not studying computer science, there may also be opportunities for you to gain experience of programming languages

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If you're not studying for a computer science-related degree, a career involving coding is still an option for you. A handful of employers will train graduates with no coding experience in the languages they need for the role (see pages 8–9).

You can also increase the number of employers you can apply to by learning a programming language in your own time. Attending classes and meetings or learning through online courses is also a great way to build up evidence of your passion in technology – a key quality that recruiters want to see in graduates.

What languages do employers look for?

Different employers' requirements vary widely, so always make sure you've done your research before applying.

- 'It's definitely beneficial to have knowledge and experience of some programming languages,' comments Kirsty Smith, graduate and apprentice recruitment manager at **Capgemini**. 'Specifically, knowledge in Java, JavaScript, Python, SQL, C#, Ruby and PHP would be of value. It not only demonstrates that the individual has the capability of picking up coding skills, but it also shows the passion and desire to learn them.'
- **BlackRock** has previously told TARGETjobs that, while they primarily work with Java, any object-oriented language (such as Python, JavaScript or C++) would be beneficial.
- **Morgan Stanley** specifies that its graduate technical analysts need to have an understanding of Linux/Unix and Windows, as well as good knowledge in at least one programming language, offering C

Many of the employers we spoke to specified that, while they may not ask for specific languages, it's beneficial for graduates to have learned the fundamentals of at least one language.

- Francesca White, technology graduate recruiter at **Deutsche Bank** explains: 'Programming languages, toolsets and techniques allow you to build systems and explain solutions and are something all developers need to keep on top of: learning a common language is a good idea. However, tools and frameworks go out of date very fast, so the key is to be able to think algorithmically without tying yourself to a specific tool.'
- 'I wouldn't say we're looking for graduates who know a specific coding language or technology,' states Iain McFadyen, global graduate recruiting manager at **London Stock Exchange Group**. 'What we're looking for is people who have taken the opportunity to familiarise themselves with, and have a passion for, technology in general.'

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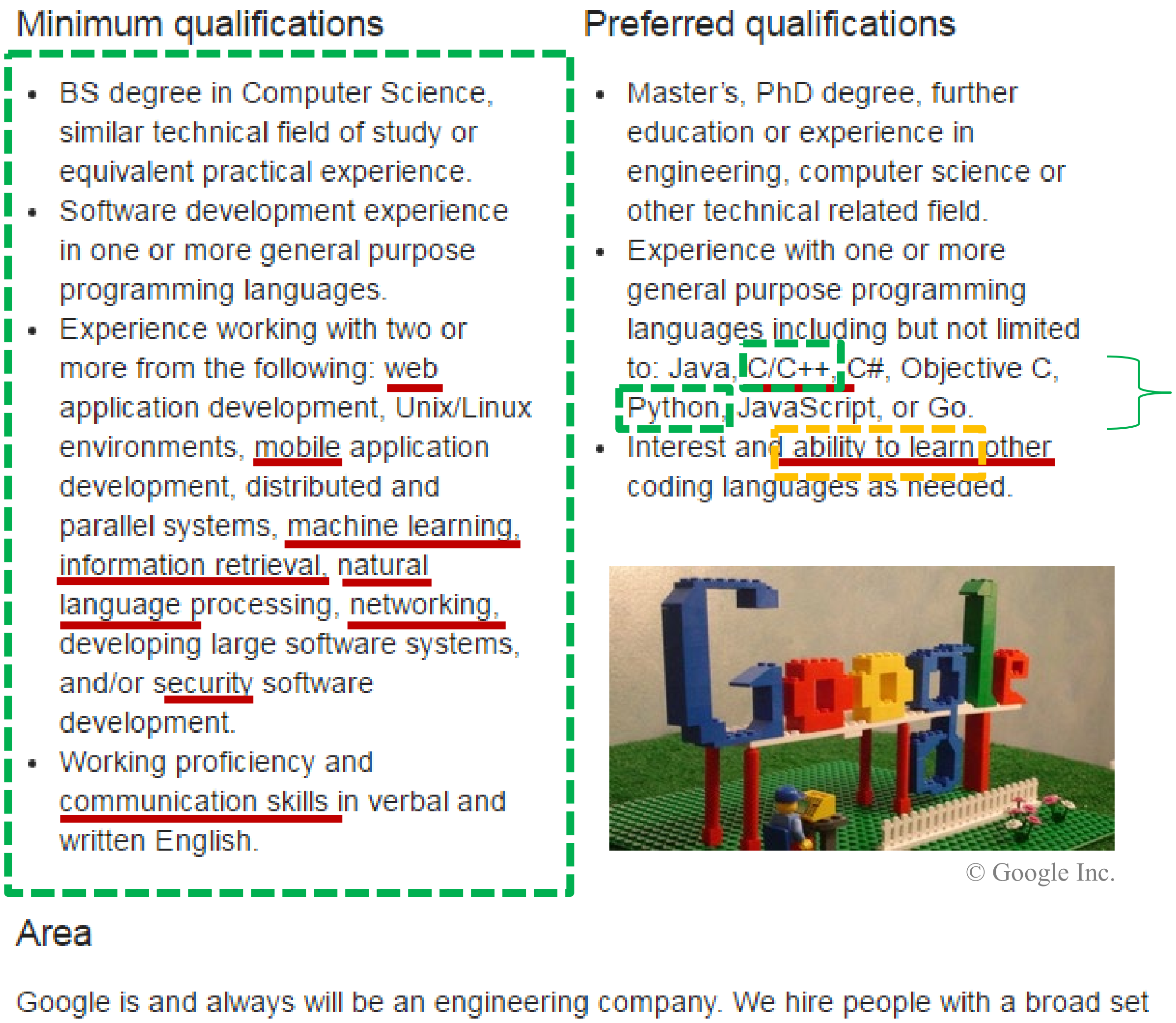
Career Prospects



Discipline-specific knowledge

Minimum qualifications

- BS degree in Computer Science, similar technical field of study or equivalent practical experience.
- Software development experience in one or more general purpose programming languages.
- Experience working with two or more from the following: web application development, Unix/Linux environments, mobile application development, distributed and parallel systems, machine learning, information retrieval, natural language processing, networking, developing large software systems, and/or security software development.
- Working proficiency and communication skills in verbal and written English.

Preferred qualifications

- Master's, PhD degree, further education or experience in engineering, computer science or other technical related field.
- Experience with one or more general purpose programming languages including but not limited to: Java, C/C++, C#, Objective C, Python, JavaScript, or Go.
- Interest and ability to learn other coding languages as needed.

Skills

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Area

Google is and always will be an engineering company. We hire people with a broad set

Your job position becomes more solid. You can occupy core positions in the **future digital age**.

LLP121 Principles of Data Science and

LLP133 Advanced Programming and Visualisation

may require basic knowledge of ***Python***:

- You will see more specific and focused *use cases* of Python and libraries in Data Science.

Project-based Learning

Basic concept

-> Examples/ exercises

-> **Component** skills (as part of your **project**)

-> **Sophisticated** concept

Classroom (30 hrs)

-> **Expend** your knowledge & more **practice:**

- ✓ Self-study, tutorials
- ✓ Go back to the **project**, *i.e.* coursework

Independent self-study (**120 hrs**)

Proactively taking lectures, studying **examples** & **exercise** in the lecture slides, and doing **homework** mean you are **already doing your coursework**.

Course Overview

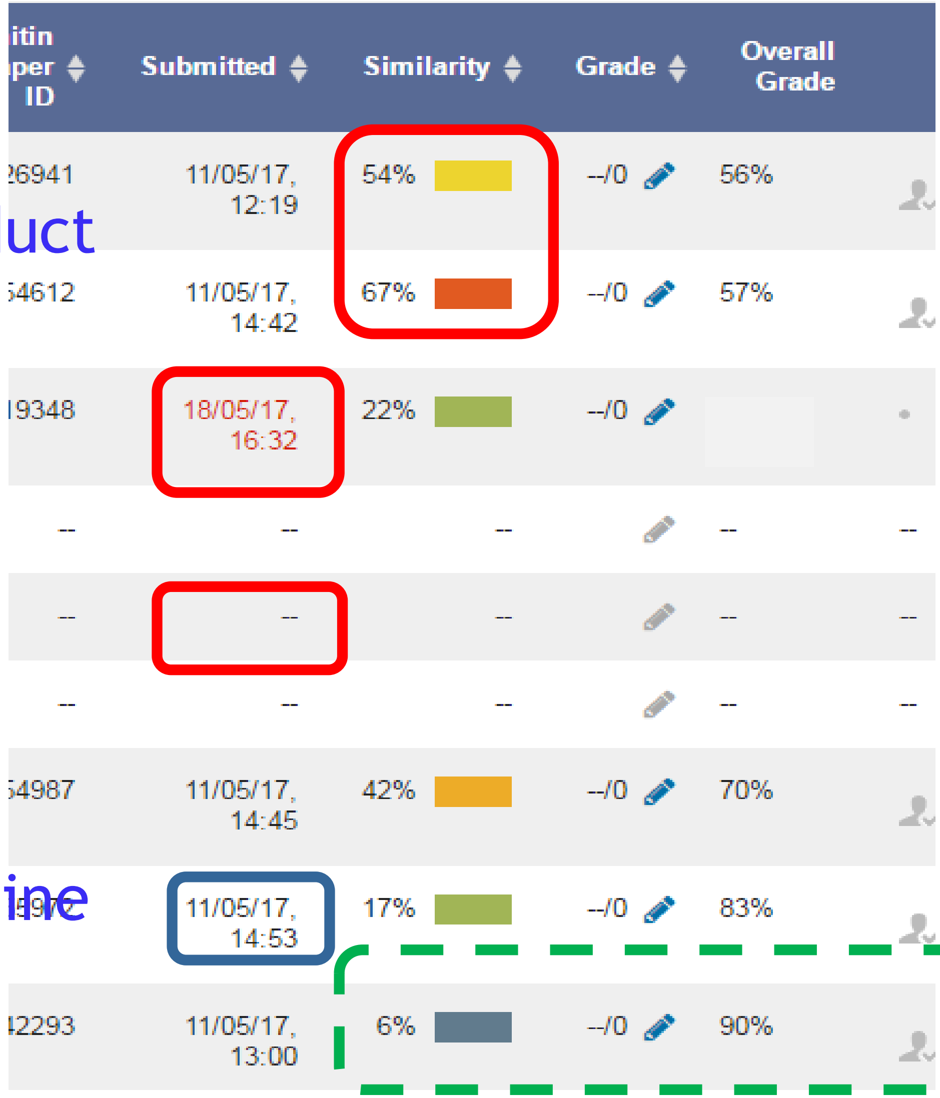
- Aims
  - To learn **the basics** of computer programming in general and **problem solving**
  - To learn how they relate to the **system** architecture
- Course Structure
  - Lectures, tutorials
  - Exercises, conversation, homework, and quizzes
- Assessments
  - **Coursework: 100%**

Coursework

- App Development Mini-project (60%): submit either **Python** or **C program**
- Report (40%): technical **report** **about your own program**

- The coursework consists of (1) a computer program (in Python or C) (2) report (**2000** words).
- The details will be found on LEARN.
- Both the computer program and report must be submitted on LEARN.

Coursework on LEARN



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26941	11/05/17, 12:19	54% 🟨	--/0	56%	
54612	11/05/17, 14:42	67% 🟧	--/0	57%	
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5972	11/05/17, 14:53	17% 🟩	--/0	83%	
42293	11/05/17, 13:00	6% ▨	--/0	90%	

Academic misconduct

problem

Late submission

No submission

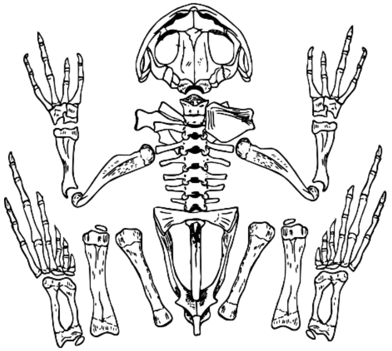
0 (zero)

(Almost) the deadline

Excellent

Coursework Project

Very simple/ basic given examples



Your own implementation of the concept

"You have **variety of options** to achieve **your goal**"

Homework

- “The only way to learn how to code is to **do it**”:

  You should type and test codes by yourself.

Attendance

- Higher pass and success rate in the module

"Seekers of Truth and Knowledge"

- When we encounter problems, be brave, **don't avoid, stick with them, don't give up easily, take time, use all available (off/online) resources**, and try to **solve** them. It will make you **feel happy** after fixing it: ***"A fixed thing is a beautiful thing."*** It is the process of **growth** to maturity.
- You are connected and supported: refer to online resources (refer to the later slide) and ***Tips/ Resources*** sections on LEARN.

Be Responsible

- Be **responsible** for your codes. Let's don't ask the lecturer questions just like "***Why my code does not work?***", but **yourself**. Because those questions often ask the lecturer to find out trivial/ typo errors or correct your problematic codes **on behalf of you**. Our codes quite often does not work immediately.

No Irrelevant Questions

- *"How are you going to find out about things if you don't ask questions?"* – Anne of Green Gables
- However, no irrelevant questions to the lecturer:
  e.g. IT technical problems including software installation, laptops, attendance apps
  -> contact **IT-Service**
- I wish you **don't ask the lecturer how to use your Python coding tools after today**, e.g. *Visual Studio* or *Python IDE*, especially during the lectures. Because **it is not in the main scope of this module** and we need to study and discuss much more important and valuable topics.

Good Habits in Programming

- Good computer program :
- No "~~*Run and Fix*~~" strategy
- But, "*Fix and Run*"
  - ➢ Design/plan/conceptualise : draw a flowchart (conceive the **logic**)

    e.g. draw flowcharts **on a piece of paper** -> implement a code on your computer
  - ➢ Predict/expect errors in advance, and think how to eliminate them
  - ➢ Think enough before writing an actual code

Online Resources

- Free Online Tutorials & Courses
  - ***tutorialspoint.com***, including **C/C++** & **Python**

    Python Tutorial
    https://www.tutorialspoint.com/python/index.htm

    C Tutorial
    https://www.tutorialspoint.com/cprogramming/index.htm

- Q&A
  - *stack**overflow***
    https://stackoverflow.com/questions

Other Questions

- Use **Student services** on the **4th floor** for assistance
- '**Check-in**' to in-person sessions using the ***MyLboro*** app : https://www.lboro.ac.uk/students/welcome/app/attendance-check-in/
- **Self-isolating** students: **keep taking the sessions on-line**, do not stop learning.

Drink, Snack, Phone, SNS

- Drinks are generally all right, e.g. **water, tea, coffee**
- Please have food outside
- **Strictly No meSsengers**, be fully engaged in class