THE UNIVERSITY OF WESTERN AUSTRALIA

CITS1401
Computational Thinking with Python

THE UNIVERSITY OF WESTERN AUSTRALIA

Lecture 0
Introduction

My introduction

- Unit Coordinator: Dr. Ghulam **Mubashar** Hassan
- Consultation time : 2 – 3 pm Tuesdays
- My research areas: Artificial Intelligence, Machine Learning interdisciplinary problems & Engineering Education
- Website: Click here
- Office: **CSSE Room: 2.12 and MS Teams**

All of you are part of MS Teams. Please use your Pheme details to access it.

Teaching team

- Teaching team
  - *Associate Lecturer*
    - Dr. **Syed** Zulqarnain Gilani
  - *Lab facilitators*
    - **Mustafa** Saeed
    - **Jasper** Paterson
- Admin/enrolments/labs/etc.
  - *Get in touch by submitting an enquiry,*
  - *Ask a question at askUWA*
  - *Booking an appointment with an EMS Student Adviser or drop in to the EMS Student Office, located in the EZONE North Building.*
  - *Opening hours are 10am - 5pm Monday - Friday.*

What is CITS1401 About?

"Computational thinking is the thought processes used to formulate a problem and express its solution or solutions in terms a computer can apply effectively"

Cansu, S. K., & Cansu, F. K., 2019

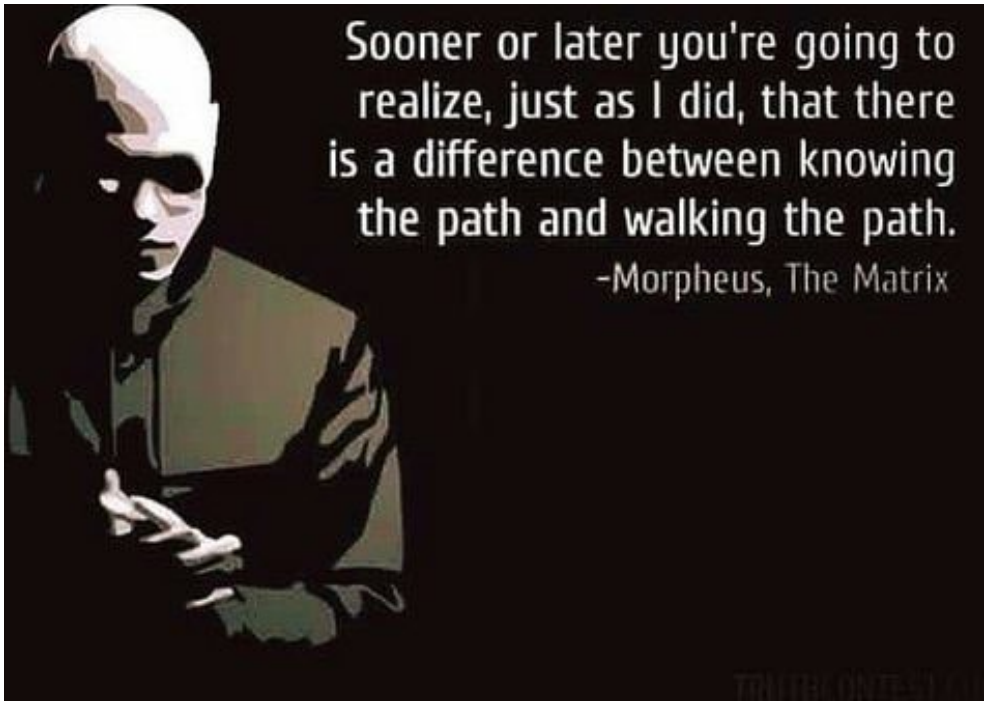
- CITS1401 is about computer-based problem solving
  - *How to formulate the problem in a computer language as series of steps*
- Will say a little about computers and how they work, and also about how to solve problems using programs
- Shall be using Python 3 as our computer language
  - *Please do not use Python 2. Related dialect, but incompatible*

Course Outcomes

- Developing computational thinking skills:
  - *Decompose:* how to divide large problem into small parts and solve them *"divide and conquer".*
  - *Pattern recognition:* recognizing common tactics to solve set of problems.
  - *Abstraction:* generalizing the problem by reducing avoidable details.
  - *Algorithm:* how to formulate ordered step-wise approach to solve the problem.
- Developing programming skills:
  - *Be able to write a program in Python 3 to:*
    - Solve small problems
    - Automate repetitive computational tasks

Both skills are transferrable

Teaching Strategy



Why Python ?

- Most popular language
  https://www.northeastern.edu/graduate/blog/most-popular-programming-languages/
  - *Easy to learn*
  - *Large library*
  - *Extensively used in:*
    - Startups
    - Artificial intelligence
    - Data science
    - Financial services
    - Interdisciplinary fields

Resources

- "Python Programming: An Introduction to Computer Science", 3rd Edition, *John Zelle, Franklin Beedle*.
- "Starting out with Python" 4th Edition, *Tony Gaddis*
- All CITS1401 resources (including PDFs of the lectures) can be found on the LMS page for the unit.
  - *You need to be enrolled in the unit to see the page.*
- All assessments' submissions will be made on Moodle which is a similar platform as LMS but can run and test your code. More details will be shared via an announcement on LMS by the end of the week.
- Students must need to follow course page on LMS as well as Moodle.

Communication

- All announcements will be made via LMS.
- All email communication will be made to/from UWA email address only.
- Help forum or discussion forum will be provided on Moodle. All queries related about clarification of assessments or discussion should be posted there. *No messages on MS Teams will be entertained*.
- Email should only be used for issues which cannot be discussed on discussion forum and will be replied in 2-3 working days.

Organisation

- 2 x 1hr lectures a week and 1 x 1hr Workshop/tutorial
  - *Both lectures and workshop slots will be treated in similar manner. The contents of workshop are embedded in the lectures to make them more interactive.*
  - *The recorded lectures/workshops/tutorial will be made available on LCS.*
  - *The lectures slides you find on LMS do not necessarily correspond to timetabled lecture/workshop/tutorial slots.*

Organisation

- 1 programming lab per week (2 hrs)
  - *Lab facilitator is available to assist*
  - *There are 7 Face-to-Face and 2 online lab sessions*
  - *Starts Week 2*
- Check your Timetable for your lab session
  - ***18 hours** of multiple time slots across the week*
  - *feel free to drop in any lab session but registered students will be preferred*
  - *maximum number of students may be restricted due to COVID-19 restrictions in Face-to-Face sessions*

COVID Contingency Plan

Our priorities are:

- To ensure your safety and well-being on campus
- To support you to progress in your studies and ensure the best teaching experience possible

Keep up to date and be prepared:

- Please check the unit LMS site and your emails regularly (at least once a day) to ensure you do not miss any announcement
- If you have difficulty accessing suitable technology for online learning, please contact the Library for support at the beginning of the semester and advise unit coordinator

In case of a snap lockdown, or campus shutdown:

- We will move to online teaching

Classes

- Lectures/Workshops/tutorials will be recorded and delivered via LCS accessible by LMS
- Labs will be shifted to online mode and will be delivered by MS Teams

Assessments

- **Note: Assessment items and weightings may need to be modified during semester as a result of the impact of COVID.**
- All assessments except final exam are already required to be submitted online.
- The arrangements of final exam will be informed.

COVID Contingency Plan

If you are unwell:

- Get in touch with the unit coordinator and Student Office as soon as possible
- Follow University and State Government protocols

If you have any other concerns or questions, please contact your the EMS Student Office as early as possible (enquiries-ems@uwa.edu.au).

If you need further support with online learning, please use the resources at:

- https://www.uwa.edu.au/students/Support-services/Learning-online
- https://www.uwa.edu.au/students/Support-services/Academic-support

If you need support with IT issues, please contact the Library at:

- https://www.uwa.edu.au/library/Help-and-support/IT-and-printing-support

IT resources are also available at: https://www.it.uwa.edu.au/it-help

University COVID advice and updates are available at:

- https://www.uwa.edu.au/covid-19-faq/Home

Labs - Expectations

- Five labs are **assessed** and rest non-assessed. Lab 00 explains Moodle and must be attempted.
- If you want to do well in the unit you should complete labs regularly.
  - *Some learning in the unit, particular related to computational thinking skills, will only take via labs.*
- Students are encouraged to start working to solve the lab as soon as they are released.
- You are welcome to attend as many lab sessions as you want
  - *preference to those timetabled to be there*
- Feel free to use discussion forum on Moodle. Teaching team will regularly check the forum during working days. Estimated time to respond your queries is 2-3 working days.

Labs - Expectations

- You are required to install Thonny on your own computers. Thonny is already available in all lab computers of EMS. You may bring your laptops to lectures/workshops/labs and use Thonny (but not for Facebook, Tiktok or any other distracting software).
- **Lab time is your time to seek help from lab facilitators**
- *The contents covered in labs are part of the course and it may be more than you have covered in the lectures*

Programming Environments

- In the lab you will use Python 3.5 (or above) via the Thonny IDE
  - *An integrated software development environment where you can write, edit, execute and debug programs*
- Thonny is student oriented. It is a free software available for all major operating systems such as Windows, OS, Linux. Python 3.5 or above is built in
  - *Not phones or tablets (Android or iOS)*
- You can download Thonny from http://www.thonny.org

Assessment

- Assessment is based on both
  - *Understanding of fundamental concepts*
  - *Practical computational thinking and programming skills*
- Final Exam (worth 55%) *TBA by Exam Office*
- Two programming projects (worth 25%)
  - *Project 1 due **Fri. 5:00 pm of Week 7** (worth 15%)*
  - *Project 2 due **Fri. 5:00 pm of Week 12** (worth 20%)*
- Labs (worth 10%):
  - *Five lab quizzes (worth 2% each) due **Fri. 5:00 pm** in two weeks after their release*

Getting Help

- Discussion or Help Forum on Moodle
- Weekly Consultation hour
- 18 hours of Labs
- Textbooks

- Above all, seek help early

Svengraph, WikiMedia

Do Something Useful in Week 1

- Get your pheme login and password
- Get an access to Moodle's server as soon as details are sent to you by email.
- Organize your UWA email account
- Obtain your timetable (online)
- Get familiar with the CITS1401 LMS and Moodle websites
- Install Thonny (it comes with recent version of Python)

Other Stuff

- You may read other textbooks or lectures to improve your understanding of fundamental concepts or learn more
- I have set slides in Century Schoolbook font (with some Courier and Arial for computer code and meta-language). If you have trouble reading it, please let me know
  - *Accessibility is important*

Other Stuff

- "10 Signs You Will Suck at Programming"
  - *Article made available on LMS->Interesting Things*
  - *Has really great advice about what you need to succeed at programming.*
  - *READ IT*
- Engage with the unit!!!
  - *From the last few years, I observed that if you watch lectures and generally engage with the unit regularly, you will do better.*

PheobeA - Redbubble

Acknowledgements

- It is important to acknowledge the PPT slides for this unit are based on a slide deck supplied by *John Zelle* (textbook author), though modified, augmented and reordered by *Ghulam Mubashar Hassan* and *Michael Wise.*