pollev.com/fabianm
Register for Engagement

# COMP1110/6710

## Structured Programming

Australian National University

Image Courtesy NASA/JPL-Caltech.

# Introductions: Conveners

## Alberto F. Martin

Applied Mathematics, Computer Science, and the Physical Sciences

## Fabian Muehlboeck

Programming Language Design & Implementation


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# Introductions: Tutors

| | | |
|---|---|---|
| **Austin Yang** | **Cathy Cheung** | **Chloe Lin** |
| Daniel Herald | **Davina Lydia Pinto** | **Indiana Wilson** |
| **Keshav Tangri** | **Patrick Reid** | **Sam Crowley** |
| **Sophie Press** | **Tal Shy-Tielen** | **Xander Phillips** |
| Xin Lu | Yash Shrivastava | |


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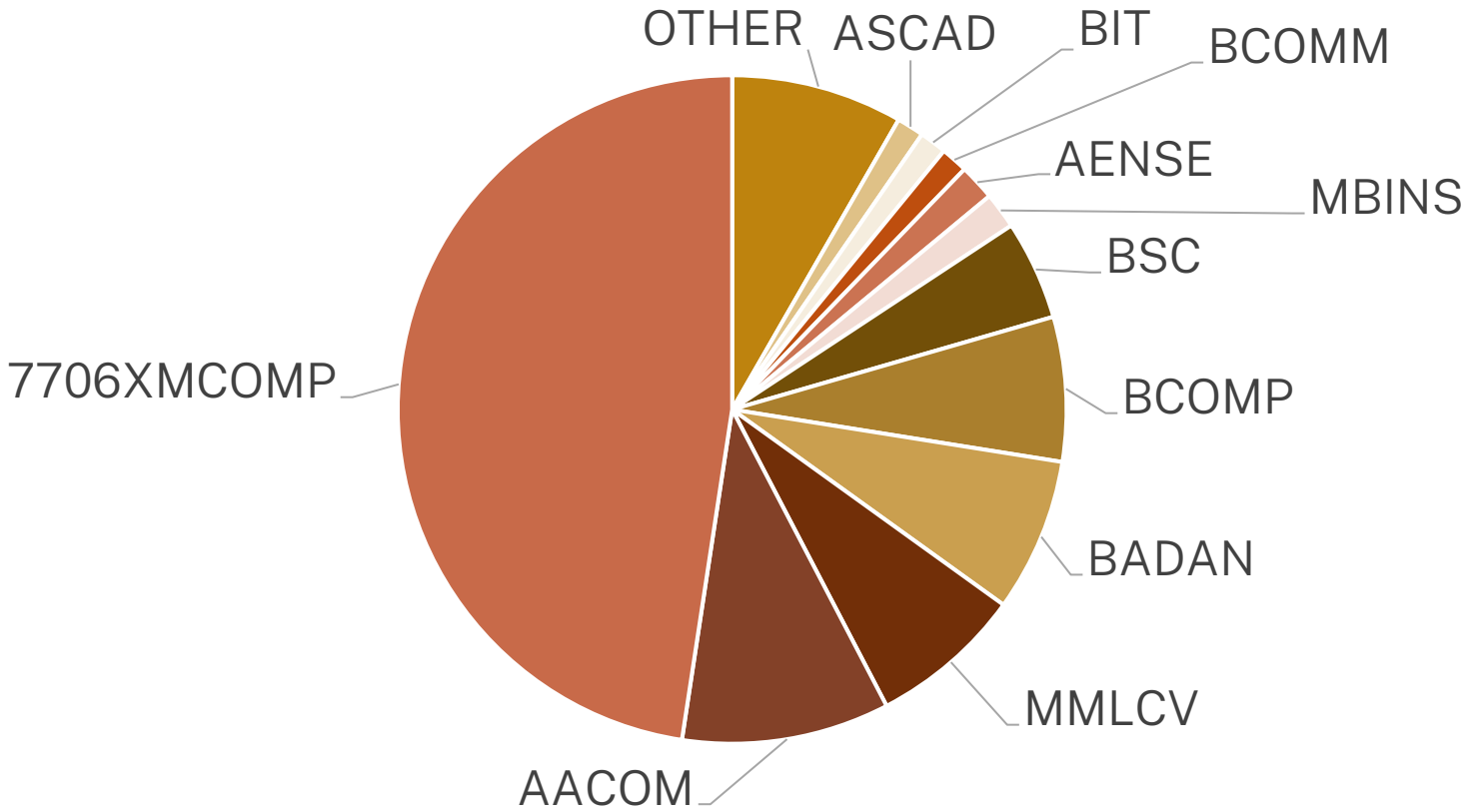
# Introductions: You





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# CSS

# CLASS REPRESENTATIVES

Class Student Representation is an important component of the teaching and learning quality assurance and quality improvement processes within the ANU College of Systems and Society (CSS).

Each semester, we put out a call for Class Representatives for all ANU College of Systems and Society (CSS) courses. Students can nominate themselves for one or more of the courses they are enrolled in.

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# Roles and responsibilities:

The role of Student Representatives is to provide ongoing constructive feedback on behalf of the student cohort to Course Conveners and to Associate Directors (Education) for continuous improvements to the course.

- Act as the official liaison between your peers and convener.
- Be available and proactive in gathering feedback from your classmates.
- Attend regular meetings, and provide reports on course feedback to your course convener
- Close the feedback loop by reporting back to the class the outcomes of your meetings.

Note: Class representatives will need to be comfortable with their contact details being made available via Wattle to all students in the class.

For more information regarding roles and responsibilities, contact:

ANUSA CSS representatives (sa.cecc@anu.edu.au).



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# Why become a class representative?

- **Ensure students have a voice** to their course convener, lecturer, tutors, and College.
- **Develop skills sought by employers**, including interpersonal, dispute resolution, leadership and communication skills.
- **Become empowered**. Play an active role in determining the direction of your education.
- **Become more aware of issues influencing your University** and current issues in higher education.
- **Course design and delivery.** Help shape the delivery of your current courses, as well as future improvements for following years.

## Want to be a class representative? Nominate today!

Please nominate yourself to your course convener by end of Week 2



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# OUR ANU VALUES

*As a member of the ANU, you are part of a community that commits to:*

- *Fairness and justice*
- *Safety and wellbeing*
- *Inclusion, equity and diversity*
- *Respectful collegiality*
- *Respecting, celebrating and learning from First Nation peoples*
- *Truth-seeking, transparency and accountability*
- *Academic freedom and integrity*

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# Student Code of Conduct

In our community, students and staff have a right to be protected from discrimination, bullying and harassment and other behaviours that could adversely affect their safety and well-being and/or undermines the values of the University.

The Student Code of Conduct sets out ANU values, principles, behaviours and conduct required of all students.



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# Breaches of the Student Code of Conduct

The University manages any breaches of the Student Code of Conduct in accordance with the ANU Policy Framework. All university policies can be accessed at https://policies.anu.edu.au/ppl/index.htm

The consequences for breaches of student responsibilities under the Student Code of Conduct are set out in the *ANU Discipline Rule* (non-academic misconduct) and the *Academic Integrity Rule.* Both instruments can be accessed at https://www.anu.edu.au/about/governance/legislation



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# Disclosure pathways

*The University encourages anyone who has experienced a harmful behaviour to reach out for support and information.*

- Harmful Behaviours Disclosure www.anu.edu.au/students/health-safety-wellbeing/getting-help-at-anu

- The form links identified disclosures to free and confidential support and information through the Student Safety and Wellbeing team.

- A de-identified disclosure pathway is also available. The form can be found at www.anu.edu.au/students/health-safety-wellbeing/getting-help-at-anu. De-identified disclosures support the University with prevention activities and reporting.



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# Support available

*There are a number of services available to you if you need further information or support.*

- **Student Safety and Wellbeing** - free and confidential support for students experiencing a range of issues that can impact on their university experience and academic engagement student.wellbeing@anu.edu.au

- **Dean of Students** –confidential, impartial advice and can help to resolve problems by acting as a neutral intermediary between students and the academic or administrative areas of the University dean.students@anu.edu.au

- **ANUSA Student Assistance team** –confidential support, advice and assistance for all ANU students sa.assistance@anu.edu.au



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# CSSA InstallFest

Computer Science Students' Association: https://cs.club.anu.edu.au/

Time: 6:30pm, Friday 21st February

Location: Hanna Neumann Labs (1.23, 1.24, 1.25)

Food provided: Yes :)


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Where are we?
Why are we here?

Public Domain

There are undeniably certain kinds of knowledge that must be of a general nature and, more importantly, a certain cultivation of the mind and character that nobody can afford to be without. People obviously cannot be good craftworkers, merchants, soldiers or businessmen unless, regardless of their occupation, they are good, upstanding and – according to their condition – well-informed human beings and citizens. If this basis is laid through schooling, vocational skills are easily acquired later on, and a person is always free to move from one occupation to another, as so often happens in life.


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# Modern University

## Knowledge

Breadth & Depth

Long-Term

General

## Connections

With World Experts

With Peers


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# Academic Skills

https://www.anu.edu.au/students/academic-skills

Book individual appointments, and use the resources on the website!


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# English Language Skills

https://www.anu.edu.au/students/academic-skills/study-skills/english-language

Book individual appointments, join conversation groups!


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# COMP1110/6710

All relevant information is on the Course Website:

https://comp.anu.edu.au/courses/comp1110 - bookmark this!

This website is publicly available – no need to sign in.

Wattle is only for Grades and EdStem sign-up link.


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# COMP1110/6710 – Course Content

## Programming

Basic Program Design

Object-Oriented Programming (Java)

## Core Computer Science

Data Structures

Algorithms

Computational Complexity


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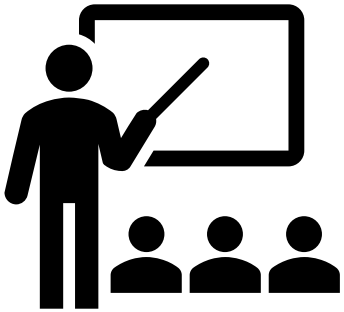
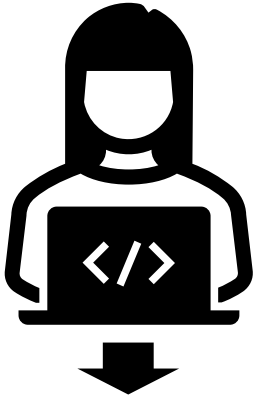
# Mechanics



Workshops
- Part Lectures
- Part Labs



5 Coding Assignments
- Due every other week
- Push to GitLab

Mid-Term Test
Final Exam
- In Computer Labs

5 Code Walks
~ 1 week after
Assignment Submission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# Marks Distribution



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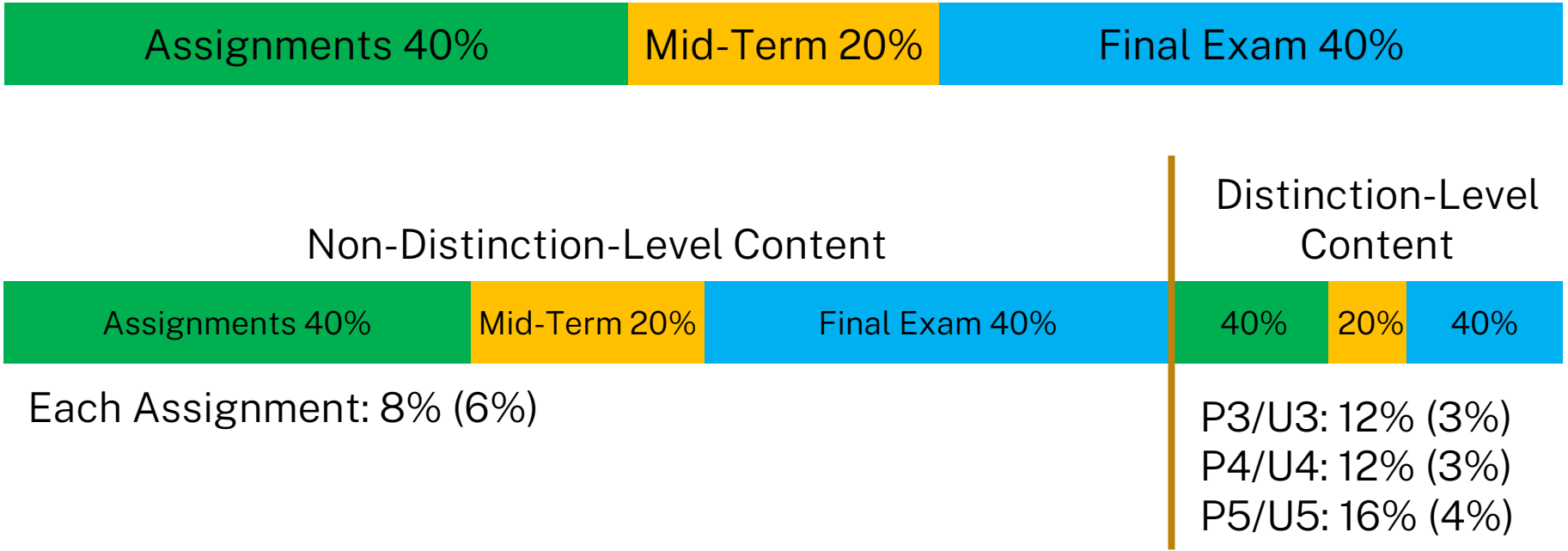
# (Non-)Distinction-Level Content





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# (Non-)Distinction-Level Content

- Need 90% of non-distinction-level marks on assessment to have distinction-level parts graded and counted
- Need to explicitly declare for each assignment that you want your code walk to be on distinction-level content
- Need 90% on automated tests for non-distinction-level parts of assignment to get distinction-level code walk if requested
- You should aim for 90% or higher regardless of whether you want to access distinction-level


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# Class Engagement

Not core part of course marks

But can get you 1-2 marks to reach grade boundary

- Participate in Workshops
- Engage in Ed class forum


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# Assignments

## COMP1110

U1 – Due in Week 3 (Redeemable)

U2 – Due in Week 5

U3 – Due in Week 7

U4 – Due in Week 9

U5 – Due in Week 11

## COMP6710

P1 – Due in Week 2 (Redeemable)

P2 – Due in Week 4

P3 – Due in Teaching Break Week 2

P4 – Due in Week 8

P5 – Due in Week 10

* Base Due Dates


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# Assignment Variables

One for each Assignment, but: $V_1 + V_2 + V_3 + V_4 + V_5 \leq 3$

Assignment $U_i/P_i$ Due Date = Base Due Date + $24 \times V_i$ hours

- Affects possible extensions (need to be submitted before due date)
- Can be reduced by successful extension requests
  (except if used to move due date for extension request)

How? CWAC 🤞


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# Key Assignment Formalities

- Must keep notebook – a log of when you worked on your assignment
- Must frequently commit and push your work to our servers
  Once every hour; At the end of every work session; Once per major assignment part
- We will check your notebook against the server log
- Must sign statement of originality
- Must submit code that compiles and can be run
- Must register intent to attend code walk, and attend if you did so.
  Registered but did not attend ➔ excluded from scheduling.


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# Assignment Timeline

| Week of Assignment | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|---|---|---|---|---|---|---|---|
| First Week | Assignment Released | | | | | | |
| Second Week | | | | | Base Deadline @ 15:00<br><br>Code Walk Registration by 18:00 (no extensions or variables) | Deadline if $V_i = 1$ @ 15:00 | Deadline if $V_i = 2$ @ 15:00 |
| Third Week | Latest deadline with Assignment Variables if $V_i = 3$ @ 15:00 | Latest deadline with Extensions @ 23:59<br><br>Deadline to decide on Assignment Variable @ 23:59 | Return Date: confirmation of Code Walk based on automated test results | Code Walks | Code Walks | | |


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# Code Walks – Explain your Code!

You + ~3 other students + 2 tutors

~1 hour

Tutor walks through your code with you for ~10 mins

You explain code and answer questions

Tutor fills out marking rubric (see website)

Scheduled during “tutorial” times

CWAC will allow giving time preferences


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# Mid-Term Test and Final Exam

In Computer Labs under Exam Conditions

- No Materials (except, with approval, an unannotated dictionary)
- No Internet Access

Mid-Term Test is redeemable against Final Exam

➔ No deferrals

**Mid-Term Times:**
COMP1110: Monday, 24/3 15:30
COMP6710: Monday, 24/3 17:30


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# Hurdle Assessments

Basic Competency Hurdle:
25% on Mid-Term Test

- including distinction-level marks
- without redeemability

Missed the Mid-Term test? Apply for an ECA for an alternate assessment for the Basic Competency Hurdle!

Final Exam:

- 40% of available marks (including distinction-level marks)


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# Hurdles

Failing a Hurdle means that by default you fail the course.

If you achieved at least 45% of the marks on the course, you may take a supplementary assessment, with a chance of passing the course with “PS”.

Students have failed the course despite getting 63% of available marks!


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Photo: Danchuter via Wikipedia

# No Generative AI

This course introduces fundamental concepts that could potentially be addressed by certain Generative AI tools (e.g., ChatGPT). Hence, the use of any Generative AI tools is not permitted in graded assessments within this course.

Any use of AI tools in graded assessments will be considered a breach of academic integrity and handled accordingly.


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# Academic Integrity

Honesty and integrity are paramount.
They are not at odds with research and collaboration.

**Do** be resourceful, collaborate and engage.

**Never represent someone else's work as your own.**

**Do** read the ANU's position on academic integrity
http://academichonesty.anu.edu.au/


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# Academic Integrity in Assignments

You are expected to work on the assignments on your own.

- NOT with a friend
- NOT with ChatGPT & Co
- NOT with an outside tutor, cram school, or online tutoring service
  **Instead of paying someone, ask us for help!**

Code written by different people is not as similar as you might think!

You must sign a Statement of Originality for every assignment.


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# Getting Help with the Course

- ✓ Ask Questions in Workshops
- ✓ Ask Questions on Ed course forum
- ✓ Go to Drop-In Consultations (see course website for schedule)
- × Don’t e-mail the conveners except for sensitive issues

General rules for where to direct your questions:

https://comp.anu.edu.au/courses/comp1110/help/contact/


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# Asking the Right Questions, Correctly

Put some thought into your question:

- What is it that causes you trouble?
- Is it a technical issue, or is it some fact you don't know, or some concept that you don't understand?
- If it's about an assignment, is there a generic version of your problem that is not directly related to the assignment?
- If posting on the class forum, use appropriate subjects:
  GOOD: U2: Can Strings be converted into DateTimes?
  BAD: Question on Assignment U2


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# Getting Help with Administrative Issues

If it is not directly related to how the course runs, your first stop should always be student services (student.css@anu.edu.au).

If you are sick or have other special circumstances, you may be able to apply for an extension (Assignments) or ECA (all other assessments): https://quicklink.anu.edu.au/101o


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# Special Circumstances

- Need to be unforeseen and out of your control
- Need to have a severe impact
- Need to satisfy ANU policy restrictions: cold, mild viruses, minor illnesses are not good enough for extensions (though please stay away from exams), etc.
- Need proof that all these conditions are satisfied

- Generally, you need to apply before the due date of an assessment, except if that's provably infeasible.


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# Medical/Sick Certificates

For extensions, we accept generic medical/sick certificates from:

- The ANU Medical Centre
- The ACT Public Health System,
  including ACT Community Health Centres

Other providers need to explicitly list ANU policy exclusions and state that they do not apply, state the relevance to the assessment type, and clarify whether they obtained any sort of physical evidence as proof of your underlying condition.


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# Education Access Plans

If you have a long-standing health condition, get an Education Access Plan (EAP);
see https://www.anu.edu.au/students/accessibility/how-to-register

When you have an EAP, make an appointment with us to discuss how to apply it in this course.


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# COMP1110/6710

Part I: Functional Java & The Design Recipe

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# Functional Java

Restricted form of Java used for first 5 weeks of the course.

Programs we write are collections of data definitions and functions.

NOT Java. Therefore:

- Do not use a Java IDE. It will mess things up.
- Do not ask ChatGPT for Java code. It will violate our rules.

Always know what you are doing! Lots of mark deductions for things IDEs/GenAI do that you would not.

# The Design Recipe

6 Steps from a Blank Screen to a Good Program

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# The Design Recipe

1. Problem Analysis and Data Definitions
2. Function Purpose Statement and Signature
3. Examples
4. Design Strategy
5. Implementation
6. Tests



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# The Wishlist

You want a program that **does something**, or even several things.

These things form your initial wishlist.

As you work on the problem (by processing your wishlist), you may discover new things to add to it.

Hopefully (and usually), you'll eventually finish things without having to keep adding more and more stuff.


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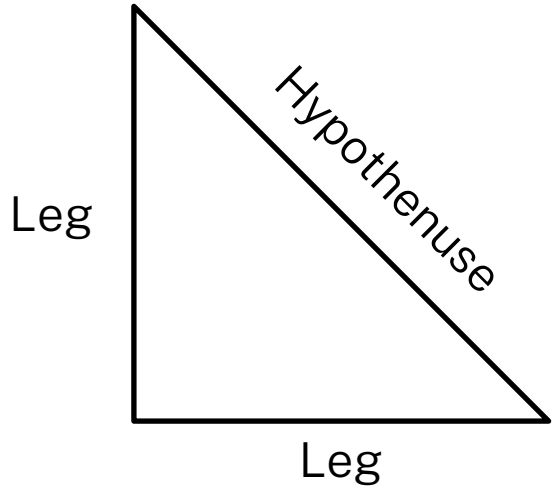
# An Example

Design a program that, given the lengths of the legs of a right triangle, calculates the length of the hypothenuse.





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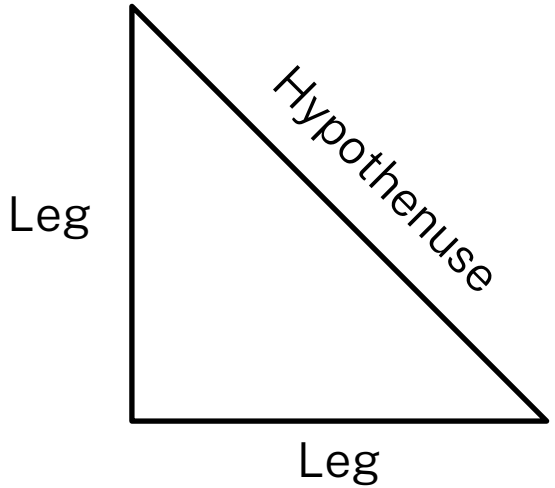
# 1. Problem Analysis and Data Design

Design a program that, given the lengths of the legs of a right triangle, calculates the length of the hypothenuse.

What problem are we dealing with here?
What kinds of data do we have?
What kinds of data can we obtain?
What kinds of data do we need to produce?





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# 2. Function Purpose Statement And Signature

Program code is about communicating ideas, to different audiences:

- Computers, who have to run the programs
- Programmers (i.e. humans), who have to understand what the programs do in order to maintain them or simply check that they do what they should

- Here, the purpose statement is for Programmers, while the Signature is for both.


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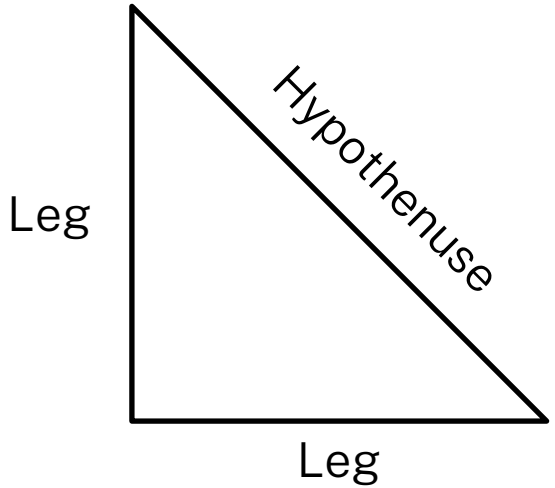
# 3. Examples

Design a program that, given the lengths of the legs of a right triangle, calculates the length of the hypothenuse.

What are particular examples for how the program is going to be used?
How should the program behave in those situations?
What are concrete inputs, and what concrete outputs would they produce?





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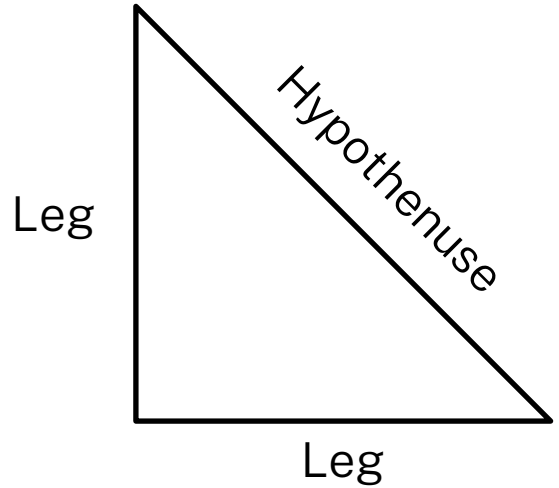
# 4. Design Strategy

Design a program that, given the lengths of the legs of a right triangle, calculates the length of the hypothenuse.

From a menu of possible strategies that we will introduce, which one should we apply here to implement our function?





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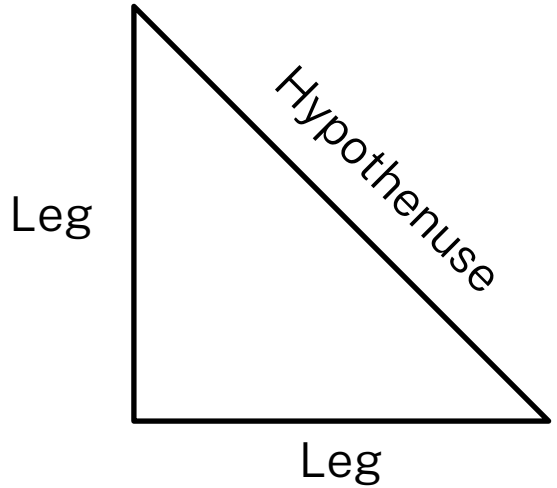
# 5. Implementation

Design a program that, given the lengths of the legs of a right triangle, calculates the length of the hypothenuse.

Following the Design Strategy, actually write some code.
This might cause new things to be added to our wishlist as we discover that some things are missing.
That's fine, we run the Design Recipe again for those.





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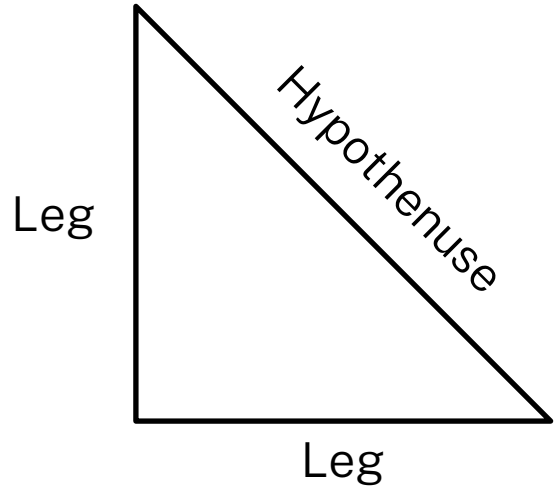
# 6. Tests

Design a program that, given the lengths of the legs of a right triangle, calculates the length of the hypothenuse.

Now that we have an implementation,
we turn our examples from earlier into code and see if they work.
Then we might try some additional ones.





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# Let’s set up your laptops!

Follow https://comp.anu.edu.au/courses/comp1110/notes/recommended-software/

Then write your first Java program (name the file “HelloWorld.java”):

```
void main() {
      println(“Hello World!”);
}
```

Run with “`java --enable-preview HelloWorld.java`”


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