

# ENGG1003 - Thursday Week 12

Final exam preparation

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# Lecture overview

- 1 Final exam organisational details
  - ▶ when, how, how long, how much ...
  - ▶ academic integrity
- 2 Overview of final exam questions
  - ▶ Q1, Q2, Q3, Q4
- 3 Questions & answers

# 1) Final exam organisational details

- **Date:** Tuesday 8 June
- **Time:** 2:00pm AEST
- **Location:** ONLINE exam, via Blackboard (BB)
- **Duration:** 130 minutes
  - ▶ 2:00pm–4:10pm
- final exam is **OPEN BOOK**
- counts for 35% of overall course grade in ENGG1003

Tue, 8 Jun 2021 2:00 PM

ONLINE

ENGG1003

Introduction to Procedural Programming

ONLINE

# Final exam organisational details

- you will be asked to write Python code in the exam
  - ▶ have your PyCharm setup prepared
- the following resources ARE PERMITTED:
  - ▶ lecture notes
  - ▶ lab sheets
  - ▶ notes, textbook, study guides
  - ▶ pre-existing Python code, eg: developed for labs, quiz, assignments
  - ▶ any pre-existing Internet resource
- the following ARE NOT PERMITTED:
  - ▶ assistance from friends, fellow students or any other person
  - ▶ active participation in online forums

# Academic integrity

- Student Academic Integrity Policy
- Student Conduct Rule
- Course Coordinators may need to perform an Oral Examination (Viva) with a student as a way of verifying the authorship of materials
- cases of suspected collusion, plagiarism or other forms of academic misconduct will be reported to the School's *Student Academic Conduct Officer (SACO)*

## 2) Overview of final exam questions

- exam consists of four (4) questions <sup>★</sup>
  - ▶ 10 marks per question
  - ▶ marks indicated for parts (a),(b),(c) etc within a single question
- ★ **NOTE:** exact format of exam may differ to fit BB requirements
  - ▶ will advise any changes to number of questions on BB/email/discord
  - ▶ BUT will only be a *re-organisation* of Q1–Q4
- questions tend to get more difficult: Q1 “easy”, Q2 slightly harder, Q3 harder again, Q4 hardest
- Q1 graded by BB, Q2–Q4 manually graded

# Question 1

- ten (10) multiple choice (1 mark each)
- given Python code, asked to:
  - ▶ identify coding error (if any)
  - ▶ what is the output when code runs? (if any)
  - ▶ maybe other styles of multiple choice questions

A student wrote the Python code below to calculate the sum total of all entries in array `x`. What happens when the code is run?

```
import numpy as np

x = np.array([-1, 3., 5., -2. ])

total = 0;
for k in range(1, len(x)):
    total += x[k]

print(total)
```

- (a) PyCharm `SyntaxError: invalid syntax`
- (b) the code prints the total 5.0
- (c) the code prints the total 6.0
- (d) the code gets stuck in an infinite loop



## Question 2

General scope of Q2 includes ...

Writing Python code to:

- evaluate an expression  $f(x)$  at a single value of  $x$
- evaluate an expression  $f(x)$  at a range of values  $x$  using *loops*
- evaluate an expression  $f(x)$  at a range of values  $x$  using a *vectorised solution*
- generate a plot
- put  $x$ -labels,  $y$ -labels, title, grid etc on plot

## Question 2—sample, not the actual Q2

Write a Python script to plot the following function:

$$f(t) = e^{-at} (\sin(5t) + \cos(10t))$$

using 200 linearly spaced time points over the range  $0 \leq t \leq 5$ . Your script should use the value  $a = 2$ . Display today's date in the title of the plot. Use of any Python library is permitted.

- (a) Upload your Python code to the submission box
- (b) Upload the plot image to the file upload box

# Question 3

General scope of Q3 includes ...

Writing Python code to:

- solve a problem using a `for` loop
- solve a problem using a `while` loop
- solve a problem using conditions:
  - ▶ `if`
  - ▶ `if-elif`
  - ▶ `if-elif-else`

## Question 3—sample, not the actual Q3

Consider the following expression:

$$S = 1^3 + 2^3 + 3^3 + \cdots + N^3$$

Write a Python script which:

- (a) uses a `for` loop to calculate  $S$  when  $N = 5$
- (b) uses a `while` loop to calculate the largest integer  $N$  such that  $S < 10^6$

Upload your Python code to the submission box. You will be graded on your Python code only, ie: numerical values are not required.

# Question 4

General scope of Q4 includes ...

Writing Python code to:

- read data from spreadsheet
- solve a problem by writing a Python function
- fit a curve to data (straight line, parabola, cubic)
- perform numerical integration
- find one or more roots of an equation using secant and/or bisection method
- upload numerical values and Python code

### 3) Questions & answers

- ask exam-related questions in #questions-lectures channel in discord