

# Case study: Edith Cowan University – Design & Technology (2017)

## Summary

Edith Cowan University (ECU) conducted two, small, in-class e-Exam trials in Term 2 2017: a) Teaching Python Programming (CSE), and b) Design and Technology OHS (DTE). The exams utilised word processing documents as the question presentation environment. The DTE exam included colour image prompts with responses also written in the document. The CSE exam involved responding to programming questions via the IDLE programming environment. Files were submitted via the e-Exam USB. No network connection was used.

Discipline	Design and Technology Education
School	Engineering and Technology
Institution	Edith Cowan University
Level	Graduate Diploma
Class size	9 students, each enrolled in both units
Mode	Once a week, face-to-face mode
e-Exam	In-class exam. All typed.
Assessment	A 1.5 hour final examinations. CSE4102: programming questions DTE4271: short answer questions

### CSE exam: questions presented in a word processor document

**Q1 [Sequence, user input, output] 5 points**  
A painter requires a program to calculate the number of litres of paint needed for a job. One litre of paint will cover 10 square metres. The program should accept the number of square metres to paint and then output the number of litres of paint required to the user.

Write a commented Python program for this task.  
Open IDLE Python environment.  
Remember to save all files as .py files!

**Q2 [Looping] 5 points**  
A program is required that receives input of five surnames one by one and then prints out the surnames sorted alphabetically.

a) Draw a flowchart to represent the algorithm for your program (3 points)  
• You can use the drawing tools within this word processor. Make some extra space here, draw the diagram and save this file (it will be submitted on the USB stick).  
• Use a separate piece of paper labelled with your student ID to draw the diagram.  
b) Write a Python program for this problem (2 points)

**Q3 [write a text file] 5 points**  
A program is needed to store a list of tools and their hire rate in dollars per day. Write a Python program to accept data from the user and store it in a text file.

Possible Data:  
Air compressor: \$45 per day  
Tile saw: \$25 per day  
Brick Saw: \$110 per day  
Nail gun: \$40 per day

**Q4 [read a text file, use a function] 5 points**  
a) Add to your program in Q3 so that it can retrieve the name of the tools and the cost per day from the text file (3 points)  
b) Display the data read from the file on the screen: make 'displayData' a function in your program (2 points).

**Q5 [Everything! 18 points]**  
Create a robust, modular, user-friendly, & commented Python program to simulate an automatic teller machine. The program should:

a) Set up the accounts for 3 people and store their four-digit pin number and their initial balance in a text file (3 points)  
b) Allow a user to login using their pin (1 point)  
c) Allow a user to see the balance of their account (2 points)  
d) Allow a user to deposit and withdraw money (14 points)

End of Exam

```

1  #!/usr/bin/env python
2  # Question #1: 5 points
3  # --- Author: #####
4
5  # Create text file to store tools and hire rates
6
7  def displayData():
8      # Read data from text file
9      f = open("tools_sheet.txt", "r")
10     # Read the file line by line
11     lines = f.readlines()
12     # Print the data
13     for line in lines:
14         price = input("Please enter the first tool needed: ")
15         price = input("Please enter the hire rate: ")
16         print(tool1, ":", price, file=f)
17     tool2 = input("Please enter the second tool needed: ")
18     price2 = input("Please enter the hire rate: ")
19     print(tool2, ":", price2, file=f)
20
21     tool3 = input("Please enter the third tool needed: ")
22     price3 = input("Please enter the hire rate: ")
23     print(tool3, ":", price3, file=f)
24
25     tool4 = input("Please enter the fourth tool needed: ")
26     price4 = input("Please enter the hire rate: ")
27     print(tool4, ":", price4, file=f)
28     f.close()
29
30     a.close()
31
32 # --- Start of Question #4 ---
33
34 # Read data from text file
35 a = open("tools_sheet.txt", "r")
36 # Print the data
37 displayData()
38 a.close()
39
40 # Display data from text file (in IDLE Shell enter 'displayData')
41
42 # --- End of Question #4 ---

```

Responses constructed using Python IDLE programming environment.

about their computer being booted from unfamiliar operating system (Thus, providing details about how the e-Exam system works is recommended to allay fears). Another common comment was for an 'auto save' feature (this was subsequently implemented and works without user intervention).

Academics involved in the implementation of the trial were positive in using the e-Exams system. Based on an offline method used in these trials, they noted a secure server based submission would save on manual handling of USBs for setup and retrieval of responses for each exam event (A robust, online mode is now available!)

Key features of this case study include:

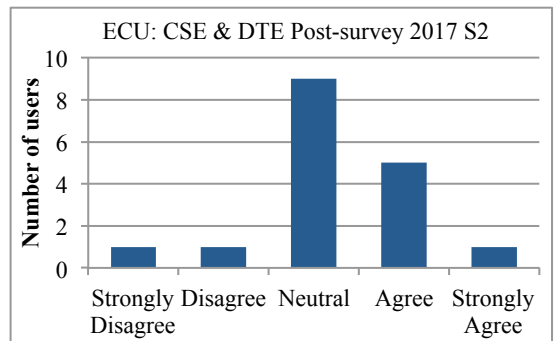
- Programming tasks utilising a basic software development environment.
- Small graduate diploma unit.
- Student apprehension about booting from USB. This indicates the need for education about the e-Exam system characteristics. The e-Exam OS prohibits access to their data drive and booting their device from the USB cannot harm their device because no data is changed or written to their device.

## Acknowledgements

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Preparation involved running a face-to-face practice session to familiarise students with the e-Exam system and to test students' laptops. Students were invited to use their own laptops for practice and exam sessions, but most students chose to use University supplied Dell computers rather than their own devices.

Collected survey data was limited due to the small number of students. Both the survey and the interviews were positive with students preferring to type rather than handwrite. Only minor tweaks of the tool used or the exam itself were noted. Overwhelmingly students expressed apprehension



**DTE exam: Word processor document with images.**

Question 16: State the required PPE for the following machines / processes: (10 MARKS)

(a) Drilling  
(b) Wood turning  
(c) Curve lathe  
(d) MIG welding  
(e) Table saw  
(f) Pillar / Planer cut

Question 17: State everything that is unsafe in the following images: (8 MARKS)