1811ICT/2807ICT/7001ICT Programming Principles Workshop 9

School of Information and Communication Technology

Griffith University

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| *Goals* | This workshop focusses on everything in the course up to sets and dictionaries. |
| *When* | Week 10 |

# Before your workshop class:

* Read the whole document.
* Review the lecture notes of sections 1 to 24.
* **Complete the pre-workshop questions posted on the course website**.

# Workshop activities

At any stage, when you are stuck, *ask your workshop instructor*!

## Problem 1

*Problem:* Ask the user for the name of a file. Then print out how many unique words are in the file, i.e. if a word appears more than once in the file it should only be counted once.

Source file name: string\_doc.txt

Number of unique words: 52

*Testing*: Test your code with the file *P1\_v1.txt*.



Did you check what happens if the file does not exist or the file is empty? How can you deal with these cases?

## Problem 2

*Problem:* Write a program that asks for the student ID of a student that enrolled in a specific course. After all student IDs have been entered, print out the number of students that are enrolled in the course. Remember that a student can only be counted once.

Student ID: 1234

Student ID: 4567

Student ID: 9367

Student ID: 1234

Student ID: -1

3 students enrolled into the course

*Testing:* Test your code for the example input shown above.



How can you extend the program to give the number of students enrolled into multiple courses, i.e. ask the user for how many courses, the course code and then for each course the students that enrolled into that course?

## Problem 3

*Problem:* Write a program to manage the inventory of a store for books (A4, A5) and pens (blue, red, black). A customer can buy a combination of books and pens, but you cannot sell them items that are not in stock. When there are only 5 books or pens left, you need to provide a message that new stock must be ordered and for which item. If a customer buys items or stock has been ordered, you must update the quantity of each item accordingly.

Number of black pens in stock: 80

Number of blue pens in stock: 80

Number of red pens in stock: 80

Number of A4 books in stock: 50

Number of A5 books in stock: 50

Number of pens requested by customer: 30

Colour of pens: black

Any other pens: no

Number of books requested by customer: 2

Size of books: A5

Any other books: no

Number of black pens in stock: 50

Number of blue pens in stock: 80

Number of red pens in stock: 80

Number of A4 books in stock: 50

Number of A5 books in stock: 48

Number of pens requested by customer: 25

Colour of pens: red

Any other pens: yes

Number of pens requested by customer: 20

Colour of pens: blue

Any other pens: no

Number of books requested by customer: 10

Size of books: A4

Any other books: yes

Number of books requested by customer: 10

Size of books: A4

Any other books: no

Number of black pens in stock: 50

Number of blue pens in stock: 60

Number of red pens in stock: 55

Number of A4 books in stock: 30

Number of A5 books in stock: 48

Number of pens requested by customer: 60

Colour of pens: black

There are only 50 pens in stock. Do you want to buy the 50 pens? Y/N: Y

New black pens must be ordered.

Any other pens: no

Number of books requested by customer: 20

Size of books: A5

Any other books: yes

Number of books requested by customer: 10

Size of books: A4

Any other books: no

Number of black pens in stock: 0

Number of blue pens in stock: 60

Number of red pens in stock: 55

Number of A4 books in stock: 20

Number of A5 books in stock: 28

*Testing:* Test your code for the example input shown above.



What can use as input to indicate that the customer is not buying anything else, and the program can stop?

## Problem 4

*Problem:* Write a program that allows the user to enter the marks of 5 students in 4 courses, and outputs the highest average marks for students and courses. Previously we used 2-dimensional lists. Change your code to use a dictionary instead.

*Example input and output:*

Student 1 (courses 1-4): 50 60 70 60

Student 2 (courses 1-4): 100 90 87 90

Student 3 (courses 1-4): 70 100 90 90

Student 4 (courses 1-4): 30 65 50 50

Student 5 (courses 1-4): 58 50 74 43

The highest average mark of students: 91.75

The highest average mark of courses: 74.2

*Testing:* Test your code for the example input shown above.



How can you extend the code to work for any number of students?

What will be a good key to use for the dictionary?

## Problem 5

*Problem:* Write a program to manage multiple customer’s bank account’s balance. Use a dictionary, where each customer is an element in the dictionary. What will be a good key and what will be the associated value? Change your code to read in files with the various transactions as shown below. The file will also indicate which customer made the transactions. Then provide the summary for each customer as output (either to the console or to a file).

*Example data in the file:*

Customer1 Opening balance of account: 500

Customer2 Opening balance of account: 300

Customer1 Amount deposited or withdrew (negative value): 40

Customer1 Amount deposited or withdrew (negative value): -20

Customer2 Amount deposited or withdrew (negative value): -50

Customer2 Amount deposited or withdrew (negative value): 20

Example output:

Customer1:

Opening balance: 500

Deposits: 40

Withdrawals: 20

Closing balance: 520

Customer2:

Opening balance: 300

Deposits: 20

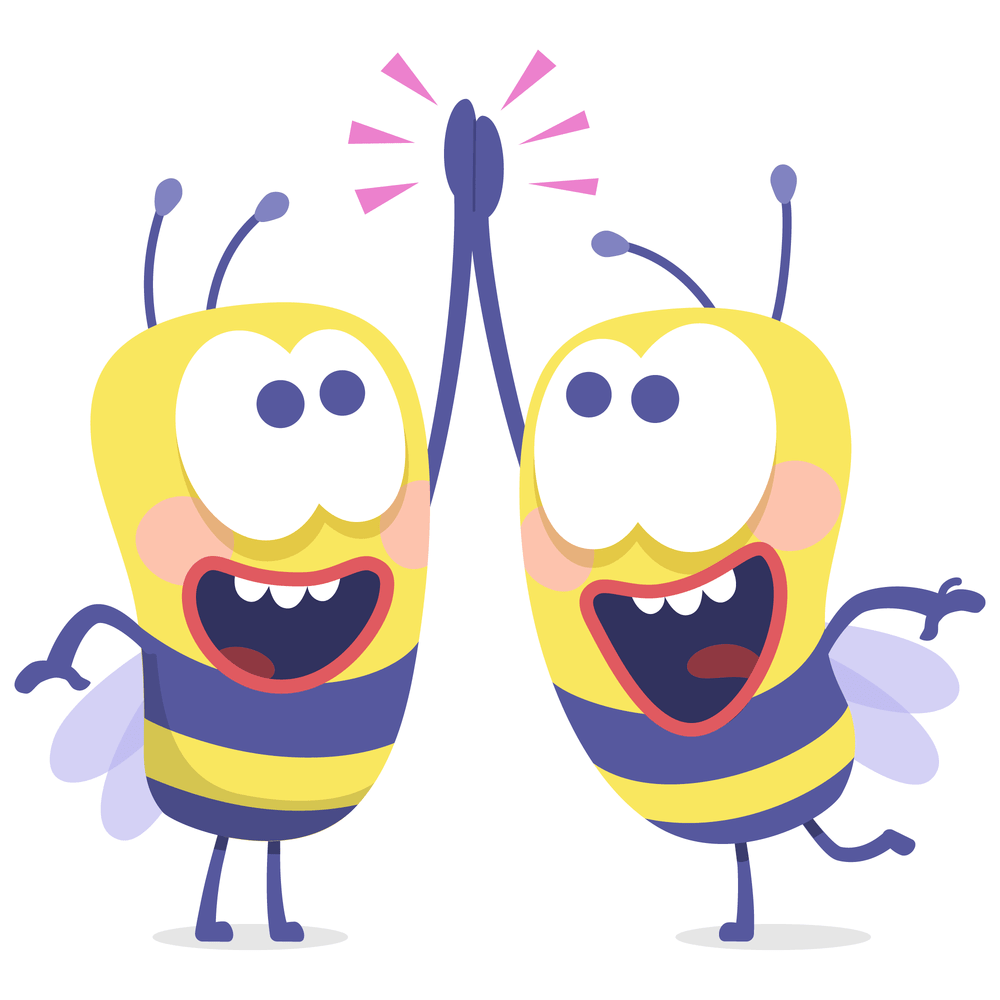
Withdrawals: 50

Closing balance: 270

*Testing:* Test your code for the example input shown above.

## Problem 6

Go back to the previous workshops’ sheets and look at the problems again. Try to solve some of the previous activities using sets or dictionaries.



Well done for finishing these activities!