FIT1045 Intro to Algorithms and Programming – Workshop 12

Objectives

The **objectives of this workshop** are:

- To apply the skills developed in FIT1045 to create an automated quiz program.
- To create a tool to revise the unit material.

Useful Links:

For this workshop, you may find it useful to review some of the following concepts:

- Some string methods - for example, split and strip. (`https://docs.python.org/3/library/stdtypes.html#string-methods` or Perkovic book, page 97–98.)
- Lecture materials to create your own quiz questions.

In particular, you may find it useful to understand how split on the first occurrence of a symbol.

Task 0 (To be completed before class):

In this workshop you will be building a quiz program which can be used to revise the content you have learned in FIT1045. For this preparatory task, review the topics we have covered in this unit and note down anything you may have had trouble with. Come up with a few revision questions so you can add them to your quiz.

Task 1:

Write a function `readQuestions` that takes as input a file name, reads a sequence of multiple choice questions from the file, and returns a list of lists. Each line in the file contains the question followed by four multiple choice answers. The multiple-choice answers are comma-separated, but you will need to split on ":" to separate the first choice from the question.

For example: The file might contain the following two questions:

```
How many lectures are there in FIT1045?:A:12,B:24,C:22,D:Another number
Does P=NP?:A:Yes,B:No,C:Sometimes,D:The answer is not known
```

Your function should return a list of lists containing the questions. Each line of the file should be converted to a list with the question at position 0 and the choices for the answers stored at positions 1–4.

For example: Your program should ask for a file:

```
Enter Question File: Questions
```

The file name "Questions" should be passed to `readQuestions`, which should return:

```
[['How many lectures are there in FIT1045?', 'A:12', 'B:24', 'C:22', 'D:Another number'],
['Does P=NP?', 'A:Yes', 'B:No', 'C:Sometimes', 'D:The answer is not known'], ['The following
Python expression is true', ' A:true and false', 'B:not true', 'C:true or false', 'D:None'],
['In a binary tree', ' A:Every node has 2 children', 'B:The root node always has 2 children',
'C:All nodes have at most 2 children', 'D:All nodes have a child']]
```

Task 2:

Write a function `readAnswers` that takes as input the name of a file containing the answers to the multiple choice questions. Your function should read the answers from the file and return them in a list. The letter on line *i* in the answer file corresponds to the correct answer to the *i*th question in the question file.

For example: Your program should ask for a file:

```
Enter Answer File: Answers
```

Which might contain the following two answers:
C
D

The file name "Answers" should be passed to `readAnswers`, which should return:

```
['C', 'D']
```

Task 3:

Write a program that iterates over the list produced in Task 1, asking the user to select an answer to each question. The program should print "Correct" if the user selects the correct answer, or otherwise print "Incorrect" and give the corrected answer. It should then print out the number of questions answered correctly.

For example: Your program may do the following:

```
Enter Question File: Questions
Enter Answer File: Answers
-------------------------------------
How many lectures are there in FIT1045?
A:12
B:24
C:22
D:Another number
Answer is: A
Correct answer is C
-------------------------------------
Does P=NP?
A:Yes
B:No
C:Sometimes
D:The answer is not known
Answer is: B
Correct answer is D
-------------------------------------
The following Python expression is true
A:true and false
B:not true
C:true or false
D:None
Answer is: C
Correct
-------------------------------------
In a binary tree
A:Every node has 2 children
B:The root node always has 2 children
C:All nodes have at most 2 children
D:All nodes have a child
Answer is: D
Correct answer is C
```

```
--------------------------------------
Total correct answers: 1
```

Task 4:

Write a function `addQuestion` that allows the user to add a question to the quiz.

For example: If you call `addQuestion` before running the quiz, your program may run as shown:

```
Enter Question File: Questions
Enter Answer File: Answers
Enter question: 2**3=
Enter option A: 6
Enter option B: 4
Enter option C: 8
Enter option D: 16
Enter answer: 8
----------------------------------------
How many lectures are there in FIT1045?
A:12
B:24
C:22
D:Another number
Answer is: C
Correct
----------------------------------------
Does P=NP?
A:Yes
B:No
C:Sometimes
D:The answer is not known
Answer is: C
Correct answer is D
----------------------------------------
The following Python expression is true
A:true and false
B:not true
C:true or false
D:None
Answer is: C
Correct
----------------------------------------
In a binary tree
 A:Every node has 2 children
B:The root node always has 2 children
C:All nodes have at most 2 children
D:All nodes have a child
Answer is: C
Correct
----------------------------------------
2**3=
A:6
B:4
C:8
D:16
Answer is: B
Correct answer is C
----------------------------------------
Total correct answers: 3
```

Task 5:

Modify your quiz to help in your revision of this subject. You can do some of the following:

- Add more questions to the quiz files.
- Modify your program so that it selects the questions randomly. You can use the random function used in Workshop 11 for this.
- Modify your program so that it writes any questions that are answered incorrectly to another file for further revision.