

Title	Assignment 9
Due	11-May-2012 17:00
Number of resubmissions allowed	0
Grade	100.0 (max 100.0)
Modified by instructor	25-Apr-2012 02:31

Instructions

This tutorial is about recursion and complex data/algorithms.

Question 1

Write a Python program with a recursive function to calculate the GCD (greatest common divisor) of 2 integers. You may NOT use iteration implicitly or explicitly.

Use the classic GCD formulation:

```
gcd(x, y) = gcd(y, x%y)
gcd(x, 0) = x
```

Sample I/O

```
Enter two numbers:
15 35
The GCD is: 5
```

Save your program as **question1.py**. Submit all source files only.

Question 2

Write a Python program with a recursive function to calculate whether or not a string is a palindrome (reads the same if reversed). You may NOT use iteration implicitly or explicitly.

Sample I/O

```
Enter a string:
able was I ere I saw elba
Palindrome!
```

Sample I/O

```
Enter a string:
elba is a noob
Not a palindrome!
```

Save your program as **question2.py**. Submit all source files only.

Question 3

Write a program to solve easy Sudoku puzzles (where there is no ambiguity). This means that at any stage it is always possible to determine the value of an incomplete cell based only on the 3 rules for Sudoku puzzles.

Hints: Use an iterative algorithm where you continue to fill in obvious cells until the grid is complete. You can use a separate 2D array of lists to track the possible values for each cell as you scan through the grid each time. Whenever you encounter a list with only one possible value, this value can be chosen. Whenever you choose new values, update the possible value array by removing possibilities where applicable.

Sample input

```
059000483
000000012
010028000
098074020
040080030
070630540
000160050
620000000
735000860
```

Sample output

```
259716483
867345912
413928675
398574126
546281739
172639548
984163257
621857394
735492861
```

Save your program as **question3.py**. Submit all source files only.

Mark Weighting

Question 1 : 30
Question 2 : 30
Question 3 : 40

Submission

This assignment does not accept online submissions. Contact your instructor for additional instructions.

Done