Assignment 3

Functions and Lists

Submit a single zip file called **assignment3.zip**.
This assignment has 30 marks.
See the marking rubric that is posted on the course webpage

Problem 1 (Prime Numbers)

Write a function called **isprime** which takes a single integer argument and returns a single Boolean value representing whether the given argument is prime (True) or not (False). After writing the function, test it by using a loop to print out all the prime numbers from 1-100. To check your results, the prime numbers from 1-100 are: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97. Put your function and testing code inside a file called **prime.py** and add it to your submission zip file.

Problem 2 (Common Multiples)

Write a function called **ismultiple** which takes 2 integer arguments (*a* and *b*). This function must return True if *b* is a multiple of *a* (i.e., *a* divides into *b* evenly) and False otherwise. Write a second function called **commonmultiple** which takes 3 integer arguments (*a*, *b*, and *c*). This function must return True if *c* is a multiple of both *a* and *b*, and False otherwise. **Additionally, the commonmultiple function must use two calls to the ismultiple function to compute its return value.** Once you have implemented both functions, include testing code that asks the user to enter two numbers (*a* and *b*) and prints out all numbers between 1 and 100 (inclusive) that are common multiples of *a* and *b*. Save your functions and testing code in a file called **multiples.py** and add it to your submission zip file.

Problem 3 (List Slicing Function)

Python provides slicing functionality for lists, but for this question, you will implement your own function capable of producing list slices (note: you cannot use the slicing operator in your solution). The function should be called **slice** and take the following three arguments in this specific order:

1. A list, **source**, which the slice will be created from. This list cannot be modified by your function.

2. A positive integer, **start**, representing the starting index of the slice you will create. If this value is not in the range [0, len(list)-1], your function should return an empty list.
3. A positive integer, **end**, representing the ending index of the slice you will create. If this value is not in the range [start, len(list)-1], your function should return an empty list.

If the parameter values are acceptable, your function will return a list that contains the items from **source** beginning at the index **start** and ending at the index **end** (inclusive). This is different from the Python slice operator, as the item at the index **end** is also included in the new list. Examples:

mylist = [“A”, “B”, “C”, “D”, “E”, “F”, “G”, “H”, “I”, “J”]
slice(mylist, 0, 9) should be [“A”, “B”, “C”, “D”, “E”, “F”, “G”, “H”, “I”, “J”]
slice(mylist, 3, 4) should be [“D”, “E”]
slice(mylist, 4, 3) should be [ ]
slice(mylist, 3, 8) should be [“D”, “E”, “F”, “G”, “H”, “I”]
slice(mylist, 4, 4) should be [“E”]

Save your code is a file called **slice.py** and add it to your submission zip.

Recap

Your zip file should contain your **prime.py**, **multiples.py**, and **slice.py** files.
Submit your **assignment3.zip** file to cuLearn.
Make sure you download the zip after submitting and verify the file contents.
