



# **Introduction to Computer Science and Programming**

**--Python--**

## **Assignment 2**

## **Instructions**

The following assignment can be completed individually or with a partner. Each question is worth an X amount of marks and is clearly labeled. For submission you may either write it by hand and provide a hard copy of your solutions or you may type your answers. It is recommended that you type your answers as you can run the code to check if your solution is correct. Specifically, if you are typing your answers you should have all your solutions within a file called A2\_<Last\_name>\_<First\_name>.py (Ex. A2\_lam\_kavan.py). For questions that do not involve you writing code please answer the question by using comments. Ensure all solutions to the questions are labeled clearly. Note: you should be using functions to organise your solutions as we did in class. Best of luck.

### **Question 1 [3 Marks]**

Write a function called question1 which takes in a string as input and prints that string 25 times. Each print must be on different lines in the output and to get full marks you should only have one print command in your code.

### **Question 2 [2 Marks]**

What is an infinite loop? Give an example of an infinite loop. Is it possible for a single for loop to be infinite?

### **Question 3 [3 Marks]**

Describe what lists are in Python and how they can be useful. What can you store inside a python list?

### **Question 4 [3 Marks]**

Describe what dictionaries are in Python and how they can be useful. Are there any restrictions on what data types the keys can be? What about the values?

### **Question 5 [2 Marks]**

What is the difference between a method and a function? What are some example methods for dictionaries?

### **Question 6 [5 Marks]**

Write a function called question6 which takes in a one dimensional list of numbers and returns another one dimensional list containing only the numbers that are less than 50 or greater than 85.

### **Question 7 [10 Marks]**

Write a function called question7 which takes in any list (may be multidimensional) and returns True if there are no duplicates numbers in the list (ie/ all the numbers are unique) and False otherwise.

### **Question 8 [10 Marks]**

Write a function called question8 which takes in a string as input (the string can be of any length) and prints to stdout how many times each letter appears in the string. For example, if the input string is "abcabd" then the output could look like the following (order does not matter).

a : 2

b : 2

c : 1

d : 1

### **Question 9 [5 Marks]**

Write a function named question9 which prints the following. Note, you must use loops.

```
*****  
*****  
*****  
*****  
*****  
*****  
****  
***  
**  
*
```

### **Question 10 [15 Marks]**

Here you will implement a number guessing game but with a twist. We have already implemented a simple number guessing game during class and you may reuse pieces of code from that. Create a function called `question10`. This function, when called, will bring the game. The game should work as follows... first the program should ask player 1 for a two-digit number (you may assume that player 1 correctly enters a 2-digit number) then the program will ask player 2 to guess what the first digit is. Once player 2 correctly guesses the first digit the program should begin asking player 2 to guess what the second digit is. Player 2 will have a total of 4 guesses per digit and if player 2 is not able to guess correctly under the guess limit of 4 per digit then player 2 loses. If player 2 can correctly guess both digits within 4 guesses per digit, then player 2 wins.

**End of Assignment 2**