Inft1004 Visual Programming – Lab for week 12

1. Do the quiz for week 12 – Random Quiz. (You can do this a few times if you want)

NOTE: E – Easy, M – Medium, H – Hard, T – Tricky

2. Start on this Sample exam on next page (no solutions will be provided but you can ask your tutor for suggestions, hints during the tutorial.)

INFT1004 Introduction to Programming
Sample Exam Questions

This is not a sample three-hour exam; it is a set of sample exam questions. It shows the sorts of question that will be in the final exam, and the sorts of marks that would be allocated to those questions.

The final exam will be 3 hours long with 10 minutes reading time.

Calculators and books, etc, will not be permitted in the exam room. However, you will be permitted one A4 sheet of *handwritten* notes, double sided. This will be collected, along with your exam booklet, at the end of the exam.

There will be some multiple-choice questions. For these, come prepared with a soft, dark pencil (eg 2B or B, but not HB) and an eraser. You will mark your answers on a GPAS (General-Purpose Answer Sheet), and if you change your mind about an answer you will have to rub it out.

The rest of the questions will be written in an exam booklet. For these, please use a black or blue pen – *not* pencil. If you change your mind about something you've written, just cross it out.

Of course you will not have access to a computer in the exam, so if you want to get a good feel for the programming questions, answer them on paper before you take them anywhere near a computer to check them.

Section A: 20 multiple-choice questions, each worth 1 mark.
Mark the correct answer to each question on the GPAS provided.

1. Which operator is used to join two strings end to end?
   a) `&`
   b) `and`
   c) `+`
   d) `join`

2. What is the value of `9 / 2`?
   a) 4.5
   b) 4
   c) 1
   d) 7

3. How do we find the value of the red channel of a pixel called *pix*?
   a) `getRedChannel(pix)`
   b) `getRed(pix)`
   c) `redChannel(pix)`
   d) `red(pix)`

4. What is *normalising* a sound?
   a) Making it the same frequency throughout
   b) Making it the same amplitude throughout
   c) Scaling the frequencies so that the greatest frequency just fits in the full range
   d) Scaling the amplitudes so that the greatest amplitude just fits in the full range

5. If you are mirroring a picture of width *w* about a vertical line through its centre, a pixel with a horizontal value of *x* will mirror to a pixel with what horizontal value?
   a) – x
   b) w – x
   c) w – x – 1
   d) x – w – 1

6. A program that deals with many forms of name, such as Mr Adam JK Smith III, includes the assignment statement

```
fullName = title + " " + first + " " + initials + " " + last + " " + postfix
```

   At one point in the program's execution, *title*, *initials*, and *postfix* are the empty string, *first* is "Mark" and *last* is "Mancktelow". What is the value of *fullName*?
   a) " Mark Mancktelow "
   b) " Mark Mancktelow"
   c) "Mark Mancktelow"
   d) "MarkMancktelow "

Section B: the marks for each question are as shown.
Answer these questions in the 12-page answer booklet.

7. *[4 marks]* The method *find* can be called, for example, in a print statement:

```
print one.find(two, three, four)
```

Explain what this statement will do, being sure to explain what types of thing *one*, *two*, *three*, and *four* are, and what the *find* method does with them.

8. *[5 marks]* What will be printed when the following code is executed? Show your working, in the form of a desk-checking table, and then your answer to the question.

```
x = 0
for y in range(3, 7):
   x = x + 2 * y
print x
```

9. *[10 marks]* Consider the following code:

```
def question9():
    i1 = 0
    i2 = 0
    message = "Kiss Me Quick!"
    i2 = mystery(message, i1, i2)
    print message, i1, i2

def mystery(one, two, three):
    sample = ""
    uppercase = "ABCDEFGHIJKLMNOPQRSTUVWXYZ"
    lowercase = "abcdefghijklmnopqrstuvwxyz"
    while one != "":
        sample = one[0]
        one = one[1:]
        if uppercase.find(sample) >= 0:
            two = two + 2
        elif lowercase.find(sample) >= 0:
            three = three + 3
    return two + three
```

What will be printed when *question9()* is called?

10. *[2 marks]* At one point in a program that deals with the nutritional value of various foods, *energy* has a value of 850, *fat* has a value of 18, *carbohydrate* has a value of 32, and *sodium* has a value of 215. What is the value of the following expression?

```
energy > 1000 and (fat > 20 or carbohydrate > 30) and sodium > 200
```

11. *[6 marks]* Write a function called *continue()*. This function will ask the user whether she or he wishes to continue. If the user's response begins with 'y' or 'Y', the function will return true; otherwise it will return false.

12. *[6 marks]* The function shown below is intended to return half the sum of the two floats that are passed to it.

```
def halfSum(a, b)
    return a + b \ 2
```

In Python, each line of this definition generates a syntax error. In addition, when these errors are fixed, the function still returns an incorrect result.

Rewrite the function so that it is free of syntax errors and returns the correct result.

13. *[5 marks]* Describe what the following function does, not step by step, but overall; that is, explain the purpose of the function.

```
def mystery2(surname):
   num = 0
   for i in range(0,len(surname)):
      if surname[i].find("-") > -1:
         num = num + 1
   return float(num) / len(surname)
```

14. *[10 marks]* Write a function that creates a list, and fills the list in the following way: the first two elements are 1; and every element after those, up to the 12th element, is the product of its index and the element that precedes it. The function then returns the list.

So, for example, the element with index 2 is 2 * 1 = 2; the element with index 3 is 3 * 2 = 6; the element with index 4 is 4 * 6 = 24; and so on.

15. *[5 marks]* Write a function that will be given an array of integers and will calculate and return the maximum of all the integers in the array.

16. *[10 marks]* Write a Python function that takes a file as a parameter and does the following:
    - makes a sound from the file;
    - makes a new sound the same length as the sound that was made from the file;
    - makes the new sound a copy of the sound from the file, except that every fifth sample, starting with the first (then the 6th,11th, 16th, etc) will have a fixed value of 10;
    - returns the new sound.