

## **Inft1004 Visual Programming – Practical Test version 1**

**Time permitted**     one hour and 30 minutes, starting when the tutor tells you to start

**Weighting**             0% (this is a formative assessment)

### **Test conditions**

Treat this as a test. Even when you need to look away from your own screen, take care not to look at other people's screens. Do not communicate with other students in any manner (including electronic – email, ftp sites, SMS, etc).

During the test you may use the textbook and written or printed notes, but no electronic media – you are not permitted to use files that you have stored on USB drives, CDs, network drives, clouds, etc.

You will be allowed access to the Inft1004 Blackboard site. This Blackboard site should be the *only* internet site accessed during the test.

Remember to save your work often.

You are reminded about plagiarism and its penalties. With the exception of program code from the textbook and the lectures, you are not permitted to use other people's work (in any form) in the test.

### **Test advice**

You are strongly advised to test your work frequently. Even at an early stage, when you might think there's no point in testing, running the functions helps to ensure that they are free of syntax errors. You should try to keep your code free of syntax errors at all times, rather than hoping that you'll be able to deal with syntax errors at the end of the test period.

If your testing changes an image, remember that it might be wise to make the image again from the file before each test.

## **Your assessment task**

Your task in this test is to write a number of functions that will manipulate an image in different ways. You will also write an overall function that calls each of the other functions in turn. The overall function is presented below as the last task, but you might prefer to write it as soon as you have completed the first function (task 4), and just have it do its first three steps. Then each time you complete another function, you can add the next step to the overall function. That way, the overall function will develop along with the rest of the code.

1. Copy the file *twoFaces.png* from the Assessment folder in Blackboard. This is the file you will be working with throughout this test. When you are testing your functions, remember that you might sometimes need to regenerate the picture from the file before each test, so as to be sure that you are starting with the same picture each time.
2. Start a Python program whose name is your name, without spaces, followed by *PT.py*. For example, if your name is EugeneLutton, call the program *EugeneLuttonPT.py*. Be sure to save it in a location where you'll be able to find it later, such as a USB drive, your network drive, or the desktop of the computer you're working on. This is the only Python program that you may have open on your computer during the test.
3. Put a comment at the start of the program including your name, the date, and the words "Inft1004 Practical test version 1". You are also expected to comment the rest of your code as it develops.
4. Write a function that has two parameters: a picture, and an integer that we will call the threshold. This function will work directly with the picture that is passed in: it is not required to work with and return a copy.

The function will first 'clean up' the somewhat muddy colours of the picture. To do this, it will check the green channel of each pixel. If the value of the green channel is *over* the threshold, the pixel will be turned yellow; otherwise it will be turned blue. When testing, use a threshold of 100.

The function will then remove the unwanted line separating the two sides of the image. To do this, it will give the colour yellow to all the pixels with horizontal coordinates between 273 and 277, for the full height of the picture.

When your function has finished this task it should repaint the picture.

Remember, you might now like to make a start on task 7 before returning to task 5.

5. Write a function that has five parameters: a picture, the two coordinates of the top left of a rectangular area, and the two coordinates of the bottom right of the rectangular area. This function will work directly with the picture that is passed in: it is not required to work with and return a copy.

Every pixel in the rectangular area should have the value of its *blue* channel set to zero. When your function has processed all of these pixels, it should repaint the picture.

To test the function, run it with the coordinates given in step 4 of task 7 below. It should change the colour of one of the faces in the image.

6. Write a function that takes an image and *returns* a new image, of the same size, that is the original image rotated through  $180^\circ$ . To produce this rotated image, all the pixels of the original image should be copied to the new image, but with the pixel at location (x, y) in the original image being copied to location (width – x – 1, height – y – 1) of the new image.
7. Write a fourth function that has no parameters and performs the following steps
  - Allows the user to pick a file;
  - turns the file into a picture;
  - repaints the picture;
  - calls your first function (task 4) on the picture, using a threshold of 100;
  - calls your second function (task 5) on the picture, in the region from (15, 25) to (255, 285);
  - calls your third function (task 6) to produce a new rotated image;
  - repaints the rotated image.

### **When you have finished, or when you are told that time is up**

You are to hand in your Python file electronically using Blackboard's Assignment feature.

- a. Be sure you have saved the latest version of the file.
- b. Be sure that the file's name is your name plus *PT.py*.
- c. On the Blackboard site for this course . . .
  - Select the *Practical Test* folder.
  - Click the *Practical test Upload* link, which takes you to the upload page.
  - In panel 2, *Assignment materials*, click *Browse my computer* (next to *Attach file*), and navigate to your Python file. Be absolutely sure to choose the right file. There is no need to type a link title. In the comments field enter your name.
  - In panel 3, *Submit*, click the *Submit* button.
  - If you don't see a message saying the assignment is complete, go back and check that you've done all these steps. If there's still a problem, try Blackboard's help under *Course tools*, search for *assignment*, and select the help page on *submitting assignments*.

**The marking guide for the practical test will be made available after the last tutorial on Thursday at 6:30 pm. You should mark your own – or find a friend and swap the responsibility for marking. I will make a little video to help! If you have problems bring them to next weeks lecture.**