CSC 108H1 S 2010 Test 1
Duration — 35 minutes
Aids allowed: none

Student Number: |_|_|_|_|_|_|_|_|_|

Last Name: ________________________ **First Name:** ________________________

Lecture Section: L0101 **Instructor: Horton**

Do ***not*** *turn this page until you have received the signal to start.*
(Please fill out the identification section above, **write your name on the back of the test**, and read the instructions below.)
Good Luck!

This midterm consists of 3 questions on 6 pages (including this one). *When you receive the signal to start, please make sure that your copy is complete.* Comments and docstrings are not required except where indicated, although they may help us mark your answers. They may also get you part marks if you can't figure out how to write the code. No error checking is required: assume all user input and all argument values are valid.
If you use any space for rough work, indicate clearly what you want marked.

# 1:	______/ 5
# 2:	______/ 8
# 3:	______/ 9
TOTAL:	______/22

Question 1. [5 marks]

Consider the following (incomplete) function:

```
def in_range(x, y, p):
    '''Return True iff x is less than y, and p is in the range x to y
    inclusive. x, y and p are all floats'''
```

Part (a) [3 marks]

Write the body of this function using an if statement.

Part (b) [2 marks]

Write the body of this function as a single line of code, without using an if statement.

Question 2. [8 MARKS]

The following program runs without errors:

```
1    def one(a):
2        a = a / 2
3        # What does memory look like now?
4
5    def two(b):
6        x = 10 + b / 2
7        return x
8
9    if __name__ == "__main__":
10       having = 15
11       print one(having)
12       print having
13       fun = 16
14       print two(fun)
15       print fun
```

Part (a) [4 MARKS]

Draw the state of memory at the moment when the program reaches line 3, as part of the call to function `one`. Use the notation we have used in class. Include any namespaces and the names that have been defined within them.

Part (b) [4 MARKS]

This program produces exactly 4 lines of output. Show them below:

Question 3. [9 marks]

Part (a) [5 marks]

For Assignment 1, you wrote function amount_color. Suppose it has been written correctly, with the following function def.

```
def amount_color(p):
    '''Return the total (int) amount of colour in Pixel p.'''
```

Complete the following function according to its docstring description. You **must** call amount_color in your function. You do not have to import it. Assume that media has been imported.

```
def funky_effect(source, t):
    '''source is a Picture and t is an int. Set each pixel in source whose amount of
    color is below the threshold t to the color media.olive, and set each pixel whose
    amount of color is at least t to the color media.orange.'''
```

Part (b) [4 marks]

Write a main block that allows the user to choose a file, applies the "funky effect" from part (a) to the picture in that file (using a threshold value of 150), and displays the resulting picture. Assume that the media module has been imported and that the user chooses a file that does indeed contain a picture.

```
if __name__ == "__main__":
```

[Use the space below for rough work. This page will not be marked unless you clearly indicate the part of your work that you want us to mark.]

Last Name: __________________________ **First Name:** __________________________

Short Python function/method descriptions:

```
__builtins__:
  abs(number) -> number
    Return the absolute value of the given number.
  max(a, b, c, ...) -> value
    With two or more arguments, return the largest argument.
  min(a, b, c, ...) -> value
    With two or more arguments, return the smallest argument.
  raw_input([prompt]) -> string
    Read a string from standard input.  The trailing newline is stripped.  The prompt string,
    if given, is printed without a trailing newline before reading.
float:
  float(x) -> float
    Convert a string or number to a float, if possible.
int:
  int(x) -> integer
    Convert a string or number to an integer, if possible.  A floating point argument
    will be truncated towards zero.
media:
  choose_file() -> str
    Prompt user to pick a file. Return the path to that file.
  create_picture(int, int) -> Picture
    Given a width and a height, return a Picture with that width and height.  All pixels are white.
  get_blue(Pixel) -> int
    Return the blue value of the given Pixel.
  get_color(Pixel) -> Color
    Return the Color object with the given Pixel's RGB values.
  get_green(Pixel) -> int
    Return the green value of the given Pixel.
  get_pixel(Picture, int, int) -> Pixel
    Given x and y coordinates, return the Pixel at (x, y) in the given Picture.
  get_red(Pixel) -> int
    Return the red value of the given Pixel.
  load_picture(str) -> Picture
    Return a Picture object from file with the given filename.
  set_blue(Pixel, int)
    Set the blue value of the given Pixel to the given int value.
  set_color(Pixel, Color)
    Set the RGB values of the given Pixel to those of the given Color.
  set_green(Pixel, int)
      Set the green value of the given Pixel to the given int value.
  set_red(Pixel, int)
    Set the red value of the given Pixel to the given int value.
  show(Picture)
    Display the given Picture.
```