CSC 108H1 F 2010 Test 1
Duration — 45 minutes
Aids allowed: none

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

Last Name: ____________________ **First Name:** ____________________

Lecture Section: L0101 **Instructors: Horton and Engels**

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 8 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:	______/ 8
# 2:	______/ 6
# 3:	______/ 8
TOTAL:	______/22

2a: 2b: 2c: 2d:

Question 1. [8 marks]

The following code runs without errors:

```
import media

def func1(p):
    for pixel in p:
        media.set_green(pixel, 20)

def func2(p):
    p = media.create_picture(10, 15, media.black)
    for pixel in p:
        media.set_color(pixel, media.orange)

def func3(s):
    s = s + "!"

def func4(n):
    n = n - 1
    return n

if __name__ == "__main__":
    picture1 = media.create_picture(50, 50, media.black)
    func1(picture1)
    one_pixel = media.get_pixel(picture1, 0, 0)
    if media.get_color(one_pixel) == media.black:
        print "still black"
    else:
        print "changed"

    picture2 = media.load_picture("face.jpg")  # A picture with no orange
    func2(picture2)
    one_pixel = media.get_pixel(picture2, 0, 0)
    if media.get_color(one_pixel) == media.orange:
        print "changed to orange"
    else:
        print "not orange"

    message = "wow"
    func3(message)
    print message

    how_much = 10
    func4(how_much)
    print how_much
```

Assume that the picture“face.jpg” has no orange pixels in it. On the following page, show the four lines of output that this code produces. **Strong hint:** Use the blank space provided to trace the code using the memory model.

Output produced:

Question 2. [6 marks]

Each of these subquestions contains a block of code. Treat each block of code independently (code in one part is not related to code in another), and fill in the blanks for each question.

Part (a) [1 mark] Assignment

```
var_A = 11
var_B = var_A
var_A = 42
print var_B
```

The output from this block of code is _______________.

Part (b) [3 marks] Conditionals and Booleans

The table to the right shows how an employee's age and experience affects his or her hourly wage. Assume that you have a boolean variable experienced and an int variable age. Fill in the boolean conditions in the code below to calculate the hourly wage for the employee.

	Experienced?	
Age	Yes	No
under 18	$12.00	$9.50
18 and over	$15.00	$10.50

```
if ________________________________________________________________:

    if ____________________________________________________________:
        wage = 12
    else:
        wage = 15
else:

    if ____________________________________________________________:
        wage = 9.5
    else:
        wage = 10.5
```

Part (c) [1 mark] Data Types

Fill in the blank so that when this code is run, the user is asked to enter two numbers and then the average of those numbers is printed. The user input may contain decimal values (e.g., 9.75 or 4.2).

```
num1 = raw_input("How many pounds does your backpack weigh? ")
num2 = raw_input("How many pounds does your friend's backpack weigh? ")

print "Your average backpack weight is" , ________________________________________
```

Part (d) [1 mark] Calling Functions

Suppose this function has been defined:

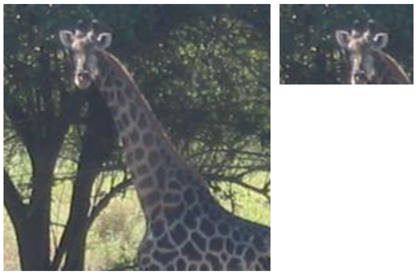
```
def area(r):
    '''r is a float.  Return the area of a circle whose radius is r.'''
    # The code for this function is not shown.
    return answer
```

Fill in the blank to call `area` to obtain the area of a circle with radius 19.6.

```
print "The area of a circle with radius 19.6 is" , ________________________________
```

Question 3. [8 MARKS]

Write the function below, according to its docstring. As an example, it could be used to create the picture on the right from the picture on the left:



You may not use the function `media.crop_picture`.
Strong hint: Iterate through the smaller picture — it is much easier that way.

```
def crop(p, w, h):
    '''p is a Picture; w and h are ints >= 1. Return a new picture of width w and
    height h containing the upperleft portion of the image in p. Assume
    that p has width at least w and height at least h.'''
```

[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.]

```
__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_height(pic)
    Return how many pixels high Picture pic is.
  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.
  get_width(pic)
    Return how many pixels wide Picture pic is.
  get_x(pix)
    Return the x coordinate of Pixel pix.
  get_y(pix)
    Return the y coordinate of Pixel pix.
  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.
```