

Name: \_\_\_\_\_

**CS110 Introduction to Computing**  
**Fall 2006**  
**Midterm Exam**

This is an open book/notes exam.

Sharing of notes and books is not permitted.

Answer all questions in the space provided. Continue on back of page if needed.

This exam contains 8 questions, pages numbered 1-8.

This exam is designed to be taken in 80 minutes.

Assume that any given Python statements do not have typographical errors.

All Python statements you write should be syntactically correct. There will be no credit for incorrect use of Python syntax.

Please remember to sign the attendance sheet.

Good Luck!

<b>Question #</b>	<b>Points</b>	<b>Maximum Points</b>
<b>1.</b>		<b>10</b>
<b>2.</b>		<b>10</b>
<b>3.</b>		<b>10</b>
<b>4.</b>		<b>10</b>
<b>5.</b>		<b>10</b>
<b>6.</b>		<b>10</b>
<b>7.</b>		<b>10</b>
<b>8.</b>		<b>10</b>
<b>Total</b>		<b>80</b>

**Question 1 (10 points)** Circle the correct answer in each of the following:

1. Which of the following is **not** one of the functional building blocks of a computer system:

- 1. central processing unit
- 2. main memory
- 3. secondary memory
- ☒ 4. monitor

2. A step-by-step set of instructions for accomplishing some task is called

- 1. a calculation
- 2. an expert system
- 3. an interpreter
- ☒ 4. an algorithm

3. What would Python print as a result of this interaction:

```
>>> print 2 + 3
```

- 1. 2+3
- 2. 2+3 = 5
- 3. Error
- ☒ 4. 5

4. What is the effect of the Python statement:

```
for i in range(10):
```


- 1. It multiplies i times 10.
- 2. It looks for the value of i in the number 10.
- ☒ 3. It causes the program to do something 10 times.
- 4. Nothing, this is just a comment.

5. Which of the following is a correct Python expression for converting temperatures from Celsius to Fahrenheit?


- 1. fahrenheit = (9.0/5.0)celsius + 32
- ☒ 2. fahrenheit = (9.0/5.0) \* celsius + 32
- 3. fahrenheit = (9.0/5.0) (celsius + 32)
- 4. fahrenheit = (9.0/5.0) \* (celsius +32)

6. What is printed by the following Python fragment?

```
s = "Bryn Mawr College"
print s[1]
```


- 1. B
- 2. Bryn
- 3. e
-  4. r

7. Suppose that the variable `x` currently has the value 20. What statement would cause the value of `x` to become 25?


- 1. `x + 5`
- 2. `y = x + 5`
-  3. `x = x + 5`
- 4. None. The value of `x` can't be changed.

8. What is printed by the following Python fragment?


```
s = "Bryn Mawr College"
print s[-1]
```

- 1. B
- 2. Bryn
-  3. e
- 4. College

9. What is the result of evaluating `7/2`?

- 1. 1
- 2. 2
-  3. 3
- 4. 5

10. What is the result of evaluating `7%2`?

-  1
- 2. 2
- 3. 3
- 4. 5

**Question 2 (5 points)** This question concerns strings in Python. Assume that the string module has been imported. Given the following:

```
str = "Baa, baa black sheep"  
str2 = "baa"
```

Give the output of each of the following expressions:

- a) `str[5]` **'b'** \_\_\_\_\_
- b) `str[3:9]` **' , baa '** \_\_\_\_\_
- c) `str[:5]` **'Baa, '** \_\_\_\_\_
- d) `str[:]` **'Baa, baa black sheep'** \_\_\_\_\_
- e) `str[-2]` **'e'** \_\_\_\_\_
- f) `string.count(str, 'a')` **5** \_\_\_\_\_
- g) `string.find(str, str2)` **5** \_\_\_\_\_
- h) `str2 + '-' + str` **'baa-Baa, baa black sheep'** \_\_\_\_\_
- i) `len(string.split(str))` **4** \_\_\_\_\_
- j) `(string.capitalize(str2) + ",")*3` **'Baa,Baa,Baa,'** \_\_\_\_\_

**Question 3 (10 points)** Consider the following program:

```
def main():  
    num = input("Enter a number: ")  
    for i in range(5):  
        num = num / 2  
    print num  
  
main()
```

Suppose the input to this program is 1024, what is the output?

**32**

**Question 4 (10 points)**

The following Python program is supposed to draw a blue circle of diameter 100 pixels in the center of the window. Write the appropriate commands needed to accomplish the task.

```
from graphics import *

def main():
    # open the graphics window
    win = GraphWin("My Graphics Window", 600, 400)

    # Draw a blue circle of diameter 100 in the center

    center = Point(300, 200) # or Point(299, 199)
    radius = 50
    circ = Circle(center, radius)
    circ.setFill("red")
    circ.draw(win)

    # end of program
main()
```

**Question 5 (10 points)** What is the output from the following program fragment?

```
for i in [1,3,5,7]:  
    print 2 * i,
```

**2 6 10 14**

**Question 6 (10 points)** What is the output from the following program fragment?

```
n = 5  
for i in range(n):  
    print i, ":", i*i
```

**0:0  
1:1  
2:4  
3:9  
4:16**

**Question 7 (10 points)** Write a Python program that opens a file and prints out its first and last lines. Your program should ask the user for the file name.

```
def main():  
    fname = raw_input("Please enter a file name: ")  
    file = open(fname, "r")  
    lines = file.readlines()  
  
    print lines[0],  
    print lines[-1],
```

**Question 8 (10 points)** Answer one of the following (circle the one you choose):

1) Write a Python program to sum the ASCII codes for all characters in an input string. For example, for the string, "ABC", the output will be 198 (because the character codes for 'A', 'B', and 'C' are 65, 66, and 67, respectively and  $65+66+67=198$ )

```
import string
def main():
    sum = 0
    str = raw_input("Enter a string: ")
    for i in str:
        sum = sum + ord(i)
    print "The sum of ASCII codes is", sum
```

2) Write a Python program that computes and prints out the average of all the integers between any two given integers (inclusive). Here are two examples:

If the numbers input are 1 and 5, the result will be 3.0  
(since  $1+2+3+4+5 = 15$  divided by  $5 = 3.0$ ).

If the numbers input are -1 and 2, the result will be 0.5  
(since  $-1+0+1+2 = 2$ , divided by  $4 = 0.5$ )

You may assume that the second input number is always bigger than the first.

```
def main():
    x, y = input("Please enter two integers: ")

    # n to count the number of integers
    # can also be calculated directly as y-x+1
    sum, n = 0, 0

    for i in range(x, y+1):
        sum = sum + i
        n = n+1
    avg = sum/float(n)

    print "The average is", avg
```



