Practice Exam 1

Python

Answer the questions in the spaces provided. **Please note** that there are no intentional errors in the code provided except in questions asking you to correct said code. Your written code does not have to be 100% syntactically correct.

Name: _____

Page	Points	Score
3	3	
4	10	
5	13	
6	8	
7	18	
8	12	
9	10	
10	5	
11	20	
12	10	
Total:	109	

Useful notes:

- The practice exam is much longer and somewhat harder than the actual exam, as more practice is better. If you want to time yourself, this I would give yourself **2 hours** as opposed to the hour and twenty of a normal lecture.

- The points roughly correspond to the difficulty of the questions.

- The amount of space given for a problem **does not** correspond to the difficultly of the problem.

- You are allowed to clarify any answer you give.

- You are allowed to ask for clarification.

- Things are never as complicated as they appear, especially the math.

- Read this on the actual exam. You will find a hint for actually reading this.

- Never leave a question blank, even if you don't know the answer. We can't give partial credit to blanks.

- Extra credit is available for exceptional answers (up to five points).

Don't Panic

1   Basic Concepts and History

Refer to the first lecture

1. (1 point) (True/False) Computer Science is the study of computers.

   1. ⎯⎯⎯⎯⎯⎯⎯

2. (1 point) (True/False) Alan Turing is often considered to be the first programmer.

   2. ⎯⎯⎯⎯⎯⎯⎯

3. (1 point) Who was Ada Lovelace and why is she an important figure?

⎯⎯⎯⎯⎯⎯⎯ 3 points

2   Expressions

4. (10 points) What would each of the following expressions evaluate to in Python?

   (a) $2 * 3 // 6 * 100$

   (a) ──────────

   (b) $1 \% 2 + 3 \% 2$

   (b) ──────────

   (c) $-1 + -10.5$

   (c) ──────────

   (d) $4 + 5 - 3 * 2$

   (d) ──────────

   (e) $0 * (1264 + 2835) - 1.0$

   (e) ──────────

   (f) $2 * 4 - 20$

   (f) ──────────

   (g) $7 // 3 + 2 * 3$

   (g) ──────────

   (h) $4 \% 2 * 3$

   (h) ──────────

   (i) $52482 // 24478198$

   (i) ──────────

   (j) $10 ** 2 * 2$

   (j) ──────────

────────── 10 points

3   Conditional Statements

5. (5 points) Evaluate the following conditional expressions to true or false.

   (a)
   ```
   (True or (3 == 2))
   ```

   (a) _____

   (b)
   ```
    not False
   ```

   (b) _____

   (c)
   ```
   (not (4 < 2) and 3 < 10)
   ```

   (c) _____

   (d)
   ```
   32//8 == 32.0/8
   ```

   (d) _____

   (e)
   ```
   not((True or 3 < 2) and not( False or True))
   ```

   (e) _____

For the next two questions, you may assume x and y already exist.

6. (4 points) Write an if statement that checks if x is a multiple of y.

7. (4 points) Write an if statement that checks if either x or y is even, and the other one is odd.

4   Iterative Statements

8. (4 points) What is the output of this code?

```python
for i in range(10):
        if (i%3 == 1):
                print(i,end="")
```

8. _____

9. (4 points) Convert the following while loop into a for loop.

```python
i = 2
while i > 0:
        print("!")
        i -= 1
```

_____ 8 points

10. (4 points) What is wrong with this loop?

```
i = 0
while i < 10:
        print(i)
```

11. (8 points) Write a nested for loop that prints out the following (this is one of those questions that is much harder on the practice exam. If you can master this question, you'll have no worries about loops during the actual exam. A hint is in the footnote[1]):

```
10 8 6 4 2
8 6 4 2
6 4 2
4 2
2
```

12. (6 points) What is the output of this loop?

```
for i in range(3):
        for j in range(i+1):
                print(i + j, end="")
        print()
```

---

[1]To print 10 all the way down to 2 by 2s, use `range(10,0,-2)`; change 10 to whatever you need

5   Programming

13. (4 points) What are the values of the x, y, and z after the following statements?

```
x = 7
y = 8
z = -5

x = x + 1
y = x + y + z
z+=1
```

14. (4 points) What is the output when annoy(5,3,4,2) is called?

```
def annoy(a, b, c, d):
        if a > b and a <= c:
                print("red")
        else if d > c or d < b :
                print("green")
        else:
                print("blue")
```

14. _____

15. (4 points) What is the output when annoy(2,3,4,5) is called?

15. _____

16. (0 points) Try some other inputs for practice.

17. (5 points) What is the output of the following program?

```python
def foo():
        print("foo")

def bar():
        foo()
        print("bar")
        baz()

def baz():
        print("baz")
        foo()


foo()
bar()
baz()
```

18. (5 points) If we change baz in the above example to the following, what happens?

```python
def baz():
        print("baz")
        foo()
        bar()
```

19. (5 points) What is the output of the following code?

```python
def confundus(y, x, z):
        x+=1
        y = y - x + z
        print(z , x, y)

x = 6
y = 8
z = 4

confundus(z,x,y)
```

For each function, the comments contain example inputs and outputs.

20. (10 points) Write a function **eachChar()**, which returns a **new** string made by separating each character with a comma and space. (self grading note: there is a 3 point penalty if you have an extra trailing comma and space. Again, this is a harder, fencepost question)

```
# "hello"    -> "h, e, l, l, o"
# "one two!" -> "o, n, e,  , t, w, o, !"
# "a"        -> "a"
def eachChar(s):
```

21. (10 points) Write a new function called **sumOfThrees(n)**, which returns the sum of first n positive integers that are divisible by 3. If n is less than or equal to 0, return 0.

```
# n =  3 will return the integer 18 because 3 + 6 + 9            = 18
# n =  5 will return the integer 45 because 3 + 6 + 9 + 12 + 15 = 45
# n = -1 will return 0
def sumOfThrees(n):
```

22. (5 points) Write a program that uses a turtle to draw a spiral.

23. (5 points) Draw the result of the turtle program below. You can draw a dot to represent a stamp.

```python
import turtle

bob = turtle.Turtle()
bob.penup()

for row in range(5):
        for dot in range(row+1):
                bob.stamp()
                bob.forward(50)
        bob.right(90)
        bob.forward(50)
        bob.right(90)
        bob.forward(50*(row+1))
        bob.right(180)
```

6   Additional Practice

You're done with the exam, but here are some more to help you practice if you want

24. (0 points) Write a nested for loop that prints out the following:

```
10 8 6 4 2 0
8 6 4 2 0
6 4 2 0
4 2 0
2 0
0
```

25. (0 points) Write a nested for loop that prints out the following:

```
10 8 6 4 2 0
10 8 6 4 2
10 8 6 4
10 8 6
10 8
10
```

26. (0 points) Project Euler Problem 1

_____ 0 points

27. (0 points) Write a method that prints out the first n powers of two.

28. (0 points) Write a method that takes an integer and returns how many digits it has.

29. (0 points) Write a method that takes an integer n and prints out all the proper factors (all the factors of n aside from n)

0 points

30. (0 points) Write a method that prints out the first n Fibonacci numbers.

_____ 0 points

31. (0 points) Draw the result of the turtle program below.

```python
import turtle

bob = turtle.Turtle()

for x in range(8):
        bob.forward(50)
        bob.right(45)
```