Anth/Biol 5221: Submitting Lab Reports

When submitting labs for this course, please submit two separate documents: one .py or .txt file with your program(s) (along with #comments), and one PDF or word document with your output and lab write-up. When submitting your program please do not upload screenshots of your IDLE window. If there is more than one program, you can submit them in the same file, but they should be clearly labeled. Your program #comments should allow someone who has never taken this course to look at your program and have a general understanding of how it works.

Your lab write up should include the output(s) of your program, as well as a write up of the experiment. If you have more than one set of outputs, be sure to clearly label them. For each write up, address the specific questions asked in the lab manual/Just Enough Python for each lab. In addition to lab-specific questions, please include your thoughts on the following:

- What question was the experiment trying to answer?
- How did you go about answering this question? What was the experiment?
- What conclusions did you come to? How do you interpret your results?

Your write up will be graded based on completeness, effort, and understanding, rather than your writing ability. However, be sure to write in complete sentences, and check for grammatical/spelling errors before submitting.

Example Program

```
# die1.py program simulates rolling a fair six-sided die

from random import random      # imports random number generator

p=random()                     # assigns the variable p a random number from generator

if p < 1/6:                    # if the random number is less than 1/6, then print 1
   print("1")                  # the value 1 is divided fairly into six, assigning one side of each
elif p < 2/6:                  # die to each sixth of probability
   print("2")
elif p < 3/6:
   print("3")
elif p < 4/6:
   print("4")
elif p < 5/6:
   print("5")
else:                          # the remaining probability (which is 1/6) is assigned to 6
   print("6")
```

Example Lab Write-Up

Lab 1 was about learning how to model different processes, such as flipping a coin and rolling a die, based on probability. The first program, “coin3”, is a four-way conditional that divides an interval into 2 parts heads and 2 parts tails using Python’s if-else statements. The goal of this program was to create a fair coin, meaning the intervals have to allow for heads and tails to have an equal probability of being “flipped”. This program was run 20 times (results shown below). The second program, “die1”, simulates a fair, six-sided die. Like coin3, this was simulated by using Python’s if-else statement, and was also run 20 times (see below). For both of these programs, the idea that a probability of 1 is one hundred percent probability was assumed. So, for a coin to be fair, heads and tails each require a probability of fifty percent, or 0.5. For each side of a die, each number requires a probability of 1/6.

The result of running each of these simulations 20 times shows a distribution somewhat close to what one would predict for a fair die and a fair coin, though not exactly. The outputs of each program seem random, with no distinguishable pattern. This supports the idea that these simulations are modeling a *fair* coin and die. With more runs, one would expect the distributions to get closer and closer to 50/50 for a coin, and 1/6 for each number on a six-sided die.

Results

20 Flips of a coin from coin3.py

= RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/coin3.py
tails!

= RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/coin3.py
heads!

= RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/coin3.py
heads!

= RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/coin3.py
tails!

= RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/coin3.py
heads!

= RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/coin3.py
heads!

= RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/coin3.py
tails!

= RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/coin3.py
tails!

= RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/coin3.py
heads!

= RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/coin3.py
heads!

= RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/coin3.py
heads!

= RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/coin3.py
tails!

= RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/coin3.py
heads!

= RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/coin3.py
tails!

= RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/coin3.py
heads!

= RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/coin3.py
heads!

= RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/coin3.py
heads!

= RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/coin3.py
tails!

= RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/coin3.py
heads!

= RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/coin3.py
tails!

Heads: 12
Tails: 8

20 rolls of a die from die1.py

=== RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/die1.py ===
4

=== RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/die1.py ===
5

=== RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/die1.py ===
1

=== RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/die1.py ===
6

=== RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/die1.py ===
4

=== RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/die1.py ===
3

=== RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/die1.py ===
4

=== RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/die1.py ===
5

=== RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/die1.py ===
2

=== RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/die1.py ===
2

=== RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/die1.py ===
6

=== RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/die1.py ===
4

=== RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/die1.py ===
3

=== RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/die1.py ===
3

=== RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/die1.py ===
1

=== RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/die1.py ===
2

=== RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/die1.py ===
3

=== RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/die1.py ===
2

=== RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/die1.py ===
3

=== RESTART: /Users/carrieschultz/Bio:Anth 5221 /Lab_Exercises/Lab_1/die1.py ===
6

1: 2
2: 4
3: 5
4: 4
5: 2
6: 3