

Name: _____ Section: 1 2 3 4

1 = Mutchler, 1st-2nd periods. 2 = Mutchler, 3rd-4th periods. 3 = Anderson, 7th-8th periods. 4 = Anderson, 9th-10th periods.

Use this quiz to help make sure you understand the videos/reading. **Answer all questions.** Make additional notes as desired. **Not sure of an answer?** Ask your instructor to explain in class and revise as needed then. **Please print two-sided.**

Throughout, where you are asked to “circle your choice”, you can underline or circle it (whichever you prefer).

Textbook Reading: Section 9.1 - 9.6 – Objects and Classes (pages 444 - 460)

1. Consider the code snippet shown to the right.

```
p1 = zg.Point(4, 20)
p2 = zg.Point(8, 2)
c = zg.Circle(p1, 60)
```

- How many **classes** are there in the code snippet? _____
 - What are the names of those classes?
 - How many **objects** are there in the code snippet? _____
 - What are the names of those objects?
- What are some of the physical devices that form the **public interface** when you drive a car?
 - A car can have a gasoline-based engine or an electric-based engine (among other possibilities). Explain how this is an example of **information-hiding** when you drive a car. (FWIW, this is probably not the world's best question, so don't worry if it does not make sense to you – but DO ask about it in class if you are not sure what **information-hiding** is.)

4. Section 9.2 describes one way to implement a **Counter** that keeps track of the number of times that the mouse is clicked. Here (to the right) is part of the **Counter** class (as shown on page 449, but modified to include a constructor that initializes the counter to 0).

```
class Counter:
    def __init__(self):
        self._value = 0

    def getValue(self):
        return self._value

    def click(self):
        self._value = self._value + 1
```


Now consider the following change to the implementation of the counter: Instead of using an **integer** counter, we use a

string of `|` characters to keep track of the clicks, just as a human might do. Here (to the right) is an implementation of the **Counter** class using that approach.

```
class Counter:
    def __init__(self):
        self._strokes = ''

    def getValue(self):
        # TODO: Implement this method.

    def click(self):
        self._strokes = self._strokes + '|'
```



- Write the implementation of the **getValue** method in this second version of **Counter** (i.e., write the code that goes below the **TODO**).
- Suppose that Alicia, a programmer from another company, is using your company's **Counter** class. Alicia had been using the first version of **Counter** above, but in your latest release you switched to the second version. What changes does **Alicia** have to make to **her** code (that constructs and uses a **Counter**)? (Hint: trick – but important! – question!)

- Is **getValue** in the **Counter** class (either version – answer is the same for both) an:

accessor method **mutator method** **both** **neither** (circle your choice)

- Is **click** in the **Counter** class (either version – answer is the same for both) an:

accessor method **mutator method** **both** **neither** (circle your choice)

- What are the names of the **field(s)** of the first **Counter** implementation above?

- What are the names of the **instance variable(s)** of the first **Counter** implementation above? (Hint: trick question.)

5. Consider a class **Time** that represents a point in time, such as **9 a.m.** or **3:30 p.m.** Give two sets of fields that can be used for implementing the **Time** class. (Hint for the second set: *military time*.)

One set of fields that would work:

Another set of fields that would work:

6. What is the main purpose of a class' **constructor**?

7. Write the line of code that constructs a zellegraphics **zg.Point** whose **x** and **y** coordinates are **100** and **75**, respectively.

8. Evaluating the expression that you wrote in the previous problem causes what chunk of code to run (i.e., **what is the name of that chunk of code**)? _____

What must that code do, at the very least?

9. Consider the **CashRegister** class on page 459, and consider the code snippet shown to the right. After that snippet executes, what is the value of:

a. **register1._itemCount**: _____

b. **register1._totalPrice**: _____

c. **register2._itemCount**: _____

d. **register2._totalPrice**: _____

```
register1 = CashRegister()
register1.addItem(0.90)
register1.addItem(0.95)

register2 = CashRegister()
register2.addItem(1.90)
```

10. Continue to consider the **CashRegister** class on page 459. Write a method **getDollars** of the **CashRegister** class that returns the amount of the total price as a dollar value without the cents. (This function should just drop the cents – for example, if the total price of the items is **\$23.65**, then this function would return **23**.)