**Unit 2: Using Objects**

**Topic 1: Intro to Objects**

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| **Name:** |  |

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| **Rectangles!** |  |
| **0.**  Create a new IntelliJ project named LASTNAMEU2T1Lab1 (e.g. "KaufmanU2T1Lab1") and login to GitHub on IntelliJ.  **1.** Create a new class in the **src** folder named **RectangleRunner** and copy/paste [**this code**](https://docs.google.com/document/d/1sRcb17AQGxo_T8ExOyoJZ9xiZuHhyuMJEyZvwAmIlUg/edit?usp=sharing).  **2.** Create a second class in the **src** folder named **Rectangle** and copy/paste [**this code**](https://docs.google.com/document/d/1MkL_dP5J9uT1FLGBZ0GpS5yEY8jMfIDmgTqv-PaDaFk/edit?usp=sharing). | |
| **3.** The RectangleRunner class has a main method but the Rectangle class does not; why is that?  Note how there are no  on the left side of the Rectangle class! |  |
| **4.** Find the “constructor” method in the Rectangle class at **line 10**.   1. What do you notice about how it’s named? 2. What do you think it does? | A.  B. |
| **5.** Jump back to the RectangleRunner class.   1. What keyword (in orange) is used to createtwo different Rectangle **objects** on lines 5 and 9? Where have we used this keyword before? 2. This code: new Rectangle(5, 6) calls the *constructor* method of the Rectangle class, passing 5 and 6 as “actual parameters” into the method. Look at the constructor again in the Rectangle class; what does the 5 represent? What does the 6 represent? How can you tell which is which? | A.  B. |
| **6.** Execute (run) the RectangleRunner class and view its output! | |
| **7.** Lines 6 and 10 of RectangleRunner are examples of “*calling a method”* on a particular Rectangle **object**. Look at the output, then go to the Rectangle class and find the printArea() method. How does the method calculate the area? |  |
| **8.** In the RectangleRunner class, create another Rectangle object named rect3. Give it a length and width of your choosing. Then call the printArea() method on your new object. Run the code to test that it works!  **Copy and paste the line(s) of code that you wrote below:** | |
|  | |
| **9.** Try creating another Rectangle object, rect4, with a width of 6.5 and length of 10.5. What happens and why do you think that is? Hover your mouse over the red squiggly in IntelliJ and see if you can figure out the error!  Is it a syntax/compiler error, or a runtime error?  Once you have the problem figured out, go ahead and delete rect4. |  |
| **10.**  Go into the Rectangle class and try writing a new method, printPerimeter(), which calculates and prints the perimeter of the Rectangle, similar to area. Start the method with "public void" like printArea() -- we will talk about what these words mean soon!  Then test your method by going to RectangleRunner and adding code to call the new method on each of the Rectangle objects (rect1, rect2, rect3). Confirm the output is what you expect!  **Copy and paste the line(s) of the method you wrote below:** | |
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| **11.** If you had to guess, what do you think public means? What about void? |  |

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| **Partner Compare**  Take some time to **compare** your answers for **1-11** with your partner. | What is your partner’s name?   |  | | --- | |  |   Did you come up with similar answers?   |  | | --- | |  | |

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| **Cats!** |  |
| **12.** Create two new classes in the src folder: **CatRunner** and **Cat.**  Give the CatRunner class a main method, and for the Cat class, copy/paste [**this code**](https://docs.google.com/document/d/184RDPGwZo_Kif-jezxvAn9YCbC1wZpXylElgxfWYxs8/edit?usp=sharing).  *Notice that you now have two classes in your project, RectangleRunner and CatRunner, which both have main methods, so both of them are executable:* | |
| **13.**  **A.** In your CatRunner's main method, write code to create a Cat object named cat1. You will need to look at the constructor in the Cat class to determine what values should get passed in as parameters! Choose the parameter values for your cat.  **B.** Next, look into the Cat class and find two different methods. What are the two methods named?   |  | | --- | |  |   **C.** Pick one of the methods then write code to call that method on cat1. Run the code to see the output.  **D.** Write code to call the *other* method on cat1, then run the code to see the output.  **E.** Write code to create a second Cat object, cat2 (again choosing your own parameter values), and call both methods on cat2.  **Copy and paste the line(s) of code that you wrote below:** | |
|  | |
| **14.** What happens if you switch up the order of the parameters when you create your Cat objects? In other words, determine if both of these are "valid" calls to the Cat constructor (i.e. will both compile):  new Cat(5, "Fluffy", 8.5)  new Cat("Fluffy", 5, 8.5)  What happens when you mix them up and why? |  |
| **15. Challenge!** In the Cat class, modify the introduce() method so that it prints: "Hello my name is \_\_\_ and I am a younger cat" if age is less than 7, and "Hello my name is \_\_\_ and I am an older cat" if age is 7 or older.  Run your CatRunner again to test! You should see the updated output for both cats. Make sure one of the cat's ages is less than 7 and one is greater than 7, just to test the method!  **Copy and paste your updated method below:** | |
|  | |
| **16. Freestyle!** Play around with any of your four classes (RectangleRunner, Rectangle, CatRunner, Cat). Change things, add things, write some new code.  Or as an added challenge, try to create your own simple class from scratch!  Jot down one thing you tried and what you figured out! Feel free to copy/paste code if you are particularly happy with it :) | |
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**Done!**

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