Without using the internet, answer each of the following.

1. At the begging of this week, I mentioned there were 5 things I would be rating you on weekly. One was **Listening**. What were the other 4?
   1. Listening
   2. Speaking/communication
   3. Programming
   4. Coding Interviews
2. Explain in 2- 3 sentences what the JRE is.
   1. The Java Runtime Environment is used when one wishes to execute a Java program. It comes with the JVM and core Java APIs.
3. Explain in 2- 3 sentences what the JDK is.
   1. The Java Development Kit contains programming tools for writing, running, and debugging Java programs. The Java compiler (javac) is one of the tools that comes with the JDK.
4. Explain in 2- 3 sentences what the JVM is.
   1. The Java Virtual Machine is an abstract machine that details specifications required to implement it. The JVM is responsible for interpreting .class files, which contains byte-code. The JVM is what makes Java platoform independent.
5. Explain the difference between an interface and an abstract class?
   1. An interface has methods without an implementation (unless it is a default method). An abstract class can have methods with or without an implementation.
   2. An interface has variables that are static final while an abstract class can have variables that are static/non-static and final/non-final.
6. What are the 4 principles of OOP? Explain each.
   1. **Abstraction**: when details of how a function/action work are hidden from the user.
   2. **Polymorphism**: when an object can take on more than one form (i.e. an Employee variable that can be initialized as either a FulltimeEmployee or a Contractor)
   3. **Inheritance**: when a class can inherit methods/variables of another class
   4. **Encapsulation:** refers to the implementation required to make a particular function/action of the program work
7. What is a singleton?
   1. A single instance of an object that last throughout the entire lifespan of the program.
8. What is the difference between composition and inheritance?
   1. **Composition** is when you implement a method for a particular object. **Inheritance** is when you allow the object to inherit the method/variables from another class.
9. Write a program that demonstrates runtime polymorphism, commit it to git, provide the git link below and explain in 2-4 sentences why it is polymorphic.
   1. <https://github.com/langiole/JuMP/blob/master/InterfaceAbstractClassDemo.java>
   2. In this program ***Router*** is polymorphic since it can take the appearance as either a ***NetgearRouter*** or as an ***AsusRouter***. Although they share the same method signatures, they both have different implementations of those methods, which is a key aspect of polymorphism.

You can use the internet to answer the following.

1. Provide 5 links to different articles you posted on your blog and 5 links to different programs written in class you committed to your git repository from yesterday or earlier. If you just joined this week, provide 3 links for each.

**Blogs:**

* 1. <https://langio.home.blog/2019/08/06/example-post/>
  2. <https://langio.home.blog/2019/08/07/understanding-variables-in-java/>
  3. <https://langio.home.blog/2019/08/09/inheritance/>
  4. <https://langio.home.blog/2019/08/09/utilizing-interfaces-and-abstract-classes-in-java/>
  5. <https://langio.home.blog/2019/08/12/read-this-before-walking-into-your-next-interview/>

**GitHub:**

* 1. <https://github.com/langiole/JuMP/blob/master/AerobicCodingAug15/DanDemo.java>
  2. <https://github.com/langiole/JuMP/blob/master/AerobicCodingAug15/MattDemo.java>
  3. <https://github.com/langiole/JuMP/blob/master/AerobicCodingAug15/RoyDemo.java>
  4. <https://github.com/langiole/JuMP/blob/master/AerobicCodingAug15/TerryDemo.java>
  5. <https://github.com/langiole/JuMP/blob/master/Inheritance.java>

When completed, please email this test to:

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