Week 4: Research

1. <u>What are the differences between Lists, Sets, and Maps in Java?</u>

Lists Allow duplicates. They also keep elements ordered by an index, just like an array and allow null values.

Sets do not allow duplicates. Sets are unordered and allow null but duplicates of it.

Maps delineate to key value pairs and is like a dictionary. Much like a Dictionary, we can have multiple differences for a word, but the word can never be duplicate. In other words, we cannot duplicate keys.

2. <u>List at least two different implementations for each collection (List, Set, and Map). When would you use one of the implementations over the other?</u>

The common implementations of a Set are HashSet, LinkedHashSet and TreeSet. HashSet would be used for instance, if we wanted to have an unordered list of states. They would not print in any order and would not have duplicates. The set also allows null but not duplicates of it

The common implementations of a Map are HashMap, LinkedHashMap, TreeMap and HashTable. When writing out a map, the first parameter is the key. The second parameter is the Value. We can only duplicate the value for the key and have multiple instances of it. This would be implemented to get hey values.

3. <u>Write a line of code that shows how you would instantiate an ArrayList of String.</u>

```java
public static void main(String[] args) {

        String[] cars = {"Camaro","Corvette","Tesla","BMW"};

        cars[0] = "Mustang";

        System.out.println(cars[2]);

        String[]sportsCars = new String[4];

        sportsCars[0] = "Porche";
        sportsCars[1] = "Ferrari";
        sportsCars[2] = "Koenigsegg";
        sportsCars[3] = "Bugatti";

        System.out.println(sportsCars[2]);

        for(int i = 0; i < sportsCars.length; i++) {
            System.out.println(sportsCars[i]);
        }
    }
}
```

4. <u>Write a line of code that shows how you would instantiate a HashSet of StringBuilder.</u>

```java
public int numUniqueEmails(String[] emails) {
        HashSet<String> set = new HashSet<String>();
        StringBuilder sb = new StringBuilder();
        String domain = "";
        for(String email: emails){
            sb.setLength(0);
            domain = email.split("@")[1];
            email = email.split("@")[0];
            for(int i=0; i<email.length(); i++){
                if(email.charAt(i)!='.'){
                    sb.append(email.charAt(i));
                }
                if (email.charAt(i)=='+'){
                    break;
                }
            }
            set.add(sb.append('@').append(domain).toString());
        }
        return set.size();
    }
}
```

5. <u>Write a line of code that shows how you would instantiate a HashMap of String, String.</u>

```
public static void main(String[] args) {


        Map<String, String> dictionary = new
HashMap<String,String>();
        dictionary.put("Augment", "make (something) greater by
adding to it; increase.");
        dictionary.put("Dropensity", "an inclination or
natural tendency to behave in a particular way");
        dictionary.put("Diminish","make or become less");
        dictionary.put("Tonality", "the harmonic effect of
being in a particular key");
        dictionary.put("Overspeak", "To speak too much; t use
too many words");


    }
}
```

6. <u>What is your favorite thing you learned this week?</u>

My really enjoyed learning about Maps and instantiating key value pairs together