CS 314 Exam One Review — Maps Short Answer

1. What is output by the method `a`?.

```
public static void a(){
    TreeMap<Integer, String> tmap = new TreeMap<>();
    tmap.put(1, "CAT");
    tmap.put(2, "FOX");
    tmap.put(3, "DOG");
    tmap.put(4, "CAT");
    tmap.put(1, "RAT");
    System.out.println(tmap);
}
```

2. What is output by the method `b`?

```
public static void b(){
    Map<String, String> map = new TreeMap<>();
    map.put("CS314", "Mike");
    System.out.println(map.get("CS429"));
}
```

3. What is output by the method `c`?

```
public static void c(){
    Map<Integer, Integer> map = new HashMap<>();
    map.put(1, 3);
    map.put(3, 2);
    map.put(map.get(3), 5);
    map.put(map.get(2), map.get(1));
    map.put(map.put(1, 4), 1);
    map.put(map.put(map.get(2), 6), 8);
    System.out.println(map);
}
```

4. In what situations would we want to use a TreeMap instead of a HashMap?

5. Why would want to use a HashMap instead of a TreeMap?

6. Suppose I want a given key to map to multiple different values. Can I still use a map? If so, how? If not, what data structure should I use instead?

7. What is output by method `d`?

```
public static void d(){
    Map<String, Double> map = new HashMap<>();
    map.put("PI", 3.1415926);
```

```
    map.put("SQRT2", 2.0);
    map.put("E", 2.7182818);
    map.put("SQRT2", 1.414214);
    System.out.println(map.size());
}
```

8. Is the error in the second line of method `e` a Syntax or Runtime error?

```
public static void e(){
    Map<String, Integer> map = new TreeMap<>();
    map.put(7, "LUCKY");    // THIS LINE
}
```

9. Does this method have a Syntax or a Runtime error?

```
public static void f() {
    Map<String, Integer> map = new HashMap<>();
    Object valToAdd = "VALUE";
    map.put("KEY", (Integer) valToAdd);
}
```

10. What is output by the method `g`?

```
public static void g(){
    Map<Integer, String> tmap = new TreeMap<>();
    tmap.put(1, "RED");
    tmap.put(2, "GREEN");
    tmap.put(3, "BLUE");
    tmap.put(1, "BLACK");
    tmap.put(2, "WHITE");
    System.out.println(tmap.put(3, "CYAN") + ", " + tmap.get(1));
}
```

11. What is output by the method `h`?

```
public static void h() {
    Map<String, Integer> map = new HashMap<>();
    map.put("UT", 40);
    map.put("CS", 314);
    map.put("Texas", 2023);
    System.out.println(map);
}
```

12. What is output by the method `i`?

```
public static void i(){
    Map<Integer, String> tmap1 = new TreeMap<>();
    Map<String, Integer> tmap2 = new TreeMap<>();
```

```
        tmap1.put(1, "A");
        tmap1.put(2, "B");
        tmap1.put(3, "C");
        tmap1.put(4, "D");
        tmap1.put(5, "E");
        tmap2.put(tmap1.get(3), 5);
        tmap2.put(tmap1.put(2, "Z"), 6);
        tmap2.put(tmap1.get(tmap2.get("C")), tmap2.put("C", 7));
        System.out.println(tmap2);
    }
```