

1. What are the differences between Lists, Sets, and Maps in Java?

Each collection type allows for different attributes and uses. Starting with Lists, they allow you to store duplicate elements, whereas Sets do not and Maps will allow duplicate values but not keys. The next difference is Lists will maintain the insertion order while Sets and Maps typically do not, unless using LinkedHashSet and LinkedHashMap. TreeSet and TreeMap also allow for a natural order sorting while Lists do not have that built in functionality. After those few differences, there isn't too much else besides lists being able to use multiple null keys, while Sets only allow one and Maps depend on the type (HashMap, LinkedHashMap, etc.).

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

The two most popular implementations for Lists are ArrayList and LinkedList. HashSet, TreeSet and LinkedHashSet are three Set implementations that are common and finally HashMap, TreeMap and LinkedHashMap are the three implementations for Map. When using either ArrayList or LinkedList, it's important to assess the performance you want for the program or software you're running. ArrayLists are much easier and faster while a LinkedList adds more options to add and remove elements. For Sets, a HashSet will be the most used unless you're looking for a sorted set of elements, then you would use TreeSet but it is much slower as opposed to HashSet, which is where the middle ground is picked up by LinkedHashSet. This is laid out exactly the same as Maps. HashMap for speed and no need for order, TreeMap for slow order and the LinkedHashMap for the middle ground.

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<https://www.javamadesoeasy.com/2016/02/difference-between-list-set-and-map-in.html#:~:text=List%20allows%20to%20store%20duplicate,allows%20duplicate%20values%20in%20java.>

2. <https://docs.oracle.com/javase/tutorial/collections/implementations/list.html>

3. <https://docs.oracle.com/javase/tutorial/collections/implementations/set.html>

4. <https://docs.oracle.com/javase/tutorial/collections/implementations/map.html>