Java APIs

Array

```
Arrays.binarySearch(arr, target) -> O(nlogn)
Arrays.sort()
Arrays.toString()
Arrays.asList(int[] arr) -> O(1) only accept object
Arrays.copyOf(originalArray, newLength) -> O(1)
Arrays.copyOfRange(originalArray, start, end) -> O(n)
comparable -> compareTo(secondNum)
```

ArrayList

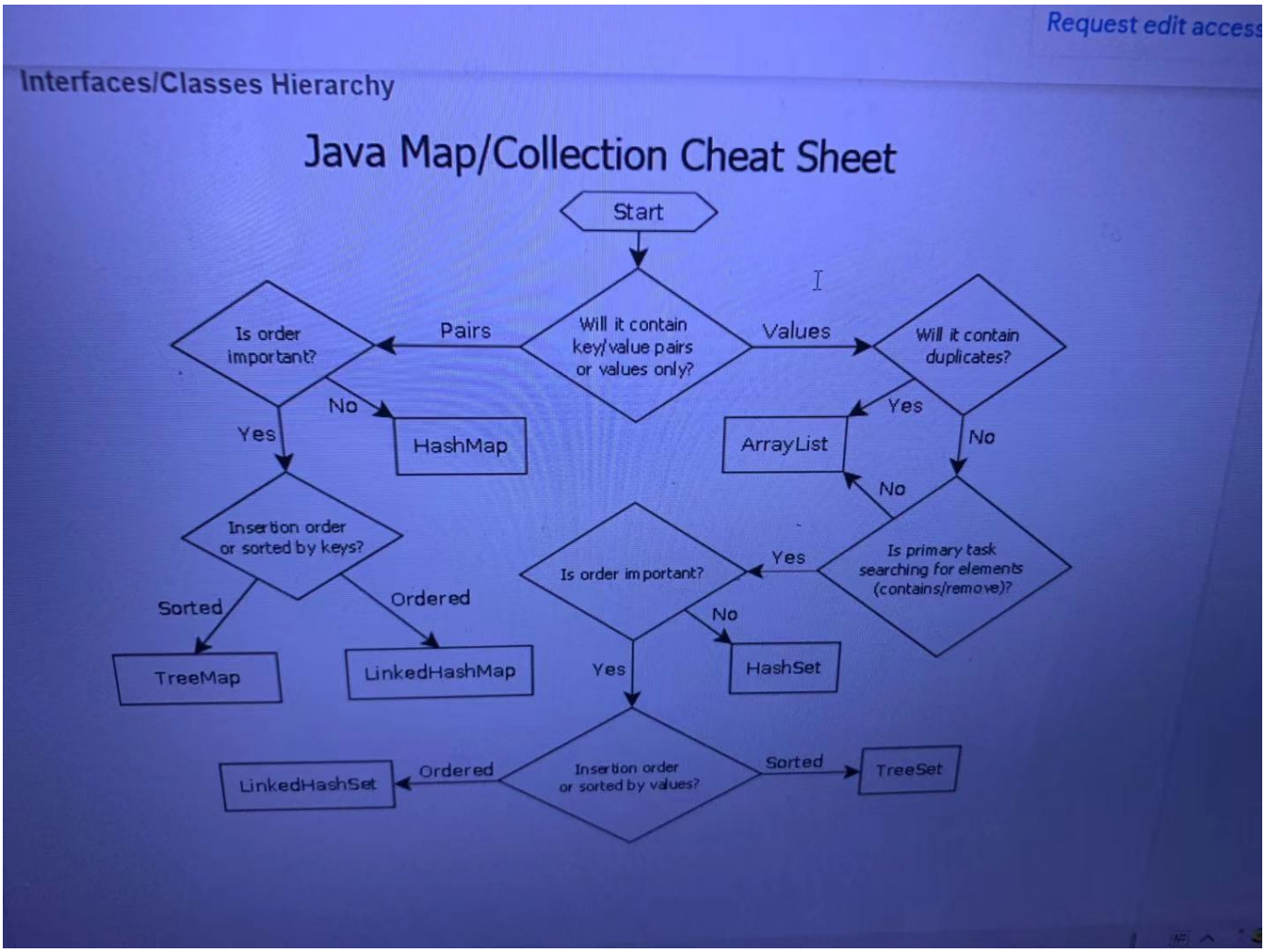
size-adjustable [ArrayList]: `List<X> list = new ArrayList<>();`

```
list.add(E e);
list.add(int index, E e); // random access
list.addAll(Collection c);
list.get(int index);
list.remove(int index);
list.remove(E e);
list.clear(); // faster than removeAll
list.set(int index, E e);
list.toArray(); // Object[]

Collections.sort(list, new myComparator());
Comparator -> compare(item1, item2);
Collectionis.reverse(list);
ArrayList.subList(start, end);
list.forEach(k -> sb.append(k));
```

HashMap

[HashMap]: `Map<String, Integer> map = new HashMap<>();`
`ImmutableMap<String, Integer> map = ImmutableMap.of(...);`



> - ordered map: LinkedHashMap
> - sorted map: SortedMap<String, Integer> map = new TreeMap<>()

```
map.get(key);
map.getOrDefault(key, defaultValue);

map.put(key, value);
map.putIfAbsent(key, value); // return null or current value

map.containsKey(key);
map.remove(key);

map.keySet()
map.values()
map.entrySet()

for (Map.Entry<String, Integer> entry : map.entrySet()) {
  String key = entry.getKey();
  Integer value = entry.getValue();
}

map.forEach((k, v) -> System.out.println(k + " " + v));
```

HashSet

[HashSet] `Set<Integer> set = new HashSet<>()`

> - ordered (by insertion): LinkedHashSet
> - sorted (object need comparator): TreeSet

```
set.add(key);
set.contains(key);
set.remove(key); // return true / false
set.toArray();
```

Integer

- Integer.parseInt(String)
- Integer.toString(number)

PriorityQueue / Heap

```
// min heap
Queue<X> minHeap = new PriorityQueue<>();

// max heap
Queue<X> maxHeap = new PriorityQueue<>(Collections.reverseOrder());
```

Deque

two end [queue]: `Deque<X> dq = new ArrayDeque<>();`

```
dp.offerFirst(E e); // offerLast(E e)
dp.pollFirst(); // pollLast()
dp.peekFirst(); // peekLast()
```

Queue

use a [queue]: `Queue<X> queue = new ArrayDeque<>();`
`Queue<X> queue = new LinkedList<>();`

```
// throw exception
queue.add(E e);
queue.remove();
queue.elements();

// return null
queue.offer(E e);
```

```
queue.poll();
queue.peek();
```

Stack

use a stack: `Deque<X> stack = new ArrayDeque<>();`
~~Stack stack = new Stack<>();~~

```
stack.push(E e); // stack.addFirst(E, e); throw exception
stack.pop(); // stack.removeFirst();
stack.peek(); // stack.getFirst();

// return null
stack.offerFirst(E e);
stack.pollFirst();
stack.peekFirst();
```

LinkedList

- getFirst() / peekFirst()
- getLast() / peekLast()
- addFirst(e) / offerFirst(e)
- removeFirst() / pollFirst()
- List<> list = new LinkedList<>();

String:

- s.length()
- s.isEmpty()
- s.equals(s2)
- s.contains("word") -> true/false
- s.indexOf(char)
- s.lastIndexOf(char)
- s.startsWith(str)
- s.endsWith(str)
- s.substring(start)
- s.substring(start, end)
- s.toCharArray()
- String s = new String(char[])
- s.split("/") -> String[]
- s.split(",");
- s.trim()
- s.replaceAll("[^A-Za-z\d]+", "").toLowerCase();
- String.valueOf(num); //int i=10; Now it will return "10"
- Integer.toString(number)
- String.join(",", char[]); "a,b,c"

StringBuilder

[StringBuilder] `StringBuilder sb = new StringBuilder()`

- contructor: (int capacity/ CharSequence seq / String str)
- sb.append('a' / char[] / int / boolean)
- sb.deleteCharAt(sb.length() - 1);
- sb.size()
- sb.insert(int index, char ch) -> O(n)
- sb.setLength(int newLength)
- sb.setCharAt(int index, char ch)
- CharSequence sb.subSequence(int start, int end)
- StringBuilder(sb).reverse().toString();

Character

- Character.toLowerCase(c)
- Character.isLetterOrDigit(c)

char

- string.charAt(index) - 'a' -> ASCII 128 char
- string.charAt(index) - '0' // char to int
- Character.toString(char c) // char -> String
- String.valueOf(char c) // char -> String
- (char) int + '0' // int to char

Collection

- Collections.binarySearch(collection, target)
- Collections.sort(list, new myComparator())
- Collections.reverse(arrayList)

Class Creation

Comparator

```
PriorityQueue<Integer> queue = new PriorityQueue<>
((a, b) -> b - a); // biggest pop first, 30 20 10
```

```
private class myComparator implements Comparator<Integer> {
    @Override
    public int compare(Integer i1, Integer i2) {
      if (i1.equals(i2)) {
        return 0;
      }
```

```
      return i1 > i2 ? -1 : 1;
    }
  }
```

```
Pair<Integer, String> pair = new Pair<>(1, "One");
  Integer key = pair.getKey();
  String value = pair.getValue();

private Object[] getPair() {
    // ...
    return new Object[] {key, value};
}
```