Java Methods Cheat Sheet for DSA Problems

String Methods

Basic Operations

- length() Returns the length of the string
- charAt(int index) Returns the character at the specified index
- substring(int beginIndex) Returns substring from beginIndex to end
- substring(int beginIndex, int endIndex) Returns substring from beginIndex to endIndex-1
- isEmpty() Checks if string length is 0
- toCharArray() Converts string to character array

String Comparison

- equals(Object obj) Case-sensitive comparison with another string
- equalsIgnoreCase(String str) Case-insensitive comparison
- compareTo(String str) Lexicographical comparison (returns int)
- startsWith(String prefix) Checks if string starts with prefix
- endsWith(String suffix) Checks if string ends with suffix
- contains (CharSequence seq) Checks if string contains sequence

String Modification

- toLowerCase() Converts to lowercase
- toUpperCase() Converts to uppercase
- trim() Removes whitespace from both ends
- replace(char oldChar, char newChar) Replaces all occurrences of a character
- replace(CharSequence target, CharSequence replacement) Replaces sequence
- replaceAll(String regex, String replacement) Replaces by regex pattern

Searching

- indexOf(String str) First occurrence of specified string
- indexOf(String str, int fromIndex) First occurrence from index

- lastIndexOf(String str) Last occurrence of specified string
- lastIndexOf(String str, int fromIndex) Last occurrence before index
- matches(String regex) Tells if string matches regex pattern

Splitting and Joining

- split(String regex) Splits string based on regex, returns array
- split(String regex, int limit) Splits with limit on array size
- join(CharSequence delimiter, CharSequence... elements) Joins elements with delimiter (static method)
- concat(String str) Concatenates another string

StringBuilder Methods

Basic Operations

- StringBuilder() Constructor creates empty builder with capacity 16
- StringBuilder(String str) Constructor with initial string
- length() Returns length (character count)
- capacity() Returns current capacity
- charAt(int index) Returns char at specified index
- substring(int start) Returns substring from start to end
- substring(int start, int end) Returns substring from start to end-1

Modification

- append(X x) Appends string representation of X (many overloads)
- insert(int offset, X x) Inserts string representation of X at position
- delete(int start, int end) Removes chars from start to end-1
- deleteCharAt(int index) Removes char at specified position
- replace(int start, int end, String str) Replaces substring
- setCharAt(int index, char ch) Sets char at specified position
- reverse() Reverses the sequence
- setLength(int newLength) Sets the length (truncates or adds null chars)
- toString() Converts to String

Arrays Methods (java.util.Arrays)

- Arrays.toString(array) Returns string representation of array
- Arrays.deepToString(Object[][] array) For multi-dimensional arrays

- Arrays.equals(array1, array2) Compares arrays for equality
- Arrays.deepEquals(Object[][] a1, Object[][] a2) For multi-dimensional arrays
- Arrays.hashCode(array) Returns hash code based on contents
- Arrays.deepHashCode(Object[][] array) For multi-dimensional arrays

Searching and Sorting

- Arrays.sort(array) Sorts array in ascending order
- Arrays.sort(array, int fromIndex, int toIndex) Sorts specified range
- Arrays.sort(array, Comparator<? super T> c) Sorts with custom comparator
- Arrays.binarySearch(array, key) Binary search on sorted array
- Arrays.binarySearch(array, fromIndex, toIndex, key) In specific range
- Arrays.fill(array, val) Fills entire array with specified value
- Arrays.fill(array, fromIndex, toIndex, val) Fills range with value

Array Conversion

- Arrays.asList(T... a) Converts array to fixed-size List
- Arrays.copyOf(original, newLength) Copies and possibly resizes
- Arrays.copyOfRange(original, from, to) Copies specified range

Java 8+ Enhancements

- Arrays.stream(array) Returns a sequential stream
- Arrays.parallelSort(array) Sorts using multiple threads

ArrayList (and List) Methods

- ArrayList<E>() Constructor creates empty list
- ArrayList<E>(Collection<? extends E> c) Constructor with collection
- size() Returns number of elements
- isEmpty() Checks if list contains no elements
- get(int index) Returns element at position
- set(int index, E element) Replaces element at position
- add(E e) Appends element to end
- add(int index, E element) Inserts element at position
- remove(int index) Removes element at position

- remove(Object o) Removes first occurrence of element
- clear() Removes all elements

Searching

- contains(Object o) Returns true if list contains element
- indexOf(Object o) Index of first occurrence or -1
- lastIndexOf(Object o) Index of last occurrence or -1

Bulk Operations

- addAll(Collection<? extends E> c) Appends all elements
- addAll(int index, Collection<? extends E> c) Inserts all at index
- removeAll(Collection<?> c) Removes all elements in c
- retainAll(Collection<?> c) Retains only elements in c
- containsAll(Collection<?> c) True if contains all elements

List Views

• subList(int fromIndex, int toIndex) - Returns view of portion

Java 8+ Enhancements

- stream() Returns a sequential Stream
- forEach(Consumer<? super E> action) Performs action for each element
- removeIf(Predicate<? super E> filter) Removes all elements matching predicate
- sort(Comparator<? super E> c) Sorts list with provided comparator

HashSet (and Set) Methods

Basic Operations

- HashSet<E>() Constructor creates empty set
- HashSet<E>(Collection<? extends E> c) Constructor with collection
- size() Returns number of elements
- isEmpty() Checks if set contains no elements
- add(E e) Adds element if not present (returns boolean)
- remove(Object o) Removes element if present
- clear() Removes all elements
- contains(Object o) Returns true if set contains element

Bulk Operations

- addAll(Collection<? extends E> c) Adds all elements
- removeAll(Collection<?> c) Removes all elements in c
- retainAll(Collection<?> c) Retains only elements in c
- containsAll(Collection<?> c) True if contains all elements

Iteration

iterator() - Returns iterator over elements

Java 8+ Enhancements

- stream() Returns a sequential Stream
- forEach(Consumer<? super E> action) Performs action for each element
- removeIf(Predicate<? super E> filter) Removes all elements matching predicate

HashMap (and Map) Methods

Basic Operations

- HashMap<K, V>() Constructor creates empty map
- HashMap<K, V>(Map<? extends K, ? extends V> m) Constructor with map
- size() Returns number of key-value mappings
- isEmpty() Checks if map contains no mappings
- put(K key, V value) Associates key with value
- get(Object key) Returns value for key or null
- getOrDefault(Object key, V defaultValue) Returns value or default
- remove(Object key) Removes mapping for key
- clear() Removes all mappings

Checking Map Contents

- containsKey(Object key) True if map contains key
- containsValue(Object value) True if map maps to value

Bulk Operations

- putAll(Map<? extends K, ? extends V> m) Copies all mappings
- putIfAbsent(K key, V value) Adds mapping if key not present

Map Views

keySet() - Returns Set view of keys

- values() Returns Collection view of values
- entrySet() Returns Set view of mappings

Java 8+ Enhancements

- forEach(BiConsumer<? super K, ? super V> action) Performs action for each entry
- replaceAll(BiFunction<? super K, ? super V, ? extends V> function) - Replaces all values
- compute(K key, BiFunction<? super K, ? super V, ? extends V> remappingFunction) - Computes value
- computeIfAbsent(K key, Function<? super K, ? extends V> mappingFunction) If key absent
- computeIfPresent(K key, BiFunction<? super K, ? super V, ? extends V> remappingFunction) - If key present
- merge(K key, V value, BiFunction<? super V, ? super V, ? extends V> remappingFunction) - Merges values

Queue and PriorityQueue Methods

Basic Operations

- add(E e) / offer(E e) Adds element to gueue (returns boolean)
- remove() / poll() Removes and returns head (poll returns null if empty)
- element() / peek() Retrieves head without removing (peek returns null if empty)
- size() Returns number of elements
- isEmpty() Checks if queue is empty

PriorityQueue Specific

- PriorityQueue<E>() Default min heap
- PriorityQueue<E>(Comparator<? super E> comparator) Custom ordering

Stack Methods

- push(E item) Pushes item onto top of stack
- pop() Removes and returns top item
- peek() Returns top item without removing
- empty() Tests if stack is empty
- search(Object o) Returns position of object (1-based)

Deque Methods (LinkedList, ArrayDeque)

- addFirst(E e) / offerFirst(E e) Inserts at front
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