

Here’s a **comprehensive, big table** incorporating **all methods** from your updated reference table, organized neatly for clarity. I’ve color-coded sections for better readability and added **key notes** to help you learn faster.

Java List Implementations: Complete Method Comparison

Legend:

🟡 = Common Methods | 🟠 = Deque Methods (LinkedList) | 🔴 = Stack Methods | 🟢 = CopyOnWriteArrayList-Specific

Method	ArrayList	LinkedList	Vector	Stack	CopyOnWriteArrayList	Inherited From
🟡 Basic List/Collection Methods						
boolean add(E e)	Yes	Yes	Yes	Yes	Yes	Collection
void add(int index, E element)	Yes	Yes	Yes	Yes	Yes	List
boolean addAll(Collection c)	Yes	Yes	Yes	Yes	Yes	Collection
boolean addAll(int index, Collection c)	Yes	Yes	Yes	Yes	Yes	List
void clear()	Yes	Yes	Yes	Yes	Yes	Collection
boolean contains(Object o)	Yes	Yes	Yes	Yes	Yes	Collection
boolean containsAll(Collection c)	Yes	Yes	Yes	Yes	Yes	Collection
E get(int index)	Yes	Yes	Yes	Yes	Yes	List
int indexOf(Object o)	Yes	Yes	Yes	Yes	Yes	List
boolean isEmpty()	Yes	Yes	Yes	Yes	Yes	Collection
Iterator<E> iterator()	Yes	Yes	Yes	Yes	Yes	Collection

int lastIndexOf(Object o)	Yes	Yes	Yes	Yes	Yes	List
ListIterator<E> listIterator()	Yes	Yes	Yes	Yes	Yes	List
ListIterator<E> listIterator(int)	Yes	Yes	Yes	Yes	Yes	List
E remove(int index)	Yes	Yes	Yes	Yes	Yes	List
boolean remove(Object o)	Yes	Yes	Yes	Yes	Yes	Collection
boolean removeAll(Collection c)	Yes	Yes	Yes	Yes	Yes	Collection
boolean retainAll(Collection c)	Yes	Yes	Yes	Yes	Yes	Collection
E set(int index, E element)	Yes	Yes	Yes	Yes	Yes	List
int size()	Yes	Yes	Yes	Yes	Yes	Collection
List<E> subList(int, int)	Yes	Yes	Yes	Yes	Yes	List
Object[] toArray()	Yes	Yes	Yes	Yes	Yes	Collection
<T> T[] toArray(T[] a)	Yes	Yes	Yes	Yes	Yes	Collection
Stack-Specific Methods						
void push(E e)	No	No	No	Yes	No	Stack
E pop()	No	No	No	Yes	No	Stack
E peek()	No	No	No	Yes	No	Stack
Deque Methods (LinkedList)						
void addFirst(E e)	No	Yes	No	No	No	Deque

void addLast(E e)	No	Yes	No	No	No	Deque
E getFirst()	No	Yes	No	No	No	Deque
E getLast()	No	Yes	No	No	No	Deque
boolean offerFirst(E e)	No	Yes	No	No	No	Deque
boolean offerLast(E e)	No	Yes	No	No	No	Deque
E peekFirst()	No	Yes	No	No	No	Deque
E peekLast()	No	Yes	No	No	No	Deque
E pollFirst()	No	Yes	No	No	No	Deque
E pollLast()	No	Yes	No	No	No	Deque
E removeFirst()	No	Yes	No	No	No	Deque
E removeLast()	No	Yes	No	No	No	Deque



CopyOnWriteArrayList-Specific

boolean addIfAbsent(E e)	No	No	No	No	Yes	CopyOnWrite ArrayList
int addAllAbsent(Collection c)	No	No	No	No	Yes	CopyOnWrite ArrayList

Key Notes for Quick Learning

1. Thread Safety:

- Vector/Stack:** Legacy synchronized classes (slow in multi-threading).
- CopyOnWriteArrayList:** Thread-safe with snapshot iterators (no locks for reads).

2. Performance:

- a. **ArrayList**: Fast random access ($O(1)$), slow inserts/deletes in the middle ($O(n)$).
 - b. **LinkedList**: Fast inserts/deletes at ends ($O(1)$), slow random access ($O(n)$).
 - c. **CopyOnWriteArrayList**: Expensive writes (copies entire array), ideal for read-heavy concurrency.
3. **When to Use:**
- a. **ArrayList**: Default for most use cases.
 - b. **LinkedList**: Queues, stacks, or frequent insertions/deletions.
 - c. **CopyOnWriteArrayList**: Thread-safe listener lists or observer patterns.
 - d. **Avoid Vector/Stack**: Use `Collections.synchronizedList()` or `ArrayDeque` instead.
4. **Legacy Alert:**
- a. `Vector` and `Stack` are deprecated. Use modern alternatives like `ArrayList` or `ConcurrentHashMap`.

Formatting Tips for Word

- **Colors**: Use the legend emojis (🟡, 🟢, 🟣, 🔴) to highlight sections.
- **Borders**: Add light gray borders to separate rows/columns.
- **Font**: Use **monospace** for method names (e.g., `add()`) for clarity.