# Time Complexity Comparison

* **Linear Search**:
  + Best case: O(1) (first element)
  + Average case: O(n)
  + Worst case: O(n) (last element or not present)
* **Binary Search**:
  + Best case: O(1) (middle element)
  + Average case: O(log n)

# Algorithm suitability

For an e-commerce platform:

* **Binary search** is more efficient (O(log n) vs O(n)) but requires:
  + The array to be sorted (adds O(n log n) sorting overhead)
  + Random access to elements (works well with arrays)
* **Linear search** is simpler but less efficient for large datasets

**Recommendation**:

* Use binary search for product searches by ID (since IDs can be sorted)
* Maintain products sorted by ID to enable binary search
* For searches by other fields (name, category) where sorting isn't maintained, use linear search or consider more advanced data structures like hash tables or search trees