How to Select Appropriate Data Structure

MAP

Map Key to Value? — NO →

Preserve order? — NO → **HashMap** — not ordered / maps Key to Value

YES ↓

Sort? — NO → **LinkedHashMap** — preserves insertion order / maps Key to Value

YES ↓

TreeMap — sorted by Key / maps Key to Value

LIST

Duplicate Values? — NO →

YES ↓

Mostly accesses at start / end? — NO → ArrayList

YES ↓

Significant size? — NO → ArrayList

YES ↓

Often inserts or removes? — NO → **ArrayList** — slow add/remove at head / fast access by index / memory efficient

YES ↓

LinkedList — fast add/remove at head / slow access by index / memory extensive

SET

Preserve order? — NO → **HashSet** — not ordered / unique values

YES ↓

Sort? — NO → **LinkedHashSet** — preserves insertion order / unique values

YES ↓

TreeSet — sorted / unique values