

# Radix Sort

## 3. Radix Sort

- **Why Important:** Radix Sort is a **non-comparative sorting algorithm** and is faster than QuickSort for integers or fixed-length data types (e.g., IDs, bitmasks). Its complexity is  **$O(N)$**  for small key ranges.
- **Where It's Useful:**
  - Sorting **IDs** for mesh vertices, bones, or texture indices.
  - **Animation Frames:** Sorting animation data with frame indices for playback.
  - Sorting **LOD levels** (Level of Detail) or objects by distance efficiently.

### Why Radix Sort?:

- It's very fast for **fixed-size keys** (integers or floats converted into fixed-size keys), which are common in graphics.

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