

The Irish Rover

$$1 = C$$

Traditional Irish Folksong

Diagram illustrating the merge sort process on the array [1, 3, 4, 5]:

- Initial Array:** [1, 3, 4, 5]
- Splitting Phase:**
 - Array is split into [1] and [3, 4, 5].
 - [3, 4, 5] is split into [3] and [4, 5].
 - [4, 5] is split into [4] and [5].
- Merging Phase:**
 - [4] and [5] are merged into [4, 5].
 - [3] and [4, 5] are merged into [3, 4, 5].
 - [1] and [3, 4, 5] are merged into the final sorted array [1, 3, 4, 5].

The four diagrams illustrate the step-by-step construction of a Huffman tree:

- Diagram 1:** Shows the initial frequencies: 1, 1, 2, 3, 2, 1, 2, 2, 7, 5, 5. The nodes are arranged in a sequence, with the two smallest nodes (1 and 1) highlighted in red.
- Diagram 2:** Shows the first merge: the two smallest nodes (1 and 1) are combined into a new parent node (2). The nodes are now: 2, 2, 3, 2, 1, 2, 2, 7, 5, 5.
- Diagram 3:** Shows the second merge: the two smallest nodes (1 and 2) are combined into a new parent node (3). The nodes are now: 3, 2, 2, 3, 2, 2, 7, 5, 5.
- Diagram 4:** Shows the third merge: the two smallest nodes (2 and 2) are combined into a new parent node (4). The nodes are now: 4, 3, 2, 3, 2, 7, 5, 5.

The diagram illustrates the decomposition of the tensor product of two irreducible representations of $SU(5)$ into irreducible components. The top row shows the decomposition of the product of the 1 and 4 representations, and the bottom row shows the decomposition of the product of the $1/5$ and 5 representations. The components are represented by colored boxes with their dimensions inside, and the total dimension of each product is shown in a larger box on the right.

Top Row (1 ⊗ 4):

- 1 (blue box)
- 5 (orange box)
- 10 (green box)
- 15 (red box)
- 20 (purple box)
- Total dimension: 20

Bottom Row ($1/5 \otimes 5$):

- 1 (blue box)
- 5 (orange box)
- 10 (green box)
- 15 (red box)
- 20 (purple box)
- Total dimension: 20