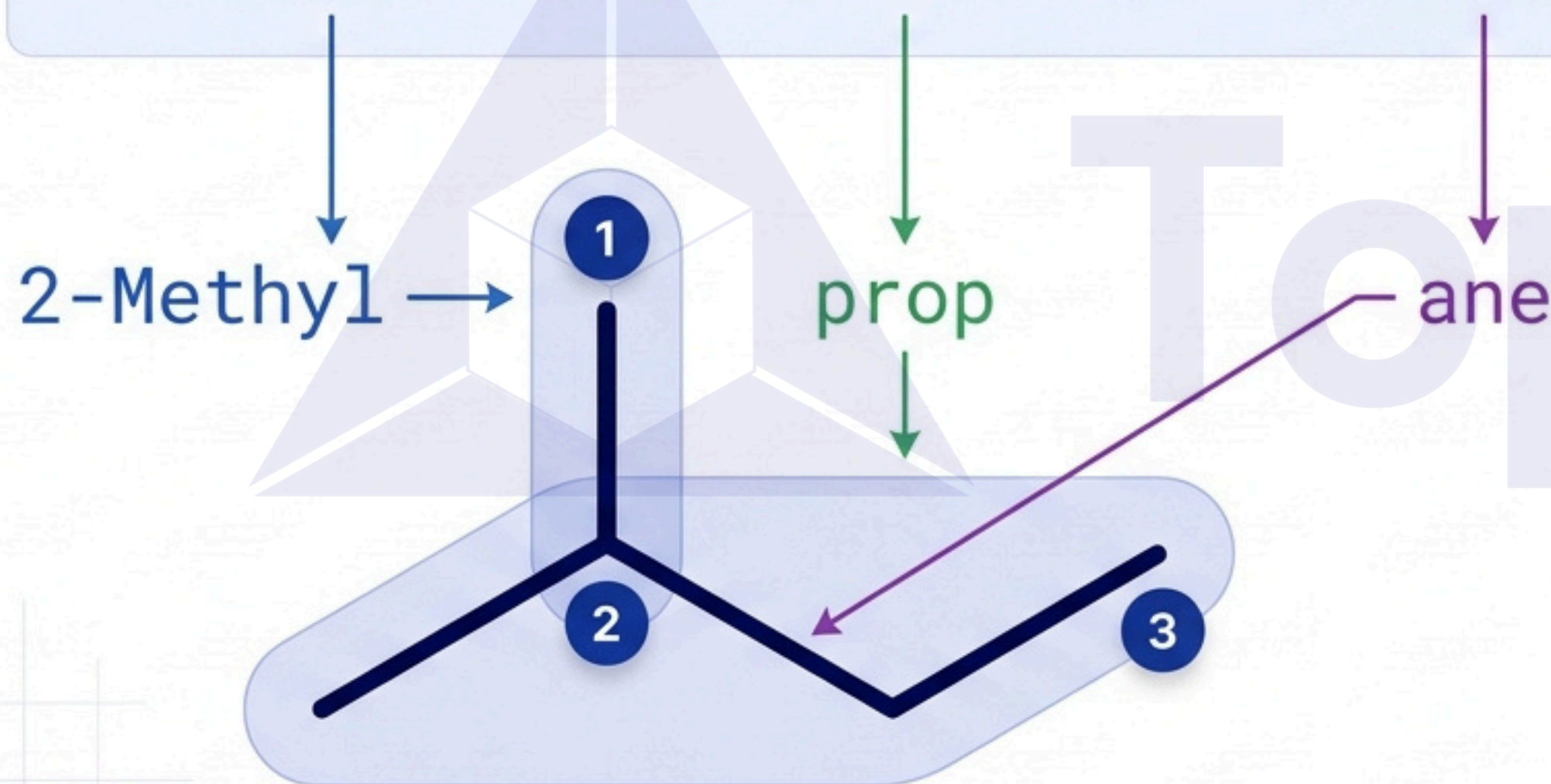


The Architecture of an IUPAC Name

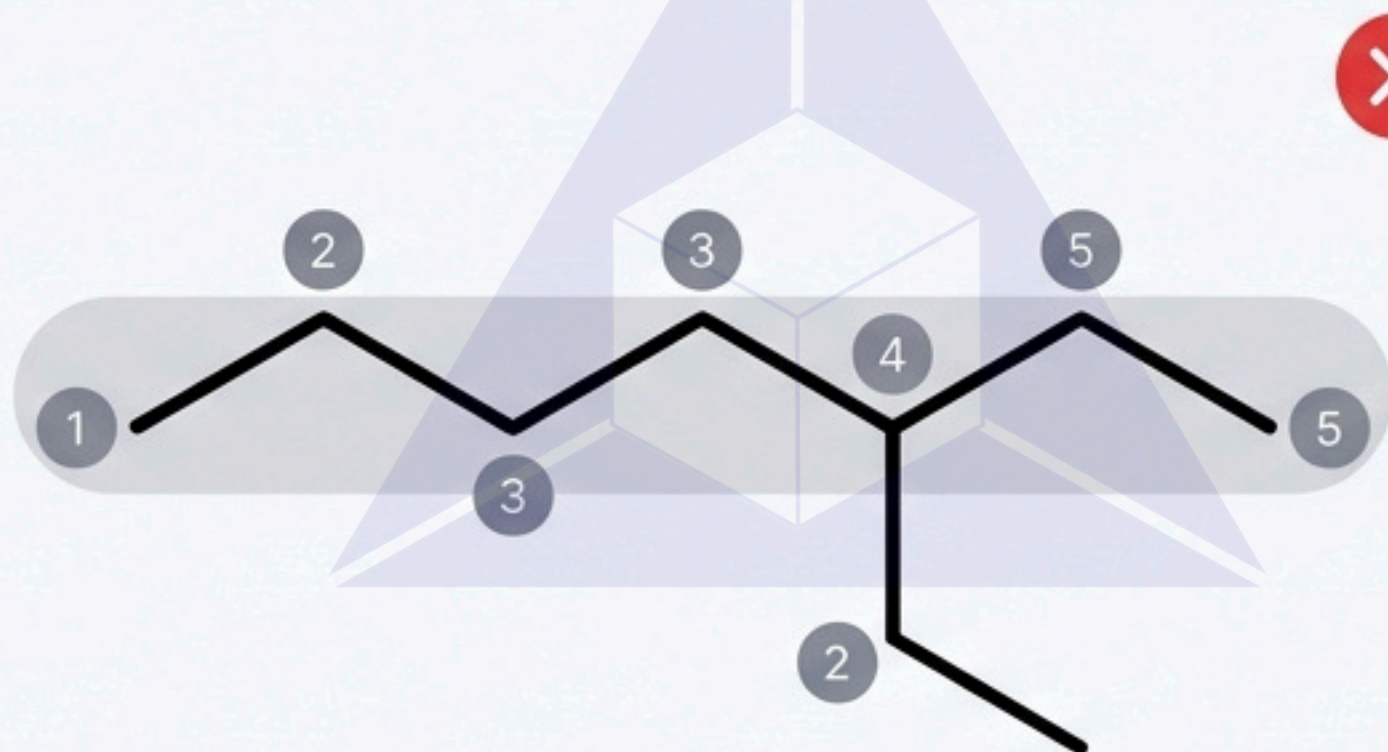
[Prefix] + [Word Root] + [Suffix] = IUPAC Name



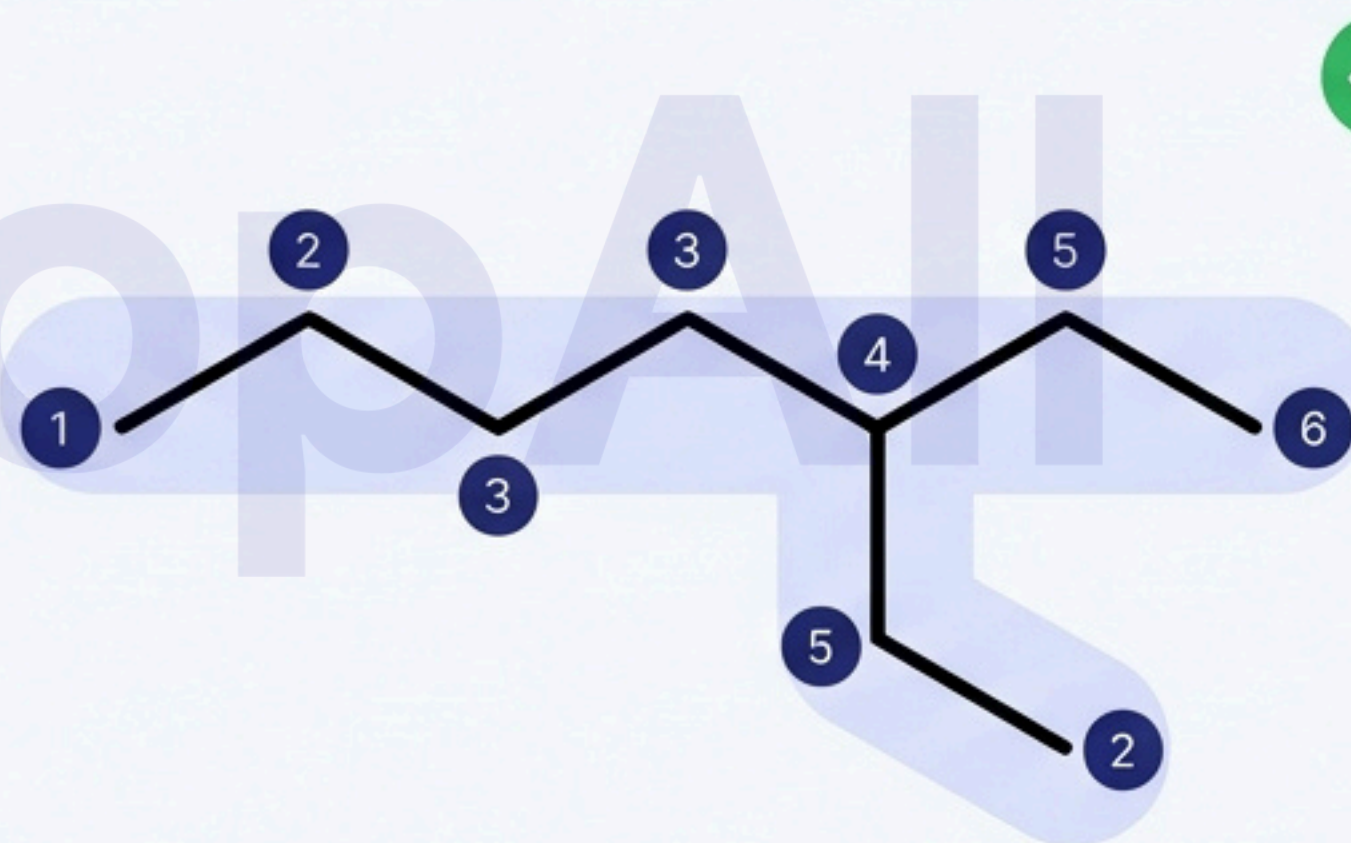
Organic nomenclature is a sequential algorithm. Execute the following 5 rules to generate the precise name for any branched alkane.

Step 1: Isolate the Longest Chain

The parent chain is the longest continuous sequence of carbon atoms. It does not have to be drawn in a straight horizontal line.

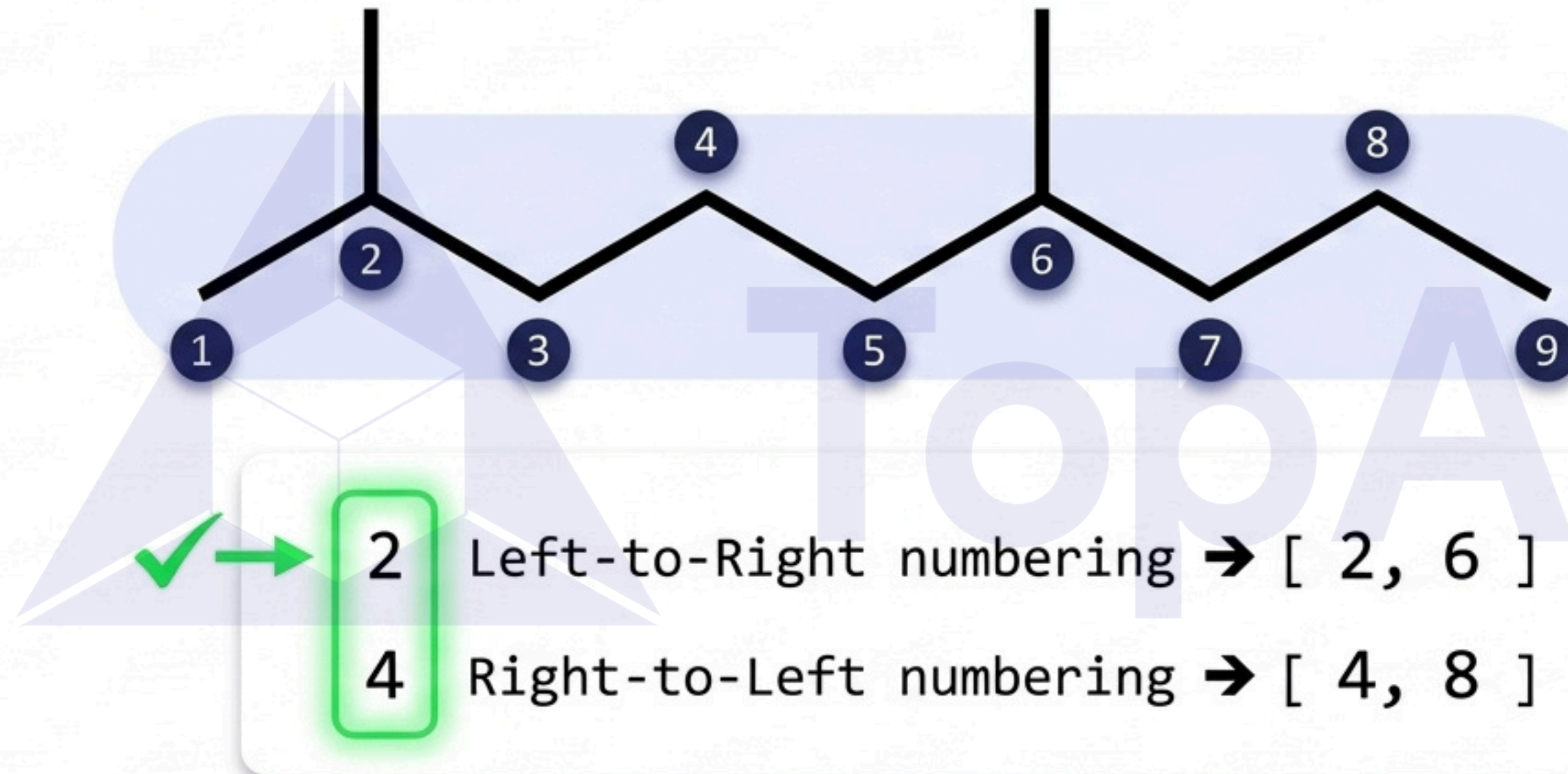


Incorrect: 5 Carbons (Misses the bend)



Correct: 6 Carbons (The true parent chain)

Step 2: The Lowest Locant Array



Compare locants position by position. The correct numbering direction provides the lower number at the first point of difference.



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$$E=mc^2$$



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Key Highlights

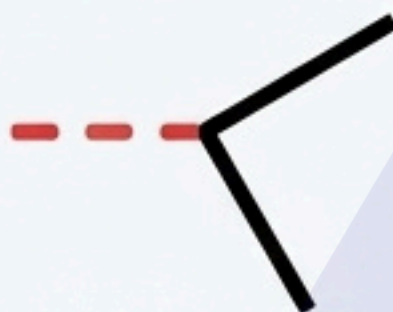
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Step 3: The Alkyl Substituents Matrix

Alkyl groups drop the '-ane' suffix and gain '-yl'.

Methyl



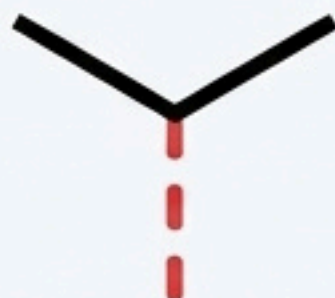
Ethyl



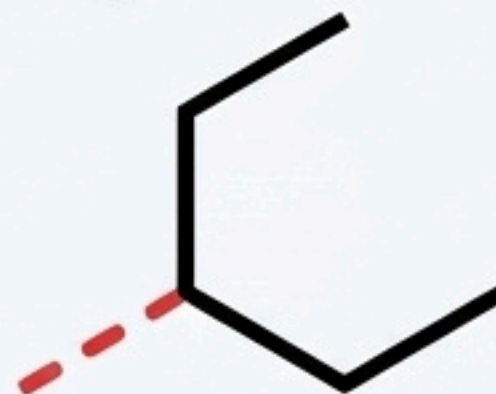
n-Propyl



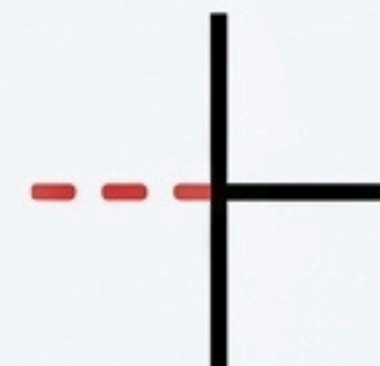
Isopropyl



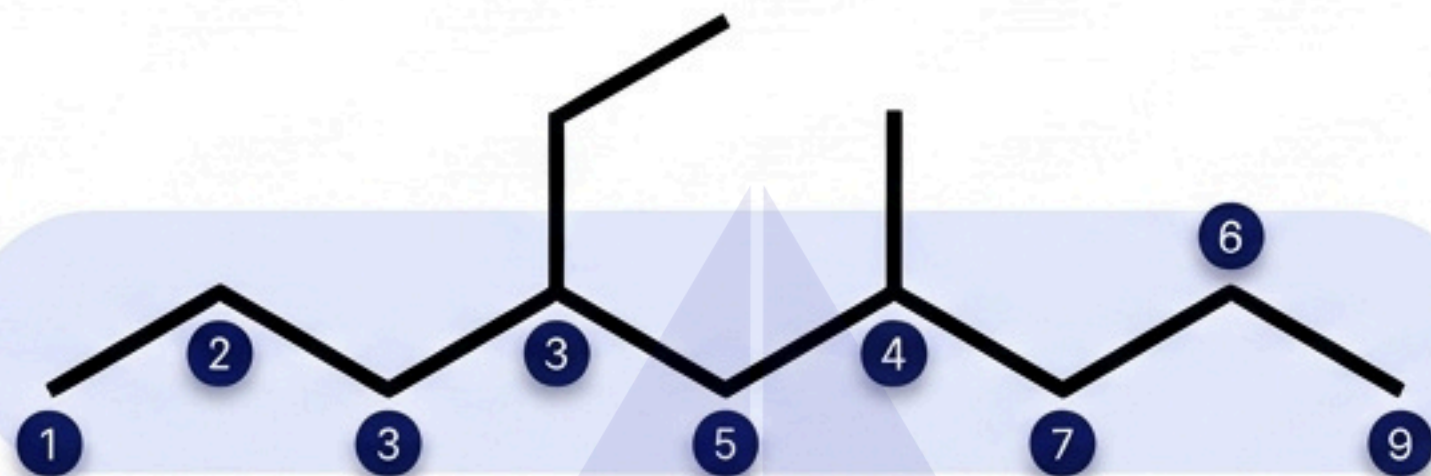
sec-Butyl



tert-Butyl



Step 4: Alphabetical Sorting & Tie-Breakers

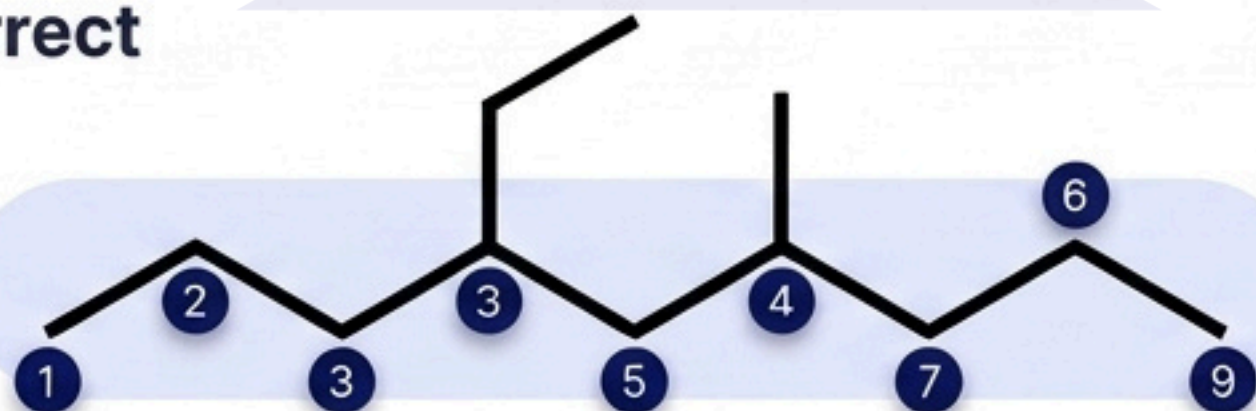


[**E**thyl] comes before [**M**ethyl]

Result: 3-Ethyl-4-methylhexane

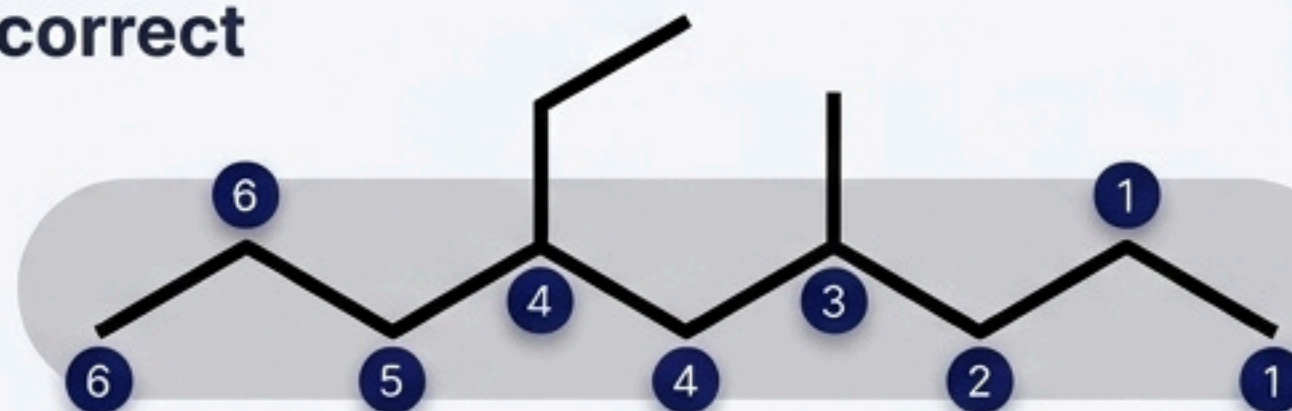
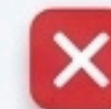
If numbering from either end gives identical locant sets, assign the lower number to the substituent cited first alphabetically.

Correct



Correct: 3-Ethyl-4-methylhexane

Incorrect



Incorrect: 4-Ethyl-3-methylhexane

Step 5: Multipliers & The Alphabetical Exceptions

Standardizing multiple groups and applying alphabetical filtering rules.

Rule 1: Identical Groups

2 groups = di

3 groups = tri

4 groups = tetra

3-ethyl-4,4-dimethylheptane

└─ [ethyl] vs [dimethyl]

→ [ethyl] vs [~~tri~~-dimethyl]

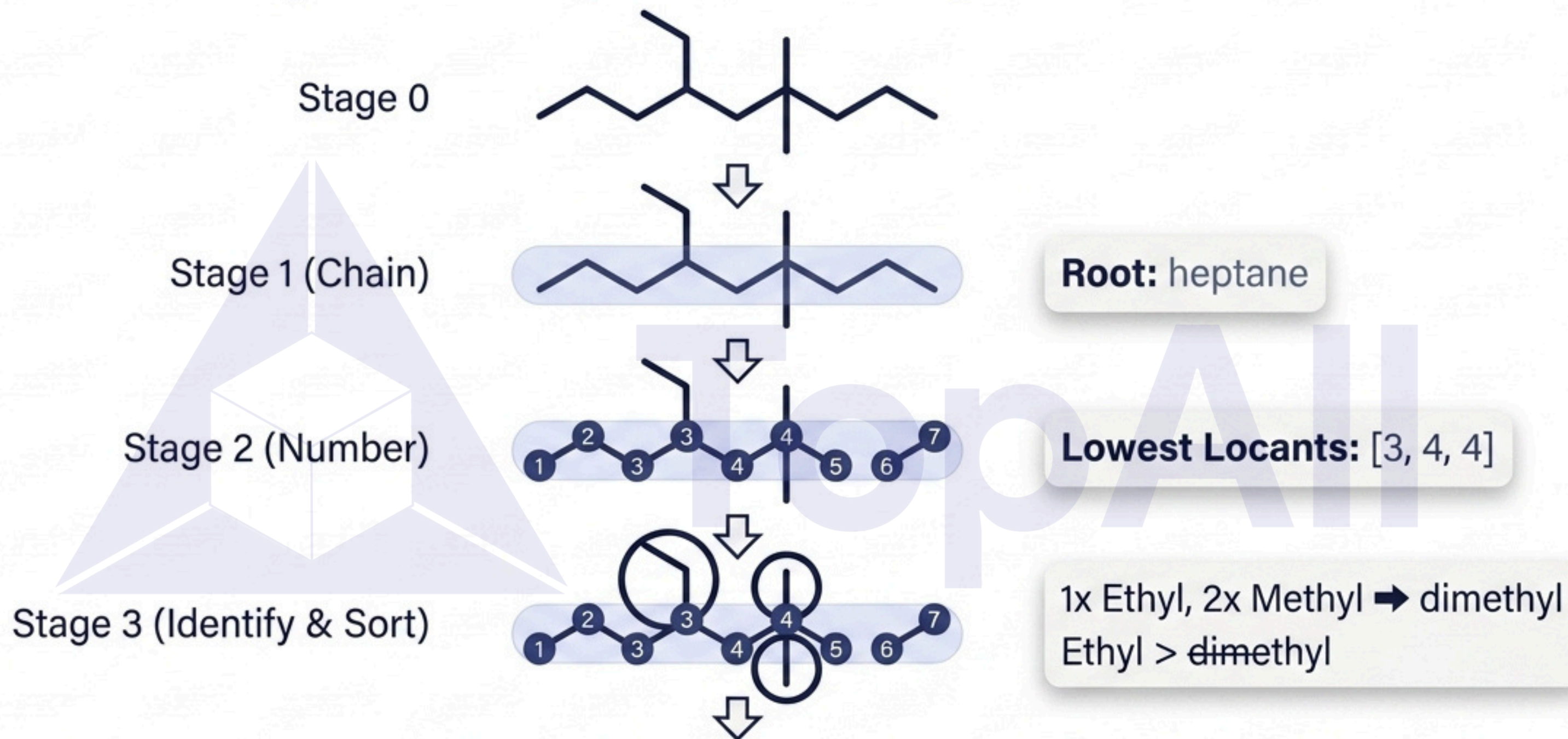
e > m

The Exclusion Matrix

IGNORED for A-Z sorting: di, tri, tetra, sec, tert

COUNTED for A-Z sorting: iso, neo

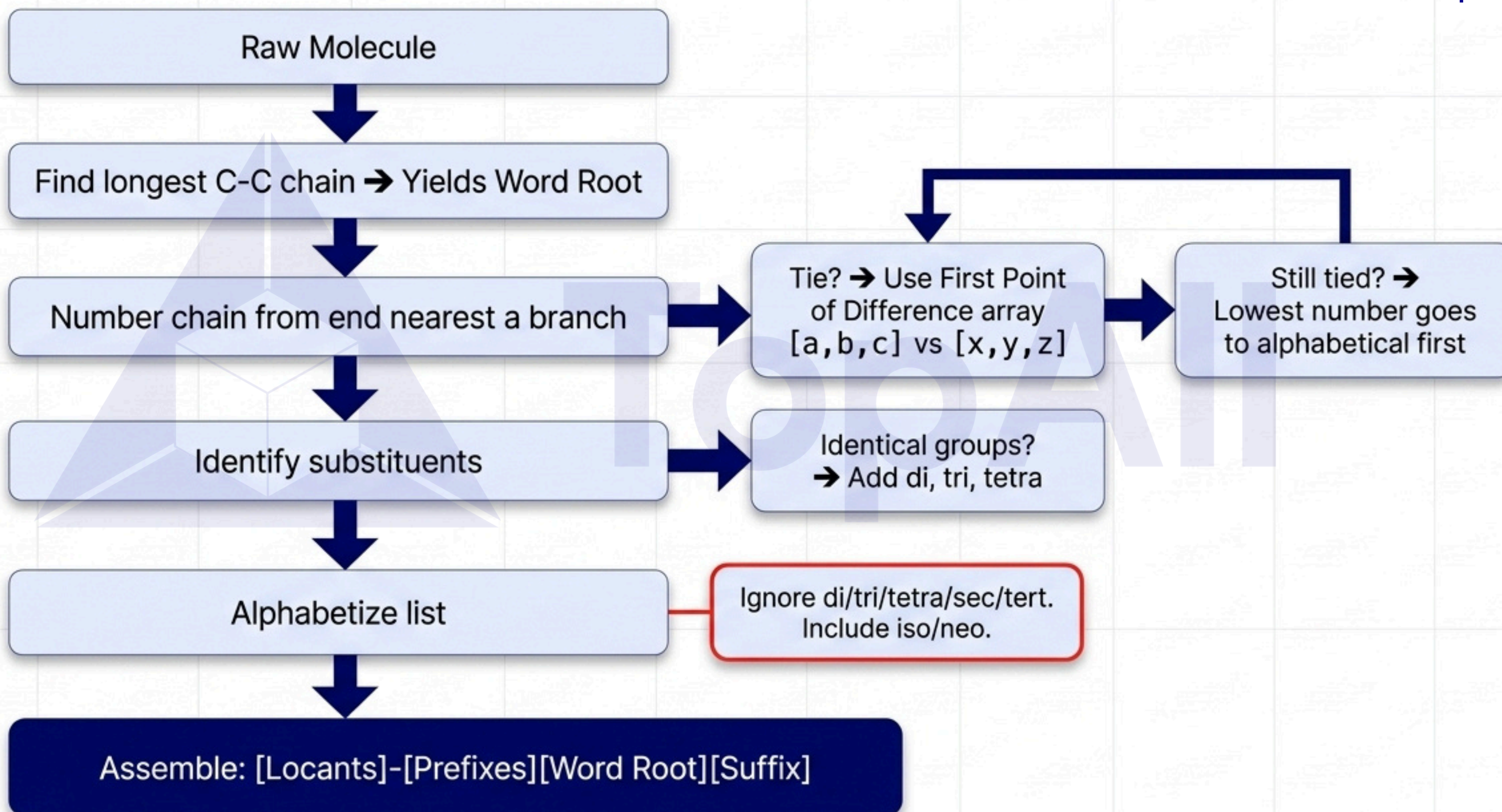
The Assembly Line: Synthesizing the Name



Final Stage

3-Ethyl-4,4-dimethylheptane

Revision Frame: The IUPAC Algorithm





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