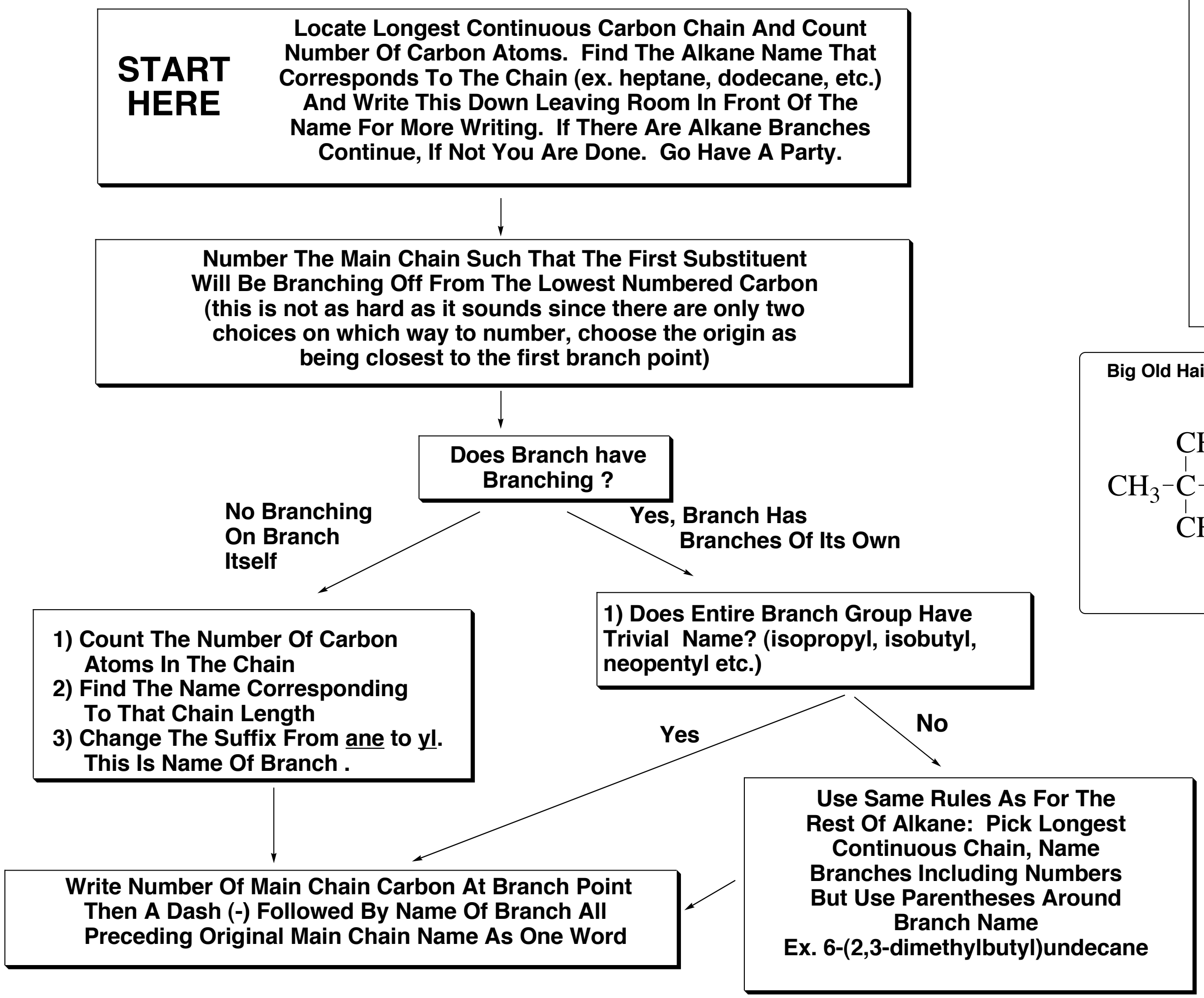
IUPAC PROCEDURE FOR NAMING ALKANES

Before you begin you must:
1) Memorize alkane chain names (Table 2.1)
2) Memorize substituent names (Tables 2.2 and 2.3)
[I apologize on behalf of all chemists for the crazy names you have to memorize. I wish I knew an easier way, but I do not]



START HERE

Locate Longest Continuous Carbon Chain And Count Number Of Carbon Atoms. Find The Alkane Name That Corresponds To The Chain (ex. heptane, dodecane, etc.) And Write This Down Leaving Room In Front Of The Name For More Writing. If There Are Alkane Branches Continue, If Not You Are Done. Go Have A Party.

Number The Main Chain Such That The First Substituent Will Be Branching Off From The Lowest Numbered Carbon (this is not as hard as it sounds since there are only two choices on which way to number, choose the origin as being closest to the first branch point)

Does Branch have Branching ?

No Branching On Branch Itself

1) Count The Number Of Carbon Atoms In The Chain
2) Find The Name Corresponding To That Chain Length
3) Change The Suffix From <u>ane</u> to <u>yl</u>. This Is Name Of Branch .

Yes, Branch Has Branches Of Its Own

1) Does Entire Branch Group Have Trivial Name? (isopropyl, isobutyl, neopentyl etc.)

Yes

No

Use Same Rules As For The Rest Of Alkane: Pick Longest Continuous Chain, Name Branches Including Numbers But Use Parentheses Around Branch Name
Ex. 6-(2,3-dimethylbutyl)undecane

Write Number Of Main Chain Carbon At Branch Point Then A Dash (-) Followed By Name Of Branch All Preceding Original Main Chain Name As One Word

ADDITIONAL RULES

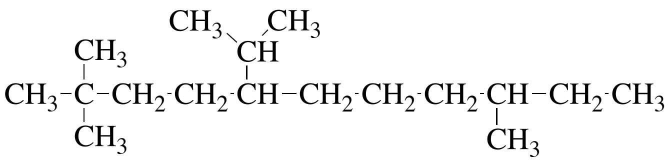
1) If A Molecule Contains Two Of The Same Branching Alkyl Groups Use The Prefix <u>di</u>, If Three Use <u>tri</u>, If Four Use <u>tetra</u>, If Five Use <u>penta</u>, If Six Use <u>hexa</u> etc.
Ex. 2,3,4-trimethylhexane

2) If Structure Has A Ring That Has More Carbon Atoms Than Any Other Open Chain, The Main Chain <u>Is The Ring</u> And Is Named By Adding <u>cyclo</u> To The Name Of The Alkane With The Same Number Of Carbon Atoms As The Ring. The Rest Is The Same As For Normal Alkane
Ex. 1,2-dimethylcyclohexane

3) If More Than One Branch, List Them In Alphabetical Order, NOT Numerical Order.
Ex. 5-ethyl-3,4-diisopropyl-7-methyldecane

4) DO NOT Include The Italicized Prefixes *n-*, *sec-*, And *tert-* OR The Mulitplying Prefixes di, tri, tetra, etc. When Alphabetizing Simple Substitutents. All Other Prefixes (iso, neo, etc.) Are Included When Alphabetizing Simple Substituents. No Need To Argue, I Did Not Invent TheseRules!
Ex. 5-*tert*-butyl-2-methyldecane

Big Old Hairy Example:



$$CH_3-\underset{CH_3}{\overset{CH_3}{C}}-CH_2-CH_2-\overset{CH_3\ \ CH_3}{\overset{\diagdown\ \diagup}{\overset{CH}{\overset{|}{CH}}}}-CH_2-CH_2-CH_2-\underset{CH_3}{CH}-CH_2-CH_3$$

5-isopropyl-2,2,9-trimethylundecane