

Alpha Diversity Method 3

- **Chao1**

- S_{obs} = total observed species
- F_1 = number of singletons
- F_2 = number of doubletons

$$chao1 = S_{obs} + \frac{F_1^2}{2F_2}$$

Alpha Diversity Method 4

- **Faith's Phylogenetic Diversity** (PD_whole_tree)
- Sum up the length of all branches in phylogenetic tree
- If a species is close to another species...
- If a species is far from any species in the tree...

Alpha Diversity Method 3

- **Chao1**

$$chao1 = S_{obs} + \frac{F_1^2}{2F_2}$$

- S_{obs} = total observed species
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