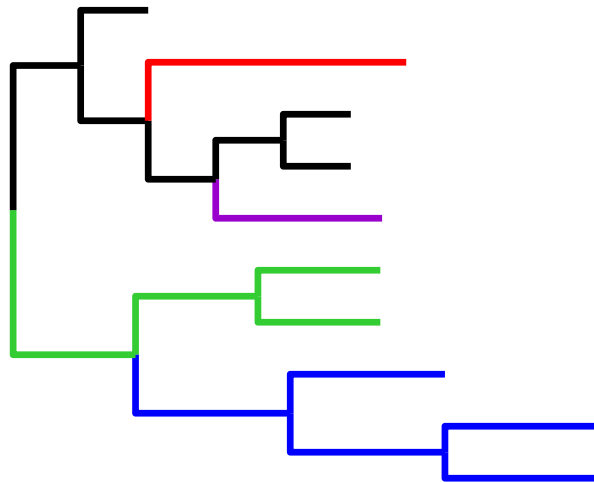


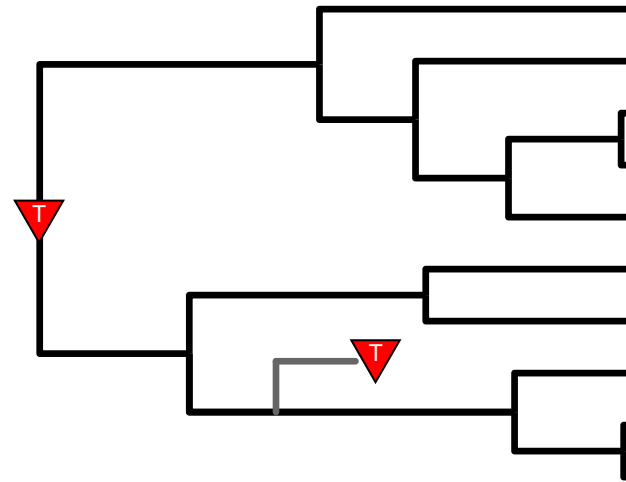
Branch lengths = SUBSTITUTION RATE X TIME

Unconstrained analyses estimate branch lengths as a product of rate and time



Branch lengths = SUBSTITUTION RATE

Divergence time estimation requires a model of among-lineage substitution rate variation to tease apart rate and time



Branch lengths = TIME

Fossils and other geological dates can be used to calibrate divergence time analyses and produce estimates of node ages in absolute time.