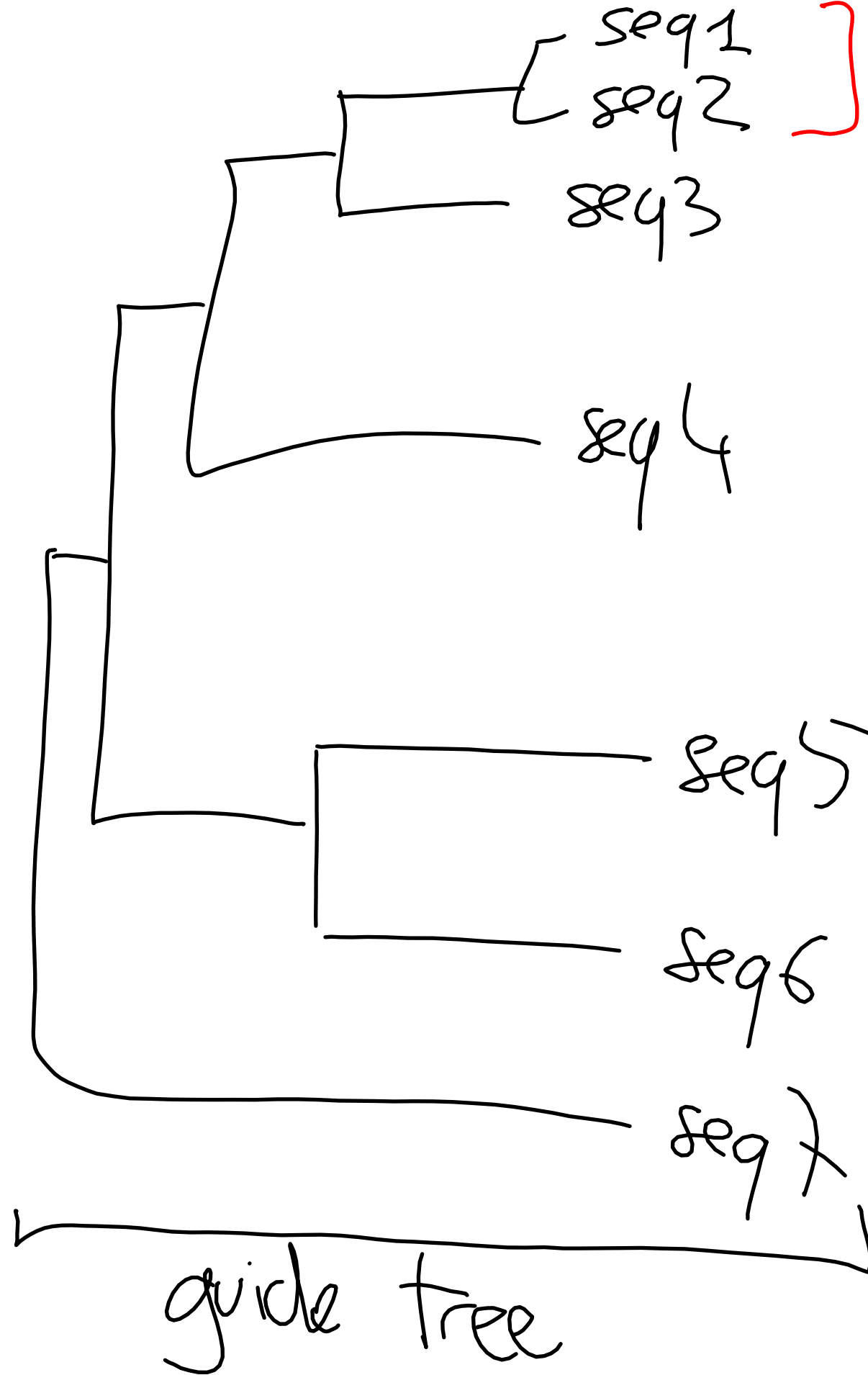
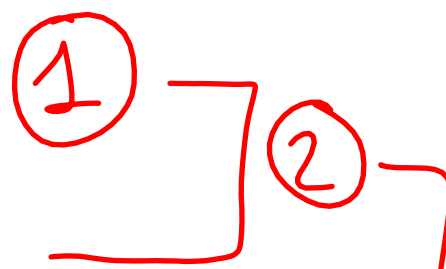


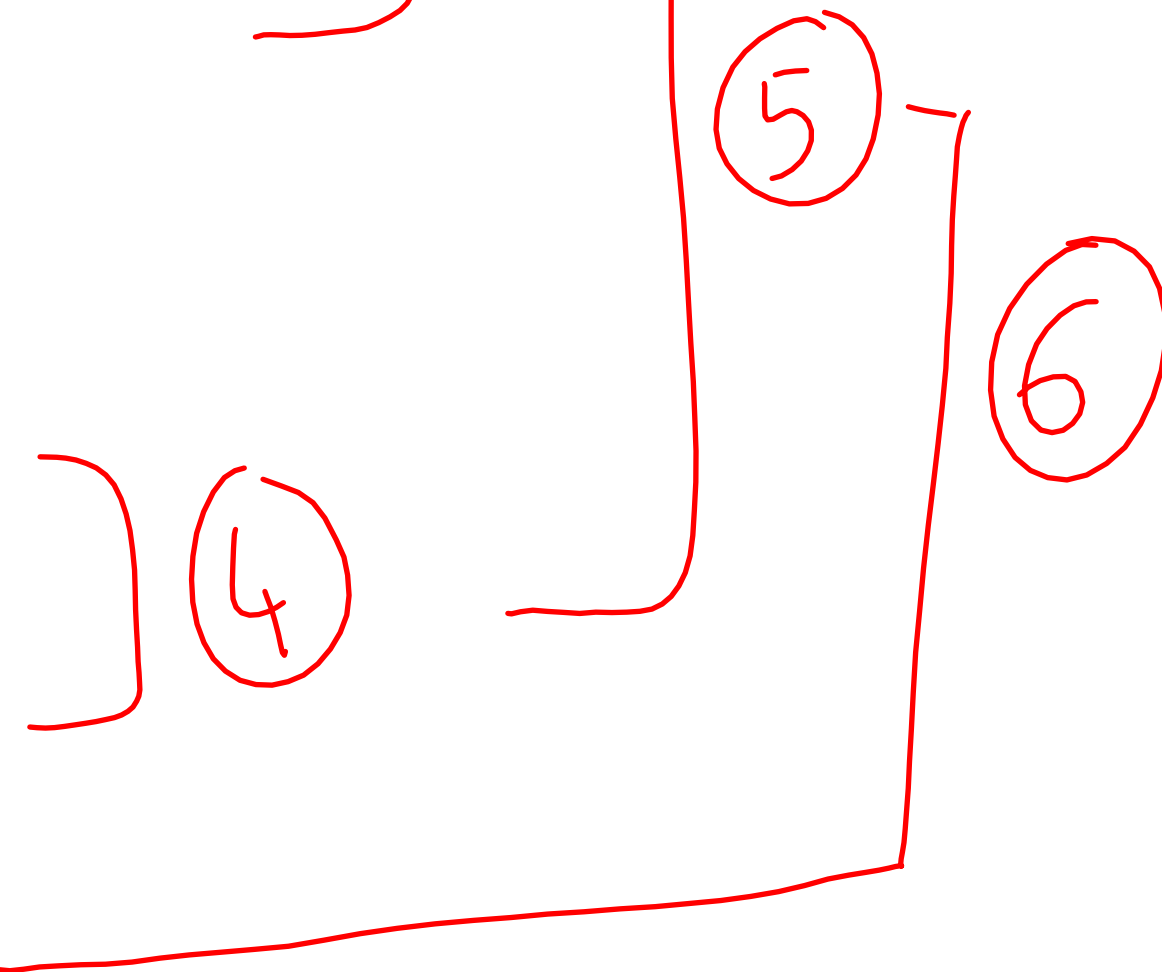
# ALIGNMENTS (PAIRWISE)



guide tree



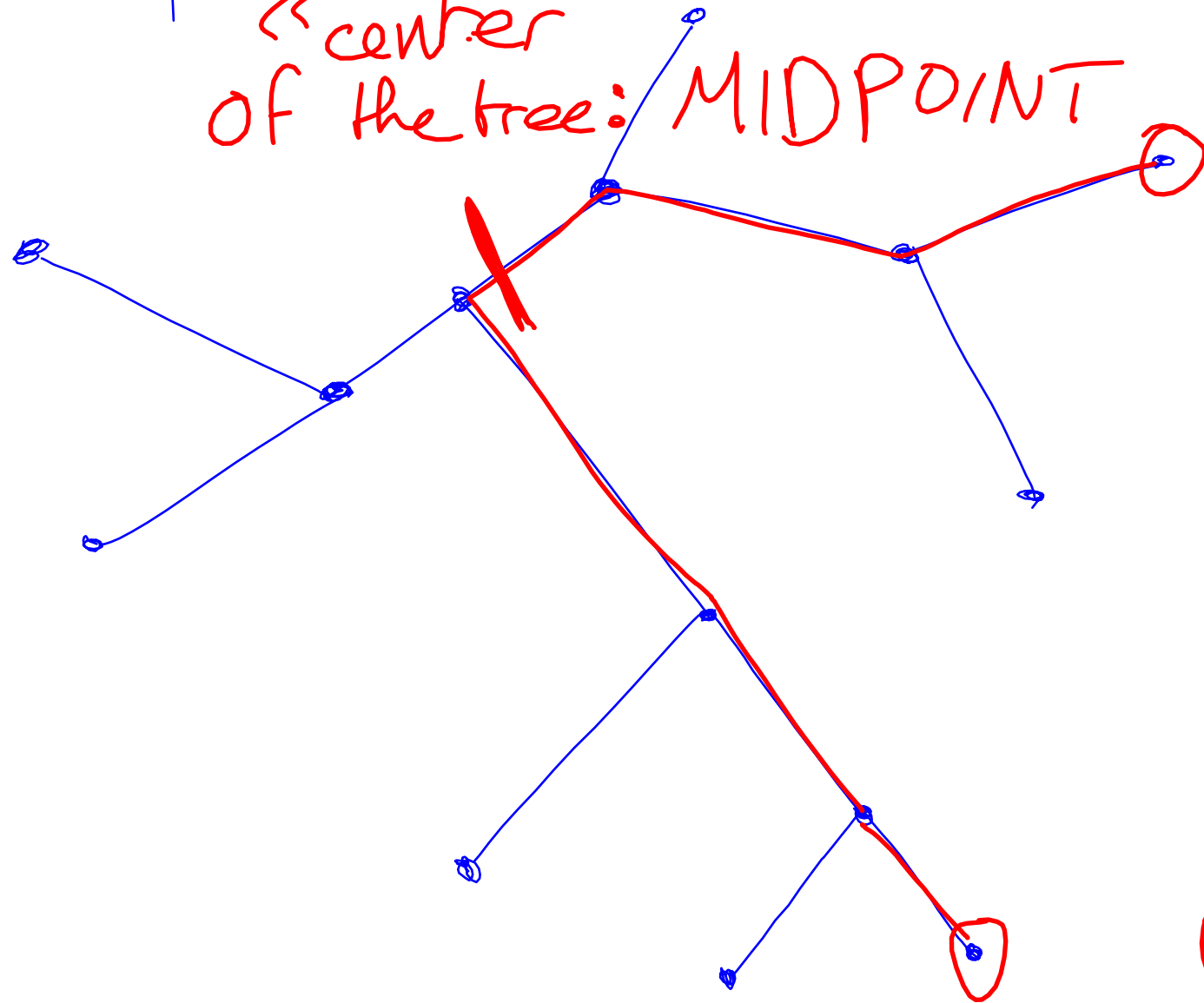
order: ① ② ③ ... ⑥



AATA  
AAGA  
? /  
AATA  
AAGA  
AAT-A  
AA-GA

# midpoint rooting

«center»  
of the tree: MIDPOINT

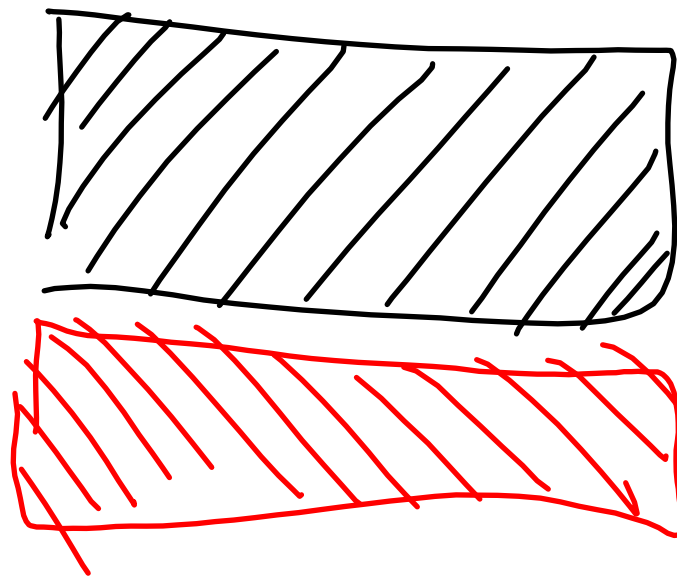


diameter of  
a tree

$\equiv$   
distance between the  
two most distant leaves

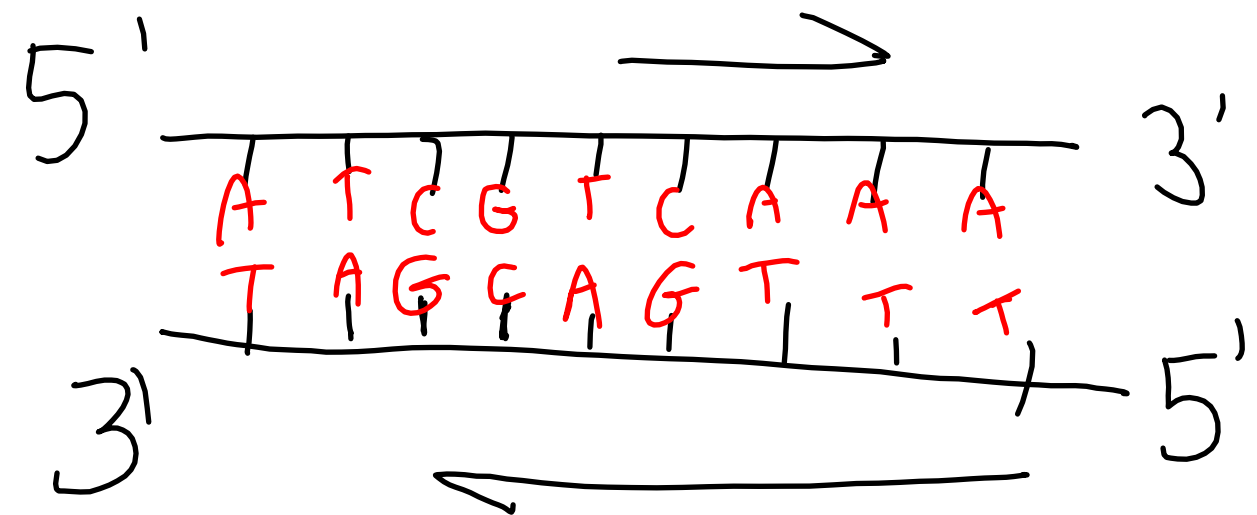
align:

A T C G T C A A A T G C  
G C A T T T G A C G A T



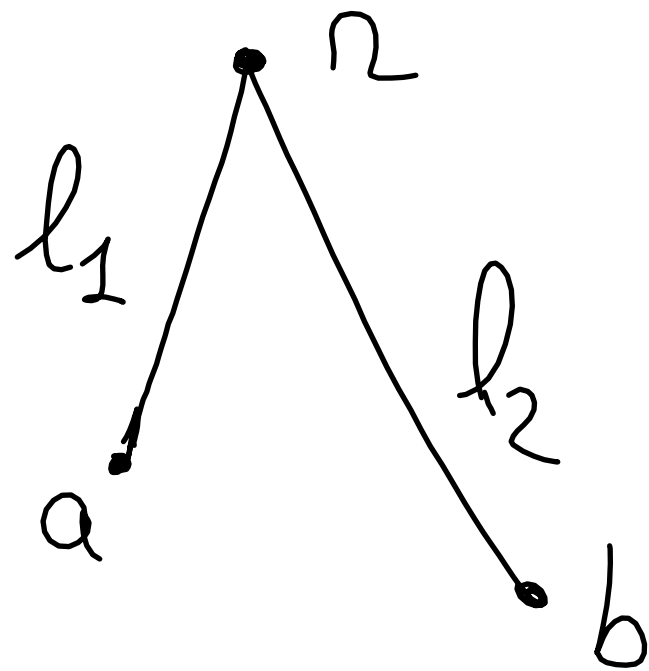
well aligned  
block

completely  $\neq$   
block



# phylogenetic models from a generative viewpoint

subs.  
model:  $Q$   
matrix of  
instantaneous  
substitution rates



I can calculate <sup>the</sup> a priori  
distribution on the root ( $\pi$ )  
as well as probability distrib.

$P_n(a | r, l_1)$  and

$P_n(b | r, l_2)$

I can generate sites according to these.