The Ranked Nearest Neighbour Interchange space of phylogenetic trees

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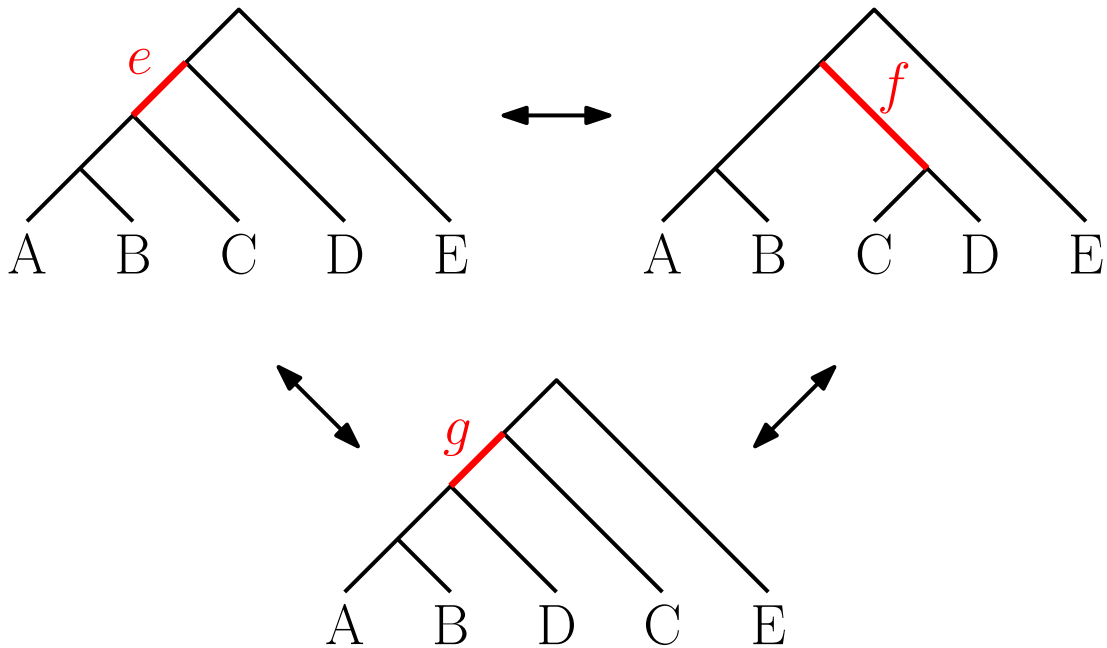
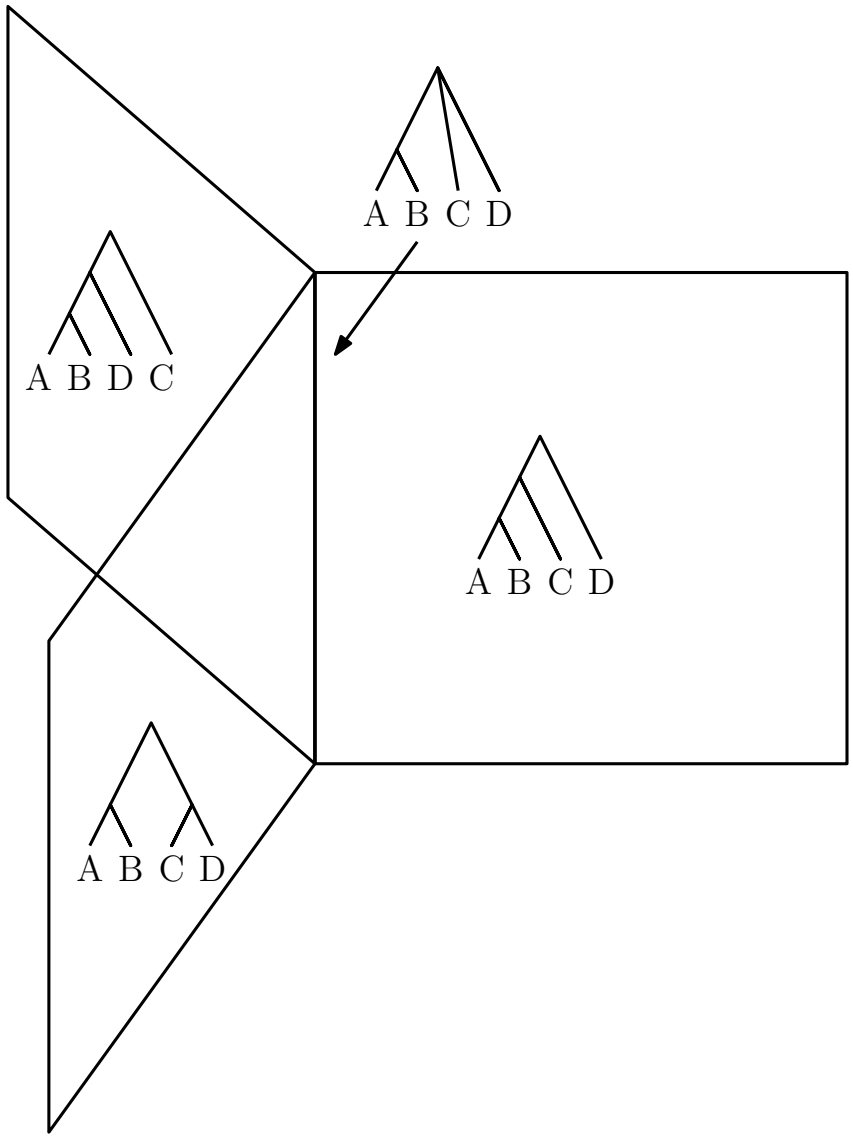
NNI

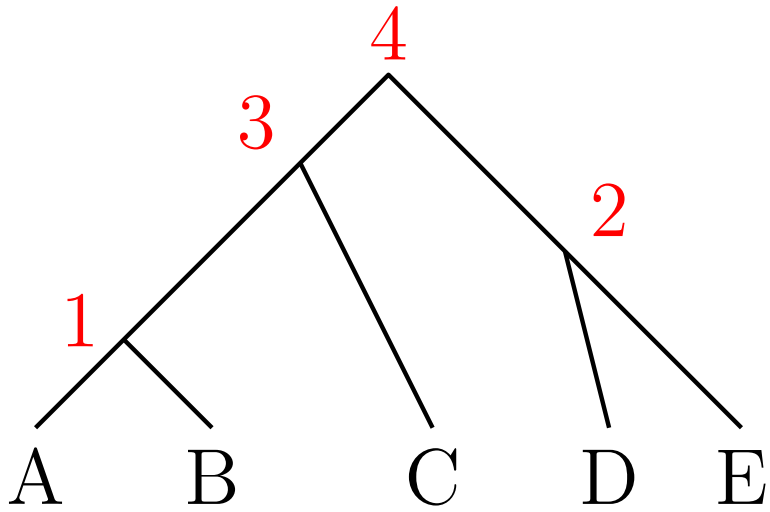


BHV-space



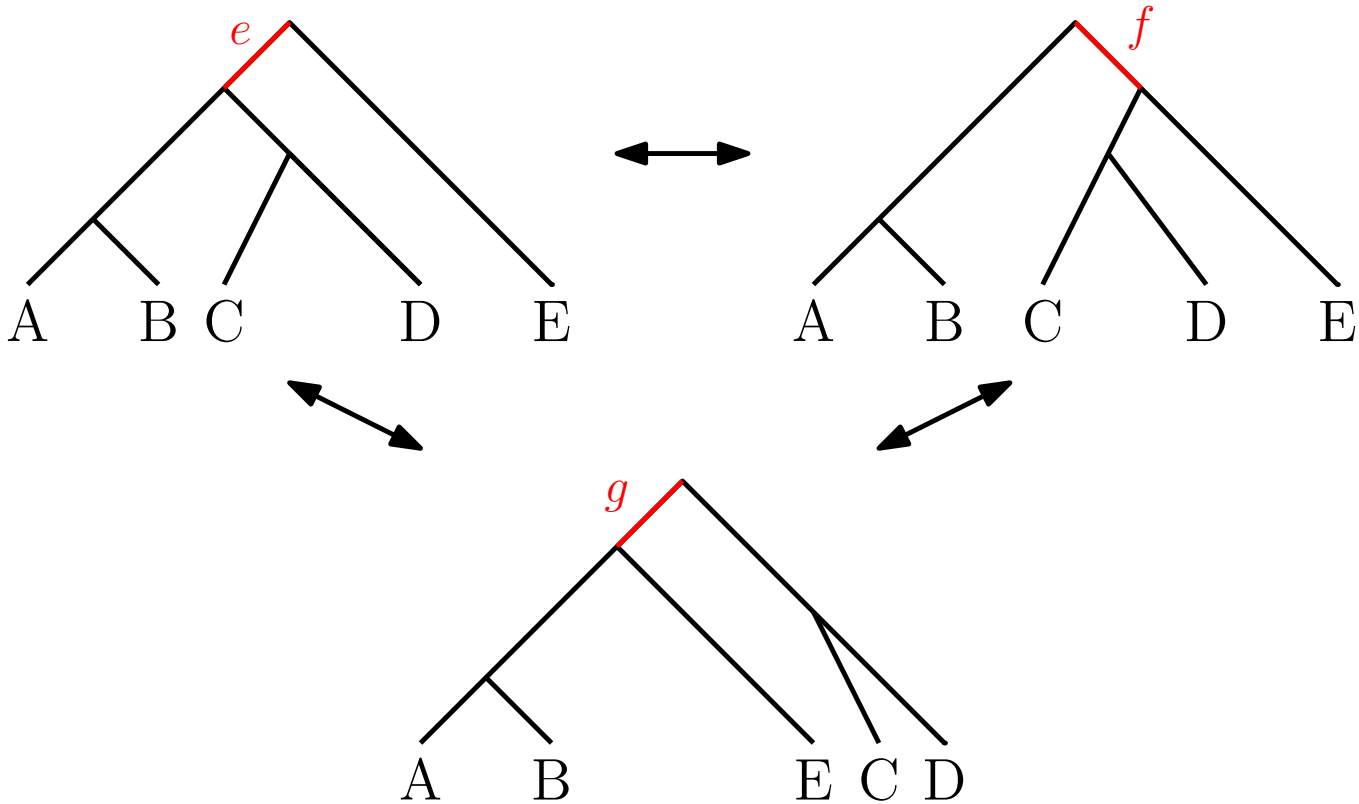
after Billera, Holmes, and Vogtmann, 2001

Ranked trees



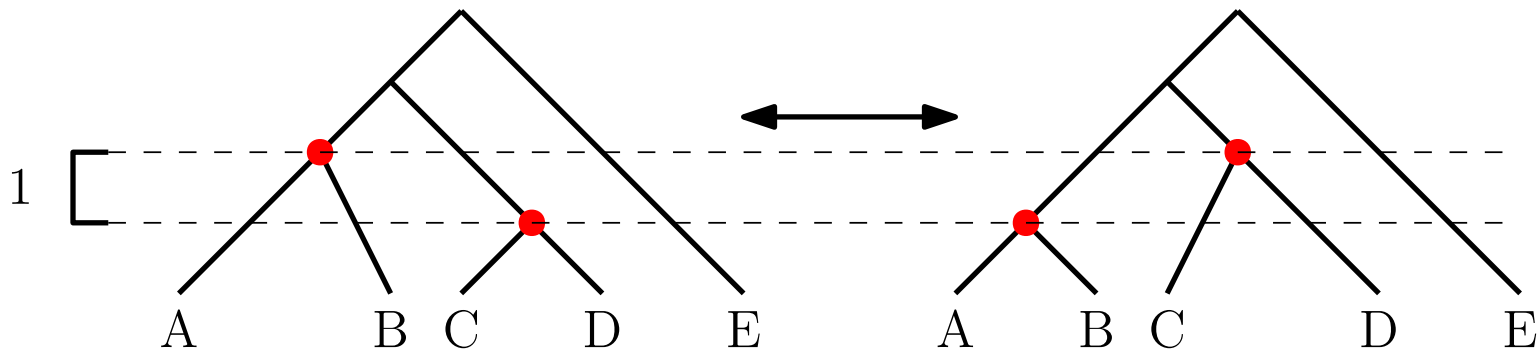
Ranked trees

NNI move

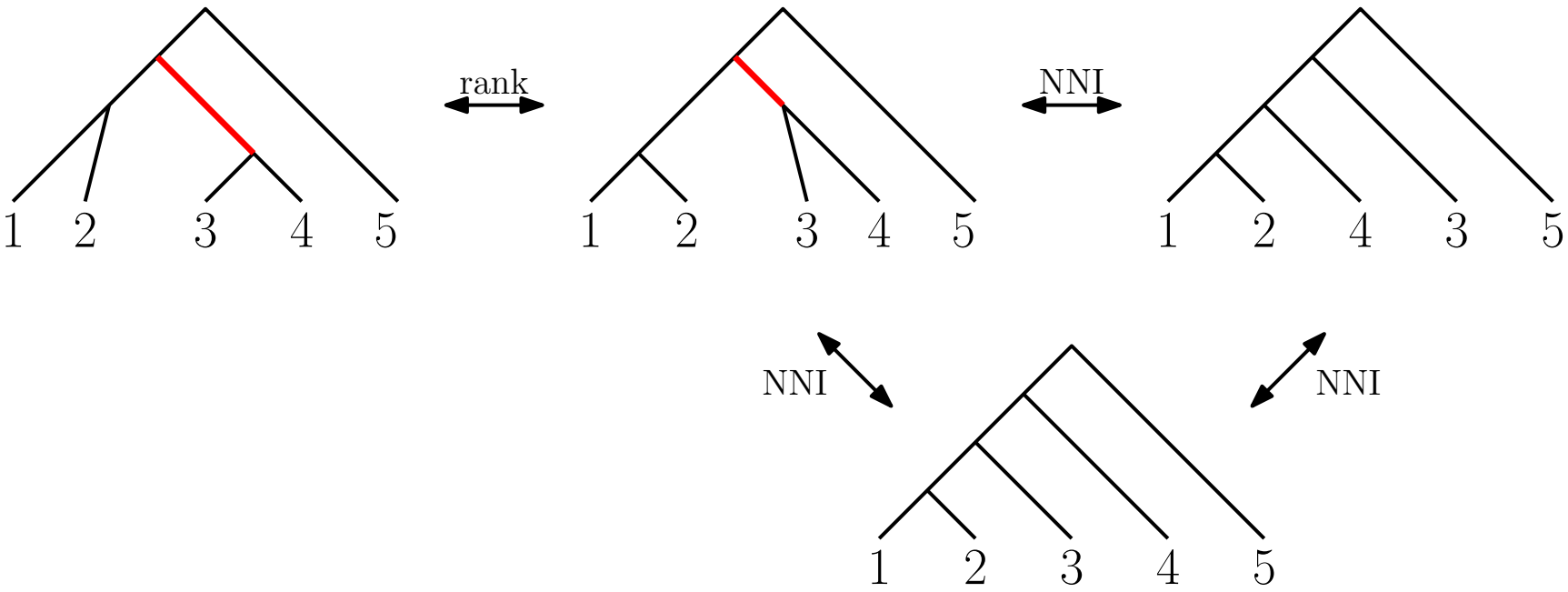


Ranked trees

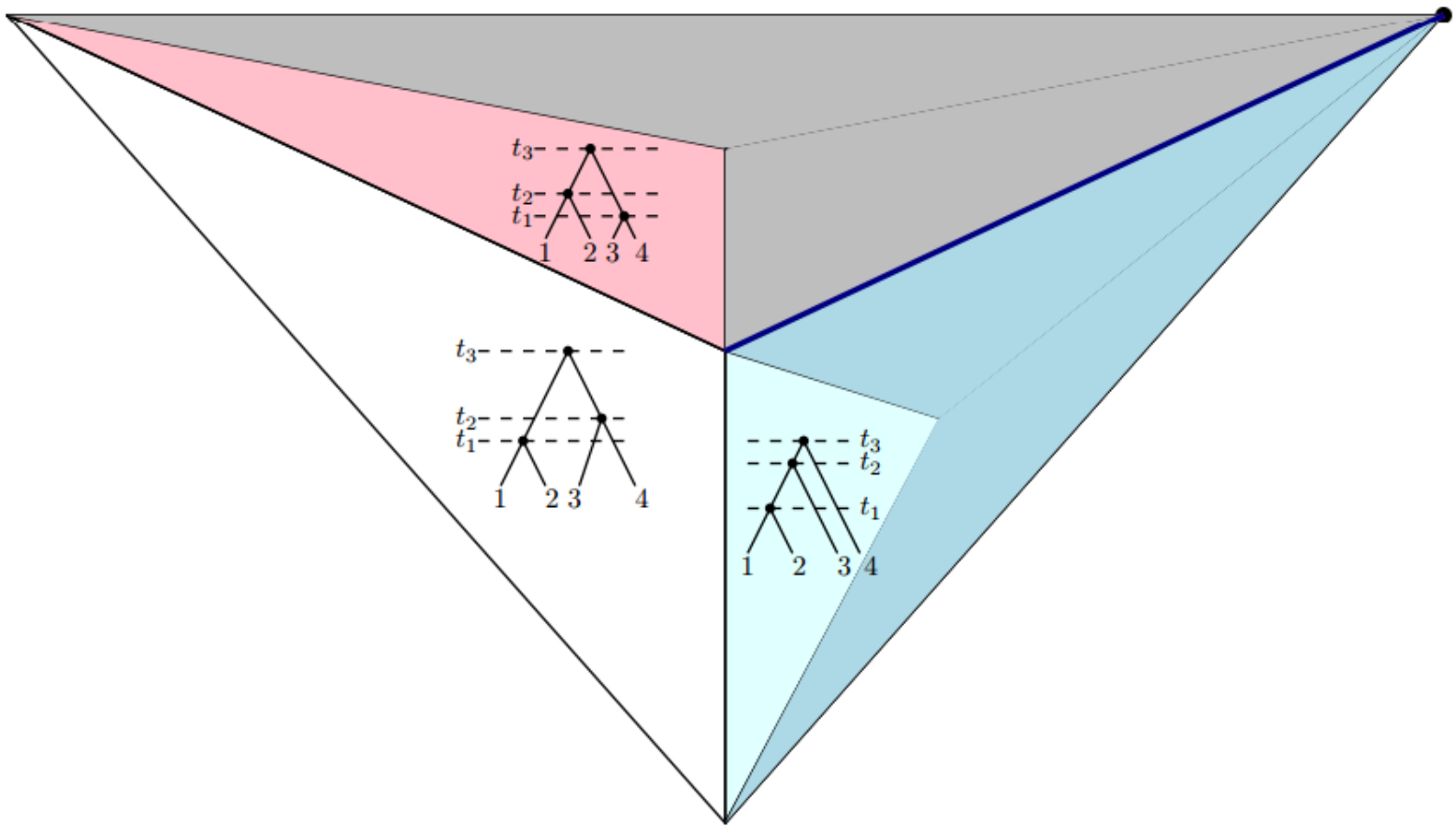
Rank swap



RNNI graph

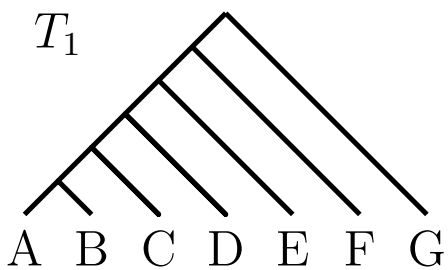


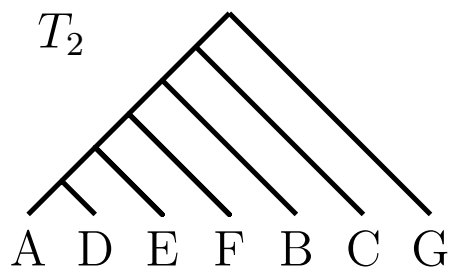
t-space



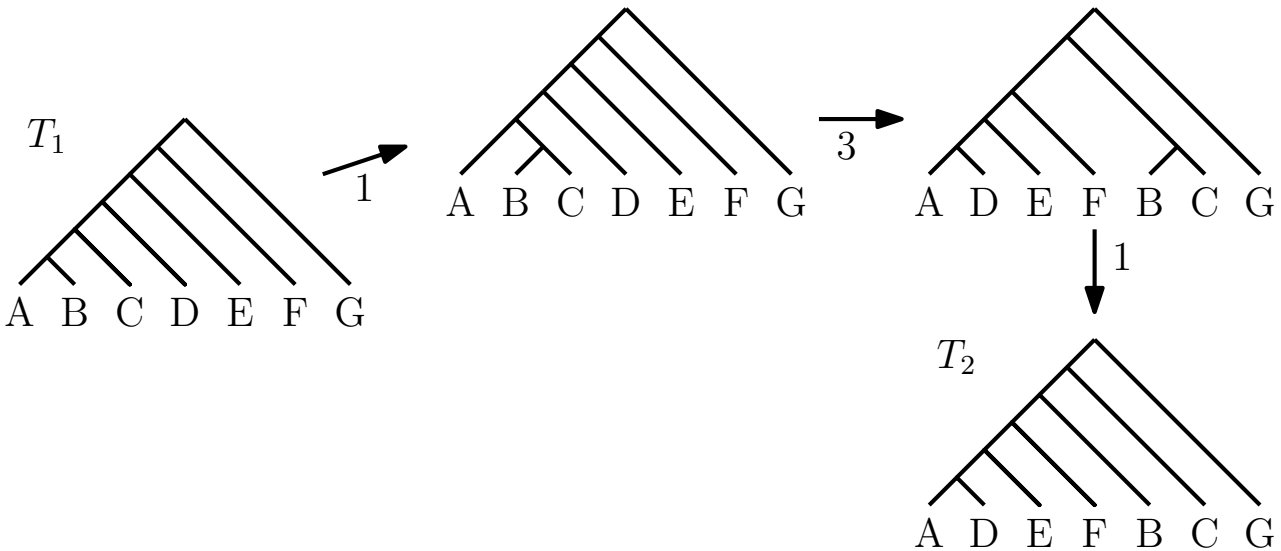
Gavryushkin and Drummond, 2016

RNNI vs NNI

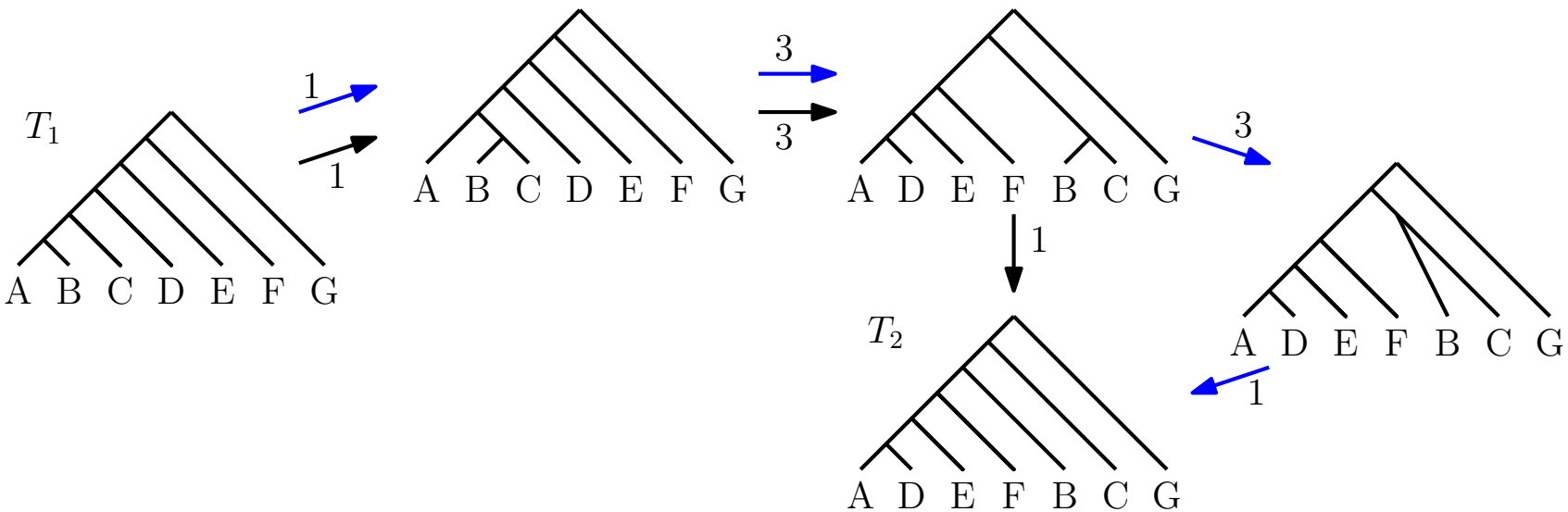




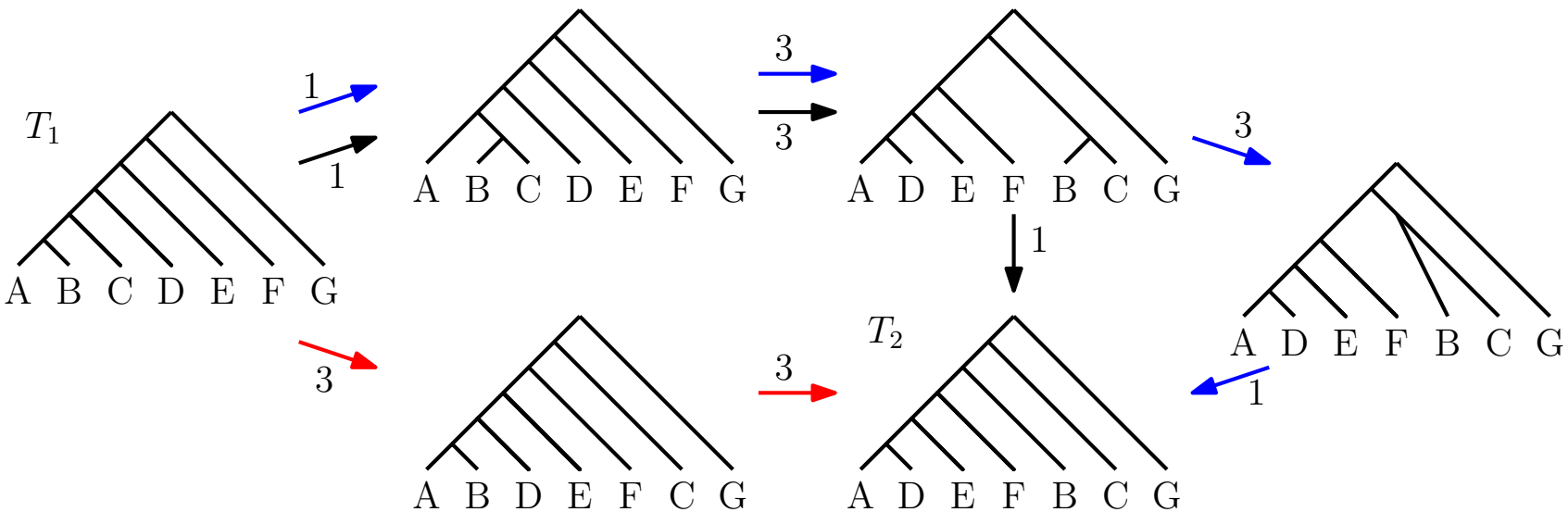
RNNI vs NNI



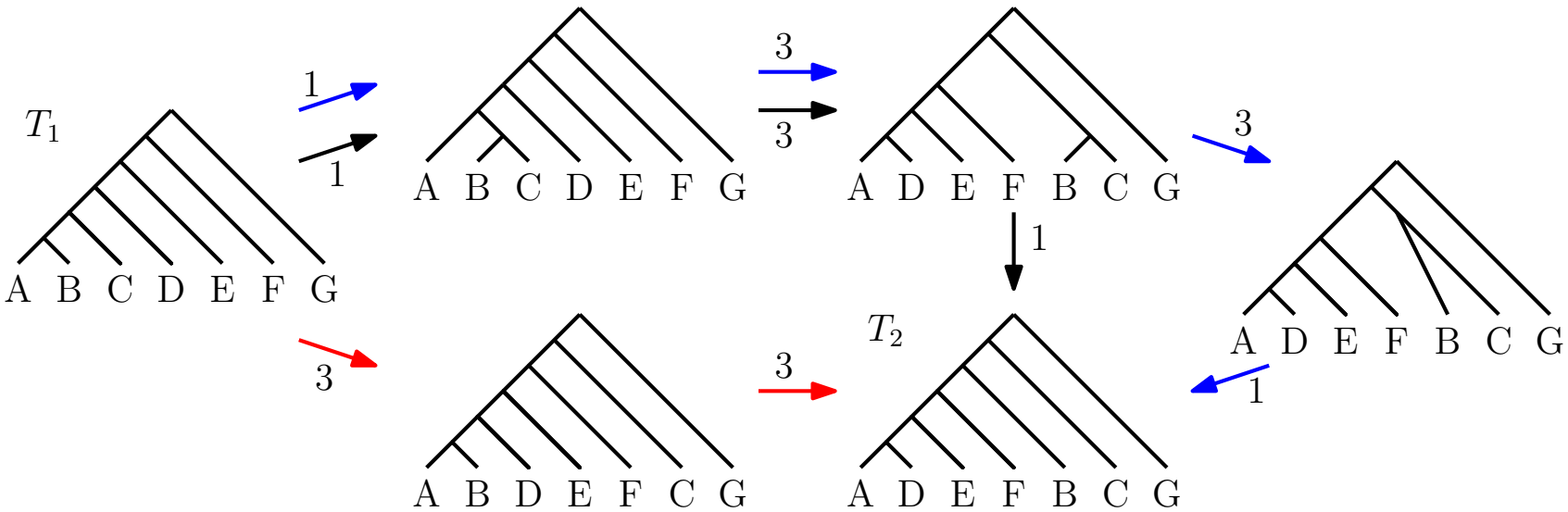
RNNI vs NNI



RNNI vs NNI


T_1
A B C D E F G
1
1
3
A B D E F C G
3
A B C D E F G
3
3
A D E F B C G
1
T_2
A D E F B C G
3
A D E F B C G
1

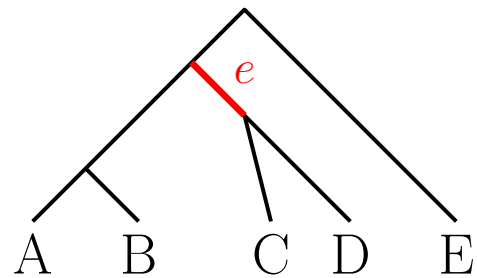
RNNI vs NNI



Conjecture

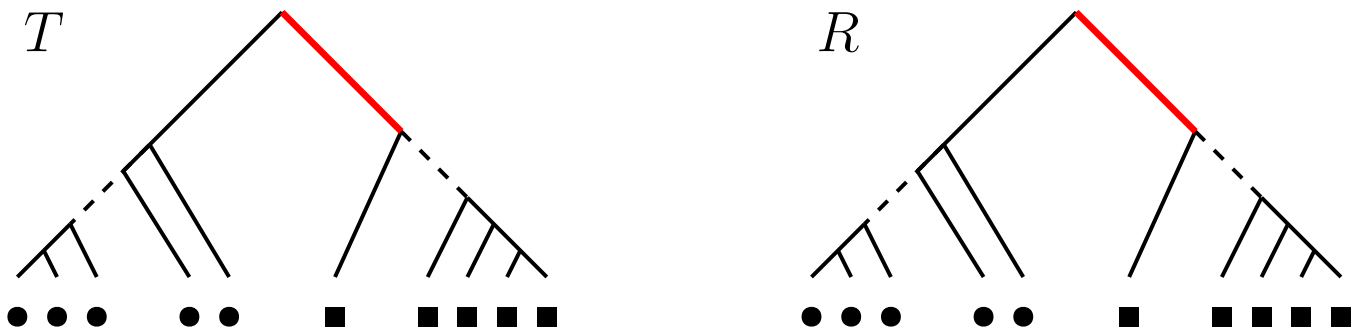
The set of caterpillar trees is convex in the RNNI *space.*

Split Theorem

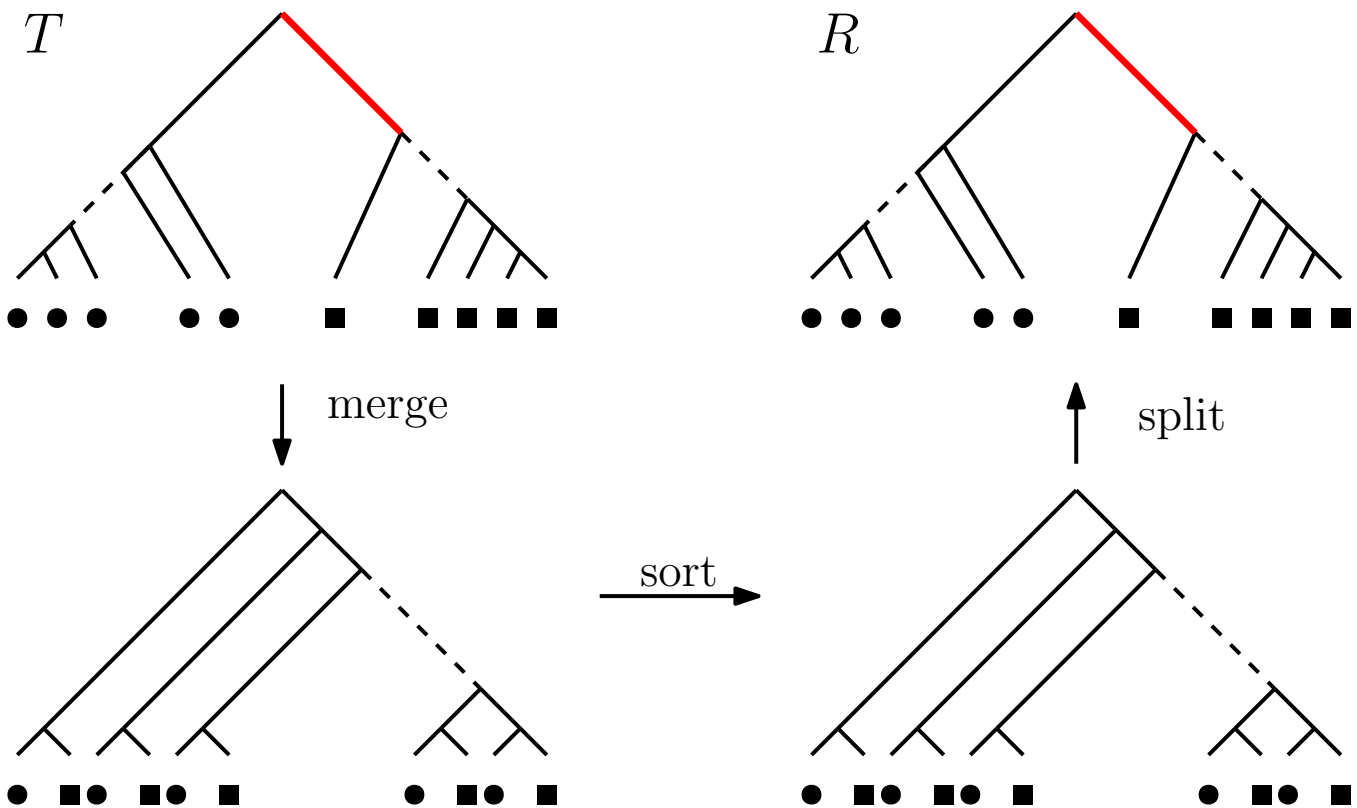


edge $e \rightarrow$ split CD|ABE

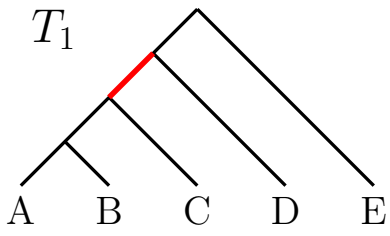
Split Theorem

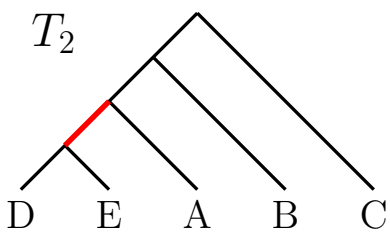


Split Theorem

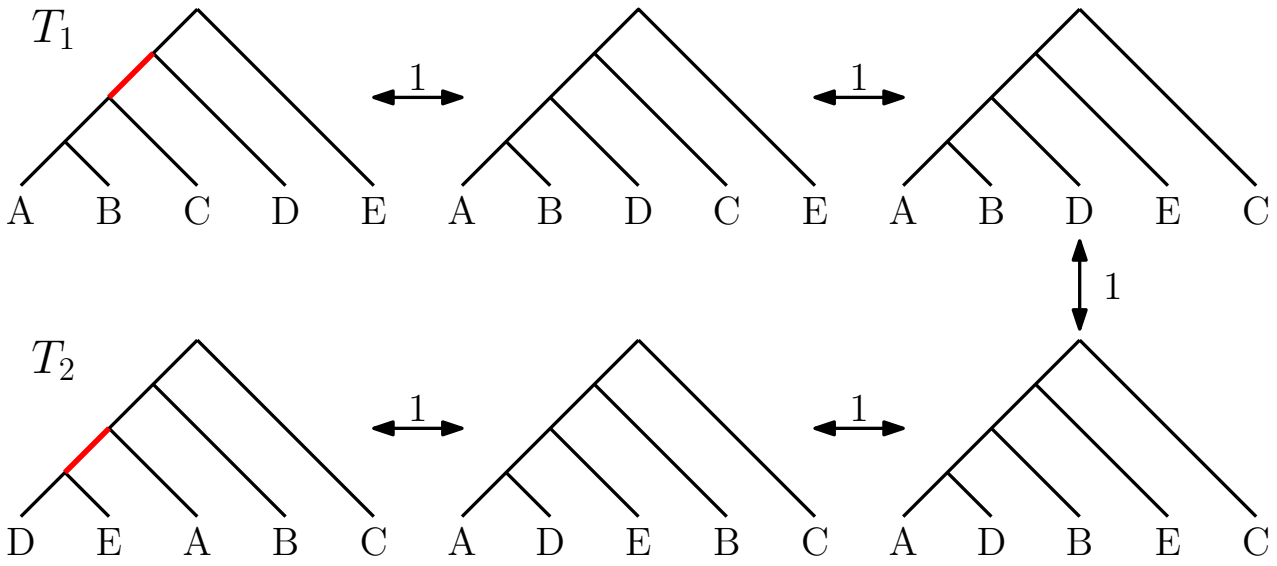


Split Theorem





Split Theorem



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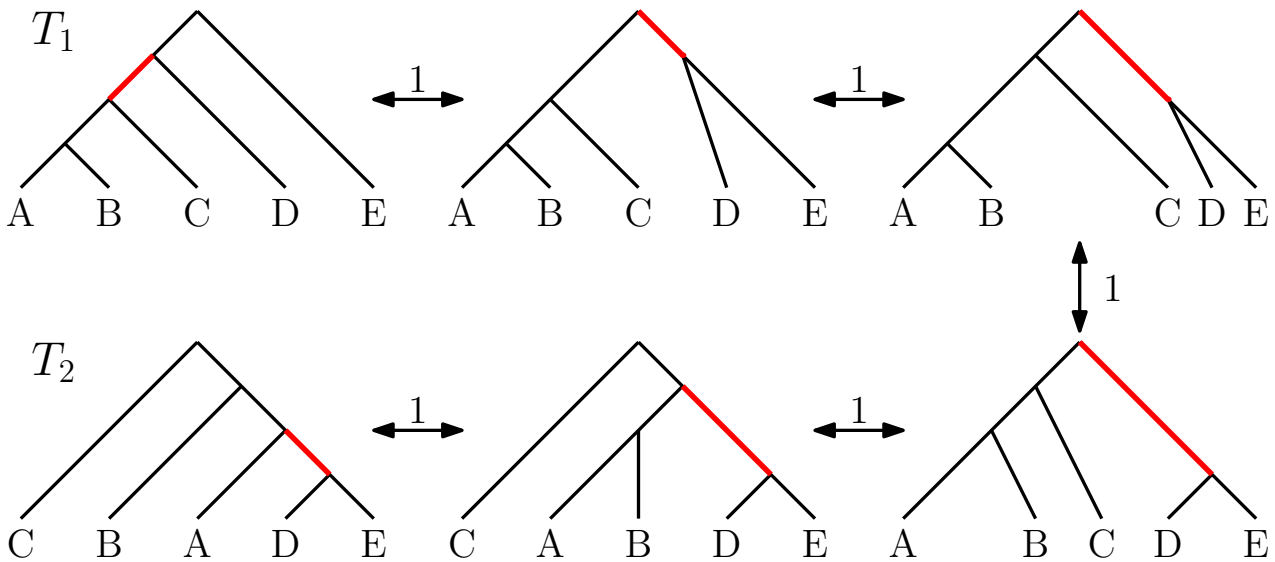
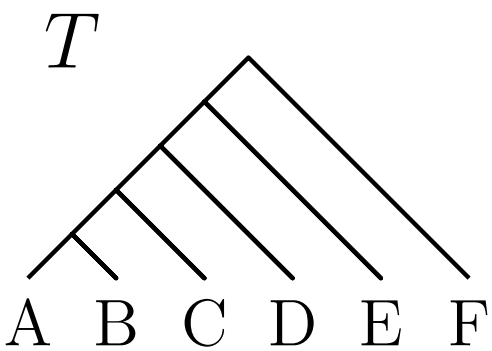
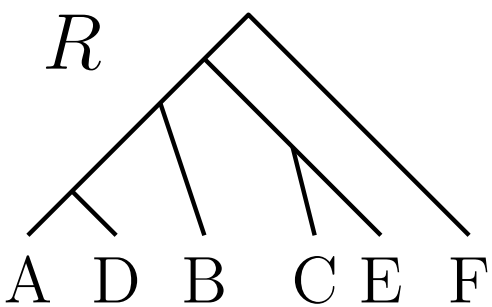


Approximating shortest paths





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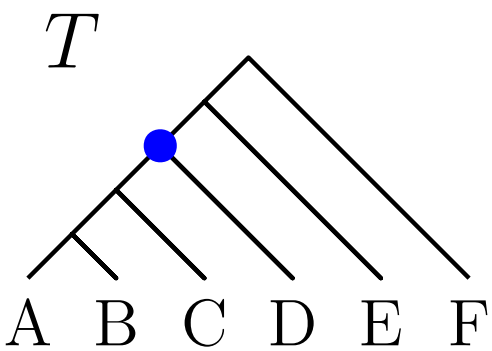

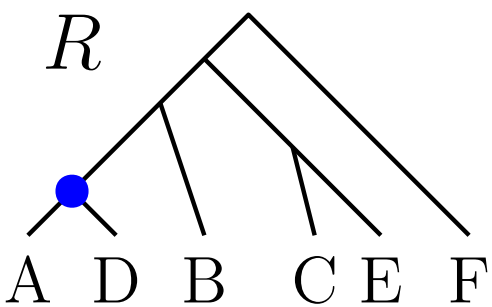

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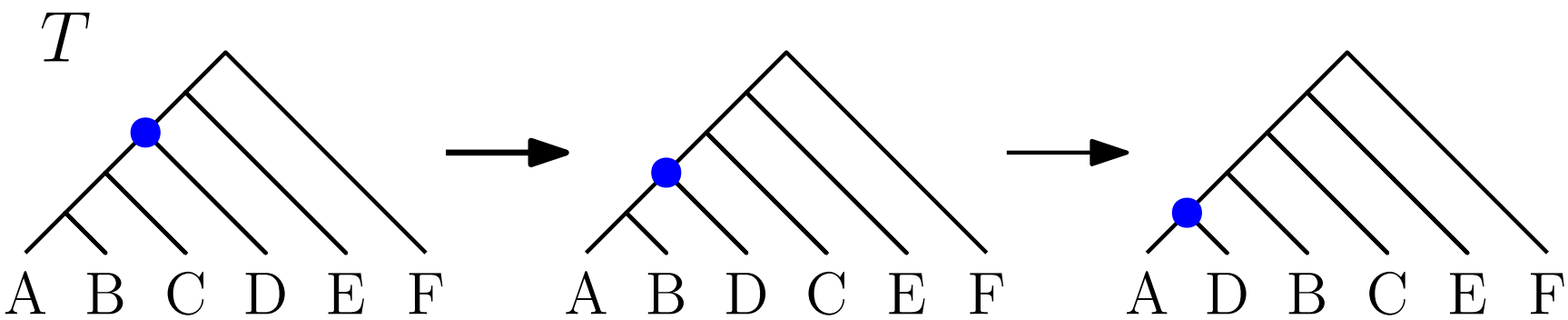

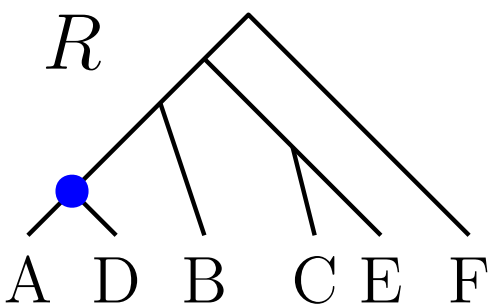

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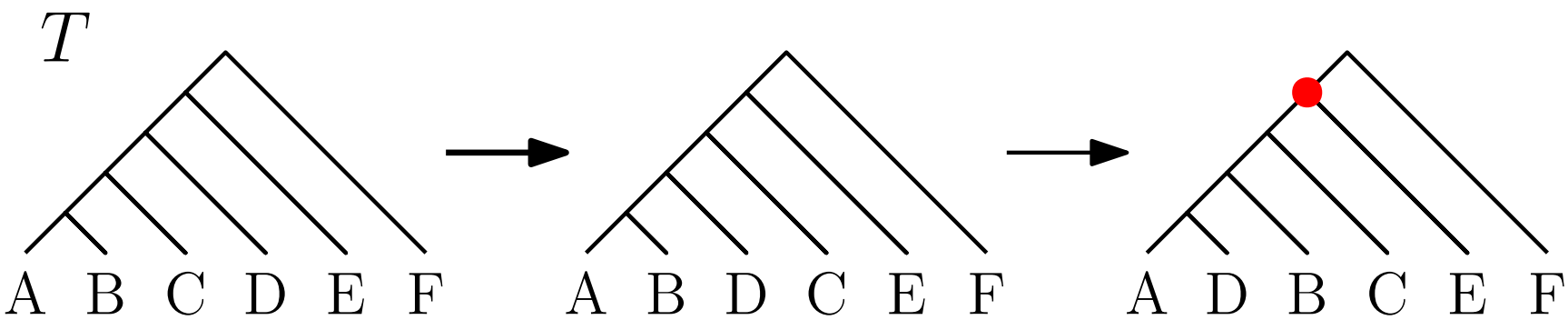

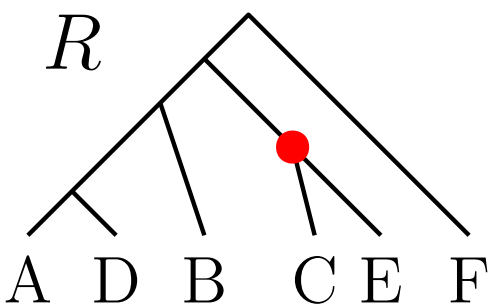

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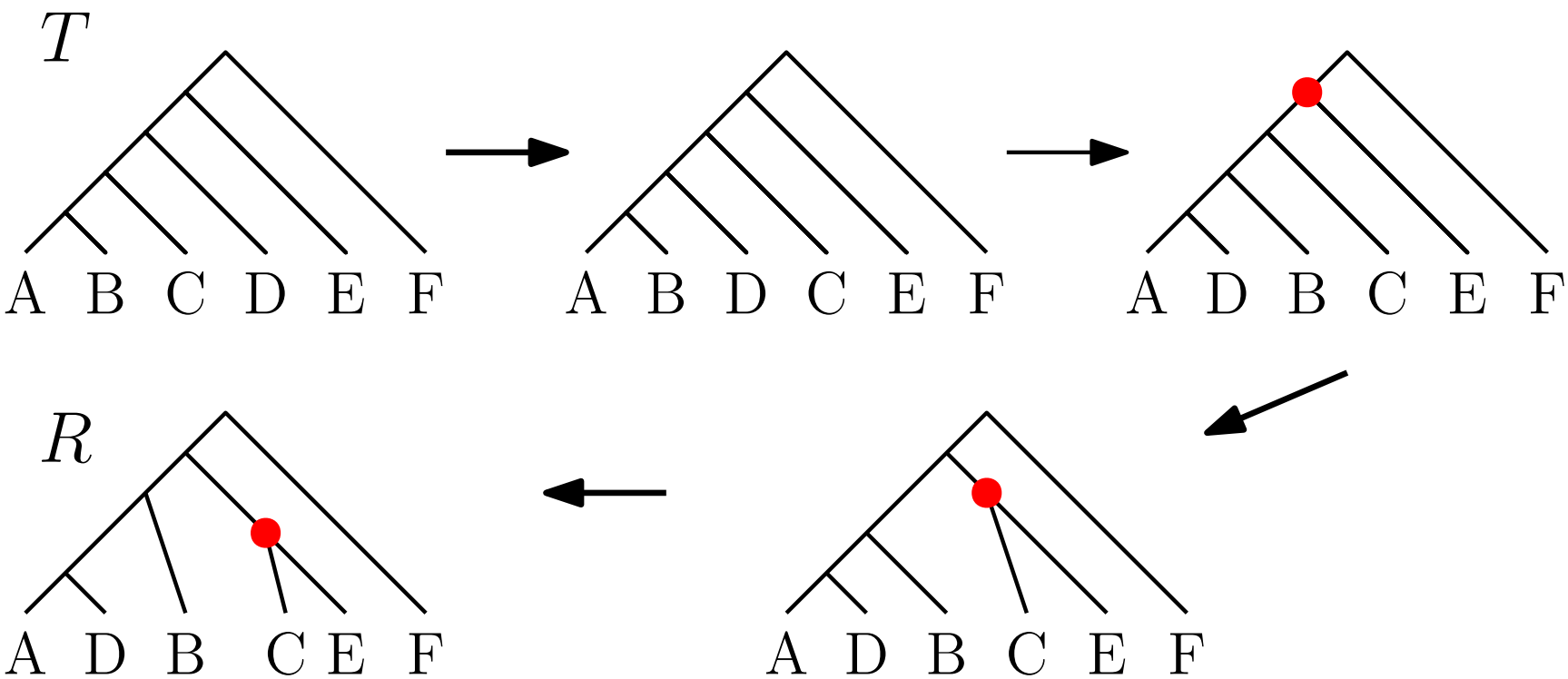

Acknowledgements

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RUTHERFORD
DISCOVERY FELLOWSHIPS

ROYAL
SOCIETY
TE APĀRANGI