أكاديمية كاوست
KAUST ACADEMY

Introduction to Bioinformatics

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Day 4: De novo Genome Assembly
12th January 2024

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Check Galaxy Slides ☺

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https://training.galaxyproject.org/training-material/topics/sequence-analysis/tutorials/quality-control/slides.html#1

Hands-on and Practical Part

Galaxy PROJECT

GitHub

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Introduction to Bioinformatics

Application: De novo Genome Assembly

Part 2: De Bruijn graph

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De Bruijn graph

“tomorrow and tomorrow and tomorrow”

De Bruijn graph

"tomorrow and tomorrow and tomorrow"

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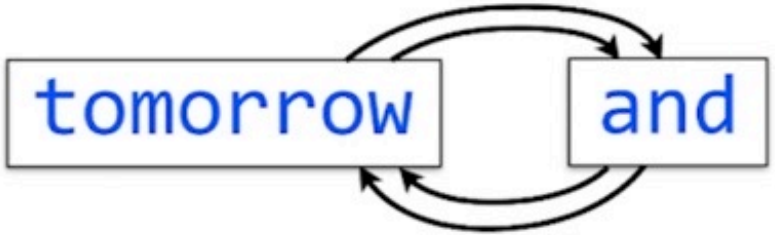
De Bruijn graph

"tomorrow and tomorrow and tomorrow"



De Bruijn graph

genome: AAABBBBA

De Bruijn graph

genome: AAABBBBA

3-mers: AAA, AAB, ABB, BBB, BBB, BBA

De Bruijn graph

genome: AAABBBBA

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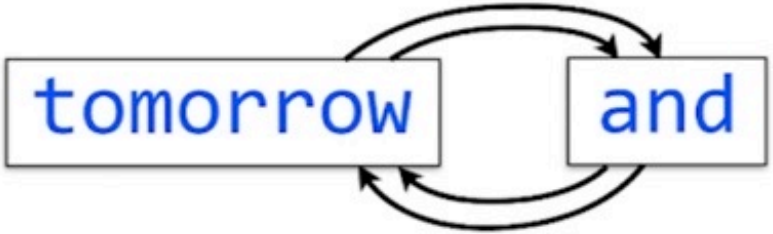
De Bruijn graph

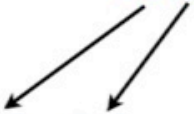
"tomorrow and tomorrow and tomorrow"



De Bruijn graph

genome: AAABBBBA

3-mers: AAA, AAB, ABB, BBB, BBB, BBA



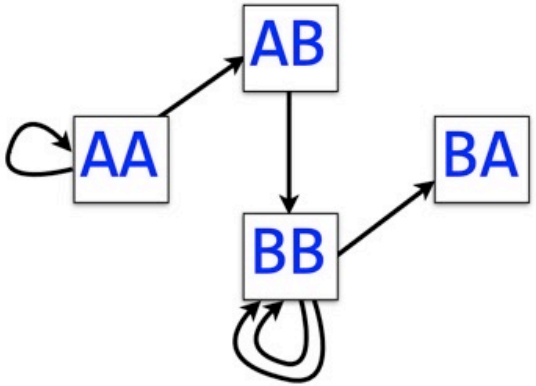
L/R 2-mers: AA, AA

De Bruijn graph

genome: AAABBBBA

3-mers: AAA, AAB, ABB, BBB, BBB, BBA

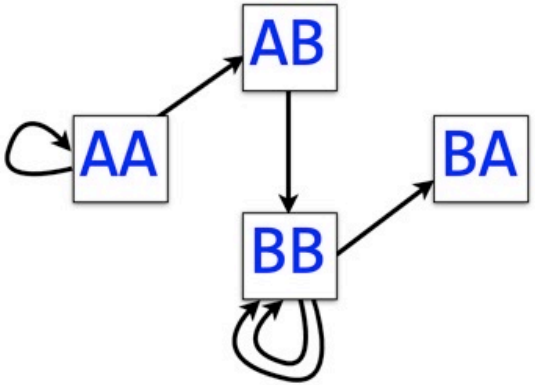
L/R 2-mers: AA, AA AA, AB AB, BB BB, BB BB, BB BB, BA



One edge per *k*-mer

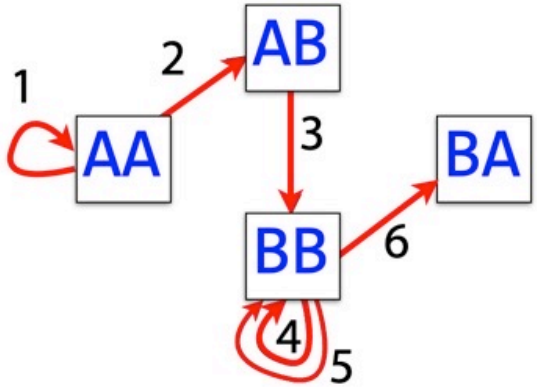
One node per distinct *k*-1-mer

De Bruijn graph



Walk crossing each edge exactly once gives a reconstruction of the genome

De Bruijn graph



AAABBBBA

Walk crossing each edge exactly once gives a reconstruction of the genome. This is an *Eulerian walk*.

Hands-on and Practical Part

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Done with Day 4, Heyyyyy!

Thank You !

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