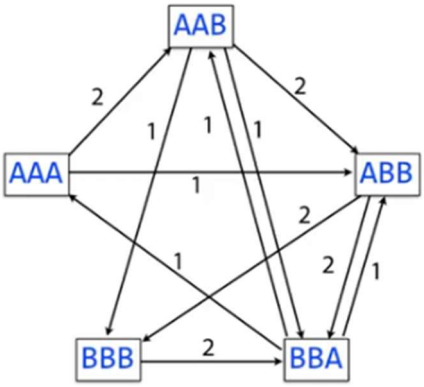
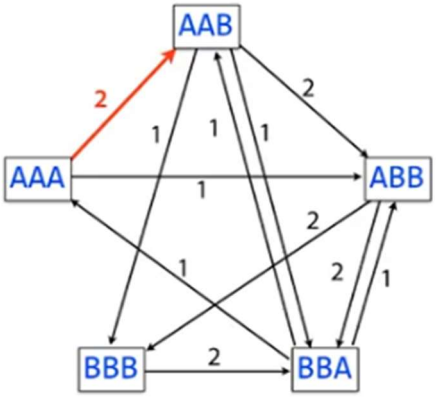
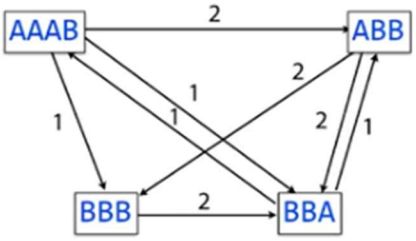
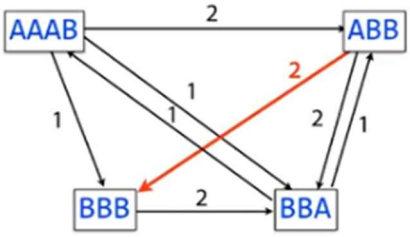
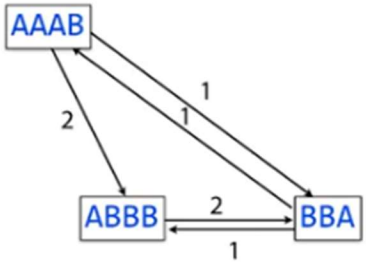
Overlap Graph and Greedy Shortest Common Superstring Search

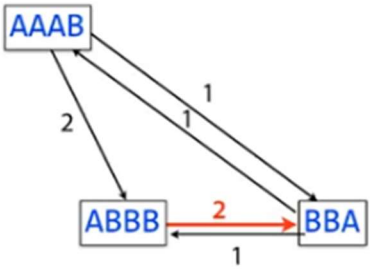


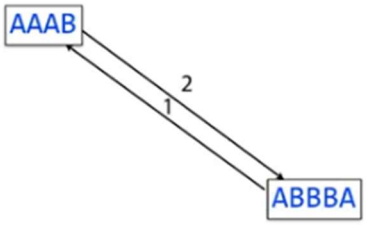


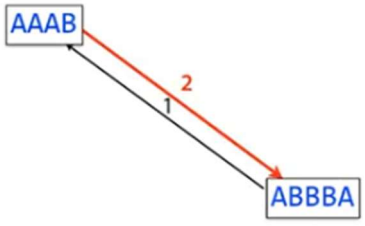






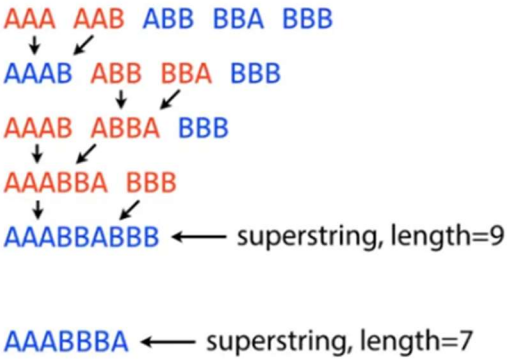




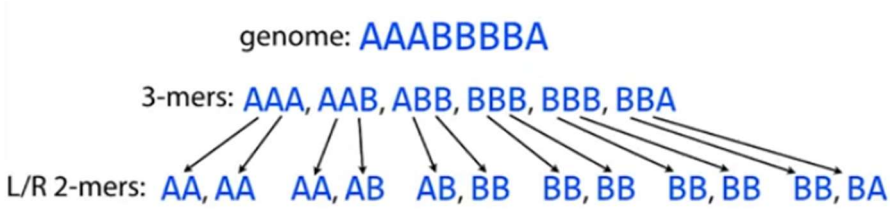


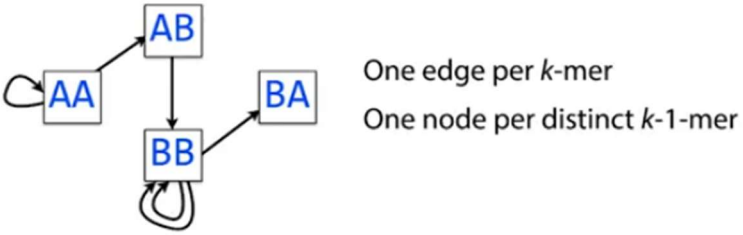
AAABBBA

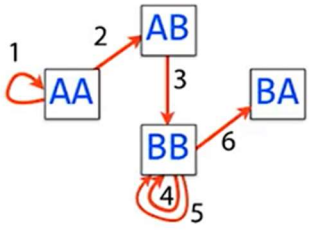
Greedy Algorithm Is Faster But Doesn't Always Find the Best Answer



De Bruijn Graphs and Eulerian Walks





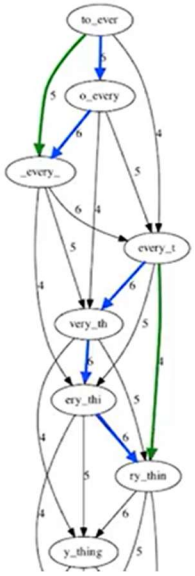


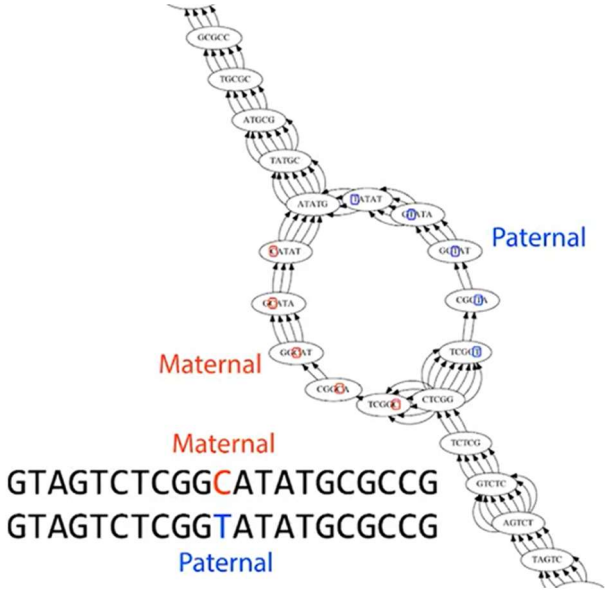
AAABBBBA

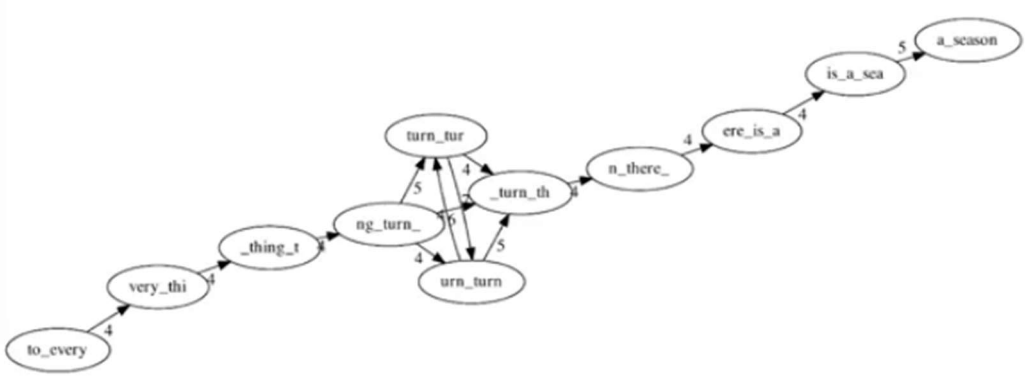
Walk crossing each edge exactly once gives a reconstruction of the genome. This is an *Eulerian walk*.

Ambiguity and Errors in De Bruijn Graphs

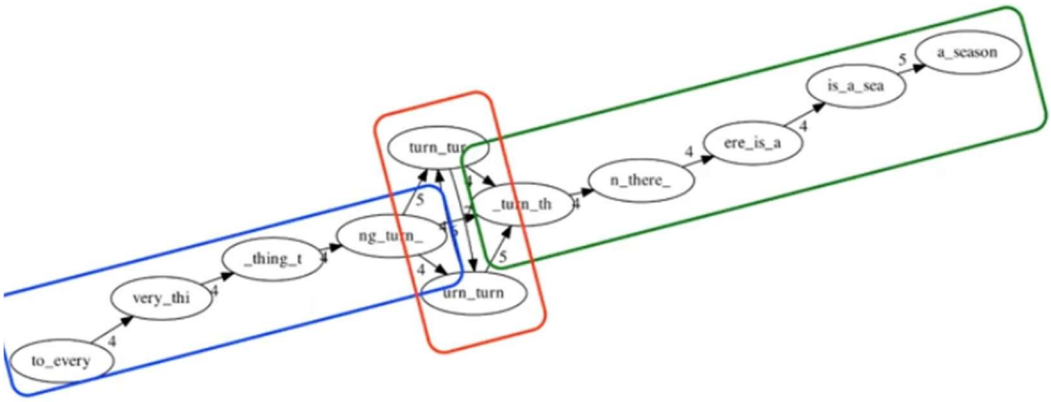
Green edges can be inferred from blue





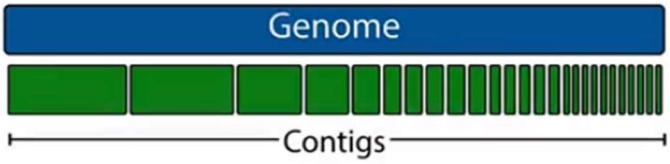


Contigs



to_every_thing_turn_ _turn_there_is_a_season

_turn (repeated)



Longer k-mers Make Better Reconstructions

6-mers:

```
ng_lon _long_ a_long long_l ong_ti ong_lo long_t g_long g_time ng_tim
ng_time ng_lon _long_ a_long long_l ong_ti ong_lo long_t g_long
ng_time g_long_ ng_lon a_long long_l ong_ti ong_lo long_t
ng_time long_ti g_long_ ng_lon a_long long_l ong_lo
ng_time ong_lon long_ti g_long_ a_long long_l
ong_lon long_time g_long_ a_long long_l
long_lon long_time g_long_ a_long
long_lon g_long_time a_long
long_long_time a_long
a_long_long_time
```

8-mers:

```
long_lon ng_long_ _long_lo g_long_t ong_long g_long_l ong_time a_long_l _long_ti long_tim
long_time long_lon ng_long_ _long_lo g_long_t ong_long g_long_l a_long_l _long_ti
_long_time long_lon ng_long_ _long_lo g_long_t ong_long g_long_l a_long_l
_long_time a_long_lo long_lon ng_long_ g_long_t ong_long g_long_l
_long_time ong_long_ a_long_lo long_lon g_long_t g_long_l
g_long_time ong_long_ a_long_lo long_lon g_long_l
g_long_time ong_long_ a_long_lon g_long_l
g_long_time ong_long_l a_long_lon
g_long_time a_long_long_l
a_long_long_long_time
```

Important k-mer:

```
a_long_long_long_time
  g_long_l
```