

Crossing Minimization in Storyline Visualizations

M. Gronemann, M. Jünger, F. Liers, **F. Mambelli**

GD 2016, Athens, 21.09.2016



Storyline Visualization



Linus van Pelt



Snoopy



Lucy van Pelt

Storyline Visualization



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Snoopy

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Lucy

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Storyline Visualization

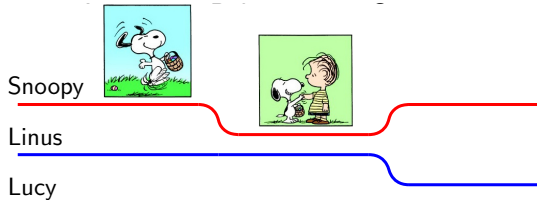


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Storyline Visualization



Storyline Visualization



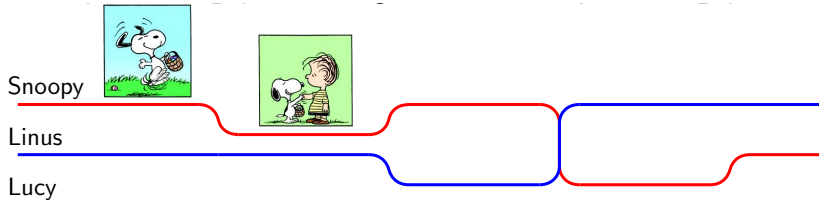
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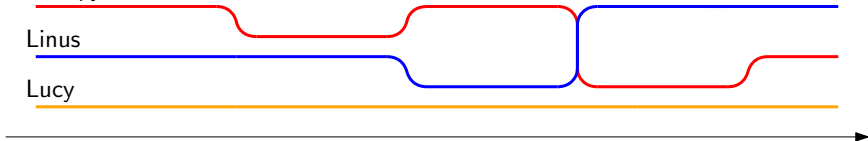
Storyline Visualization



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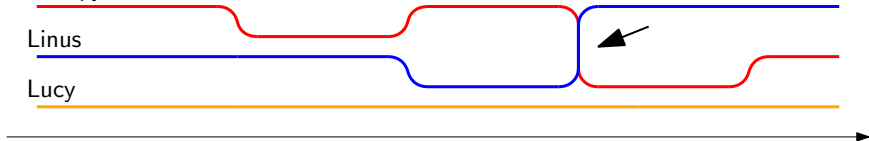
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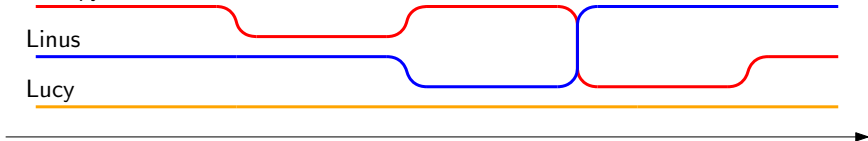
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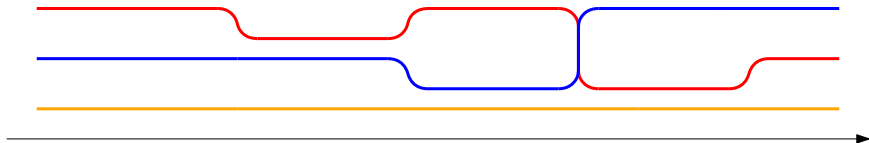
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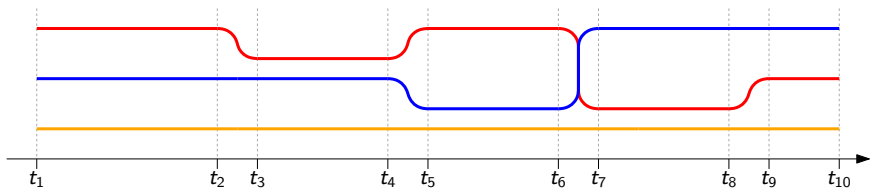
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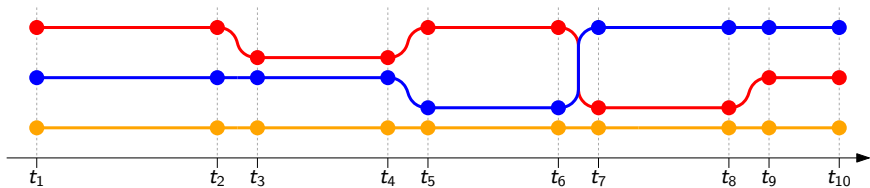
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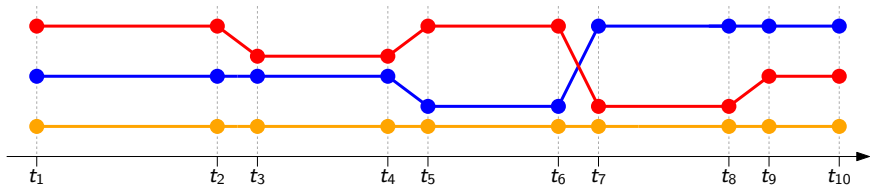
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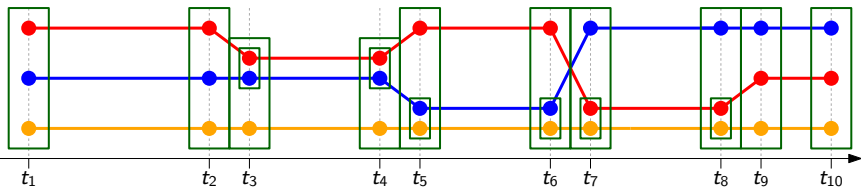
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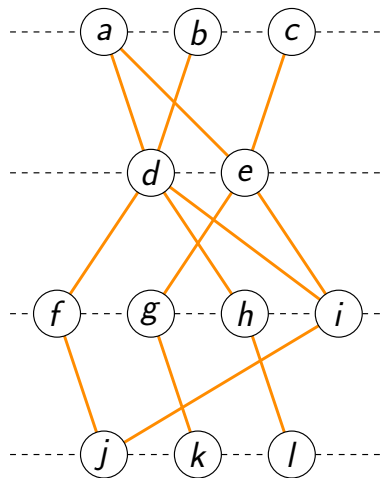


Storyline Visualization



MLCM problem

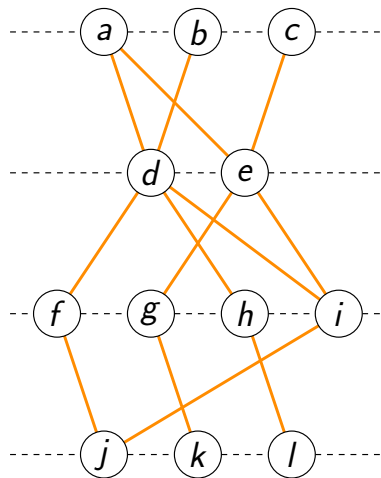
Jünger, Lee, Mutzel, Odenthal, 1997.



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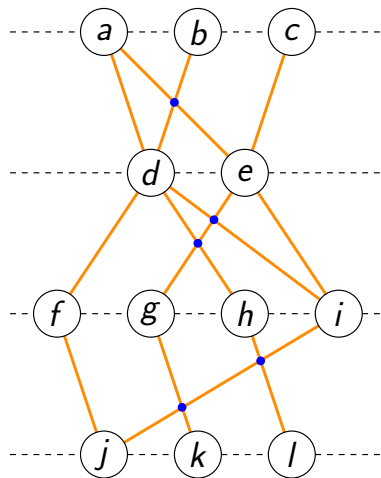
Target: minimize crossings sorting nodes on layers.



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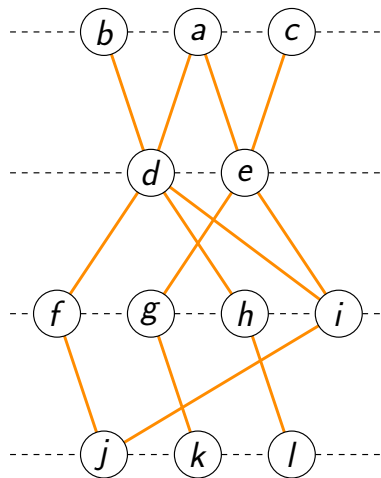
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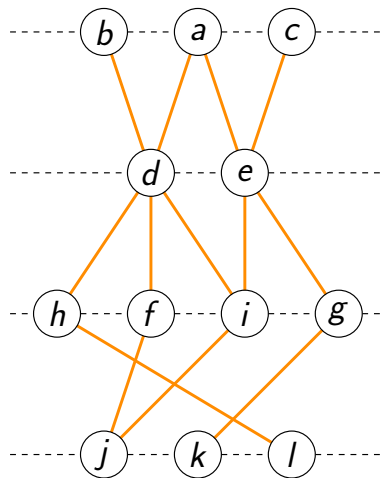
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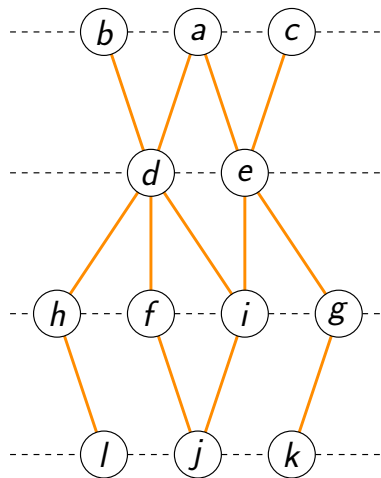
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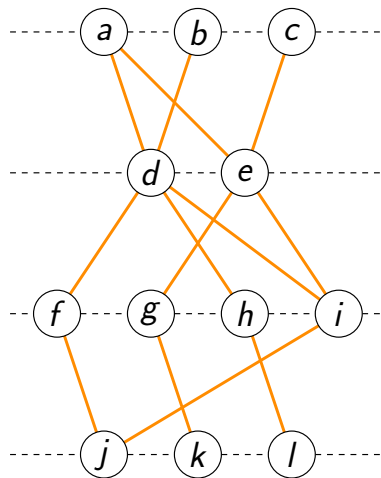
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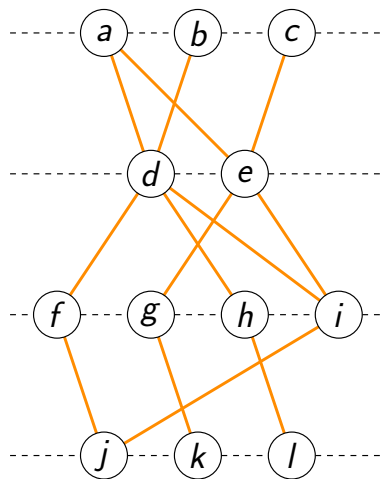
MLCM & Max-Cut

Healy, Kuusik, 1999.



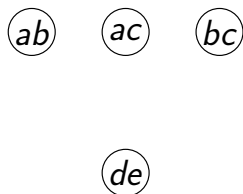
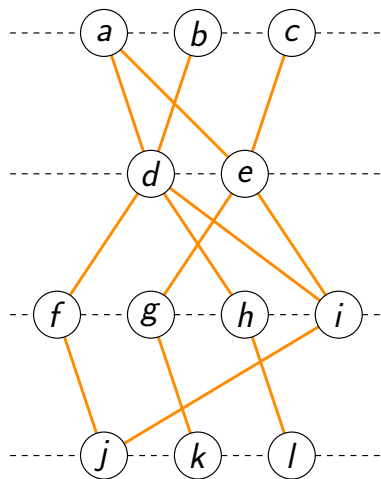
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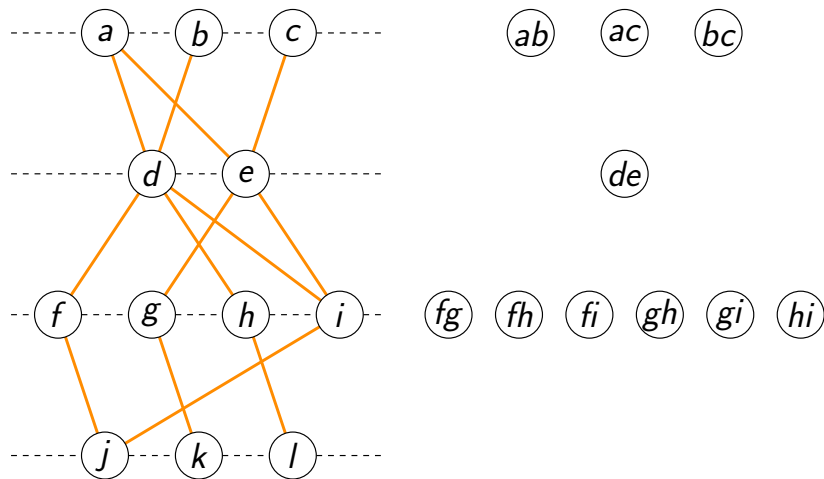
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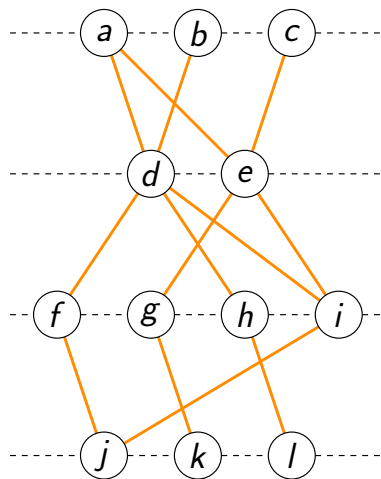
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(ab) (ac) (bc)

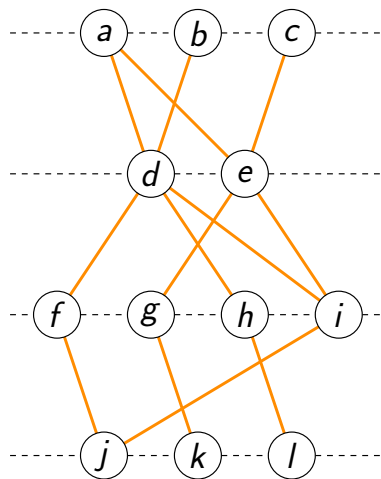
(de)

(fg) (fh) (fi) (gh) (gi) (hi)

(jk) (jl) (kl)

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ab *ac* *bc*

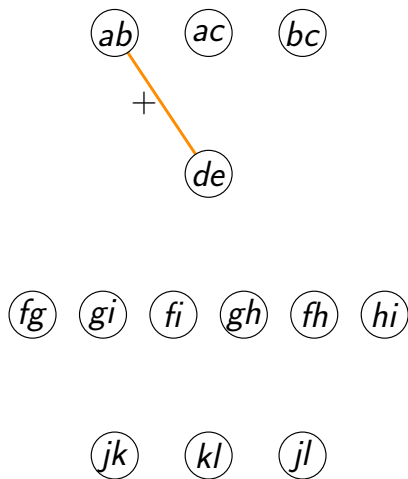
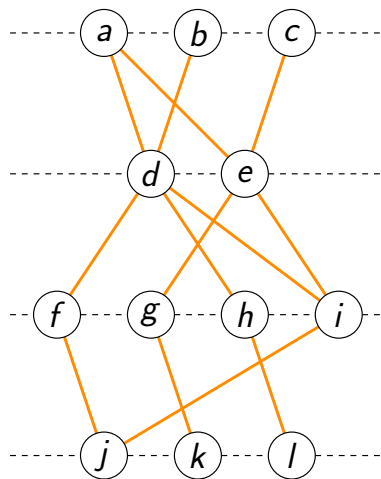
de

fg *gi* *fi* *gh* *fh* *hi*

jk *kl* *jl*

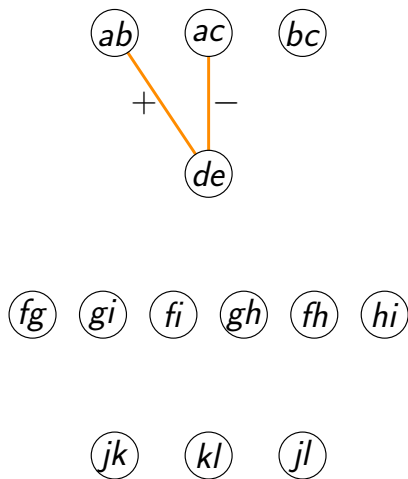
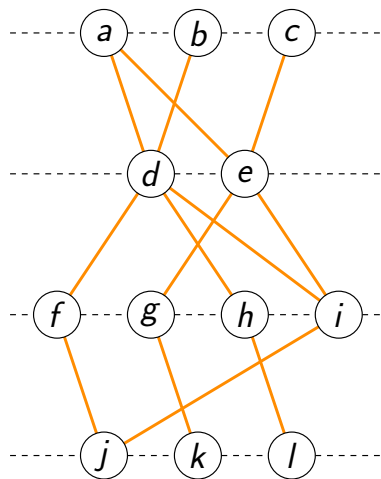
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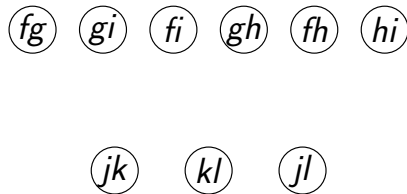
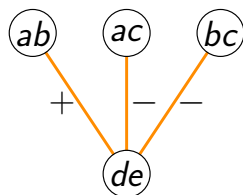
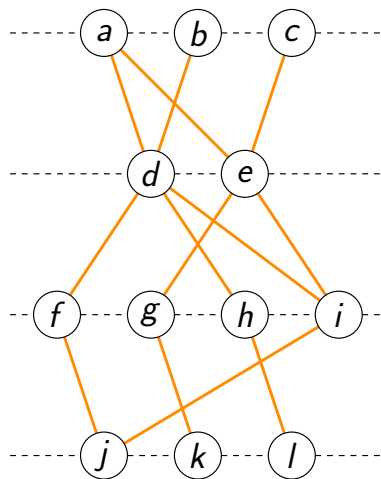
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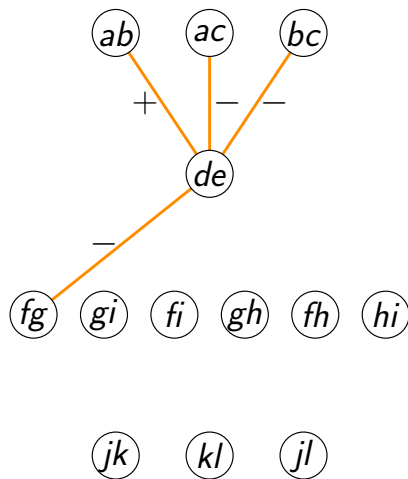
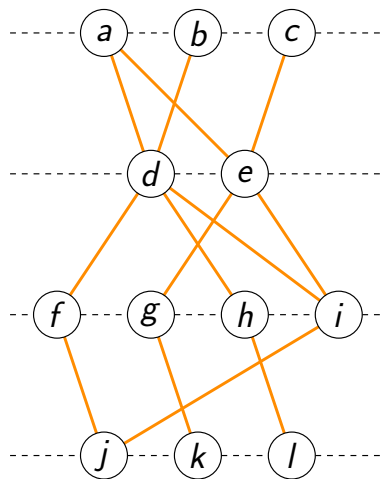
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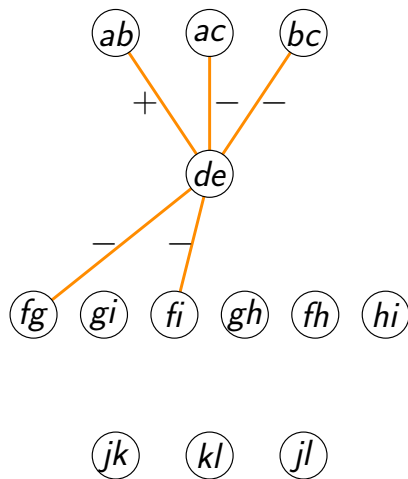
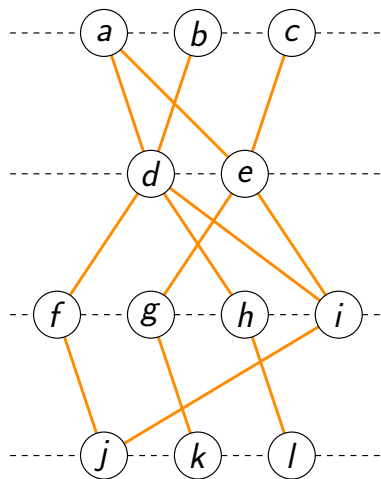
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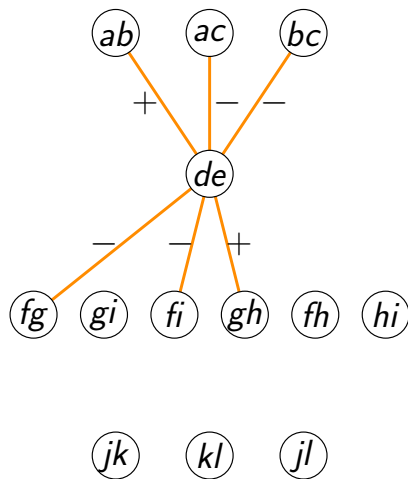
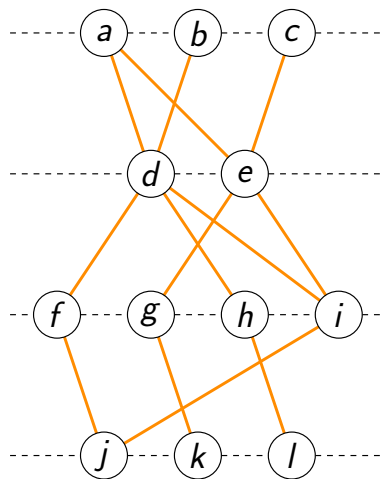
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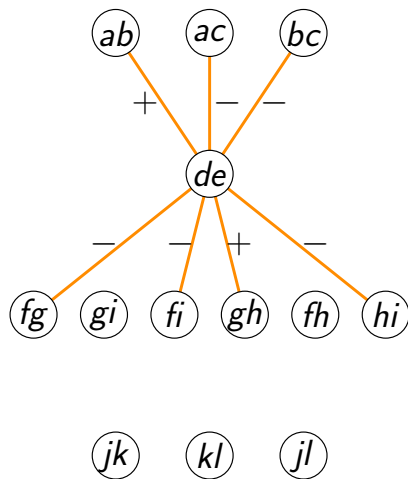
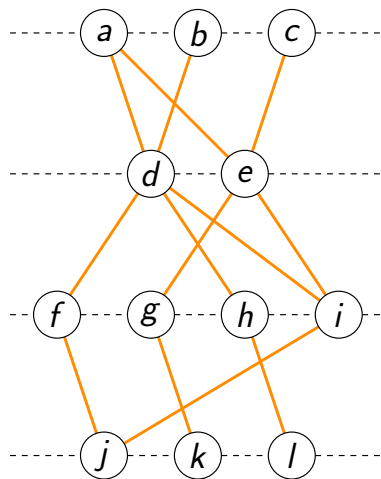
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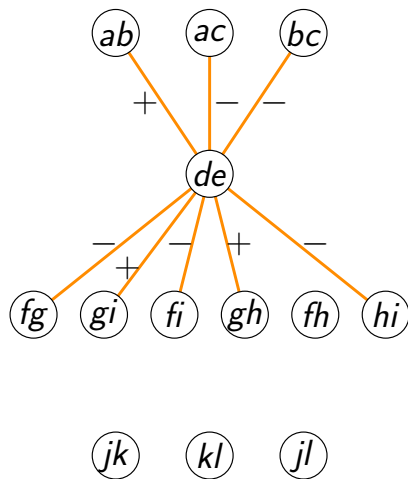
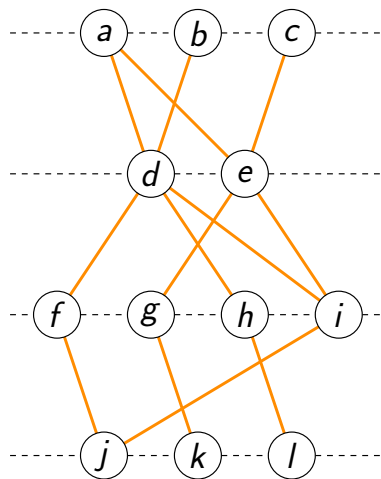
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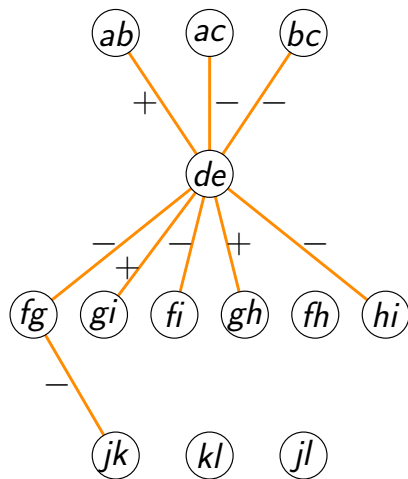
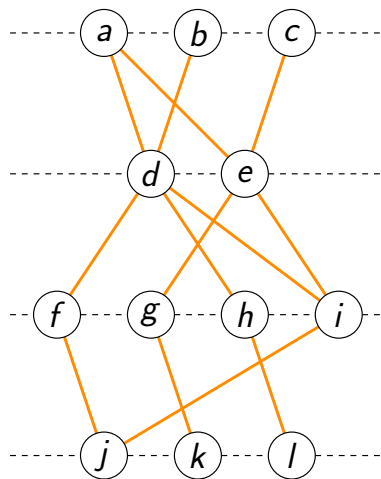
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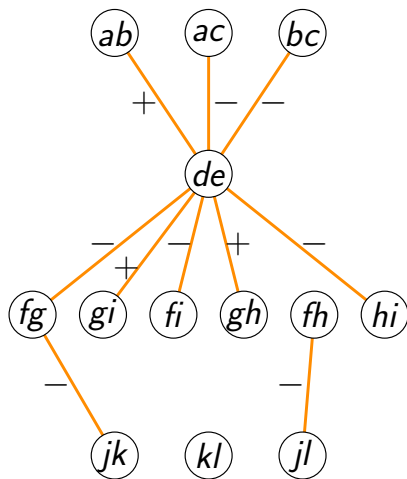
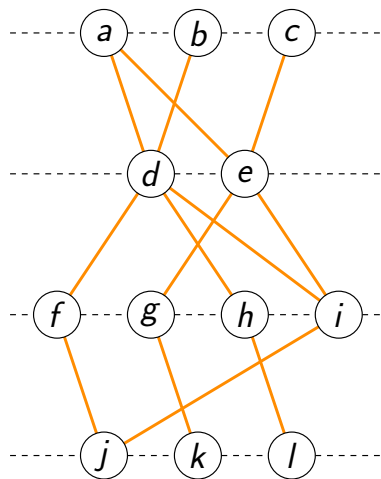
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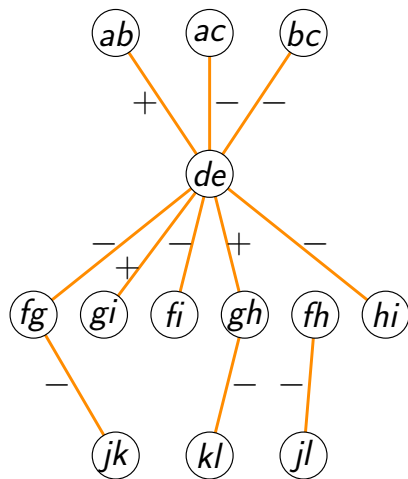
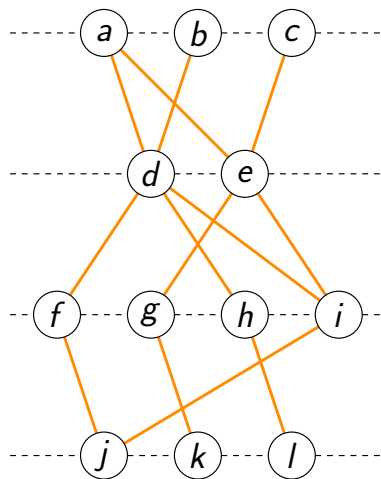
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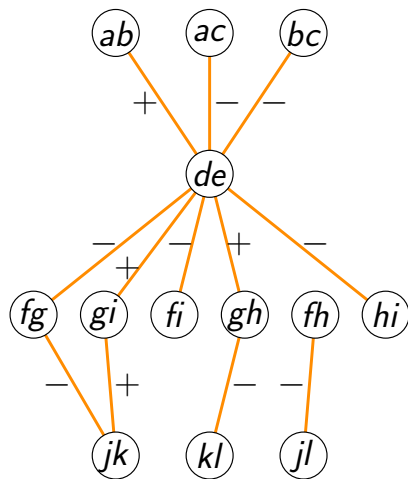
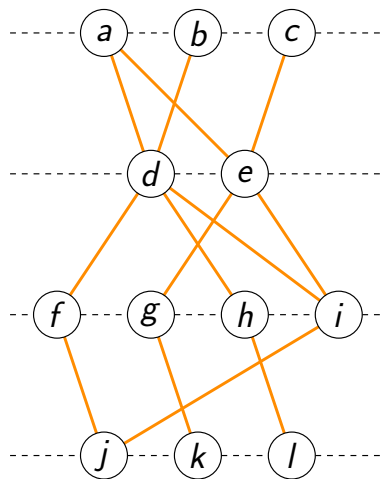
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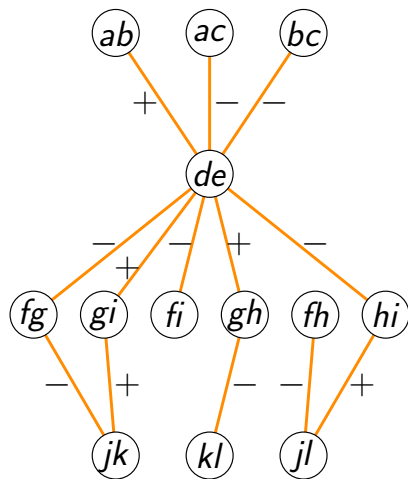
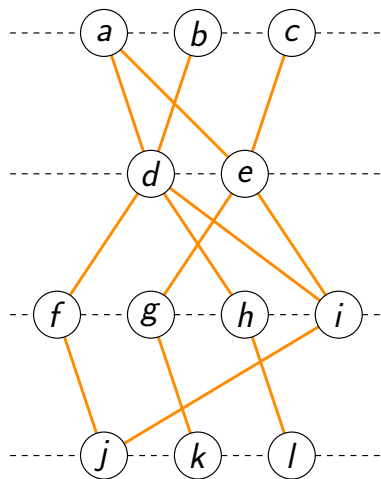
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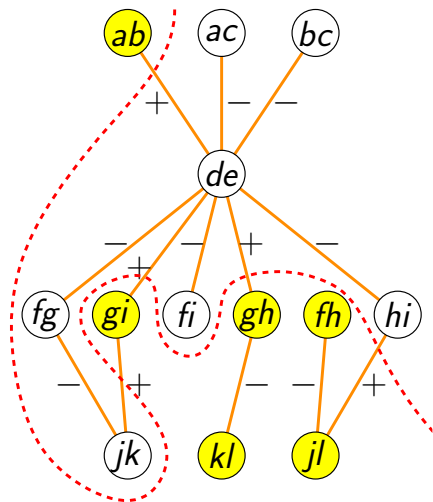
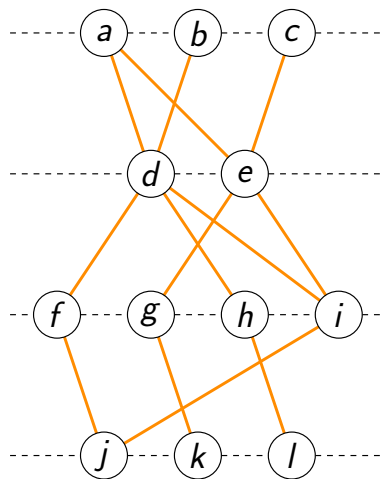
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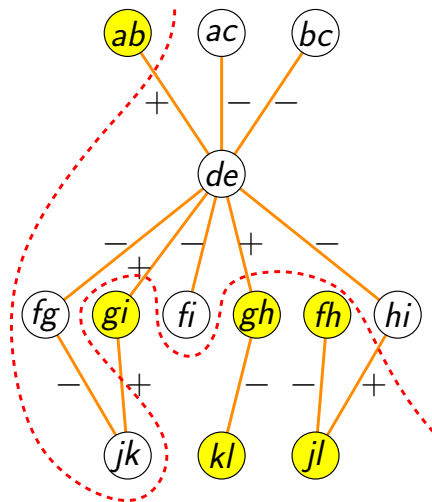
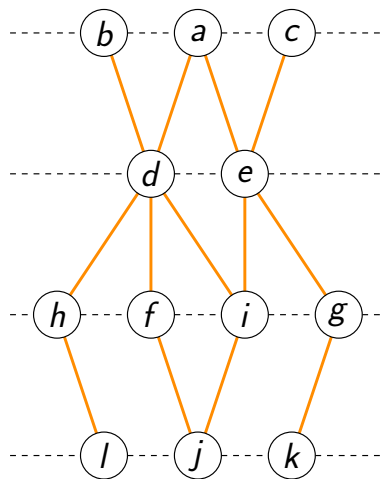
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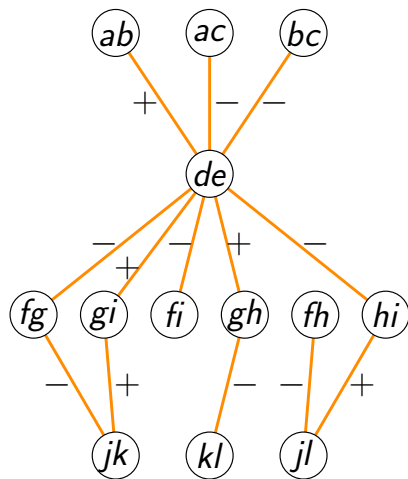
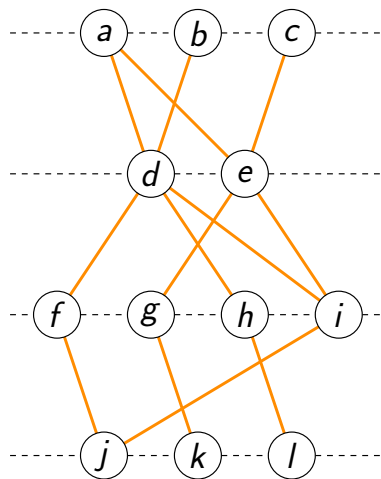
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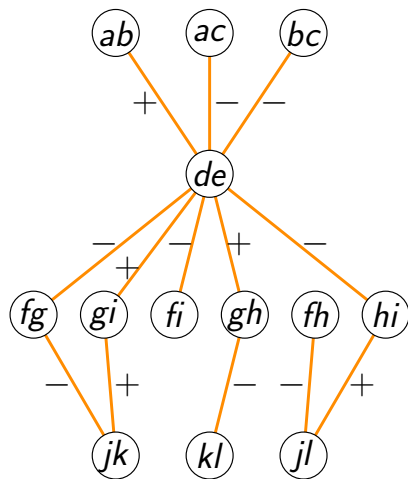
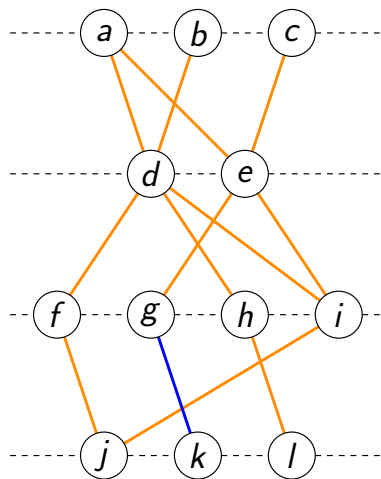
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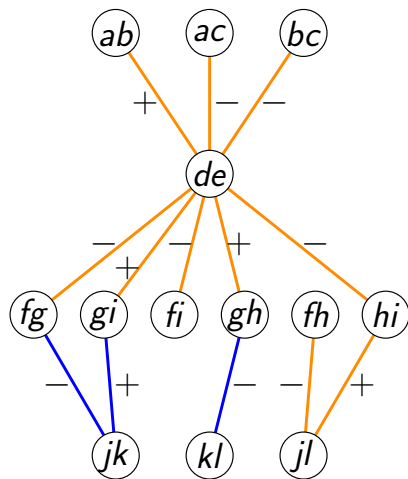
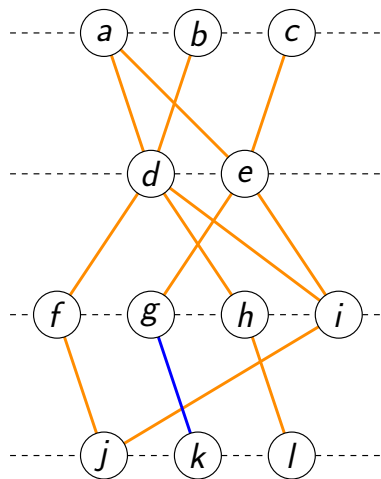
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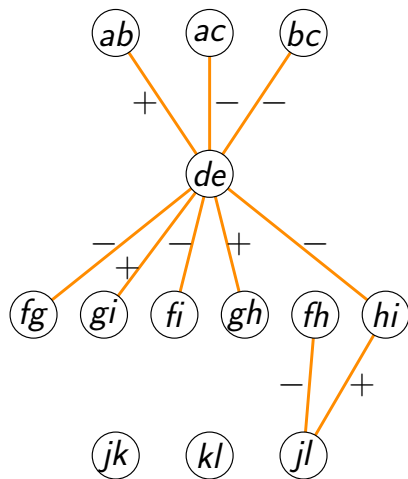
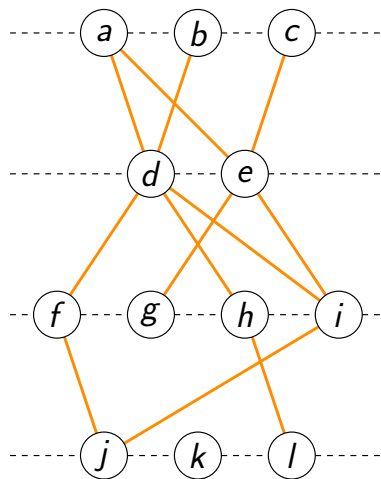
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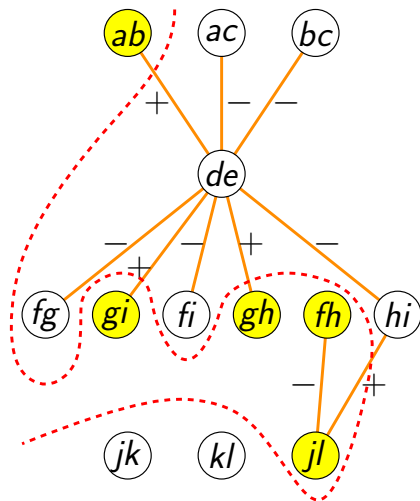
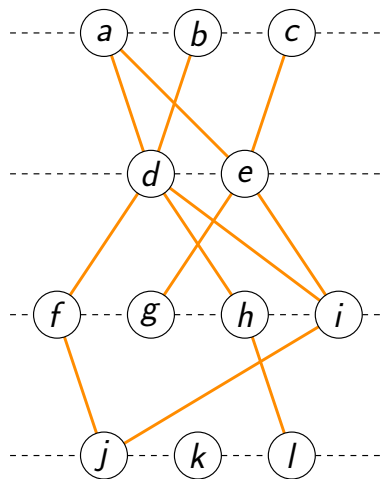
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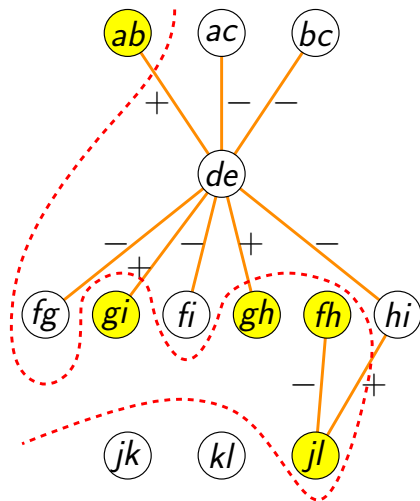
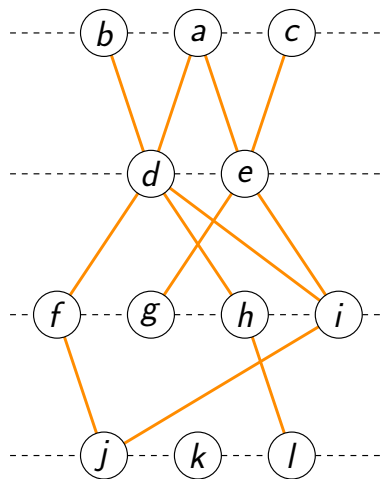
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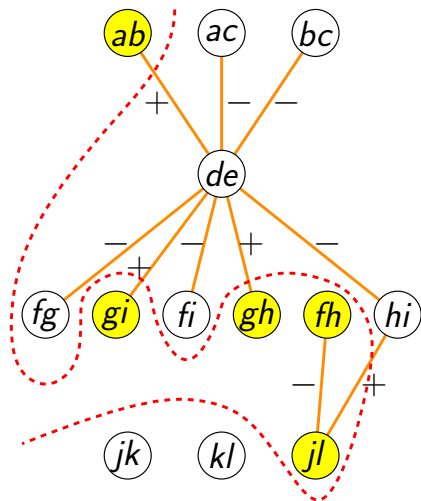
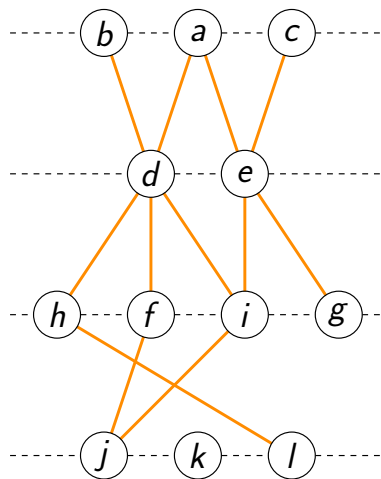
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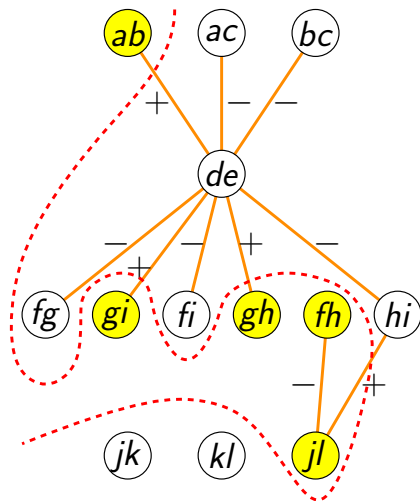
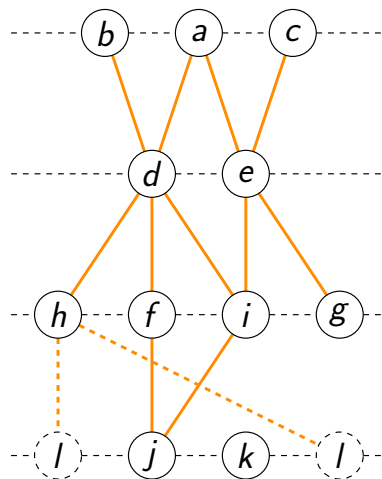
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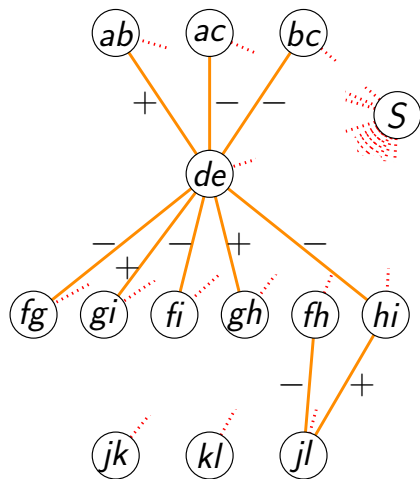
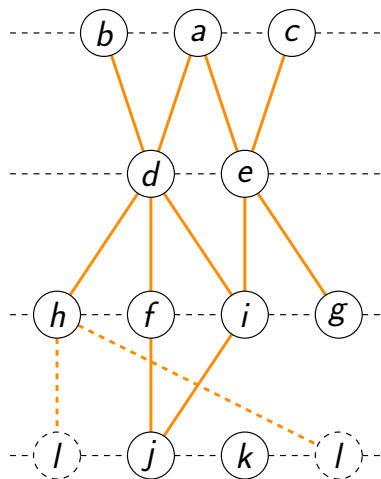
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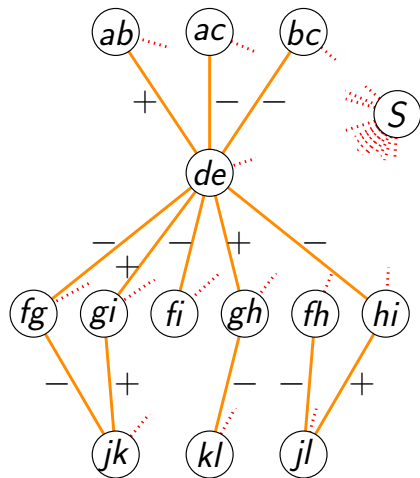
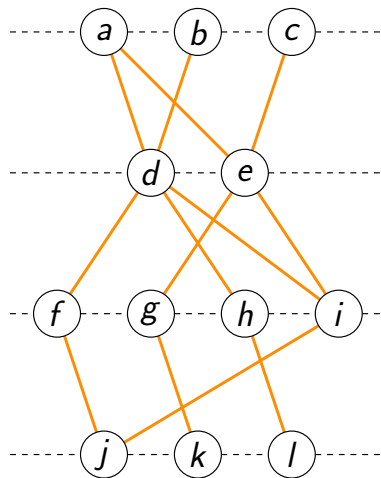
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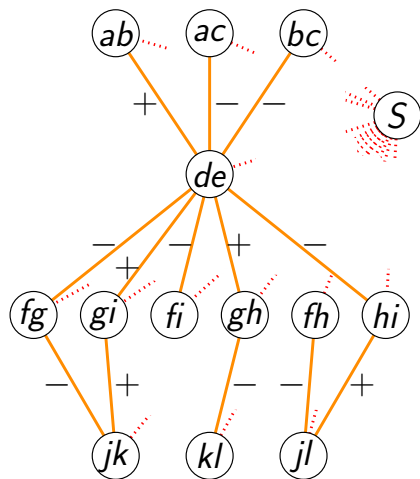
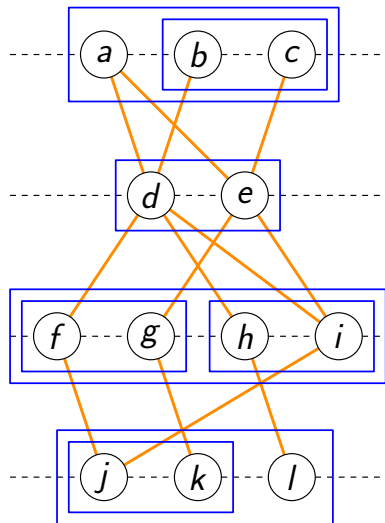
Trees on layers

Baumann, Buchheim, Liers, 2010.



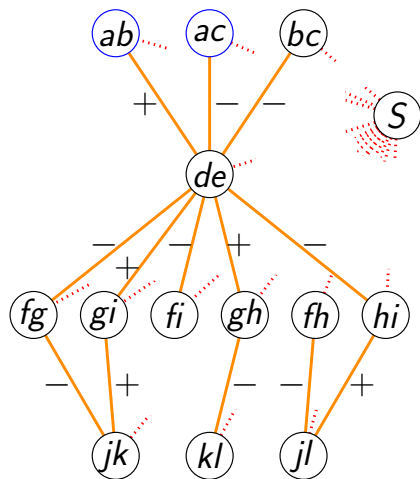
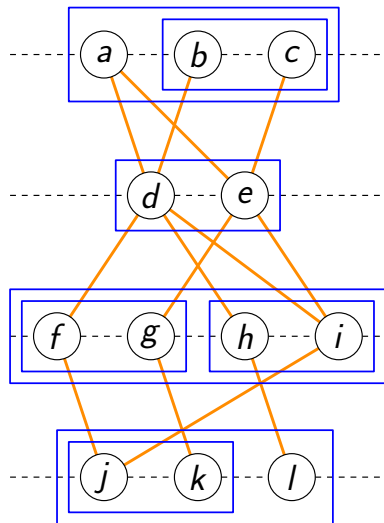
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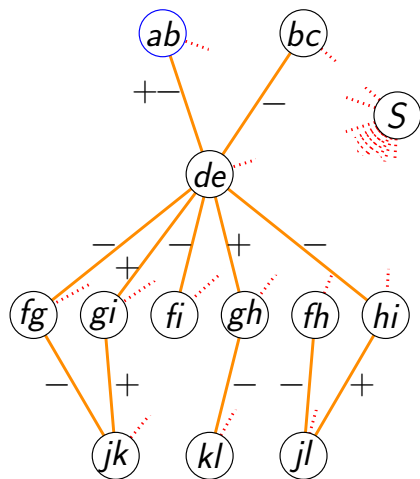
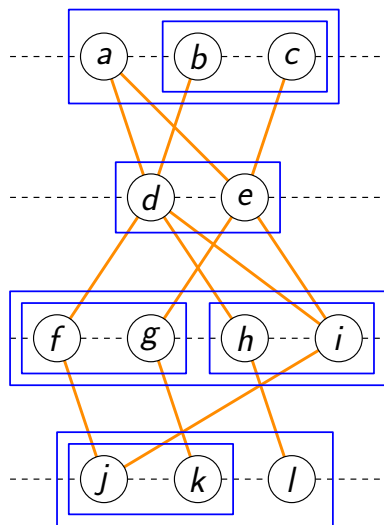
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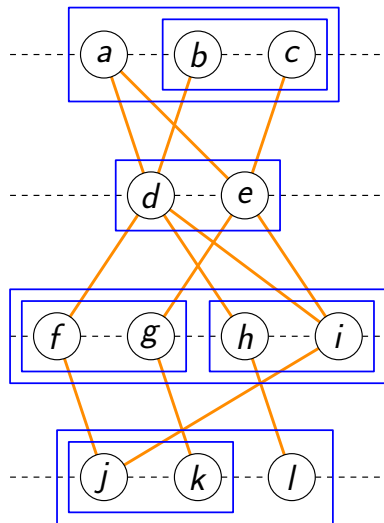
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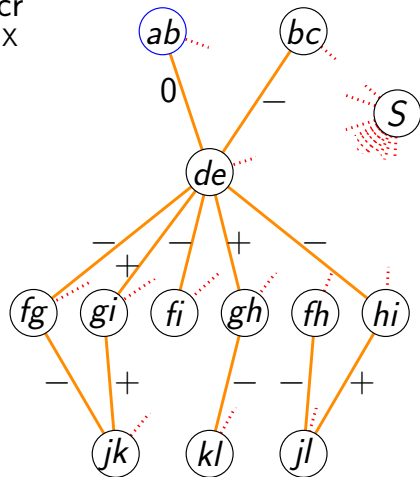


Trees on layers

Baumann, Buchheim, Liers, 2010.

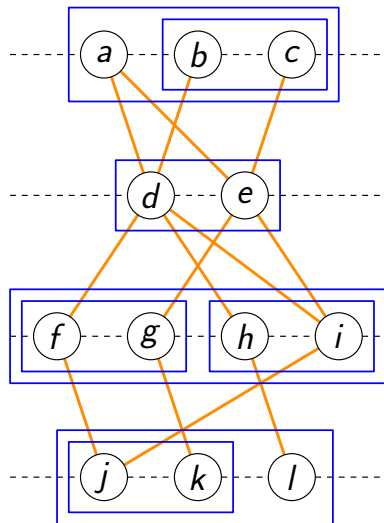


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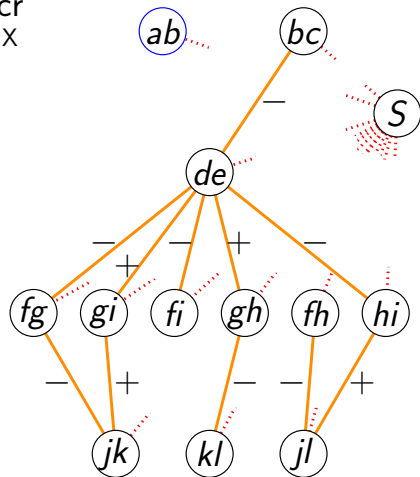


Trees on layers

Baumann, Buchheim, Liers, 2010.

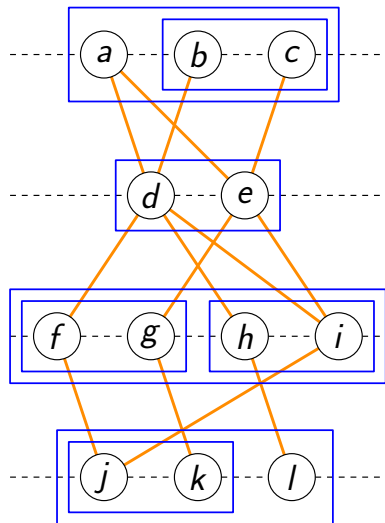


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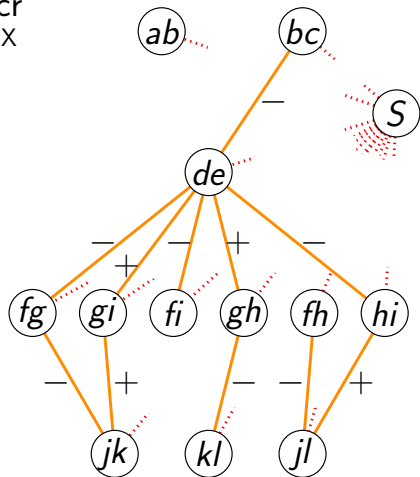


Trees on layers

Baumann, Buchheim, Liers, 2010.

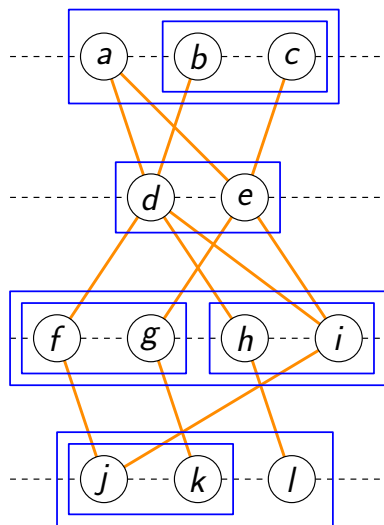


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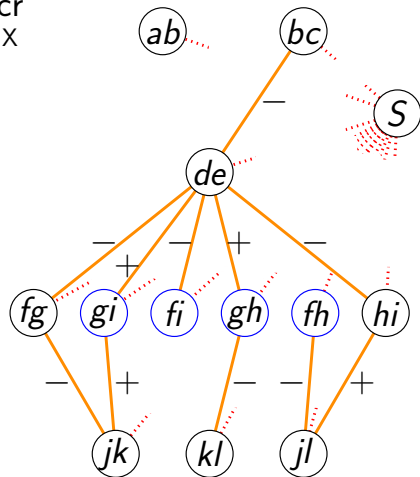


Trees on layers

Baumann, Buchheim, Liers, 2010.

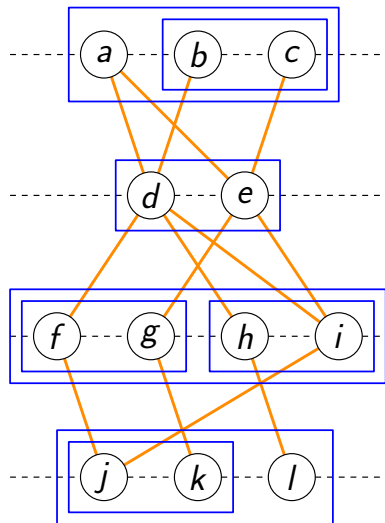


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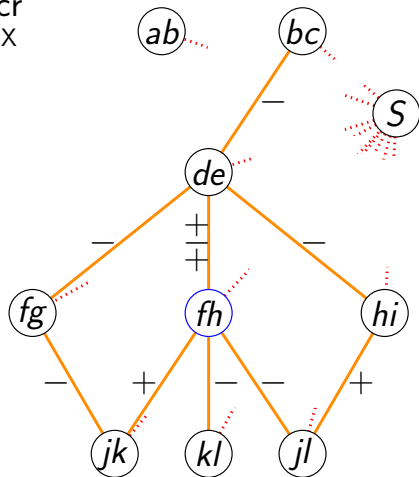


Trees on layers

Baumann, Buchheim, Liers, 2010.

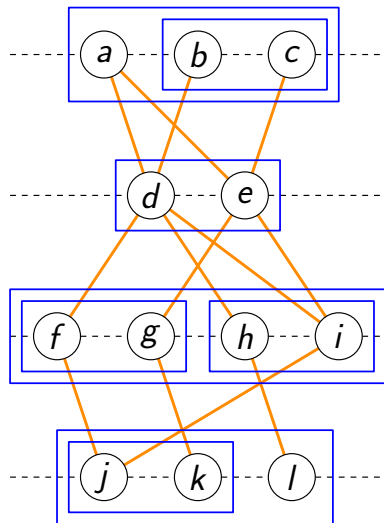


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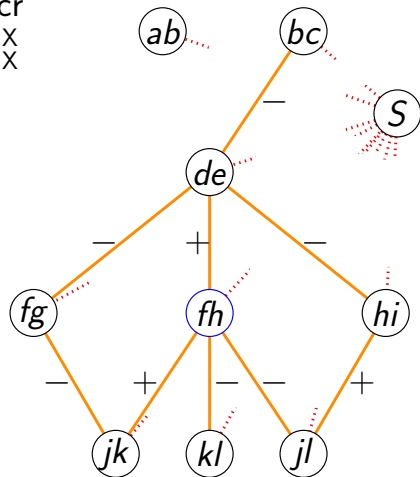


Trees on layers

Baumann, Buchheim, Liers, 2010.

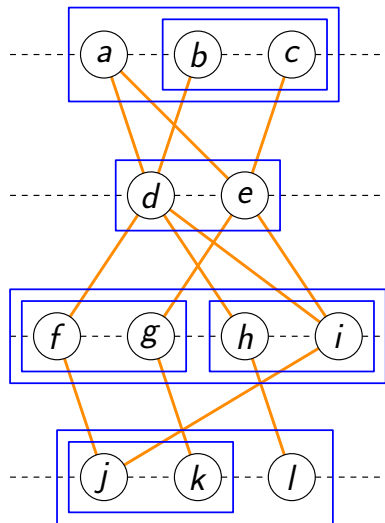


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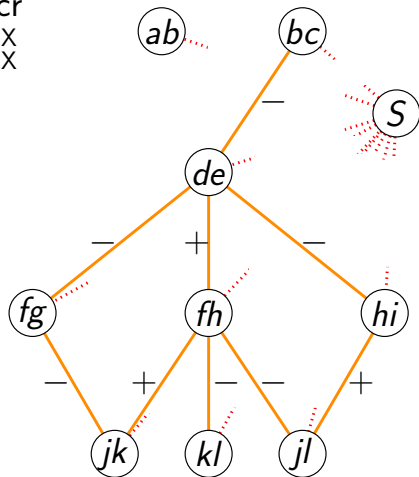


Trees on layers

Baumann, Buchheim, Liers, 2010.

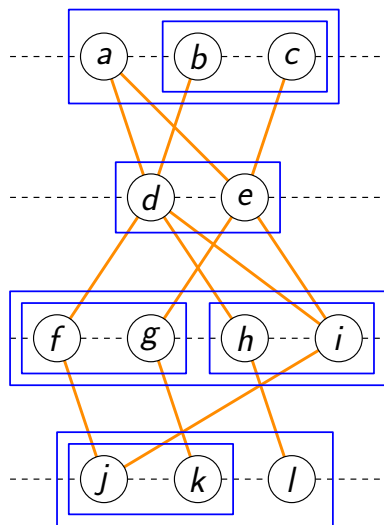


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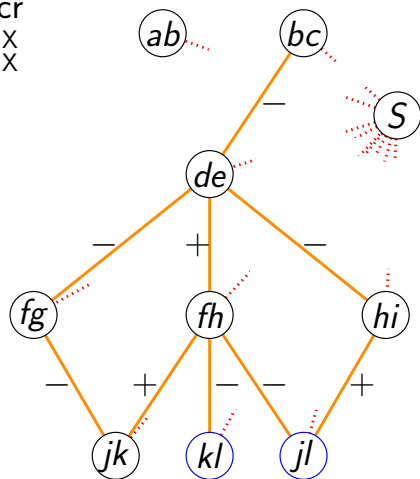


Trees on layers

Baumann, Buchheim, Liers, 2010.

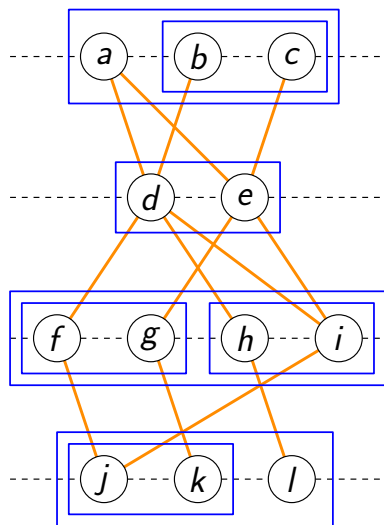


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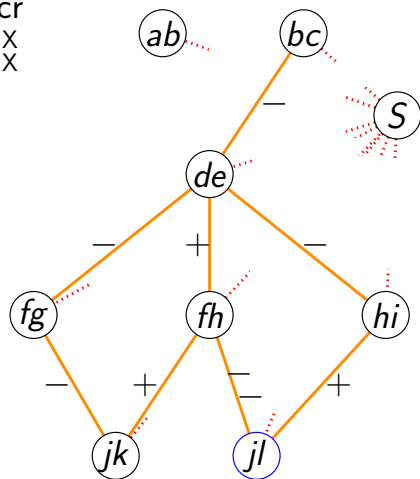


Trees on layers

Baumann, Buchheim, Liers, 2010.

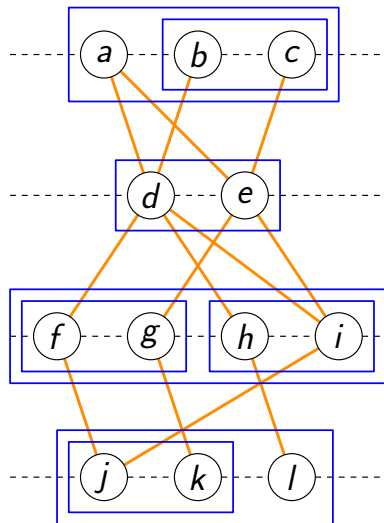


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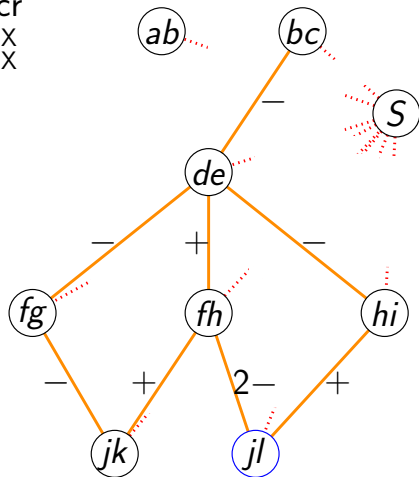


Trees on layers

Baumann, Buchheim, Liers, 2010.

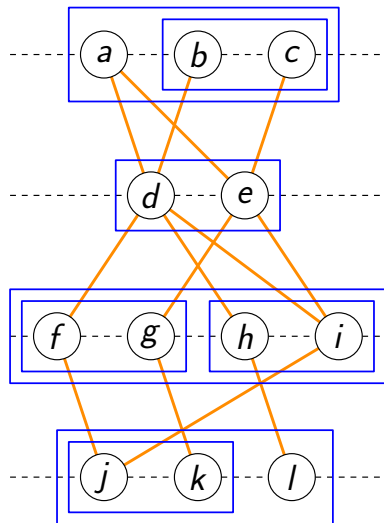


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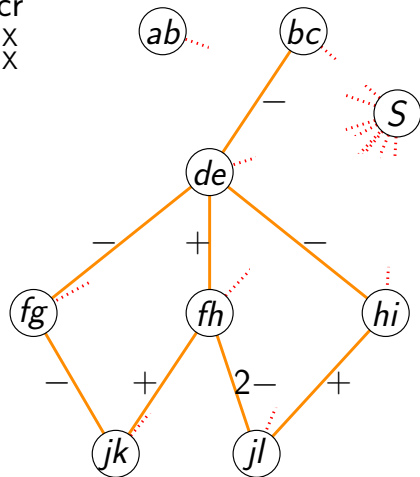


Trees on layers

Baumann, Buchheim, Liers, 2010.

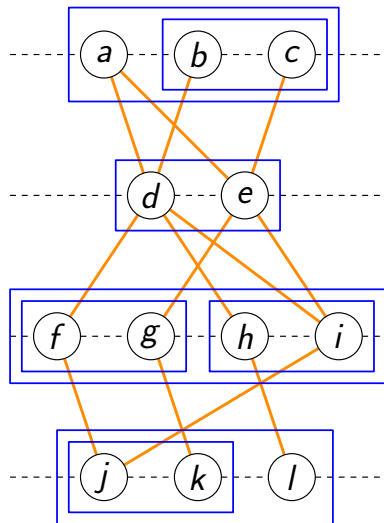


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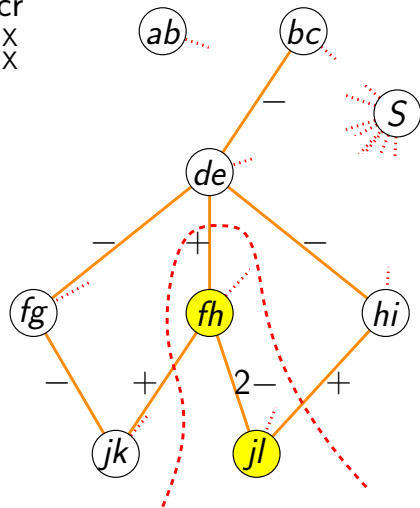


Trees on layers

Baumann, Buchheim, Liers, 2010.

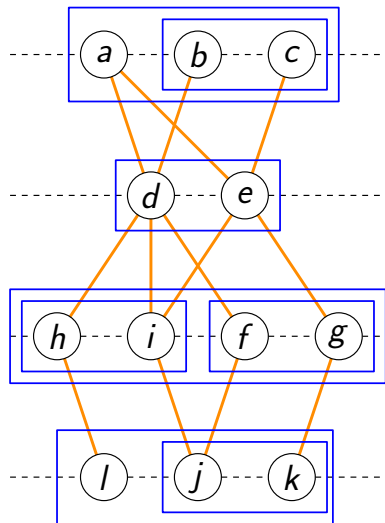


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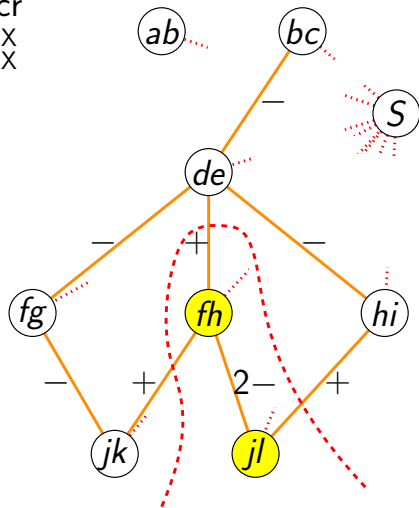


Trees on layers

Baumann, Buchheim, Liers, 2010.

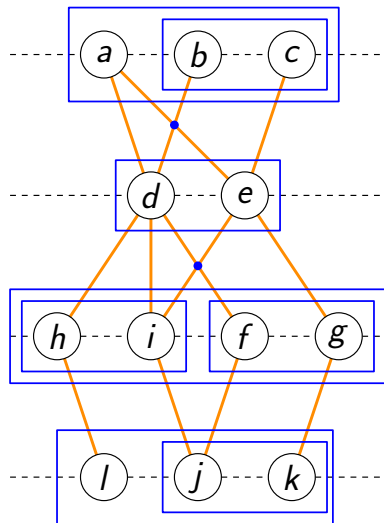


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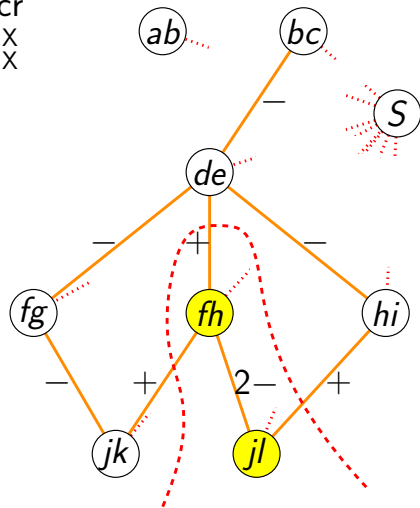


Trees on layers

Baumann, Buchheim, Liers, 2010.



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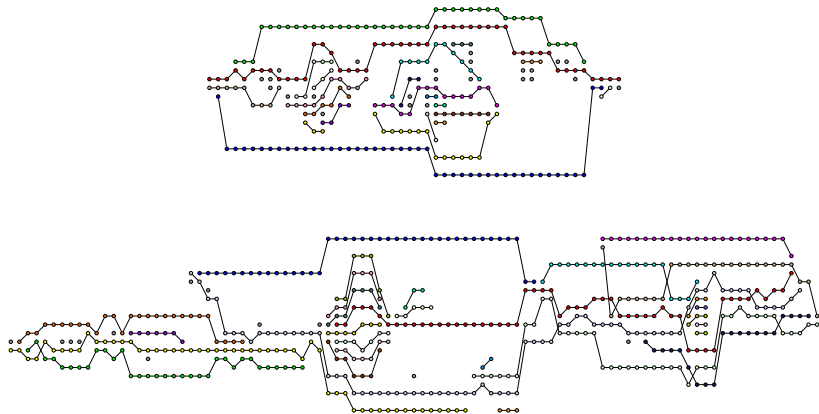
B&C computational results

	p	$ V $	$ E $	cr	Vars	Const	SubP	Time
anna1	58	409	368	20	1 944	2 744	31	13.03
anna2	58	525	489	12	3 689	2 666	1	0.88
anna3	48	265	219	0	951	0	1	0.01
anna4	49	364	334	20	2 116	2 279	13	4.86
anna5	71	615	565	17	3 821	3 242	3	2.60
anna6	56	522	495	31	3 586	4 417	3	3.89
anna7	62	467	420	9	2 525	2 360	17	7.88
anna8	28	192	175	6	1 036	851	1	0.15
huck	107	1 059	985	42	7 942	11 381	29	111.31
jean1	95	502	462	10	1 777	1 314	3	0.90
jean2	59	226	212	6	461	385	1	0.08
jean3	99	873	838	13	6 559	4 208	7	6.31
jean4	76	909	876	42	9 219	10 293	3	22.22
jean5	73	491	471	17	2 608	2 416	3	1.52
Inception	139	925	915	35	1 784	2 382	3	2.02
Star Wars	100	940	926	39	2 132	2 449	1	0.99
The Matrix	82	683	669	12	1 388	1 373	3	0.77

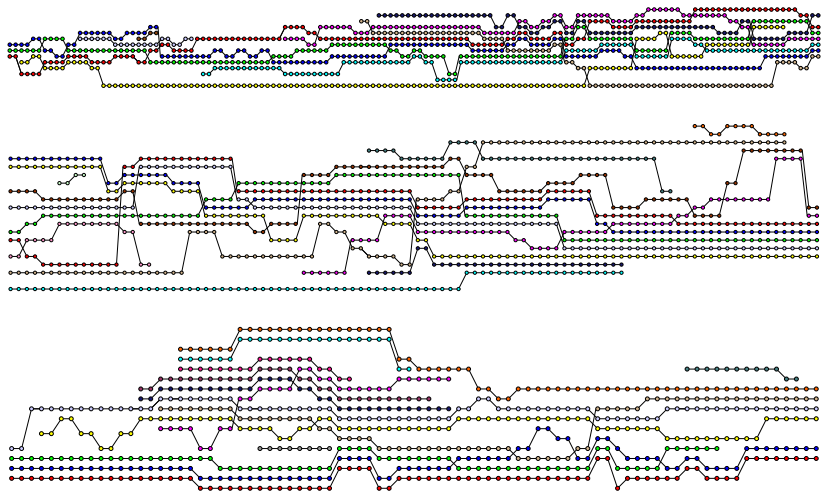
Book instances from Knuth: The Stanford GraphBase.

Movie instances from Tanahashi, Ma, 2012.

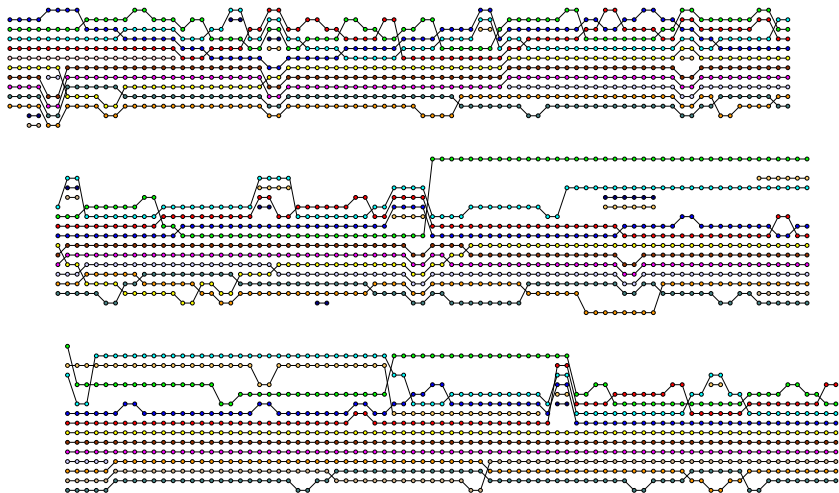
Storylines Visualizations - Books



Storylines Visualizations - Movies



Storylines Visualizations - Chair Prof. Dr. Jünger



01.09.2013 - 31.08.2016

— The End —

