Greedy Rectilinear Drawings

Philipp Kindermann
Cheriton School of Computer Science
University of Waterloo

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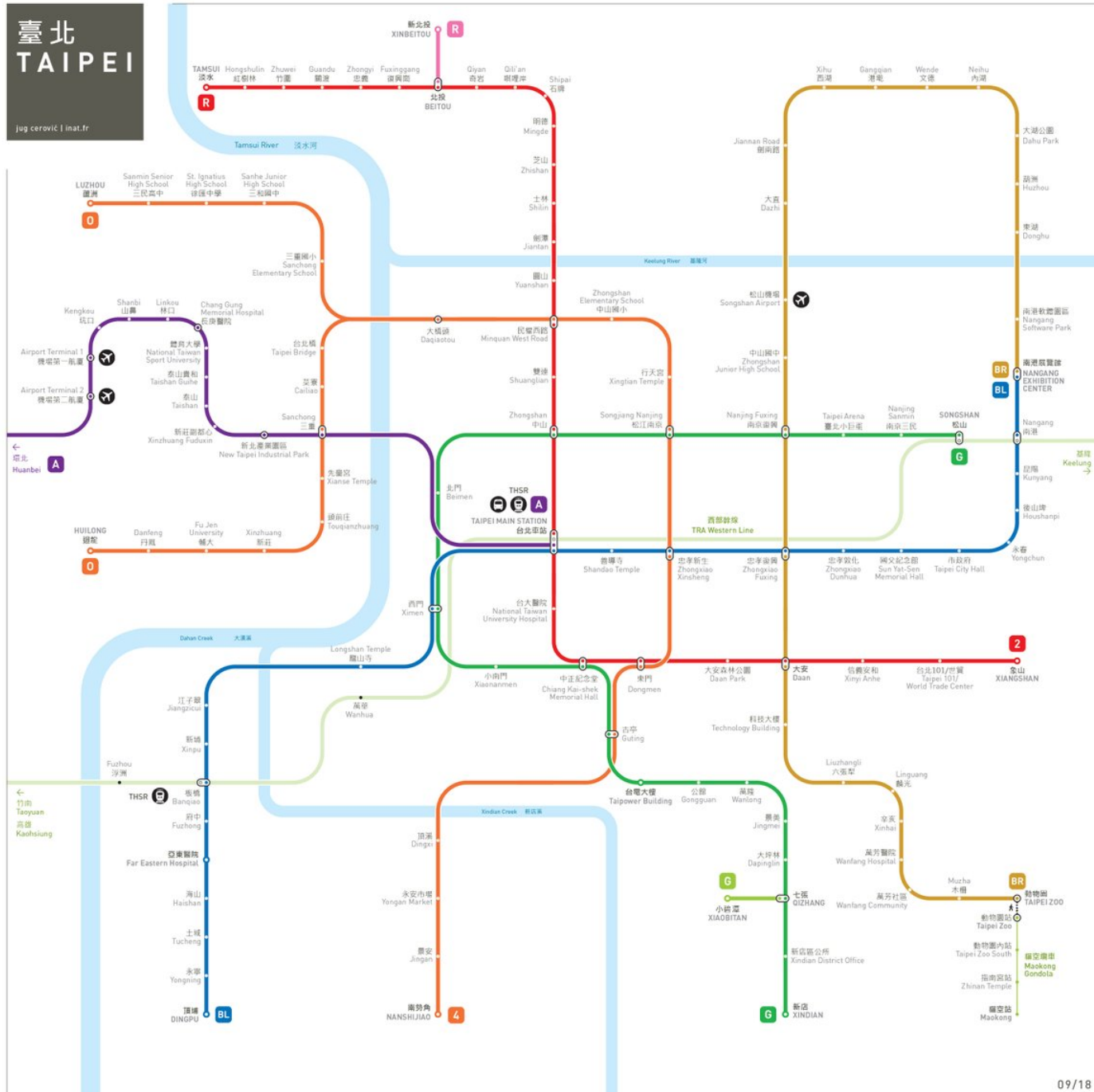
臺北
TAIPEI
jug cerović | inat.fr
新北投 XINBEITOU
TAMSUI 淡水
Hongshulin 紅樹林
Zhuwei 竹圍
Guandu 關渡
Zhongyi 忠義
Fuxinggang 復興崗
Qiyan 奇岩
Qili'an 唭哩岸
Shipai 石牌
北投 BEITOU
Tamsui River 淡水河
明德 Mingde
芝山 Zhishan
士林 Shilin
劍潭 Jiantan
圓山 Yuanshan
LUZHOU 蘆洲
Sanmin Senior High School 三民高中
St. Ignatius High School 徐匯中學
Sanhe Junior High School 三和國中
三重國小 Sanchong Elementary School
Kengkou 坑口
Shanbi 山鼻
Linkou 林口
Chang Gung Memorial Hospital 長庚醫院
Airport Terminal 1 機場第一航廈
Airport Terminal 2 機場第二航廈
體育大學 National Taiwan Sport University
泰山貴和 Taishan Guihe
泰山 Taishan
新莊副都心 Xinzhuang Fuduxin
新北產業園區 New Taipei Industrial Park
台北橋 Taipei Bridge
菜寮 Cailiao
Sanchong 三重
先嗇宮 Xianse Temple
頭前庄 Touqianzhuang
HUILONG 蘆龍
Danfeng 丹鳳
Fu Jen University 輔大
Xinzhuang 新莊
大橋頭 Daqiaotou
民權西路 Minquan West Road
雙連 Shuanglian
Zhongshan 中山
Zhongshan Elementary School 中山國小
行天宮 Xingtian Temple
Songjiang Nanjing 松江南京
北門 Beimen
THSR
TAIPEI MAIN STATION 台北車站
普濟寺 Shandao Temple
西門 Ximen
台大醫院 National Taiwan University Hospital
Dahan Creek 大漢溪
Longshan Temple 龍山寺
小南門 Xiaonanmen
中正紀念堂 Chiang Kai-shek Memorial Hall
東門 Dongmen
萬華 Wanhua
古亭 Guting
江子翠 Jiangzicui
新埔 Xinpu
Fuzhou 浮洲
THSR 板橋 Banqiao
府中 Fuzhong
亞東醫院 Far Eastern Hospital
海山 Haishan
土城 Tucheng
永寧 Yongning
頂埔 DINGPU
Xindian Creek 新店溪
頂溪 Dingxi
永安市場 Yongan Market
景安 Jingan
南勢角 NANSHIJIAO
Xihu 西湖
Ganggian 港墘
Wende 文德
Neihu 內湖
Jiannan Road 南路
大直 Dazhi
大湖公園 Dahu Park
葫洲 Huzhou
東湖 Donghu
Keelung River 基隆河
松山機場 Songshan Airport
中山國中 Zhongshan Junior High School
南港軟體園區 Nangang Software Park
南港展覽館 NANGANG EXHIBITION CENTER
Nanjing Fuxing 南京復興
Taipei Arena 臺北小巨蛋
Nanjing Sanmin 南京三民
SONGSHAN 松山
Nangang 南港
基隆 Keelung
昆陽 Kunyang
後山埤 Houshanpi
永春 Yongchun
西部幹線 TRA Western Line
忠孝新生 Zhongxiao Xinsheng
忠孝復興 Zhongxiao Fuxing
忠孝敦化 Zhongxiao Dunhua
國父紀念館 Sun Yat-Sen Memorial Hall
市政府 Taipei City Hall
大安森林公園 Daan Park
大安 Daan
信義安和 Xinyi Anhe
台北101/世貿 Taipei 101/ World Trade Center
象山 XIANGSHAN
科技大樓 Technology Building
六張犁 Liuzhangli
Linguang 麟光
辛亥 Xinhai
萬芳醫院 Wanfang Hospital
萬芳社區 Wanfang Community
Muzha 木柵
動物園 TAIPEI ZOO
動物園站 Taipei Zoo
動物園內站 Taipei Zoo South
指南宮站 Zhinan Temple
貓空站 Maokong
貓空纜車 Maokong Gondola
台電大樓 Taipower Building
公館 Gongguan
萬隆 Wanlong
景美 Jingmei
大坪林 Dapinglin
七張 QIZHANG
小碧潭 XIAOBITAN
新店區公所 Xindian District Office
新店 XINDIAN
竹南 Taoyuan
高雄 Kaohsiung
09/18

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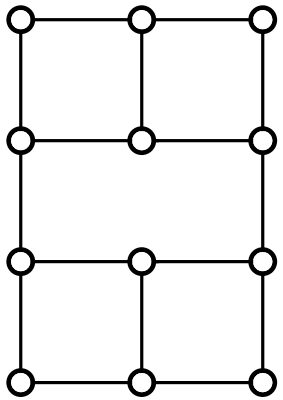

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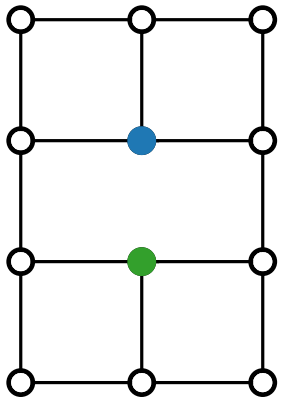

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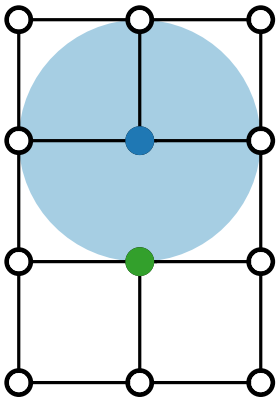

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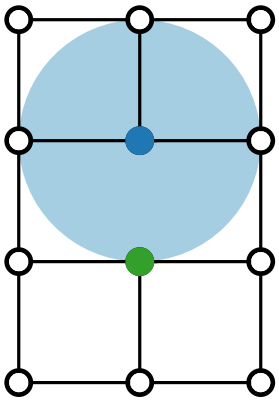

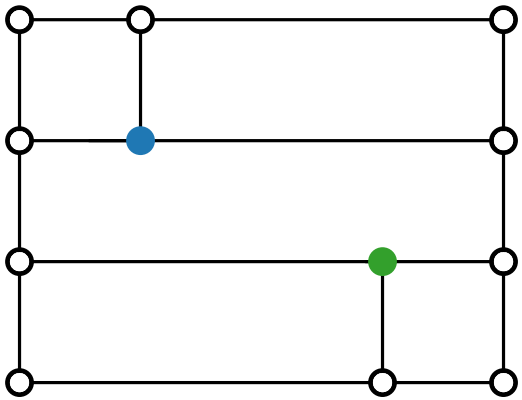

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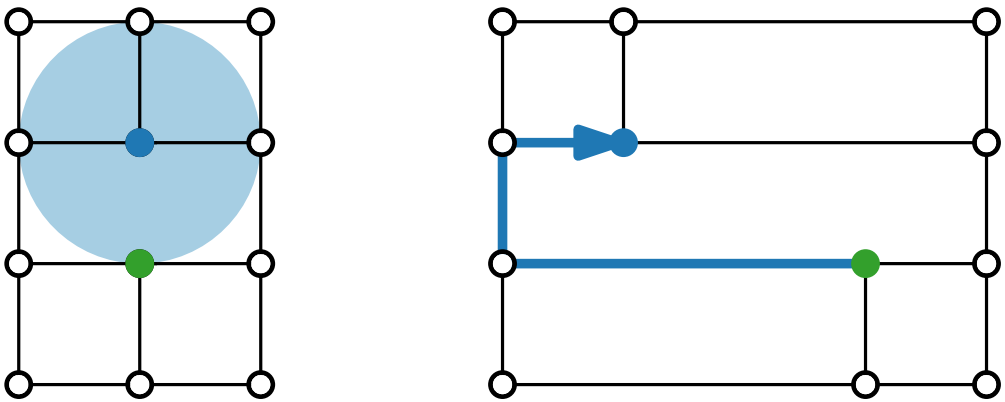

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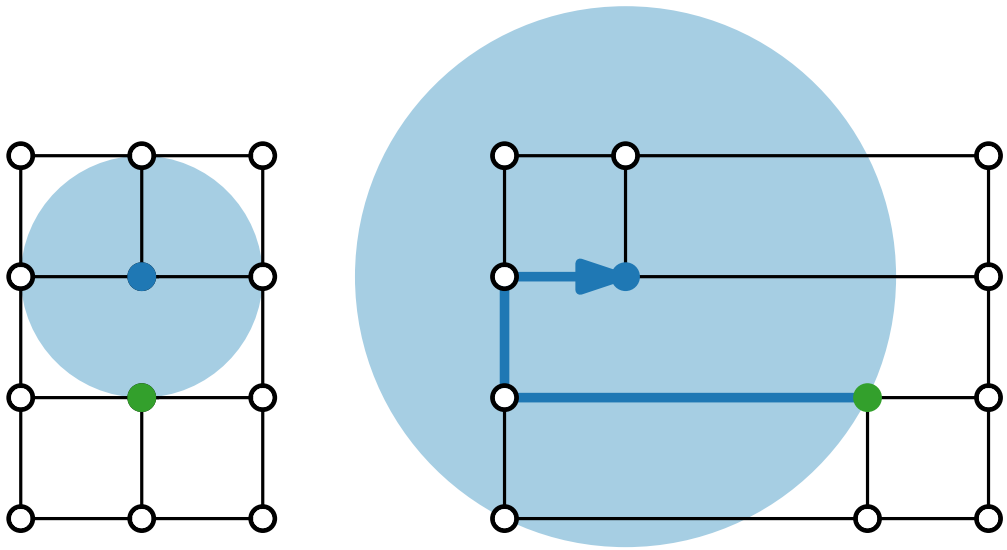

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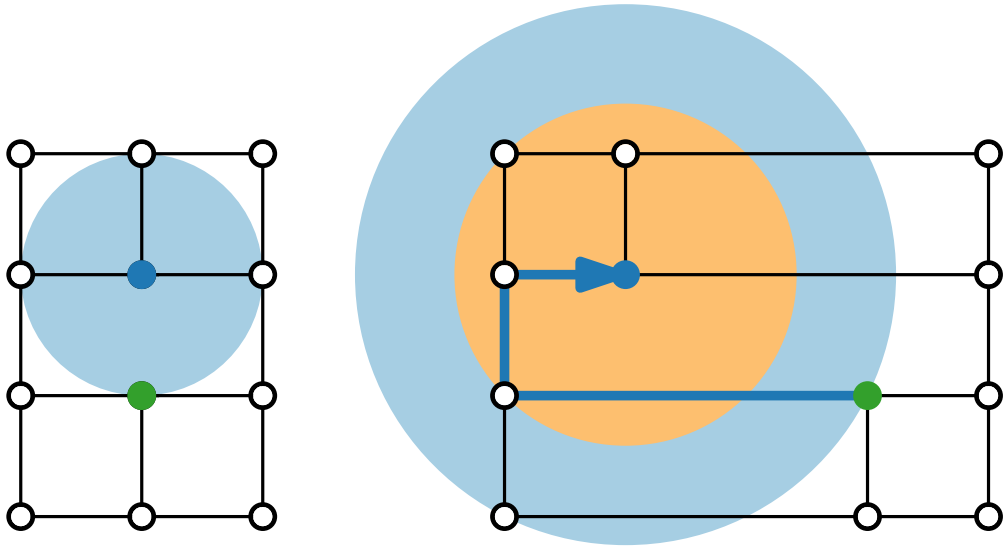

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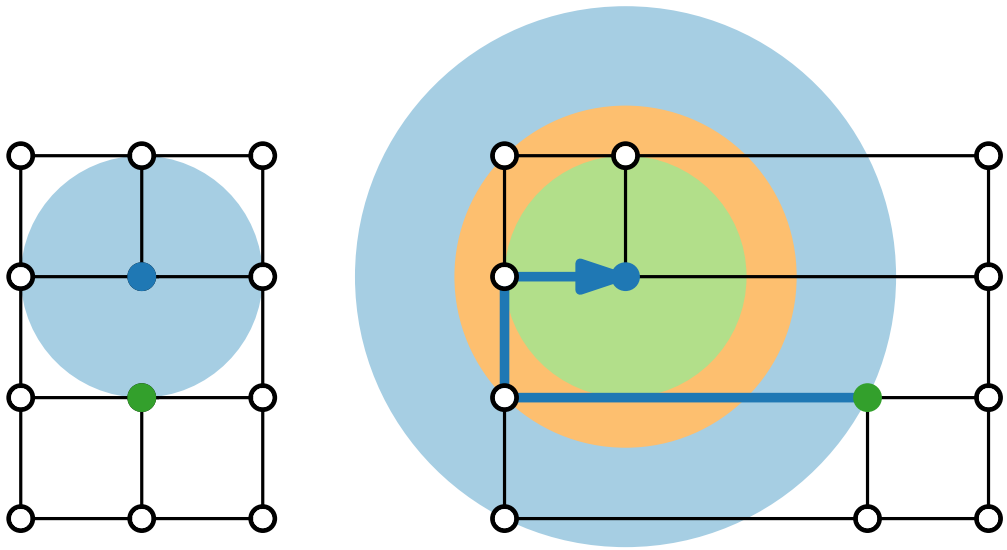

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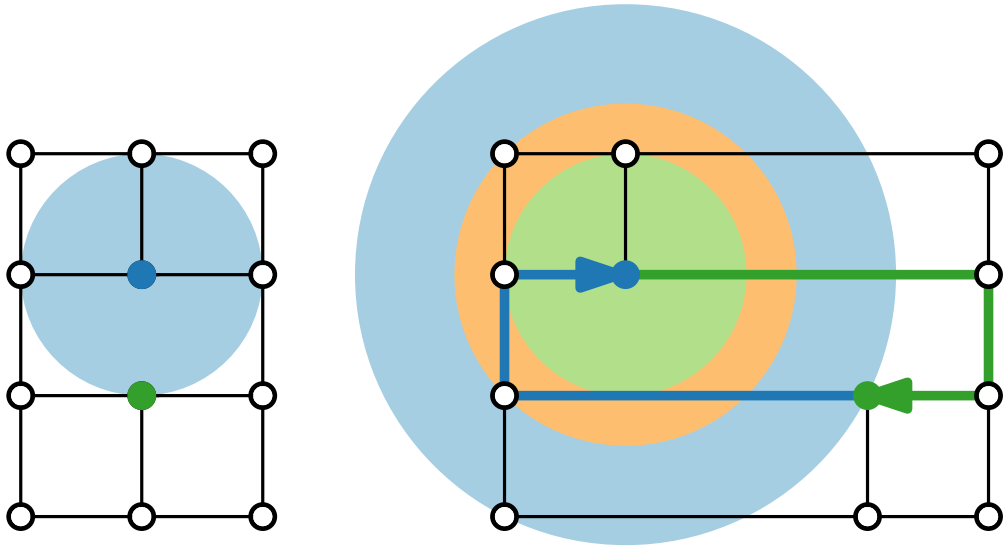

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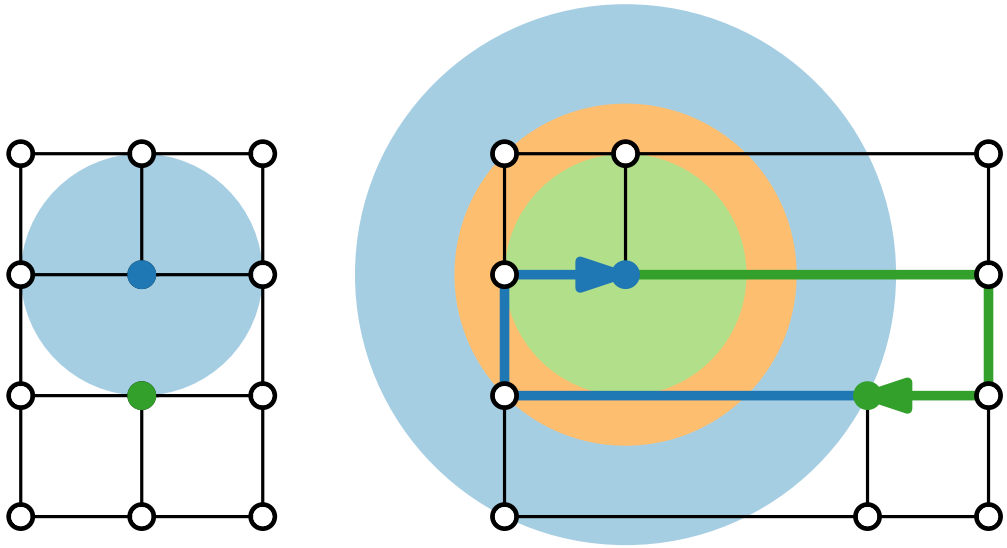

[Papadimitrou, Ratajczak]
Drawing greedy $\Leftrightarrow$ cell(v) empty $\forall v$

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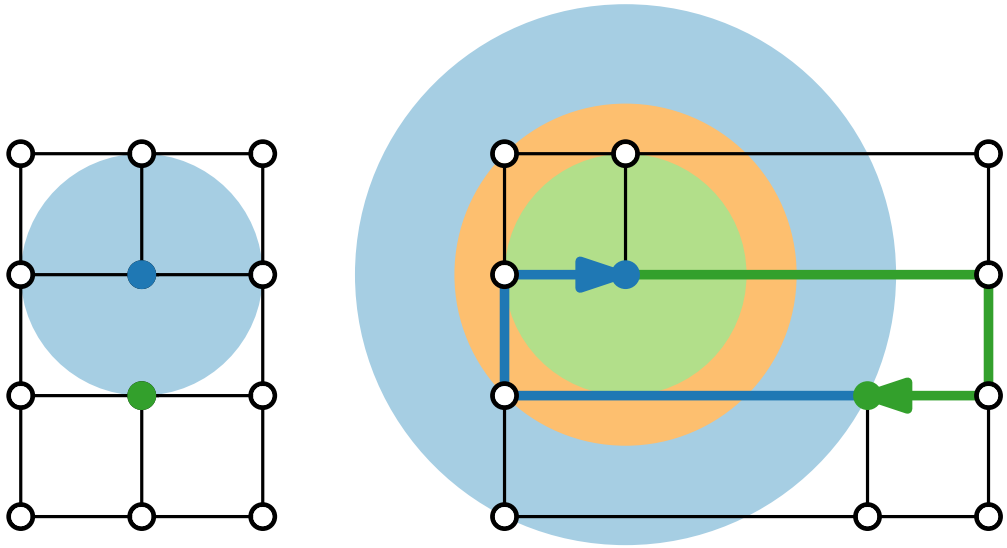

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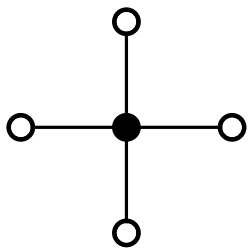

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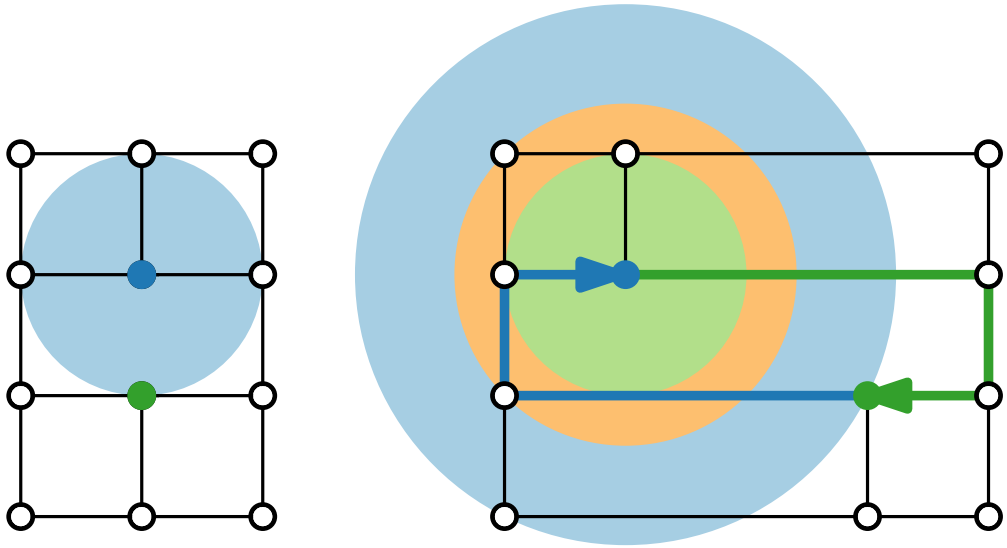

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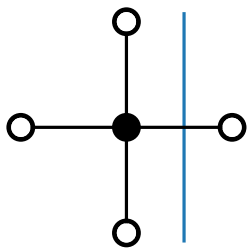

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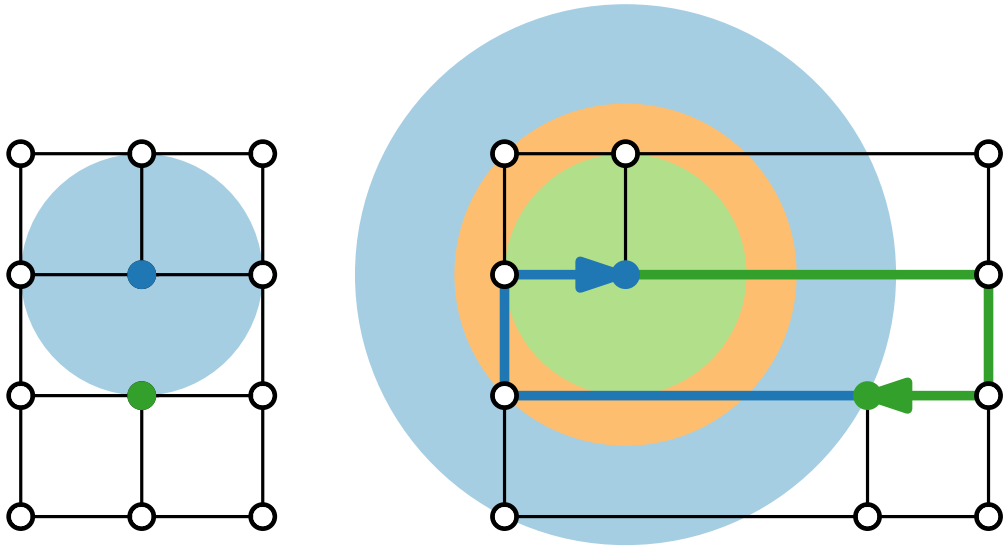

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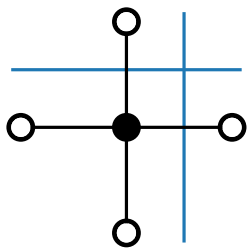

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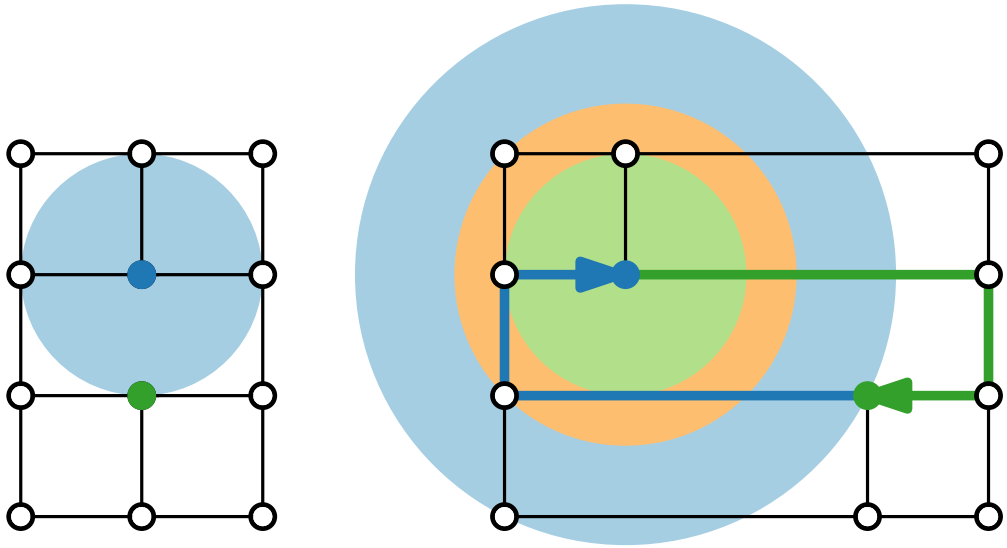

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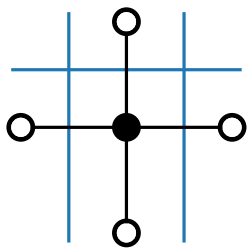

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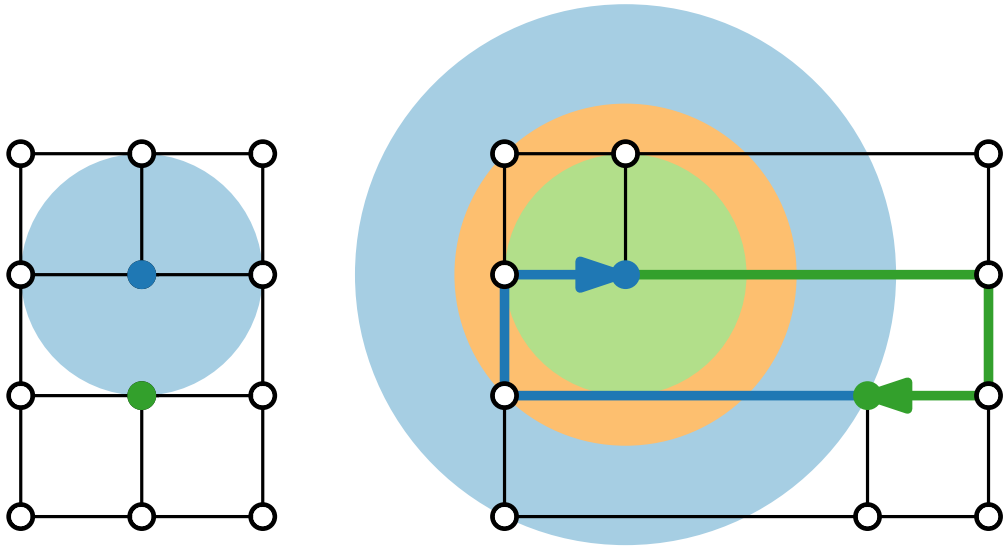

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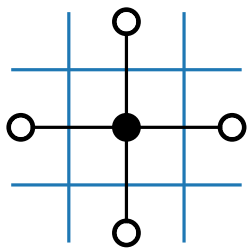

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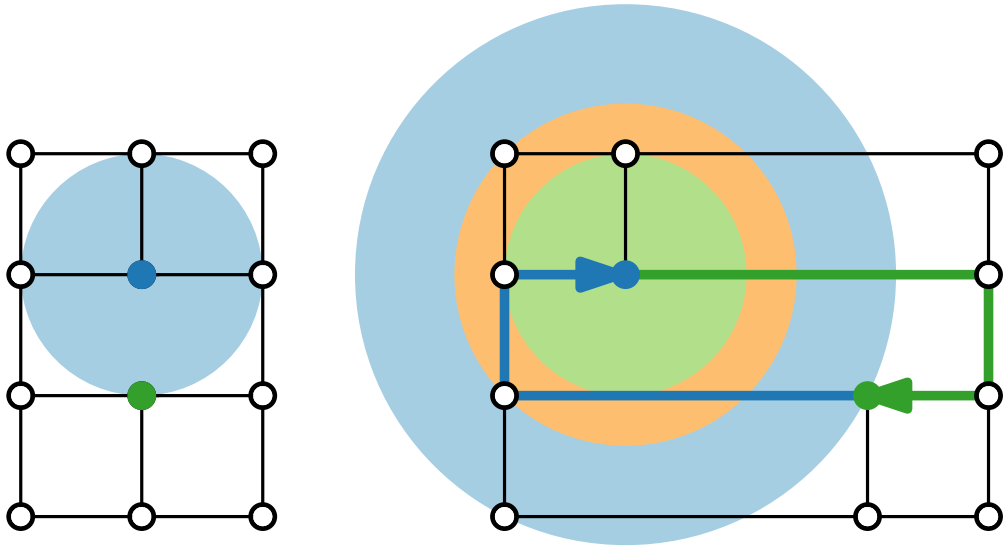

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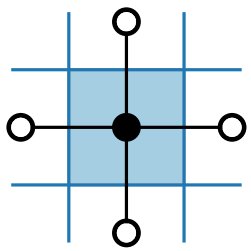

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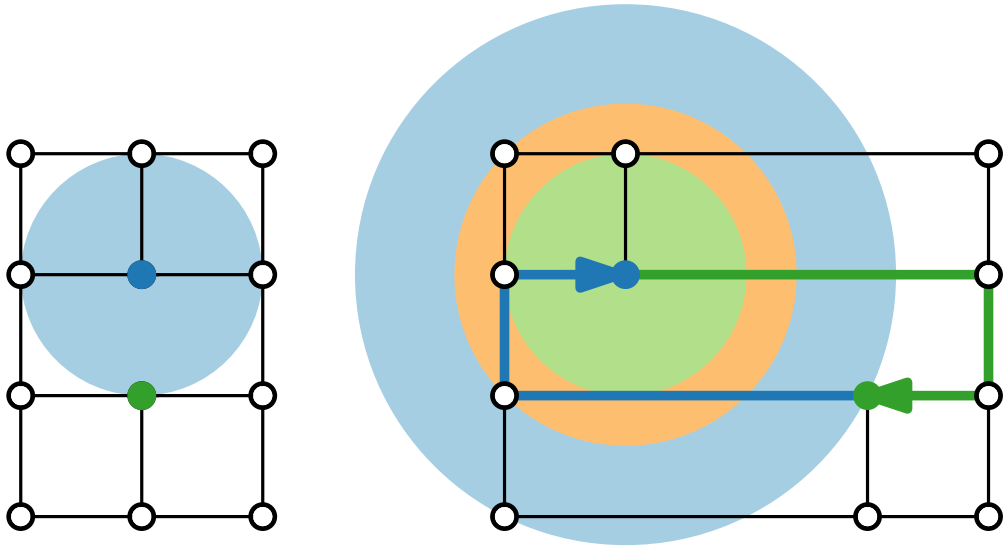

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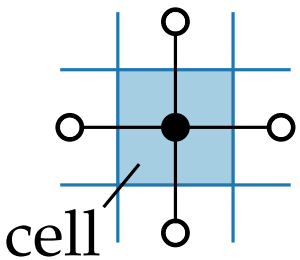

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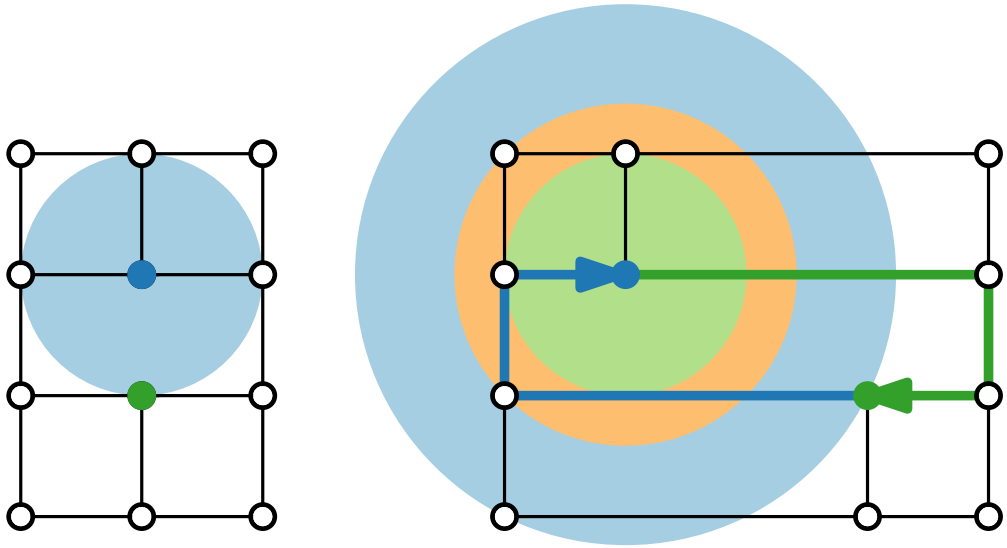

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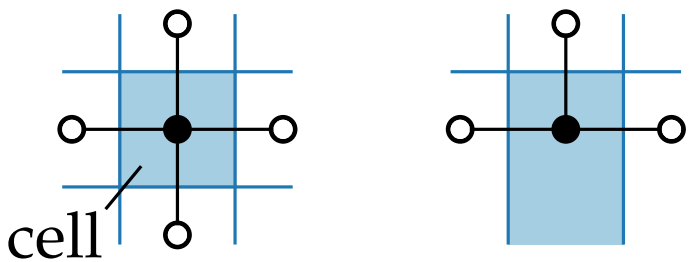

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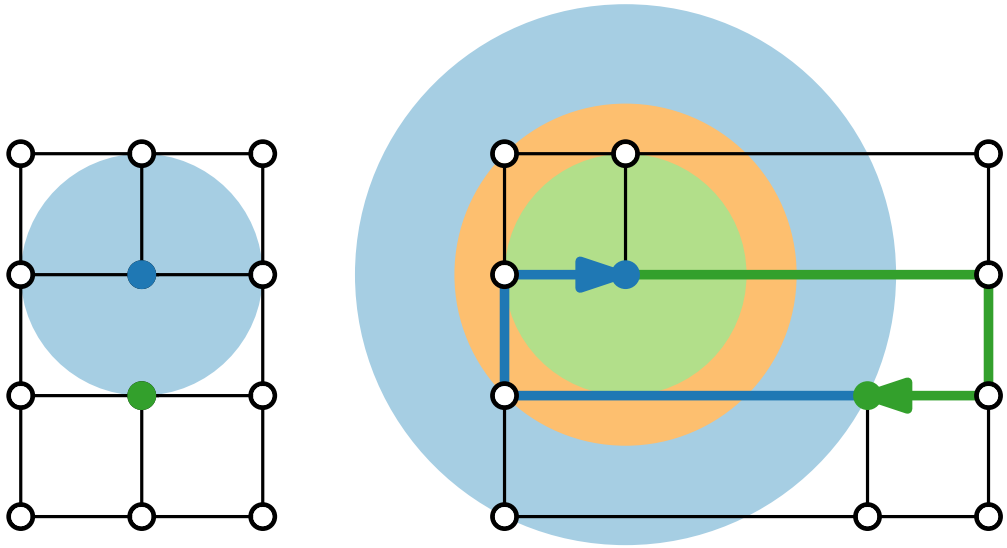

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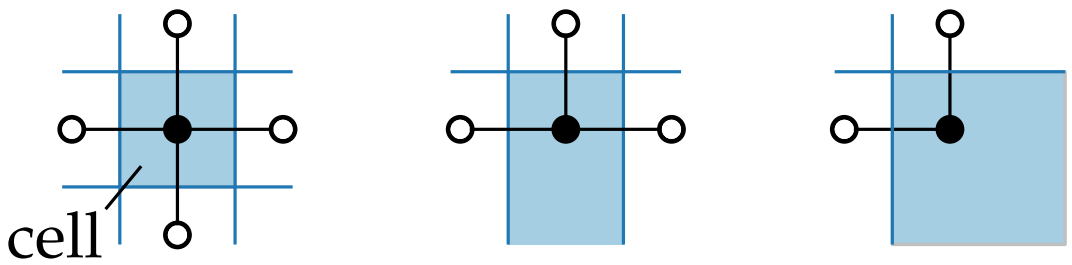

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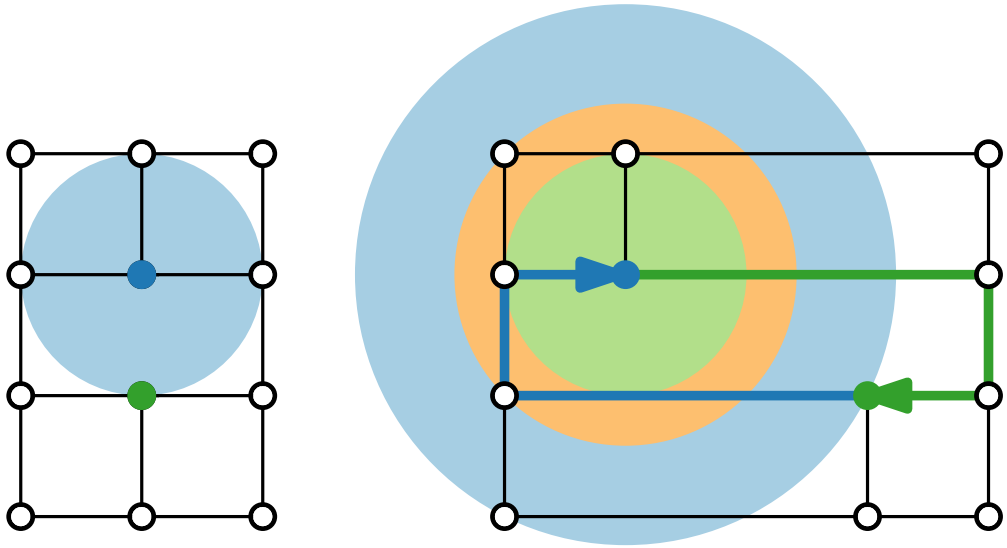

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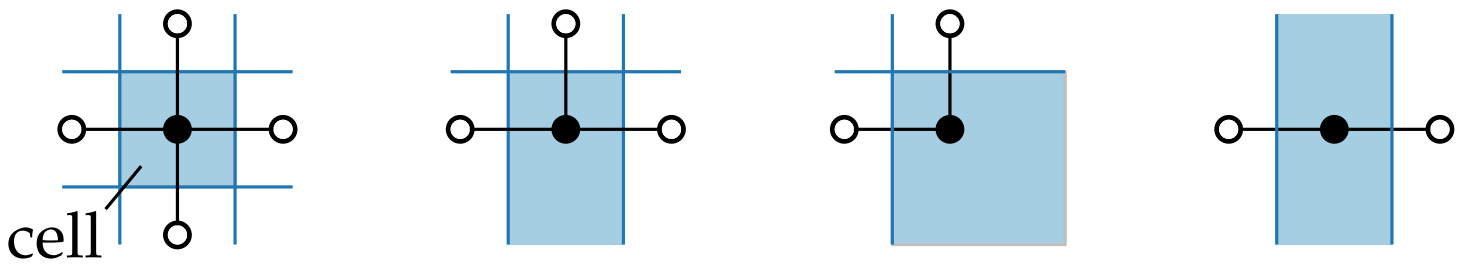

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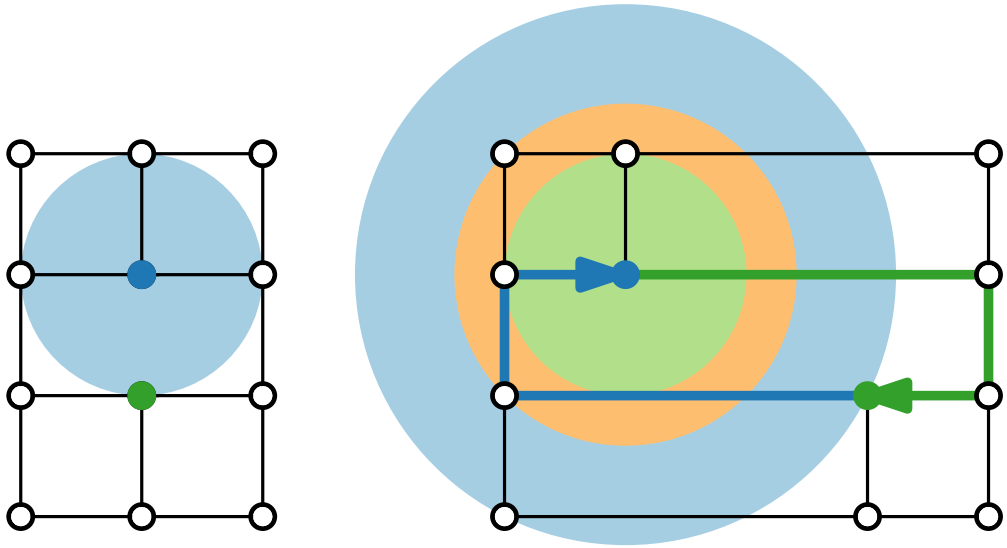

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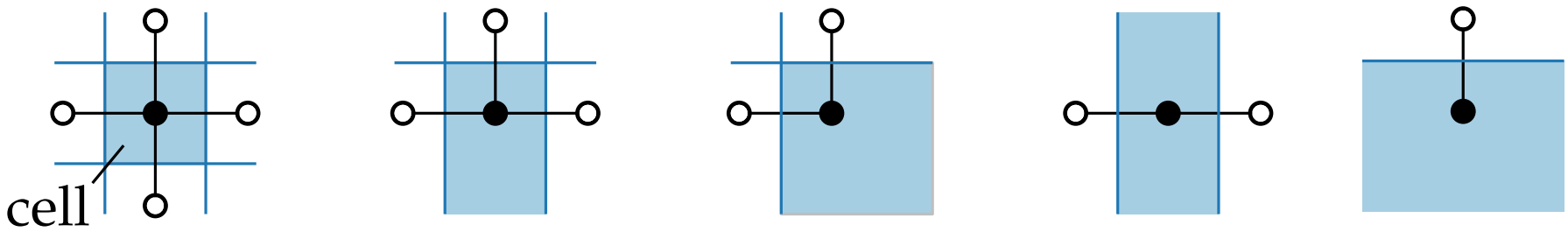

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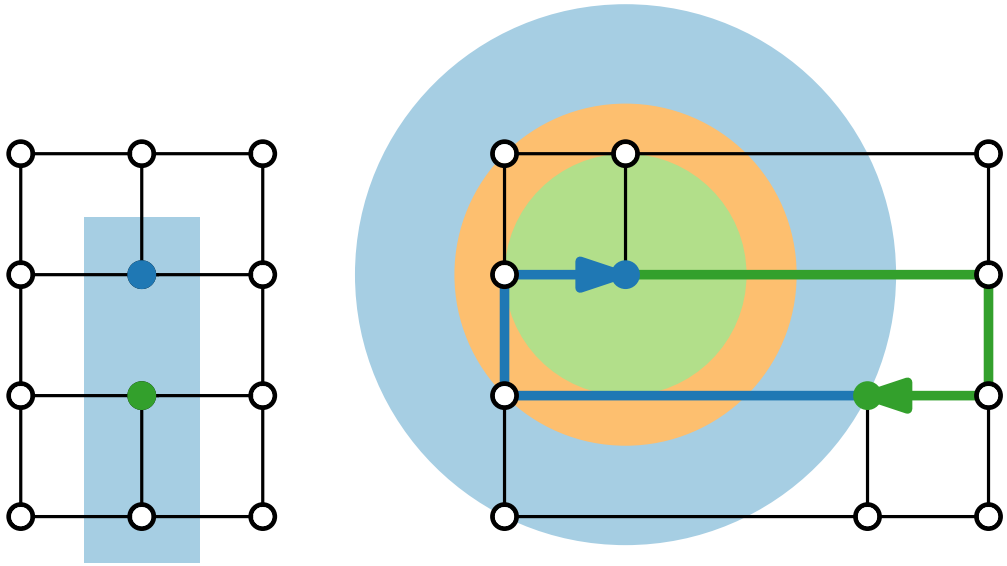

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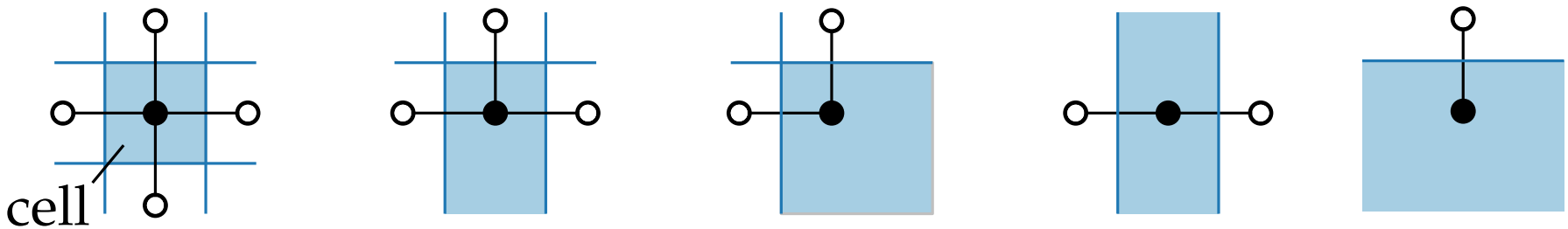

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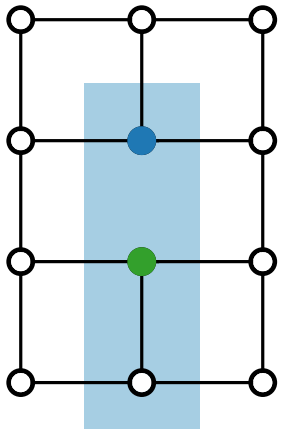

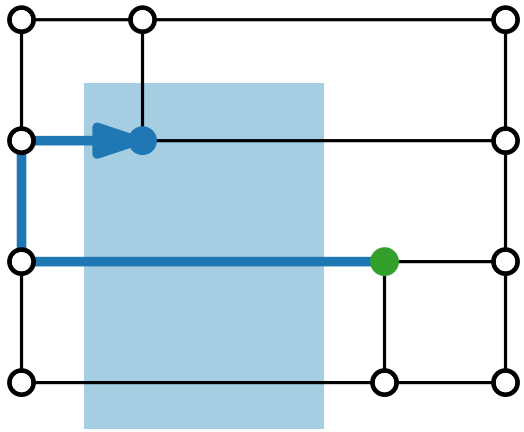

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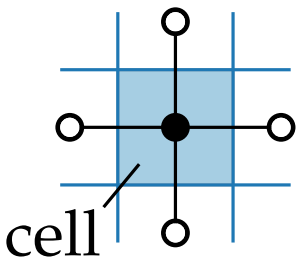

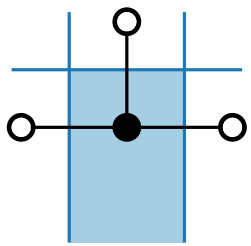

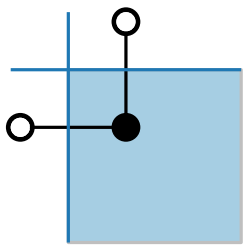

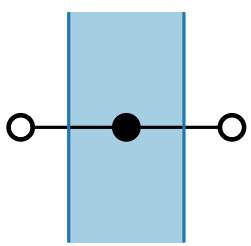

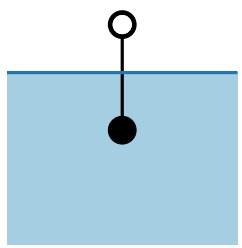

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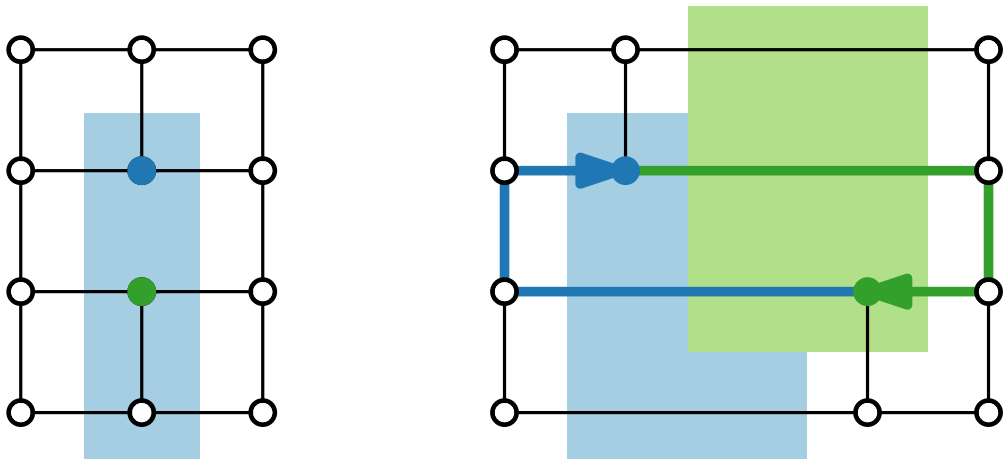

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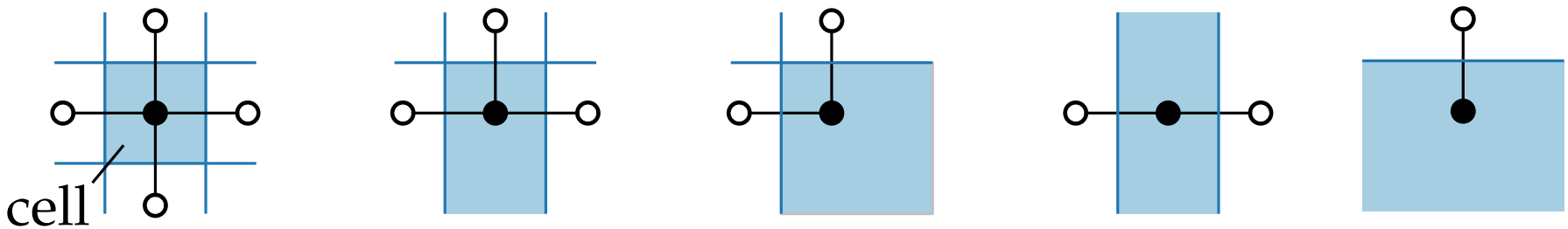
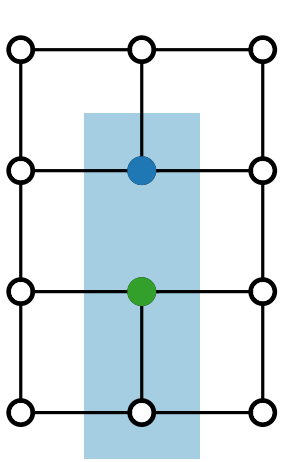
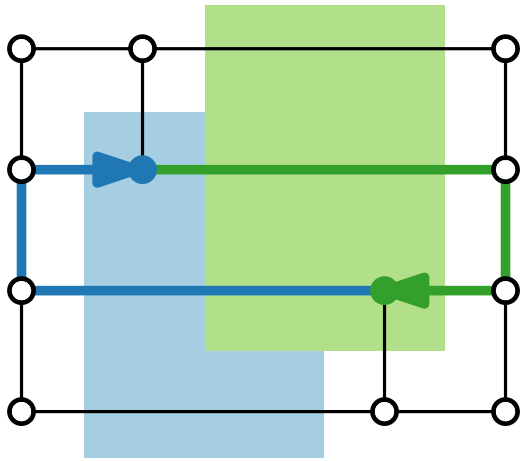
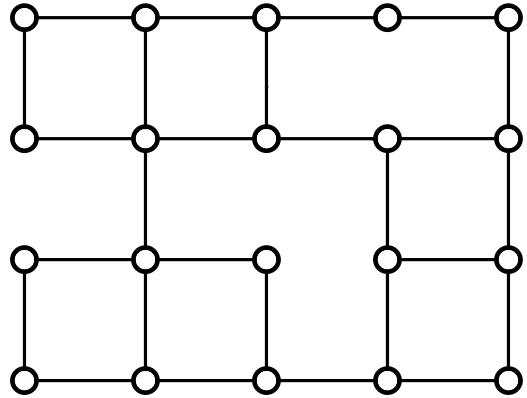


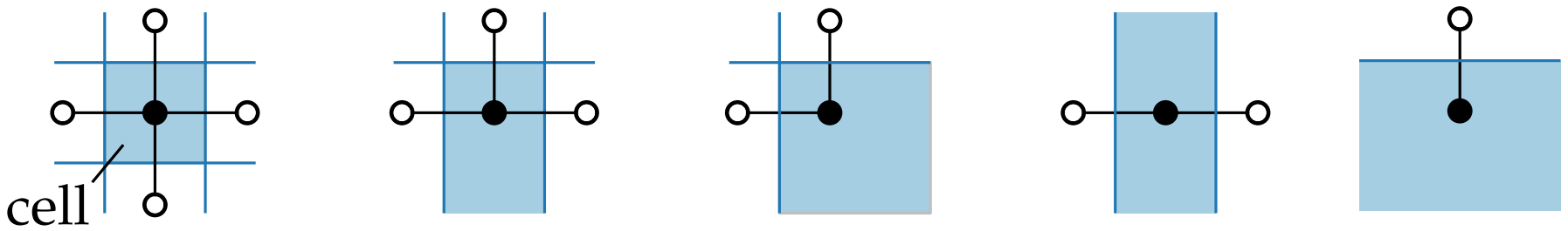
Greedy Rectilinear Drawings



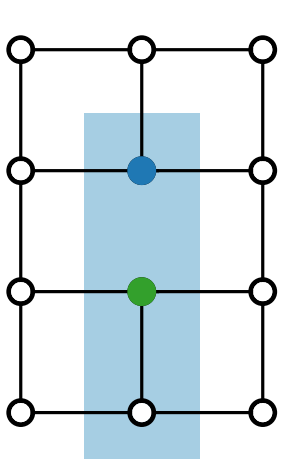


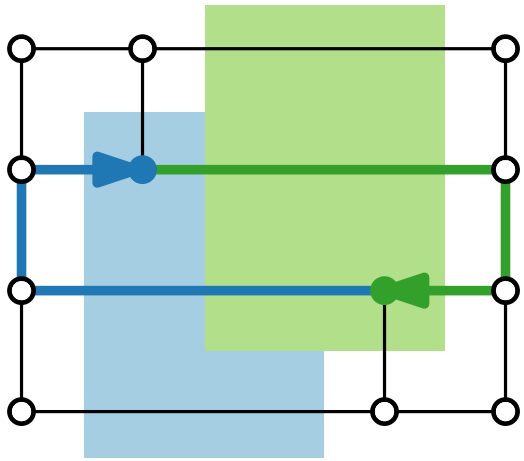


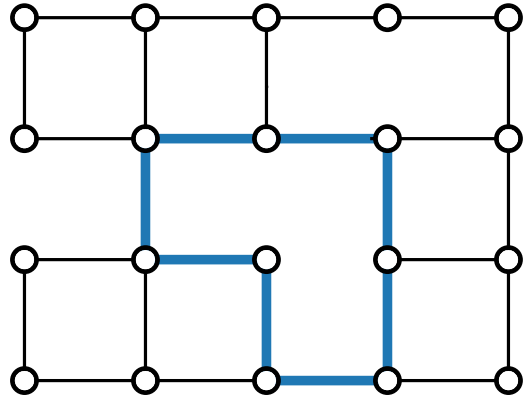
[Papadimitrou, Ratajczak]
Drawing greedy $\Leftrightarrow$ cell(v) empty $\forall v$



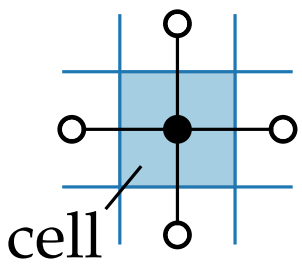
Greedy Rectilinear Drawings

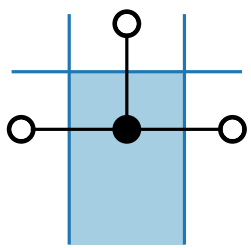


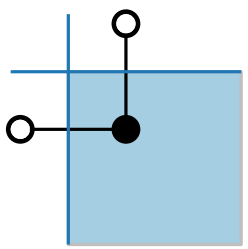


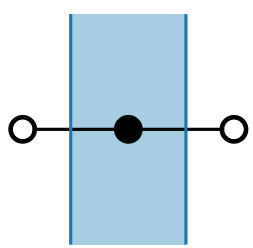


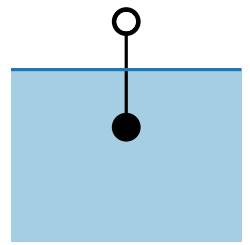
[Papadimitrou, Ratajczak]
Drawing greedy $\Leftrightarrow$ cell(v) empty $\forall v$



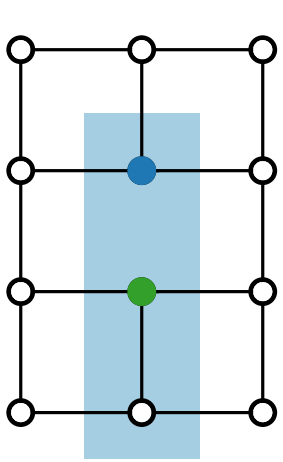


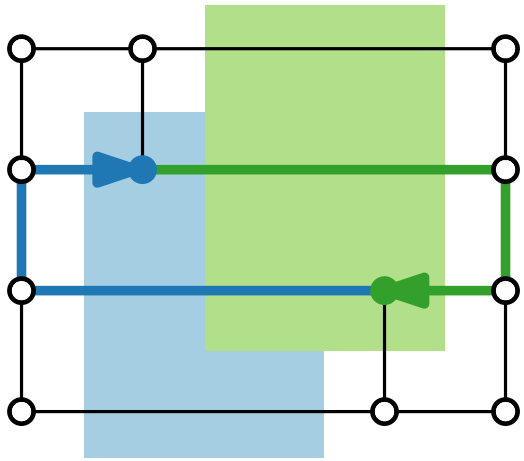


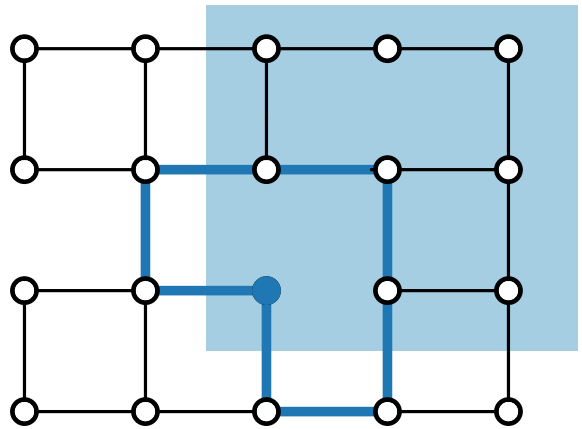




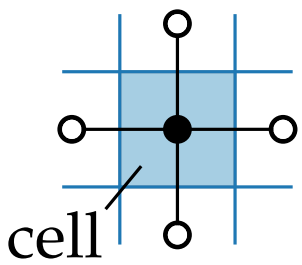
Greedy Rectilinear Drawings

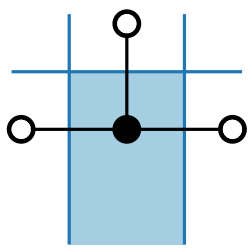


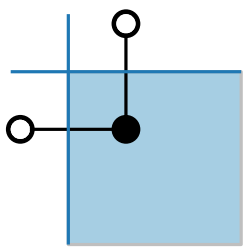


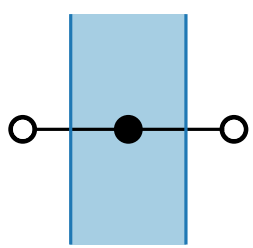


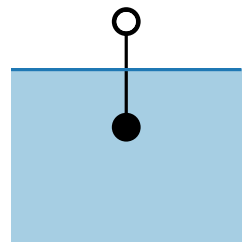
[Papadimitrou, Ratajczak]
Drawing greedy $\Leftrightarrow$ cell(v) empty $\forall v$



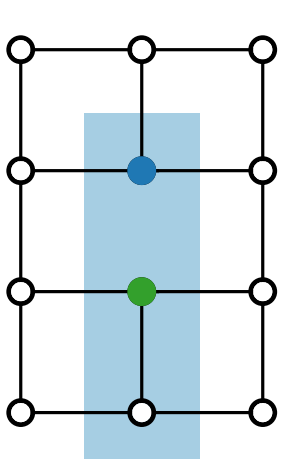


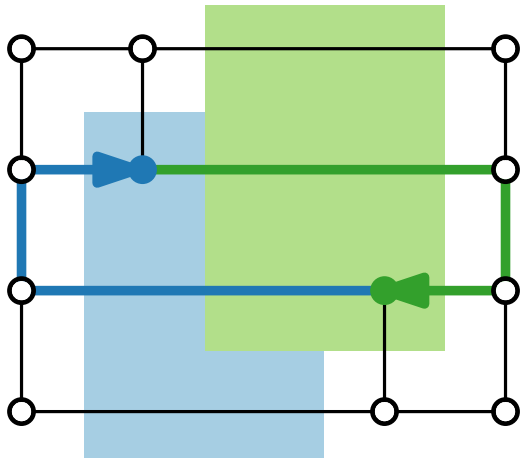


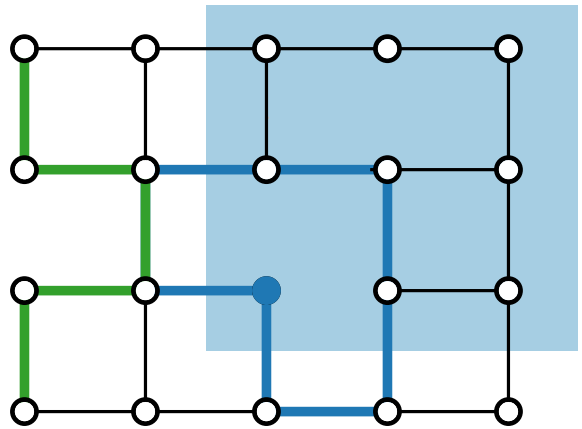




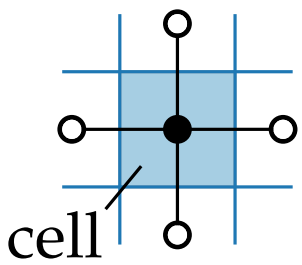
Greedy Rectilinear Drawings

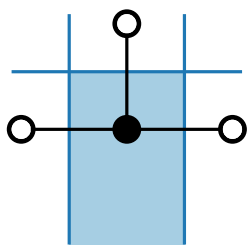


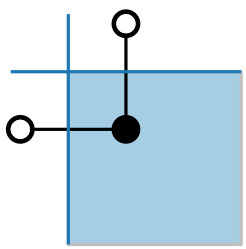


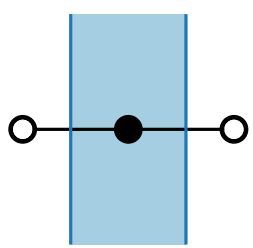


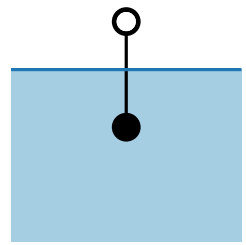
[Papadimitrou, Ratajczak]
Drawing greedy $\Leftrightarrow$ cell(v) empty $\forall v$



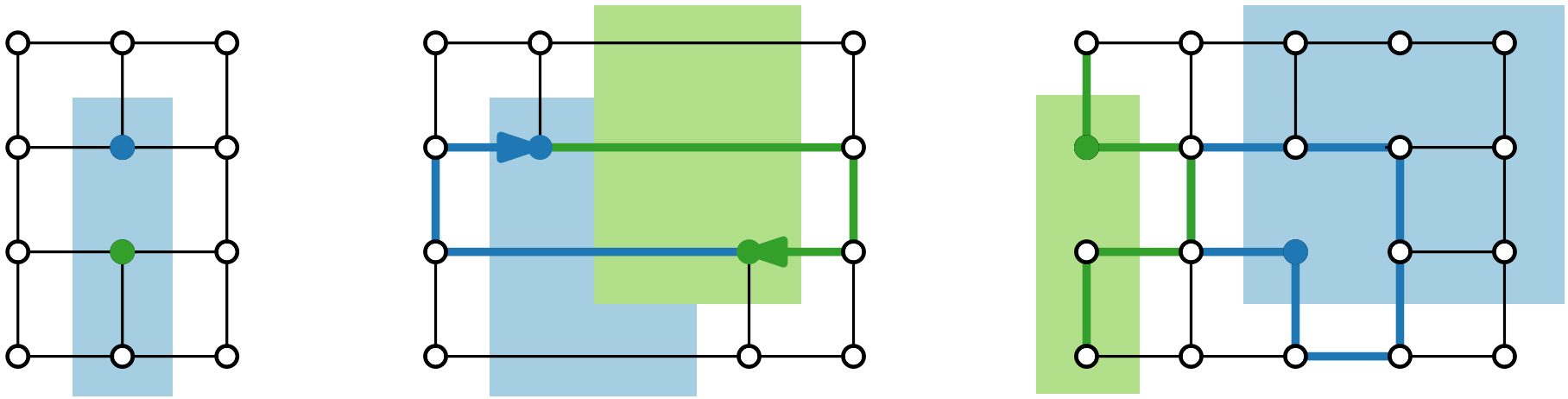




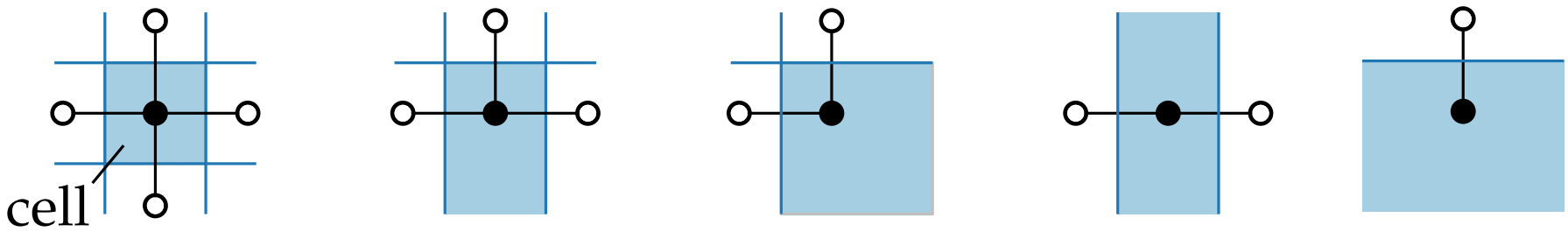




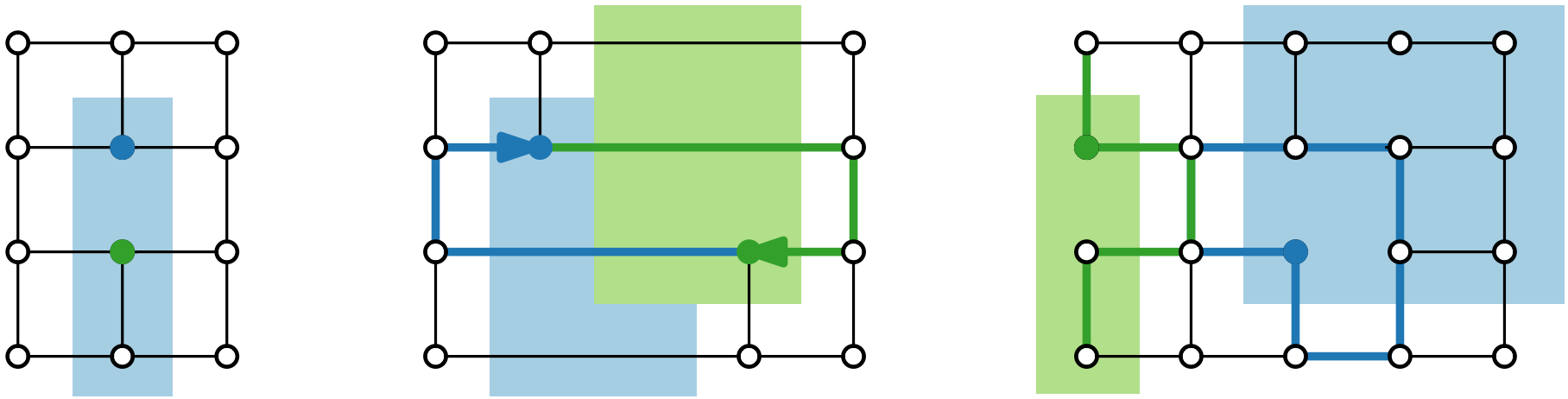
Greedy Rectilinear Drawings



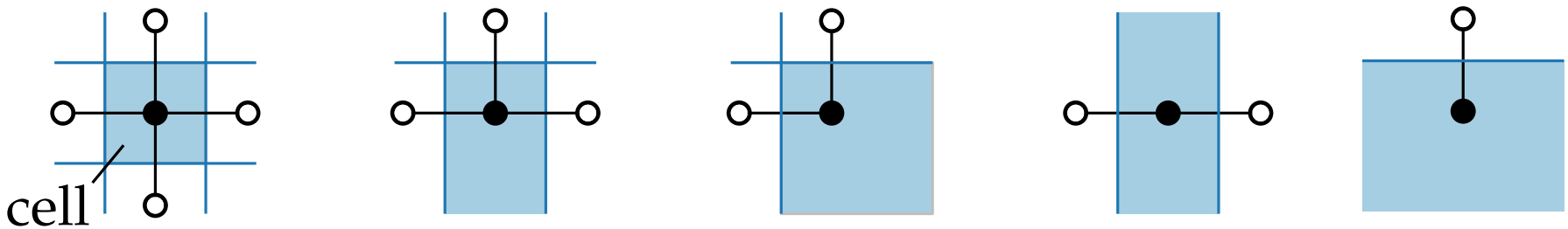
[Papadimitrou, Ratajczak]
Drawing greedy $\Leftrightarrow$ cell(v) empty $\forall v$



Greedy Rectilinear Drawings

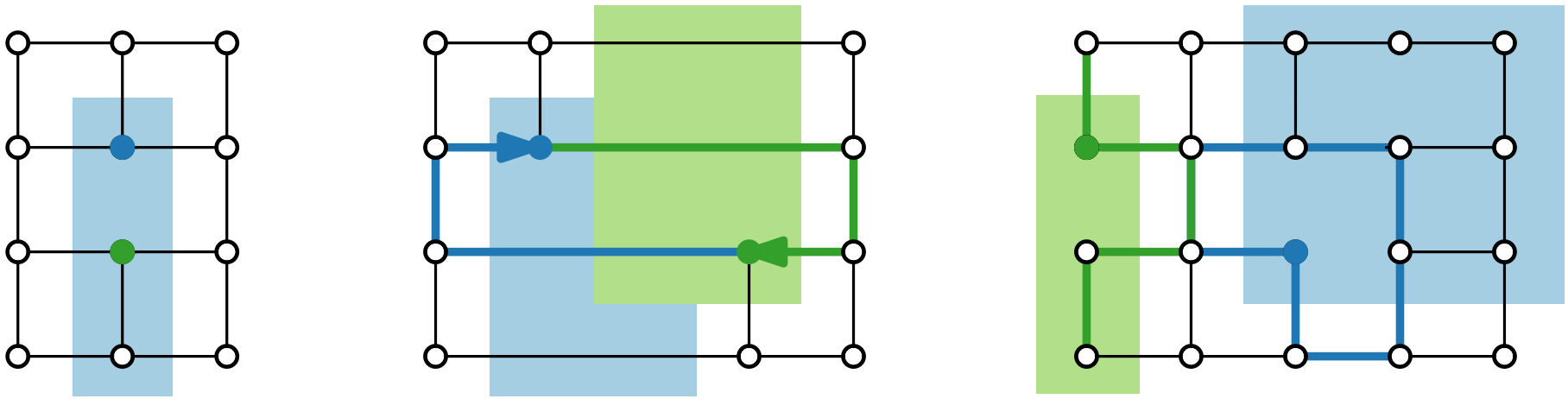


[Papadimitrou, Ratajczak]
Drawing greedy $\Leftrightarrow$ cell(v) empty $\forall v$

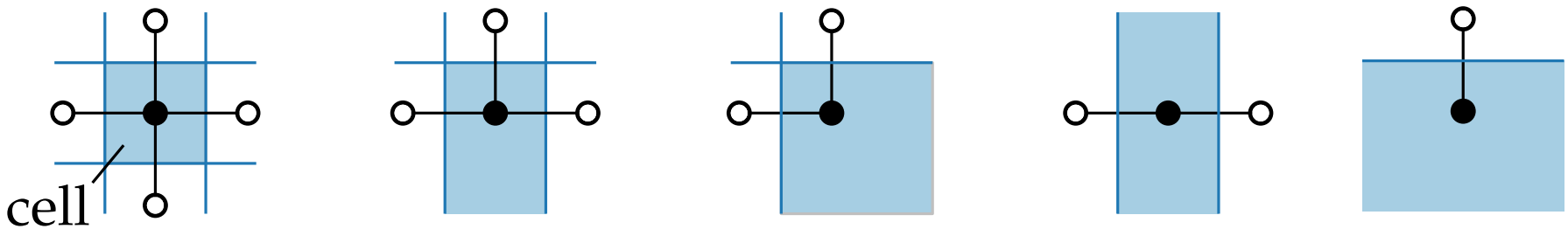


Drawing greedy $\Rightarrow$ convex

Greedy Rectilinear Drawings



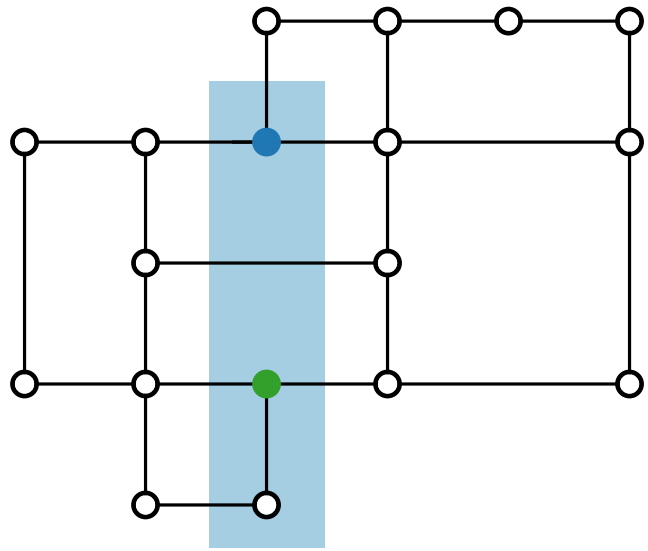
[Papadimitrou, Ratajczak]
Drawing greedy $\Leftrightarrow$ cell(v) empty $\forall v$



Drawing greedy $\Rightarrow$ convex

Assume representation given

Conflicts



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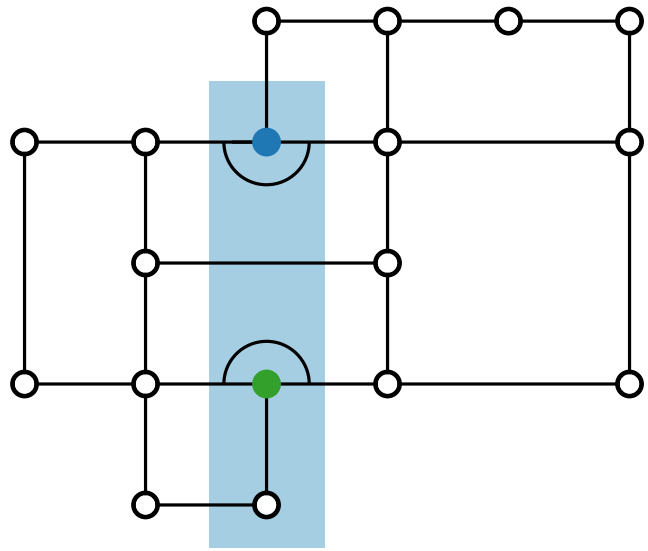

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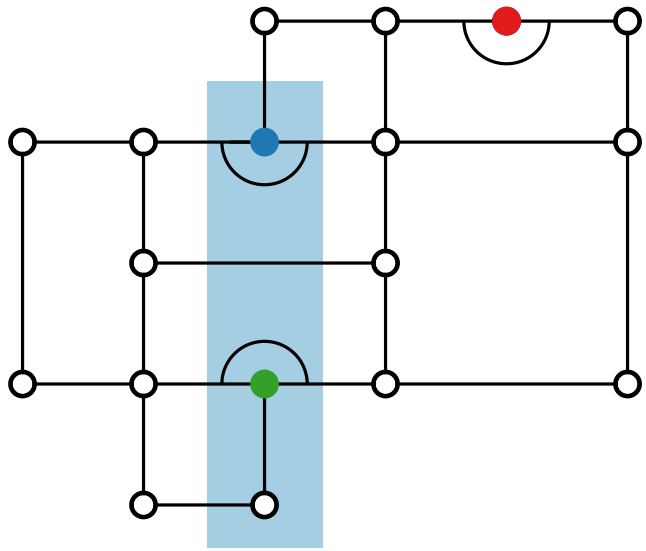

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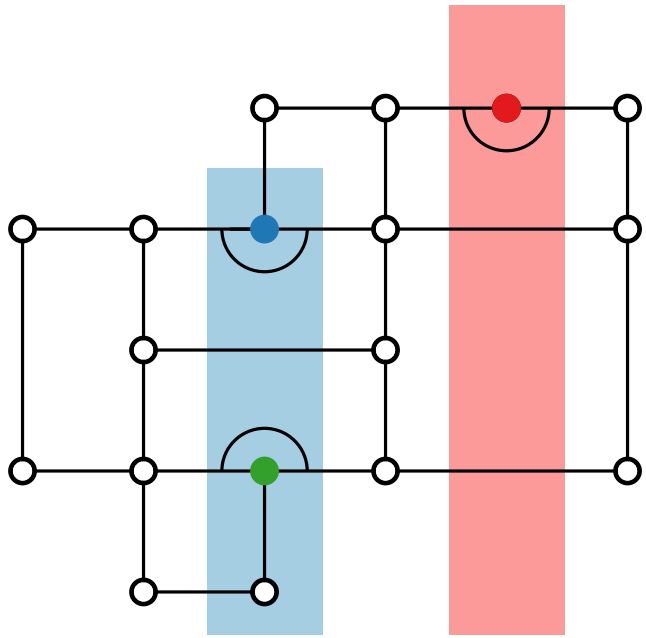

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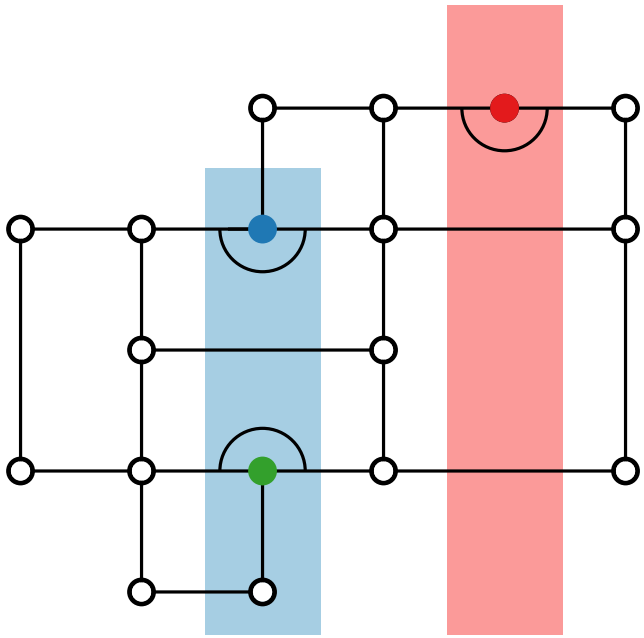

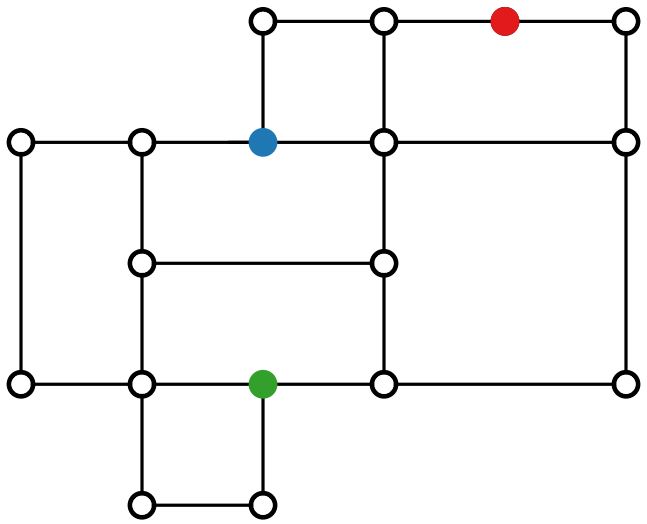

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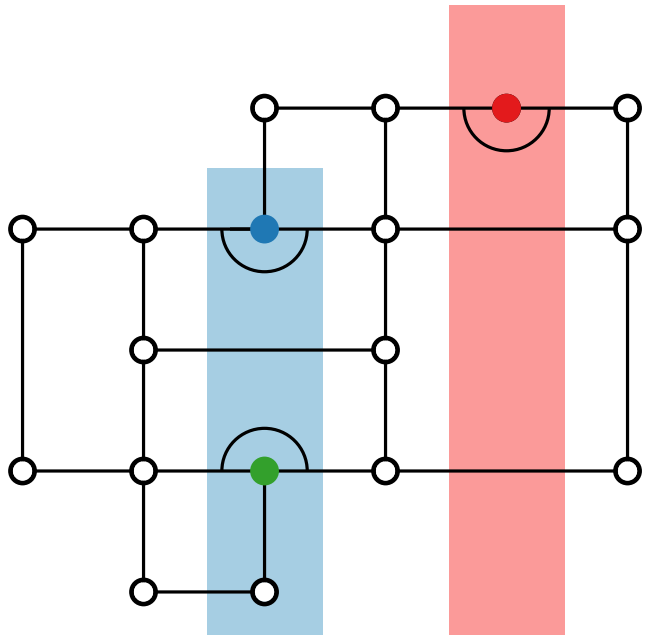

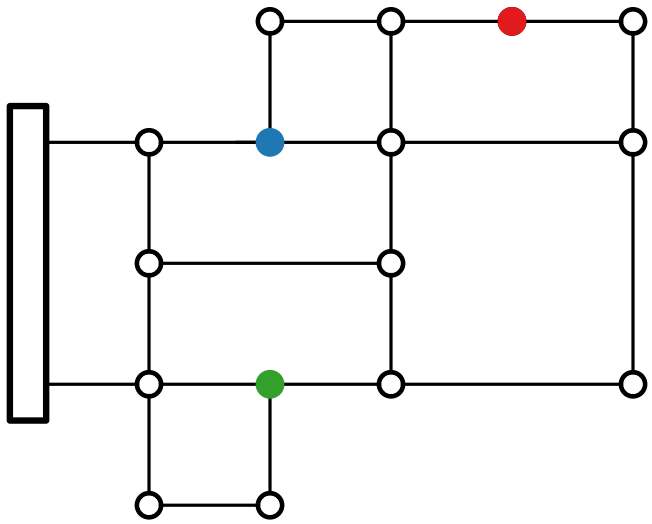

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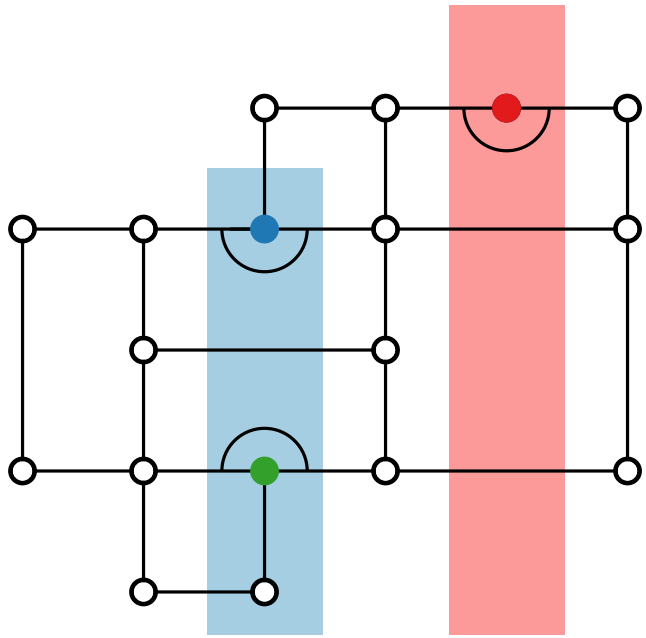

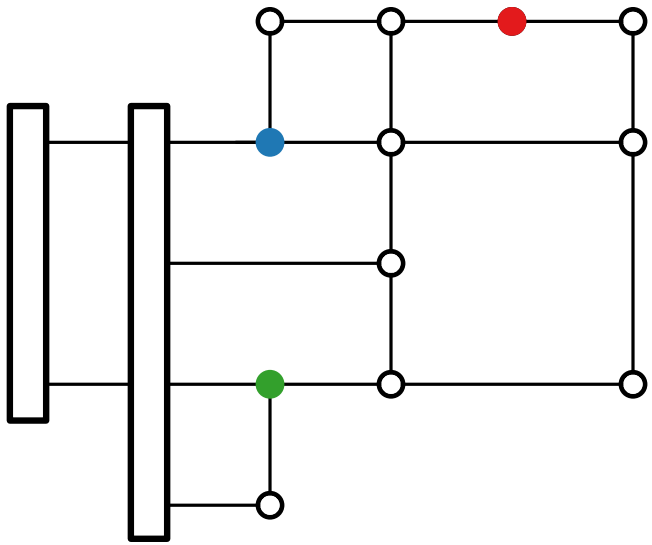

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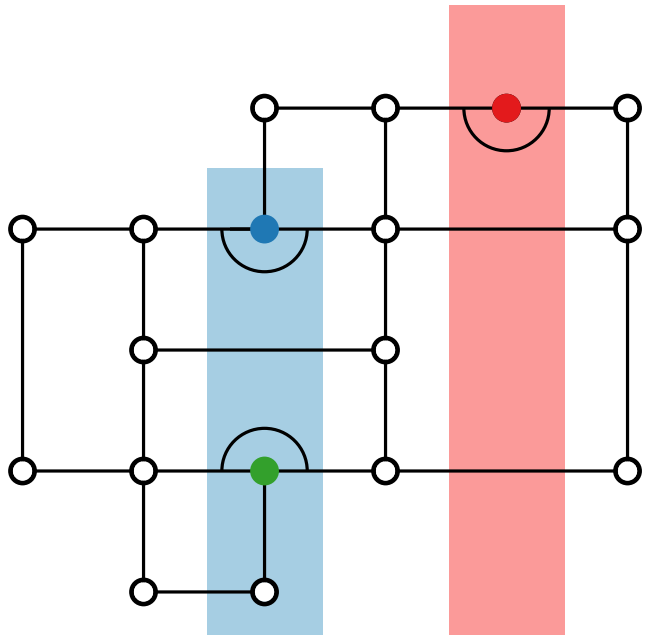

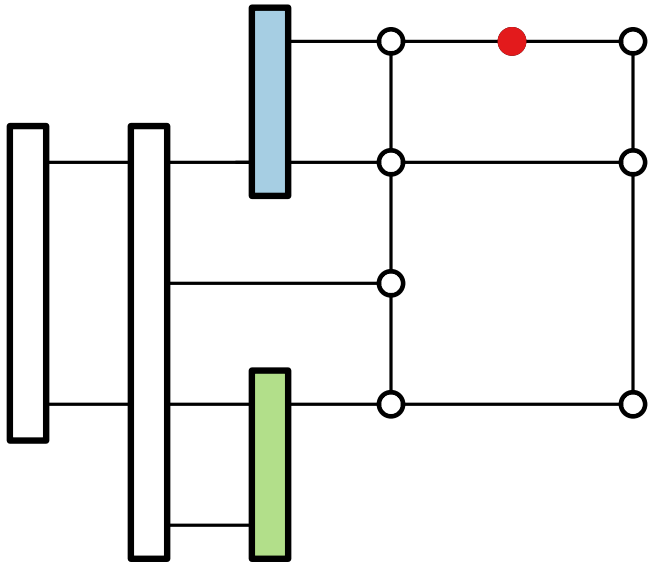

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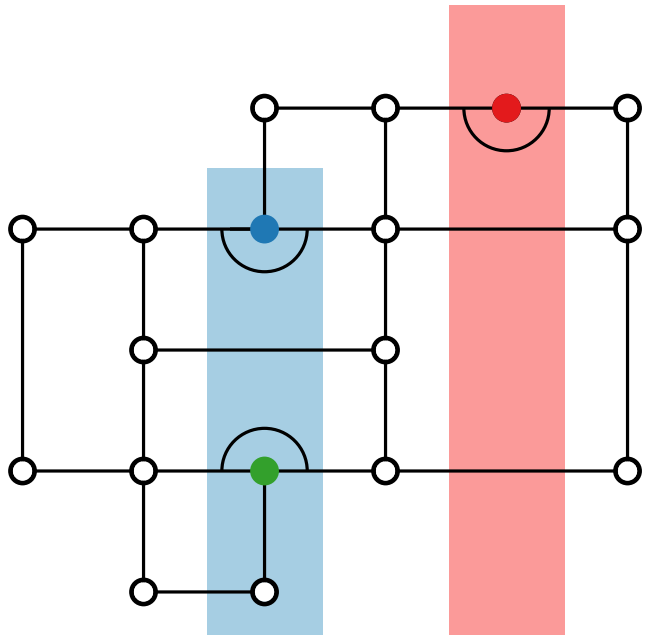

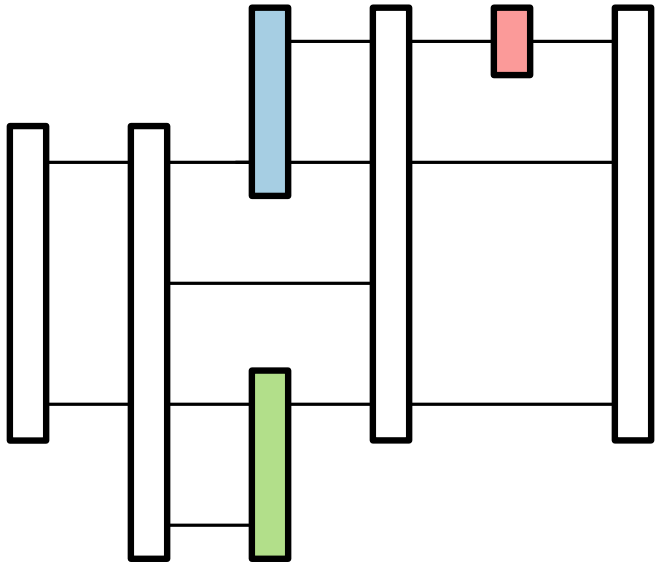

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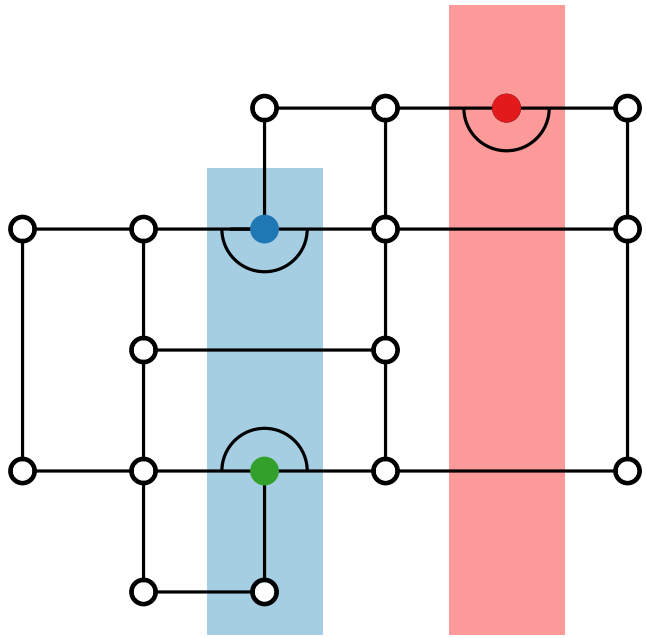

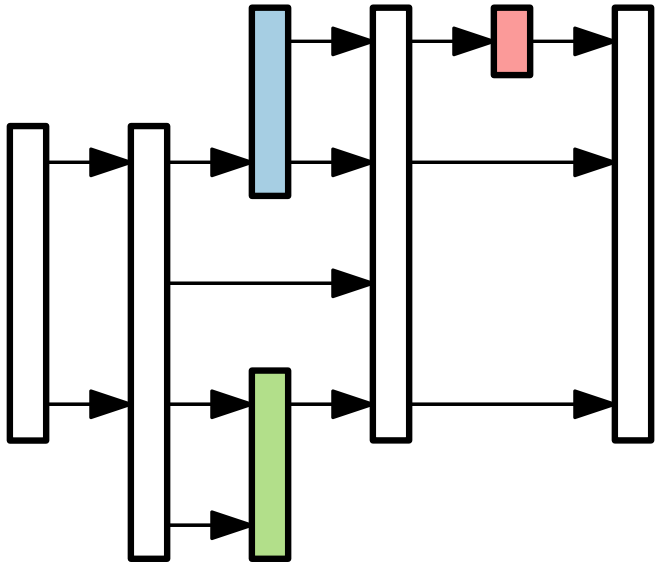

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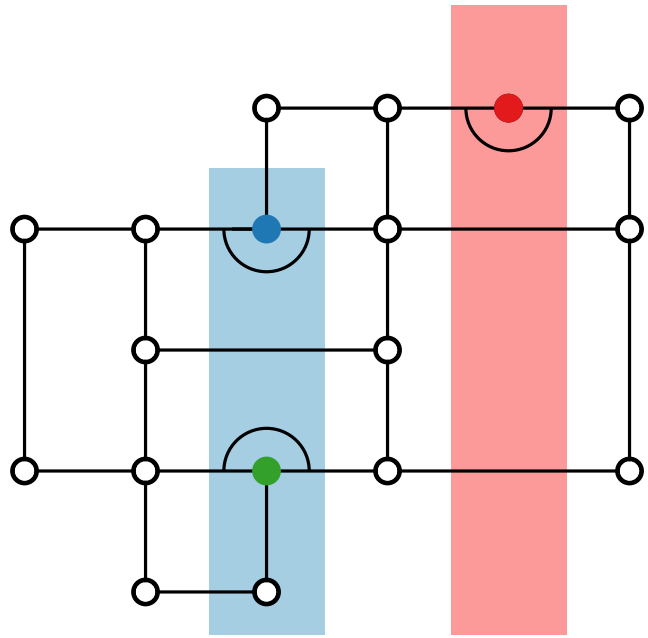

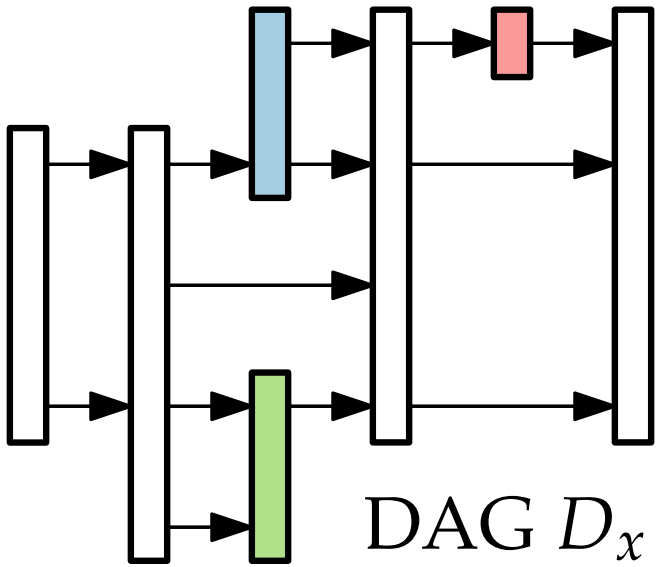

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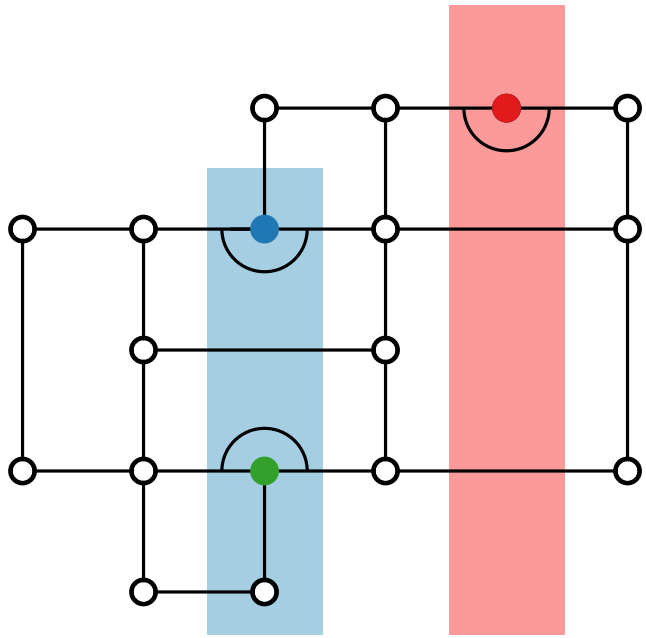

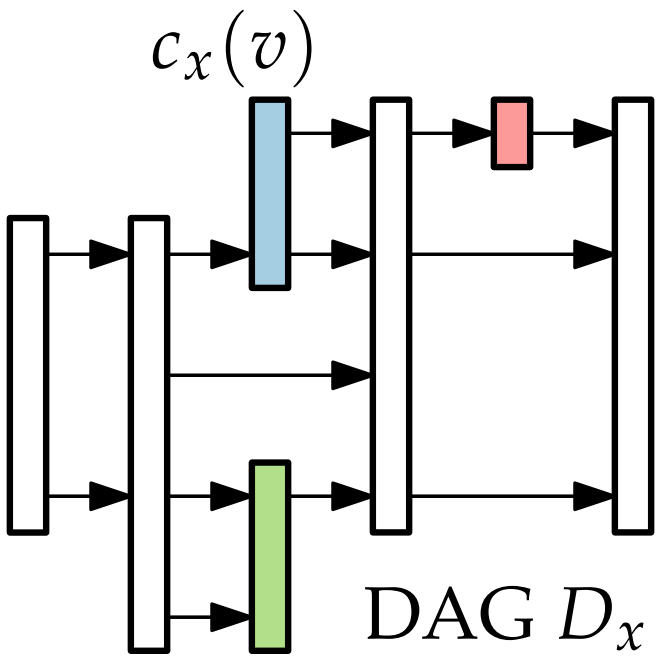

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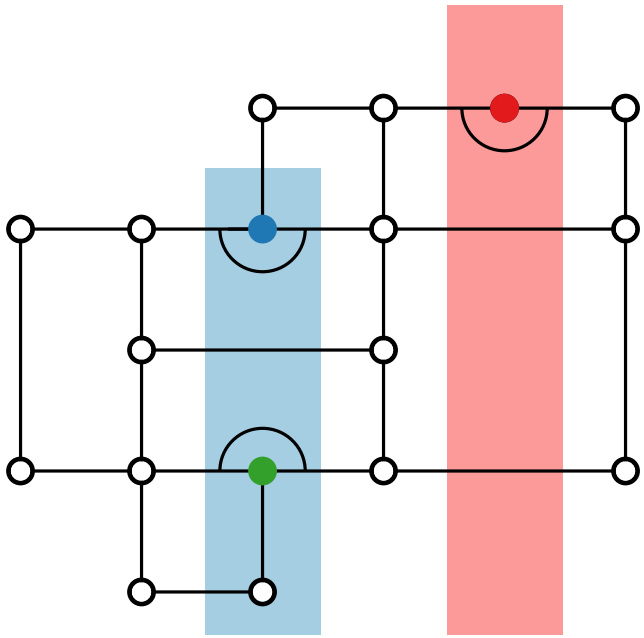

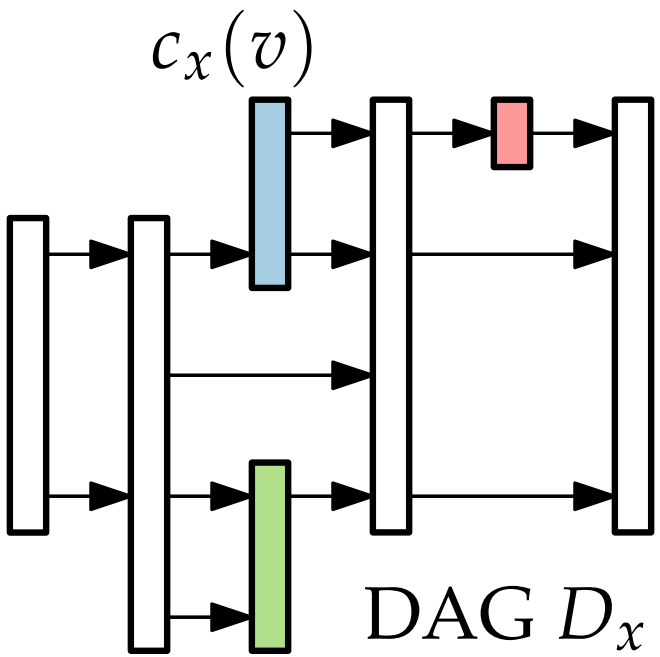

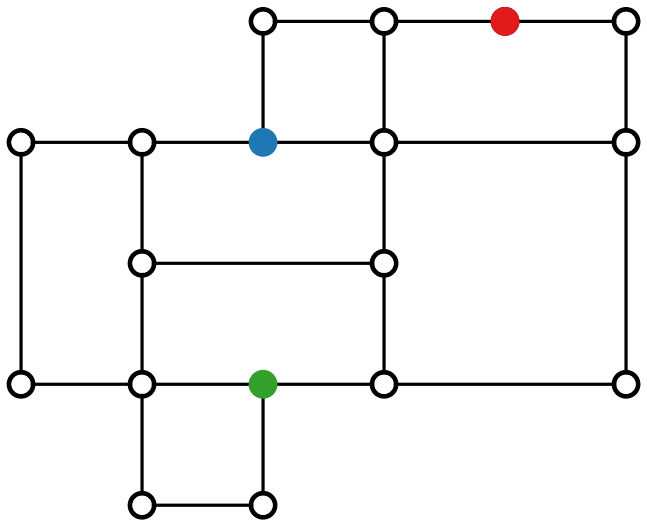

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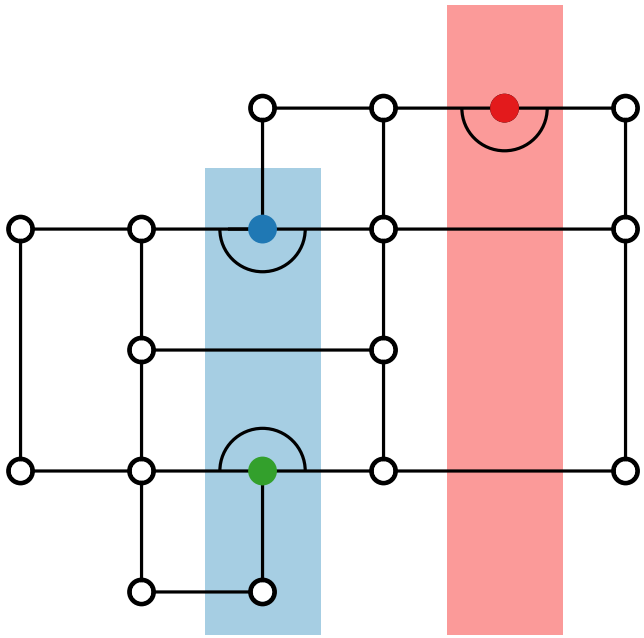
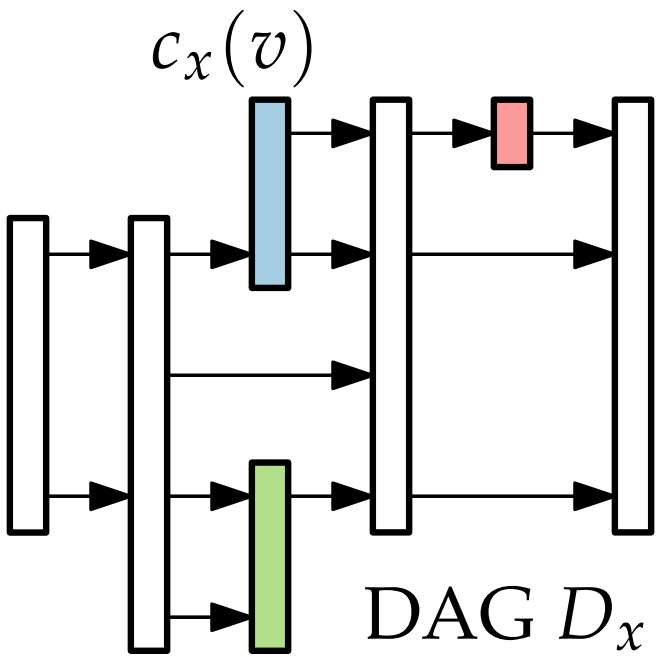
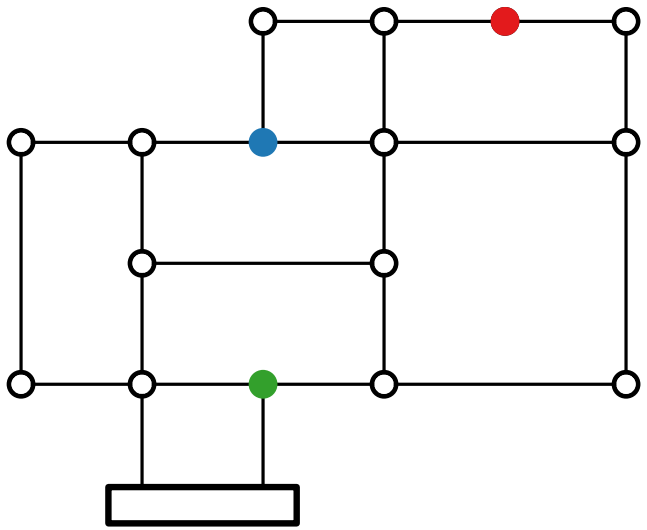
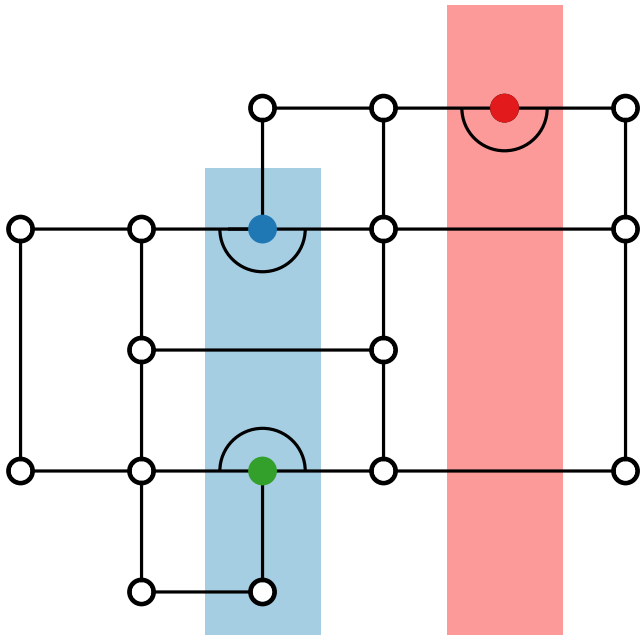
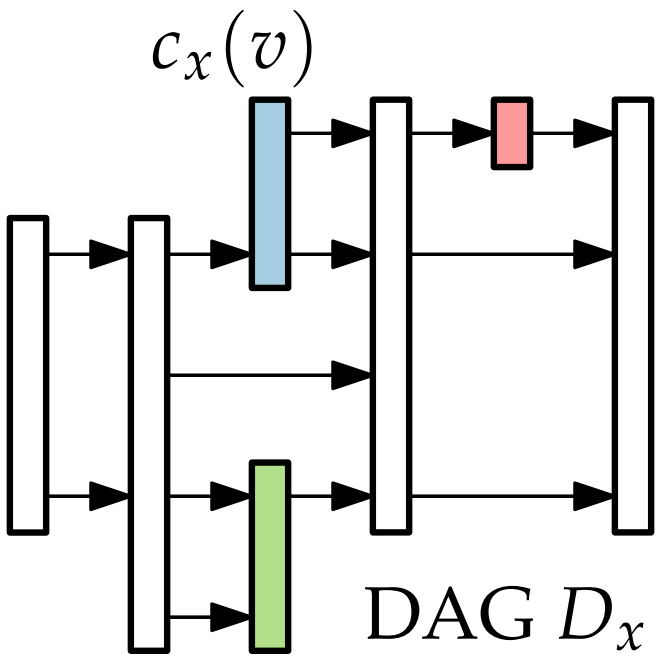


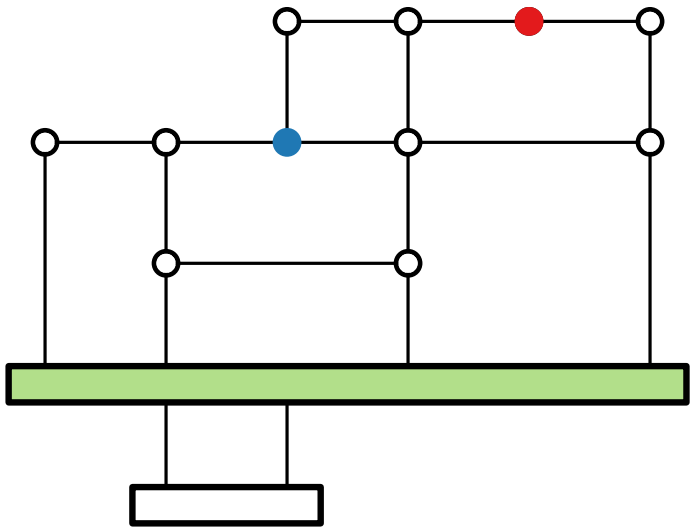




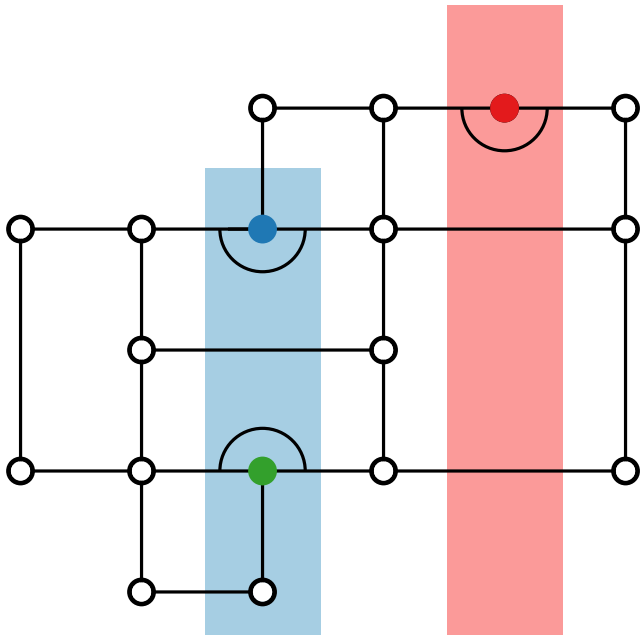
Conflicts

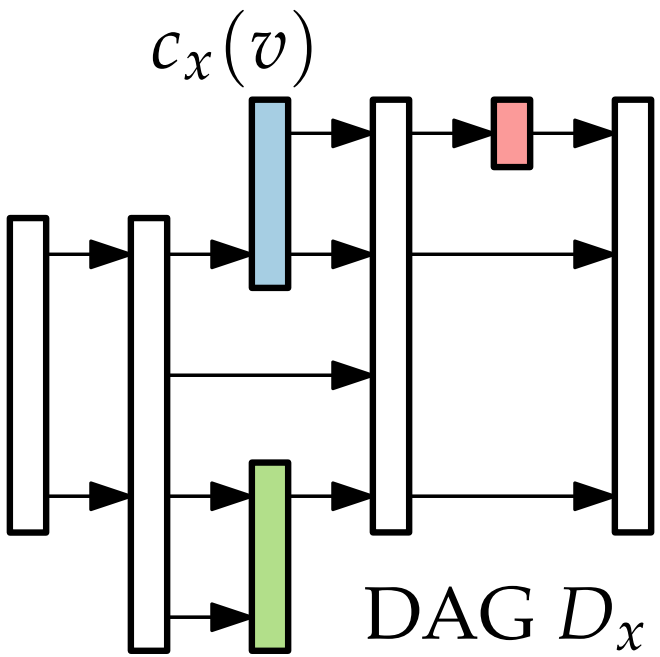


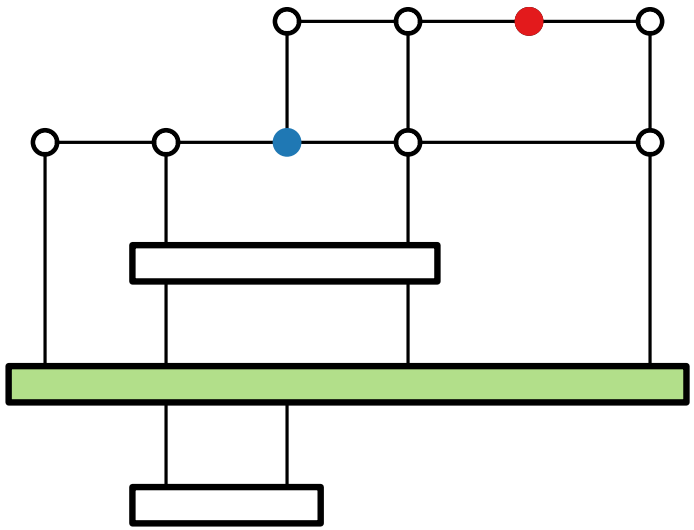




Conflicts







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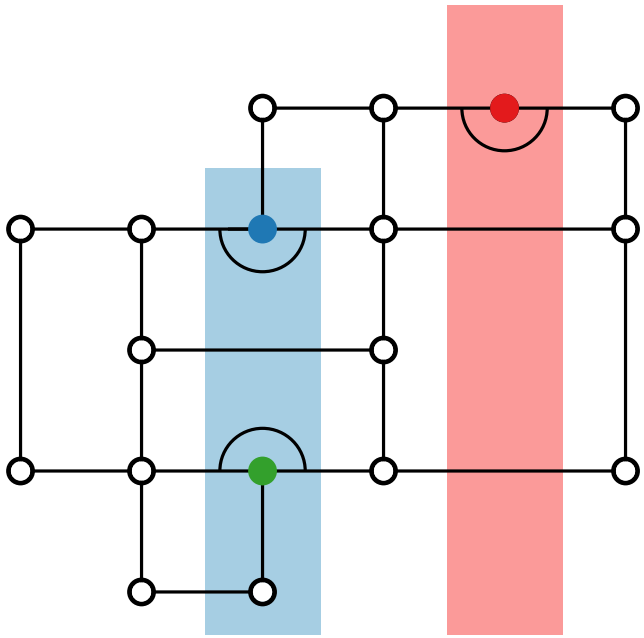
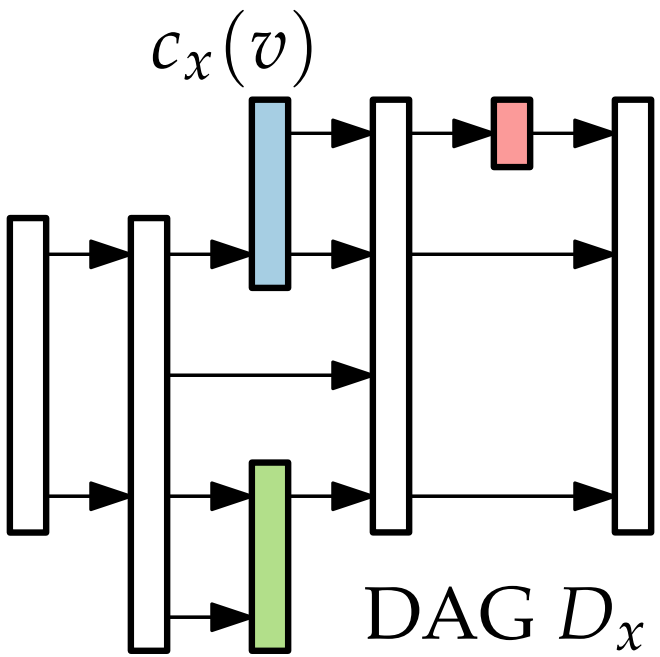
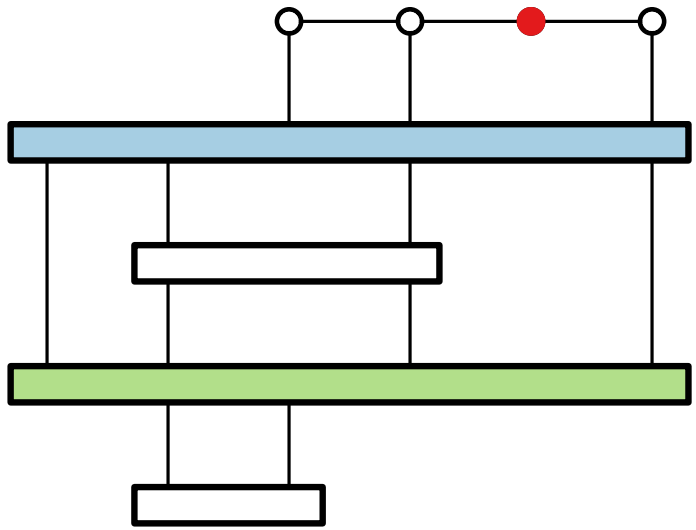
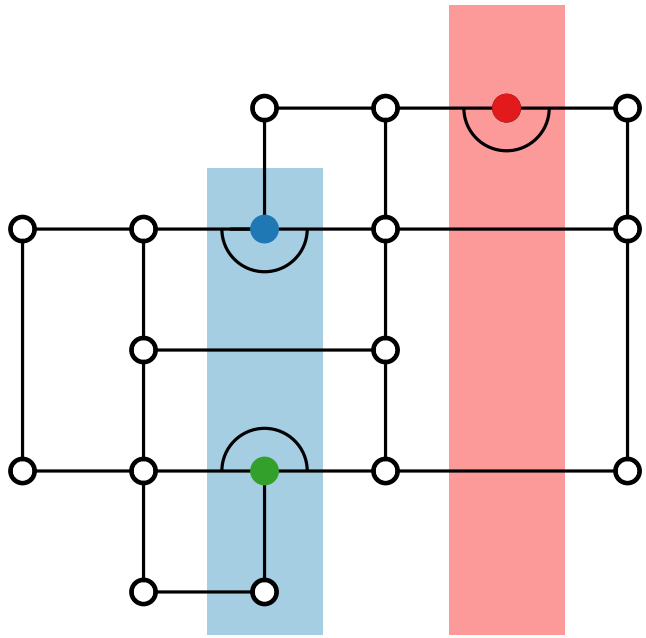
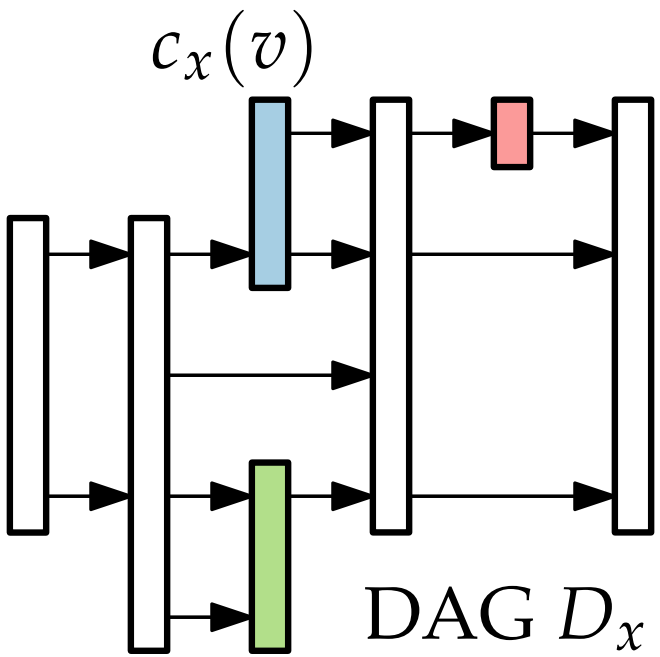


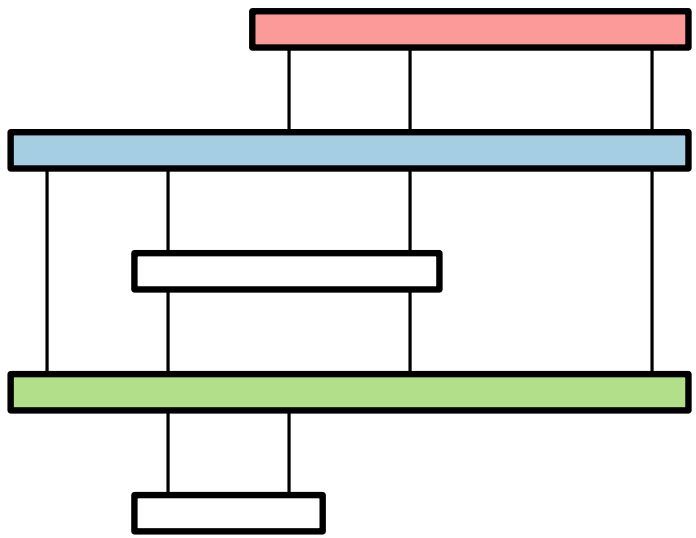




Conflicts







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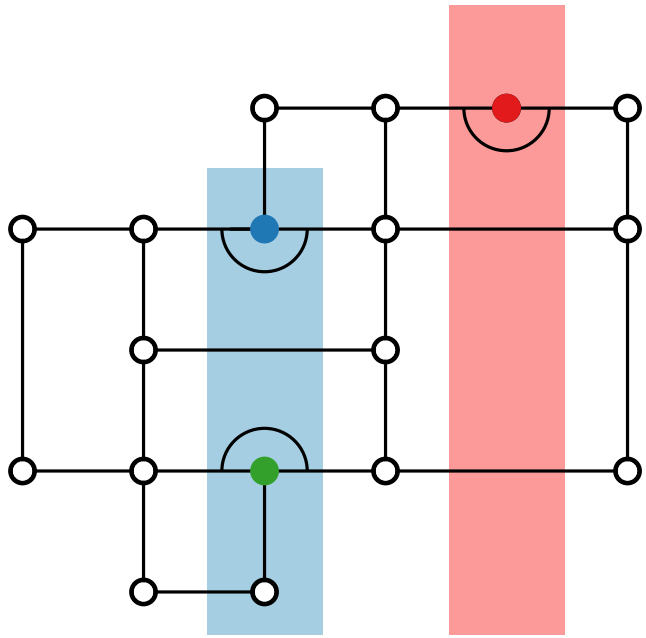
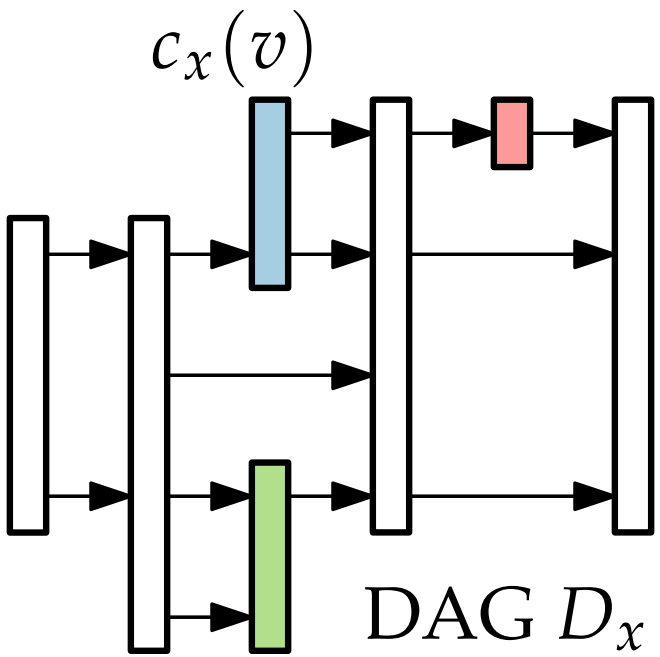
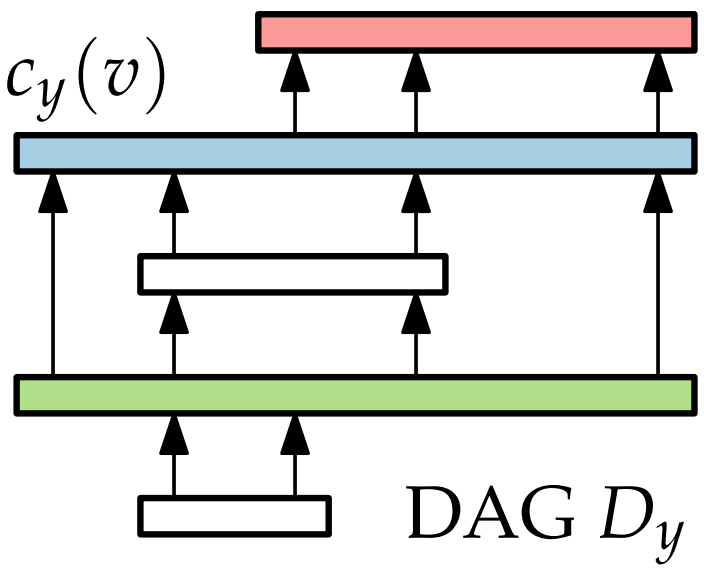
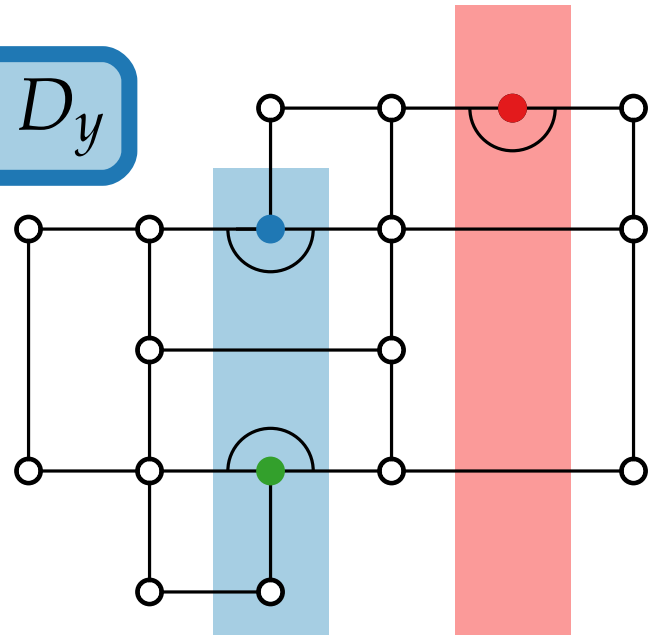


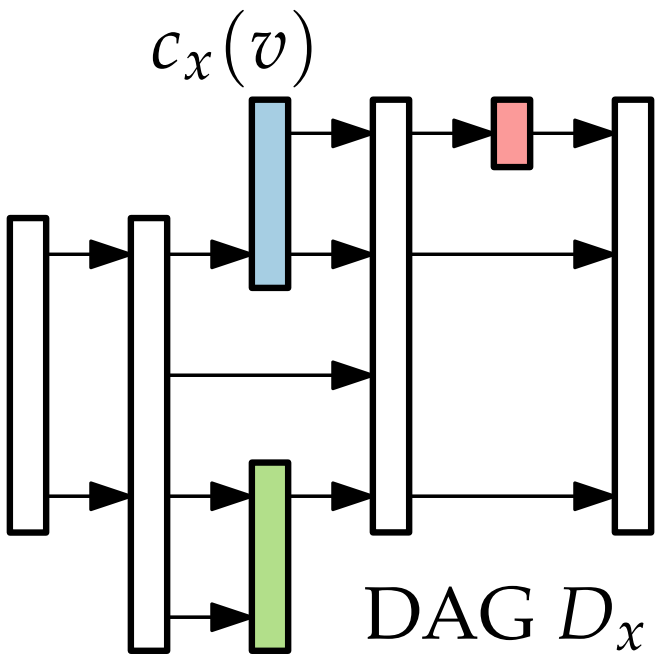


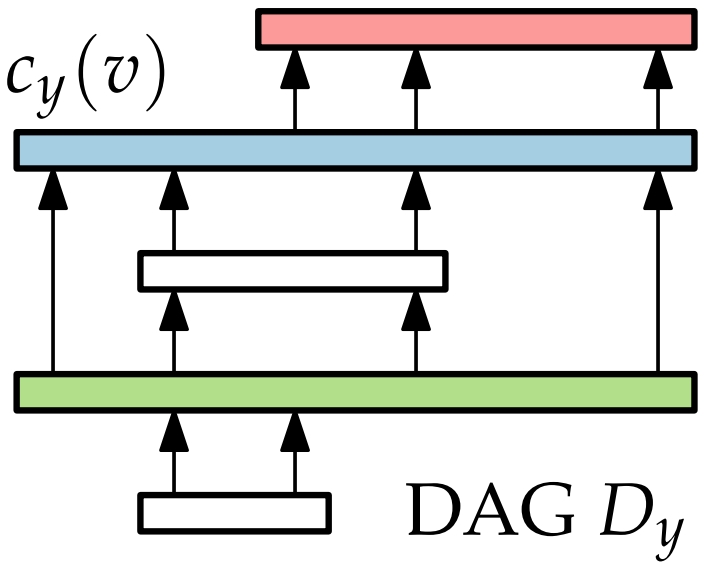


Conflicts

Conflict: no path in D_x or in D_y



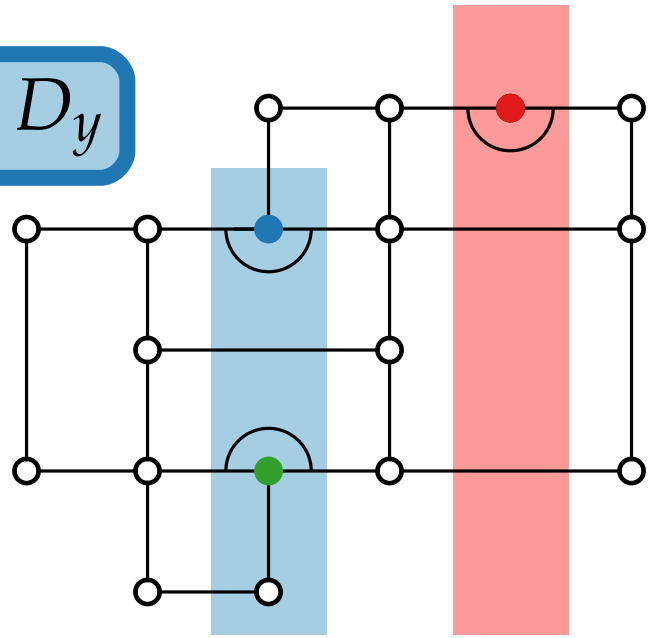


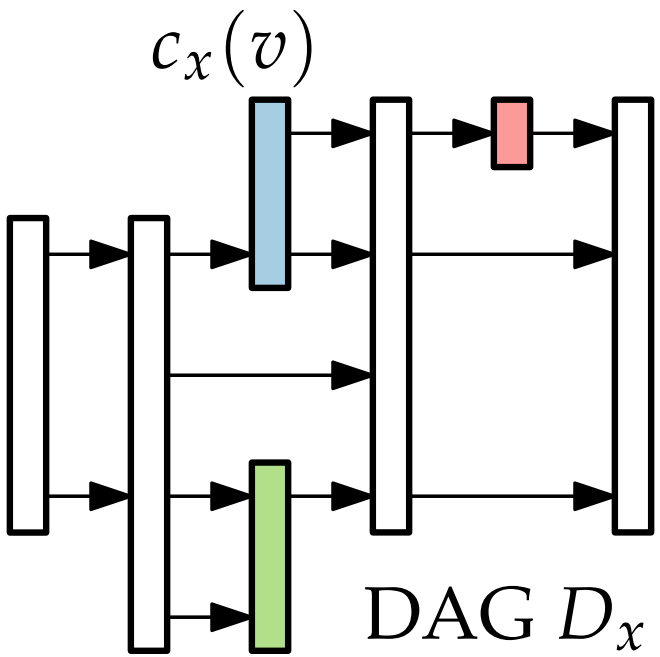


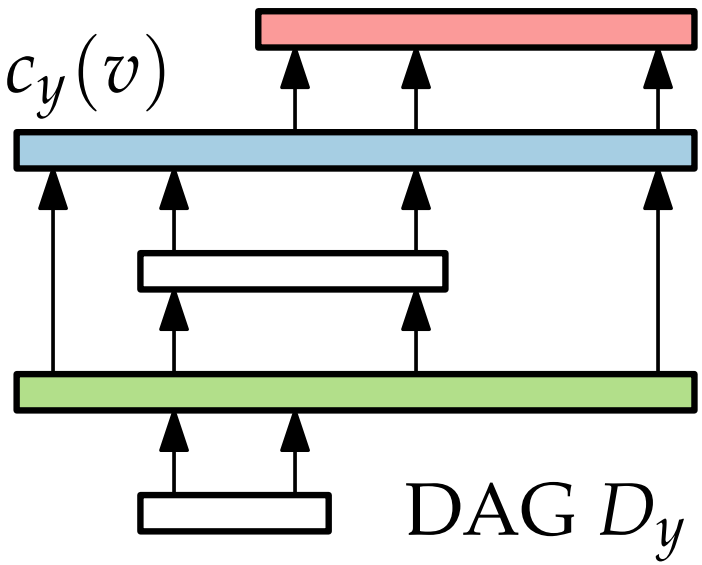
Conflicts

Conflict: no path in D_x or in D_y

either







Universal Greedy Rectilinear

universal greedy: *every* drawing is greedy

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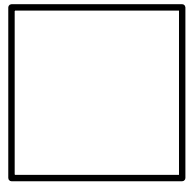
generative scheme: start with rectangle 

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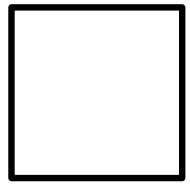
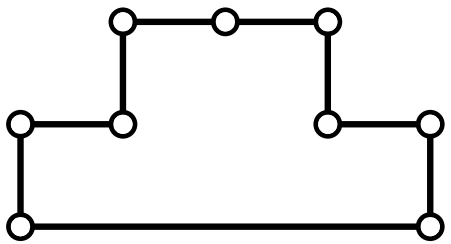
generative scheme: start with rectangle 

{1,2,3,4}-reflex vertex addition:



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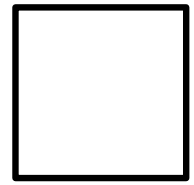
generative scheme: start with rectangle 

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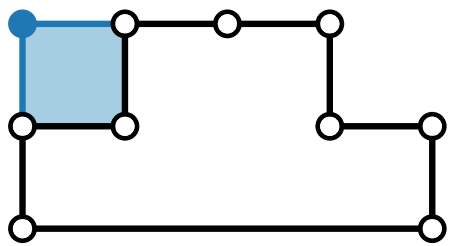

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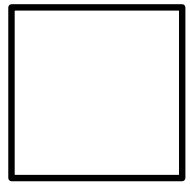
generative scheme: start with rectangle 

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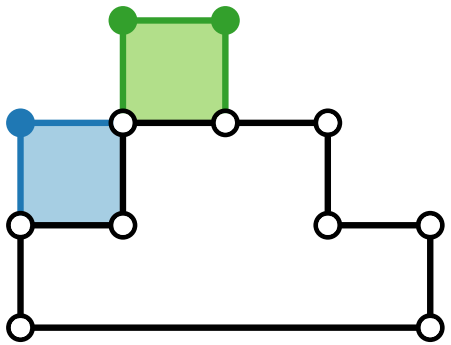

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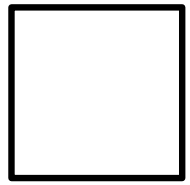
generative scheme: start with rectangle 

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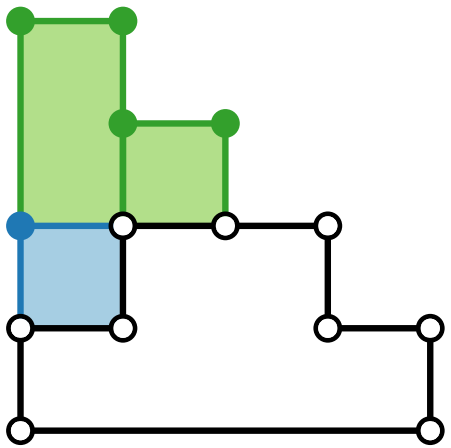

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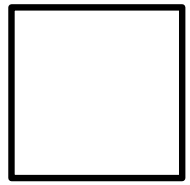
generative scheme: start with rectangle 

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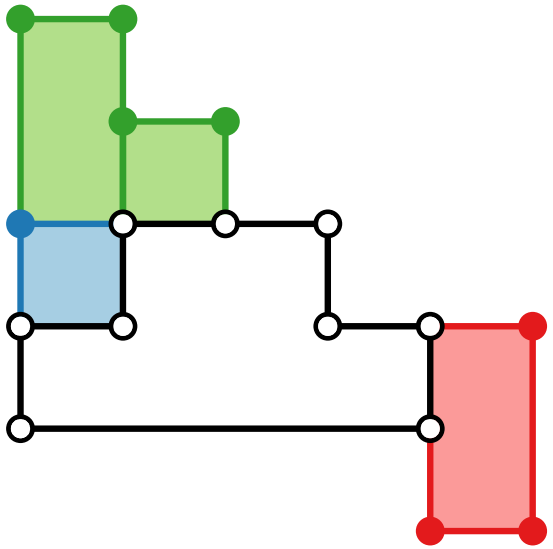

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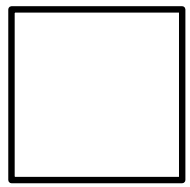
generative scheme: start with rectangle 

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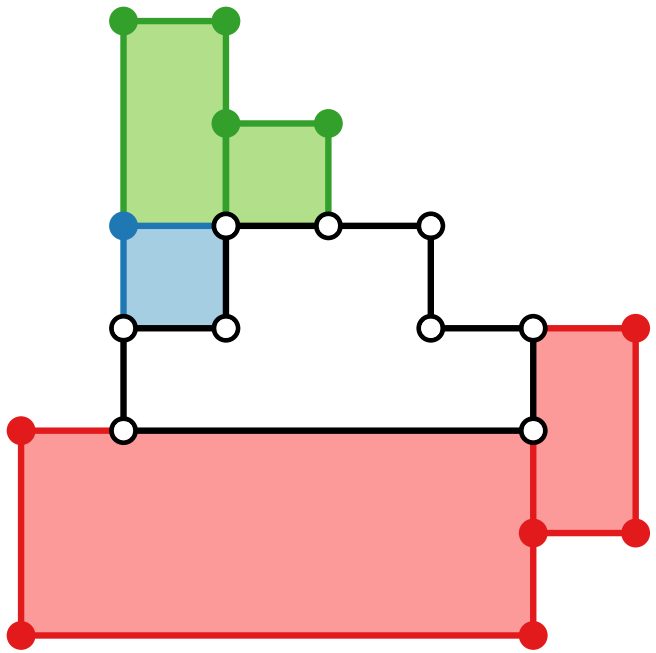

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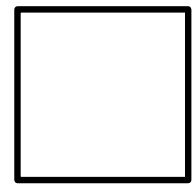
generative scheme: start with rectangle 

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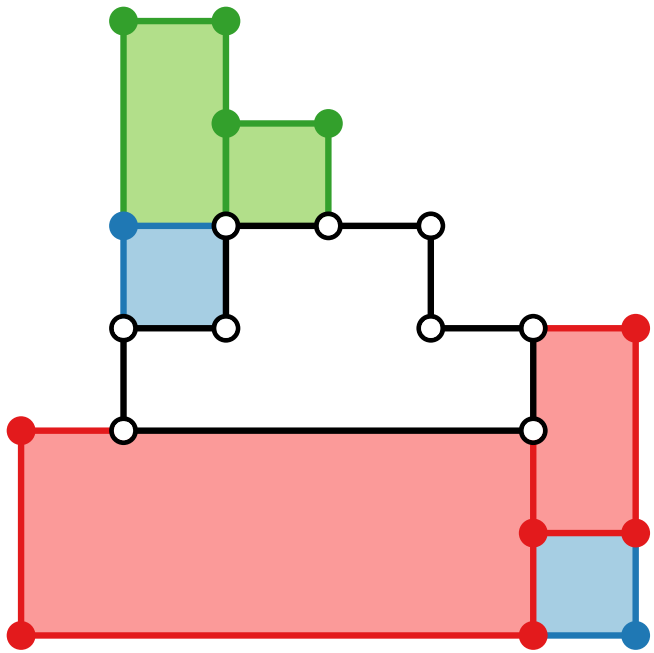

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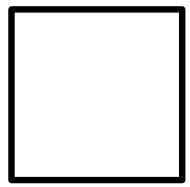
generative scheme: start with rectangle 

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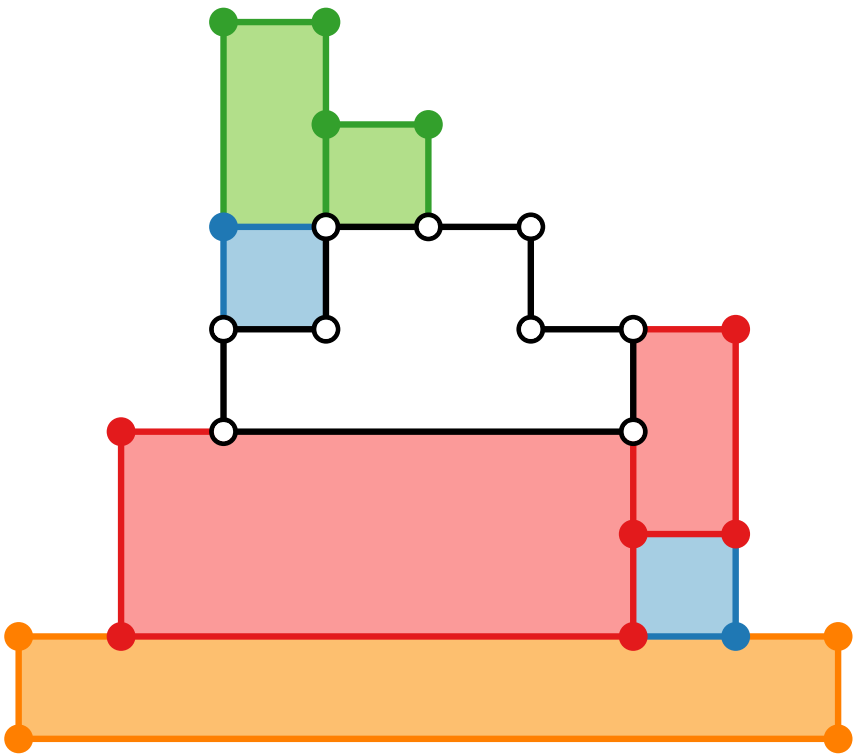

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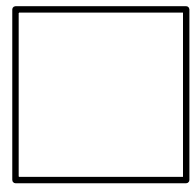
generative scheme: start with rectangle 

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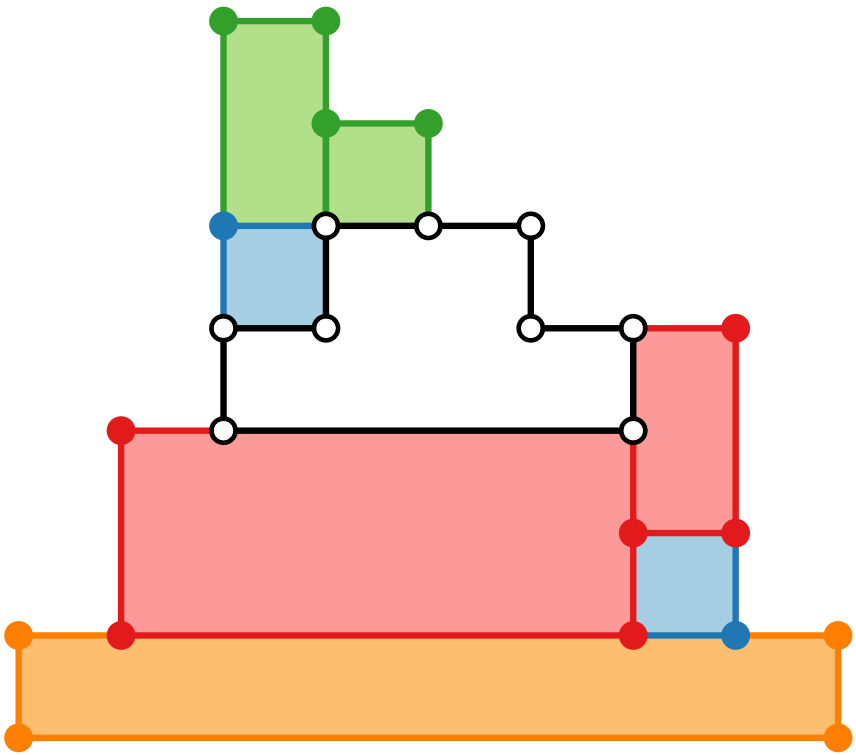
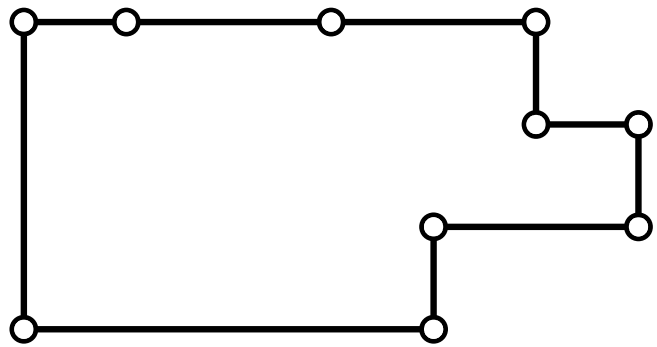


flat vertex addition:



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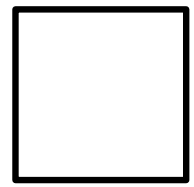
generative scheme: start with rectangle 

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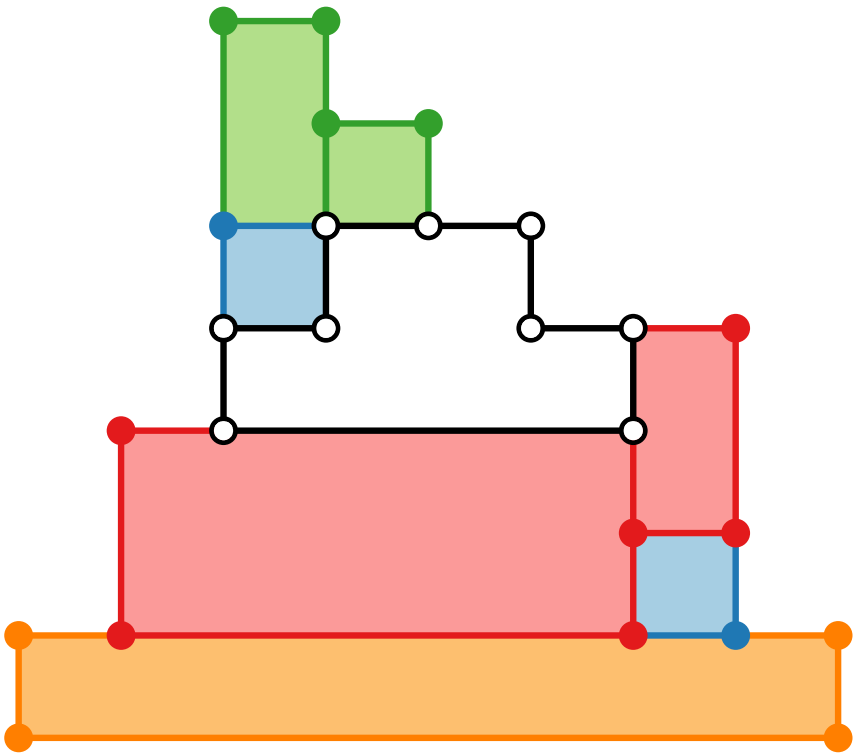

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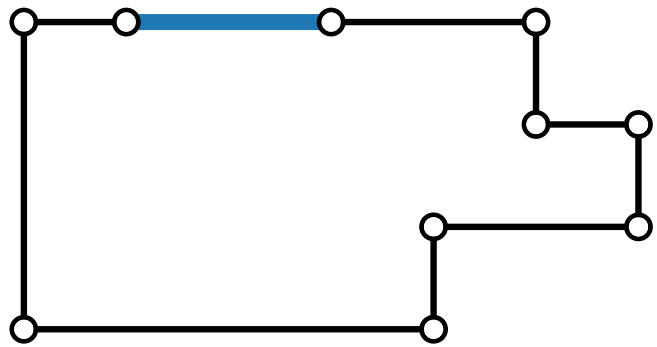

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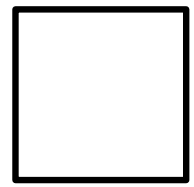
generative scheme: start with rectangle 

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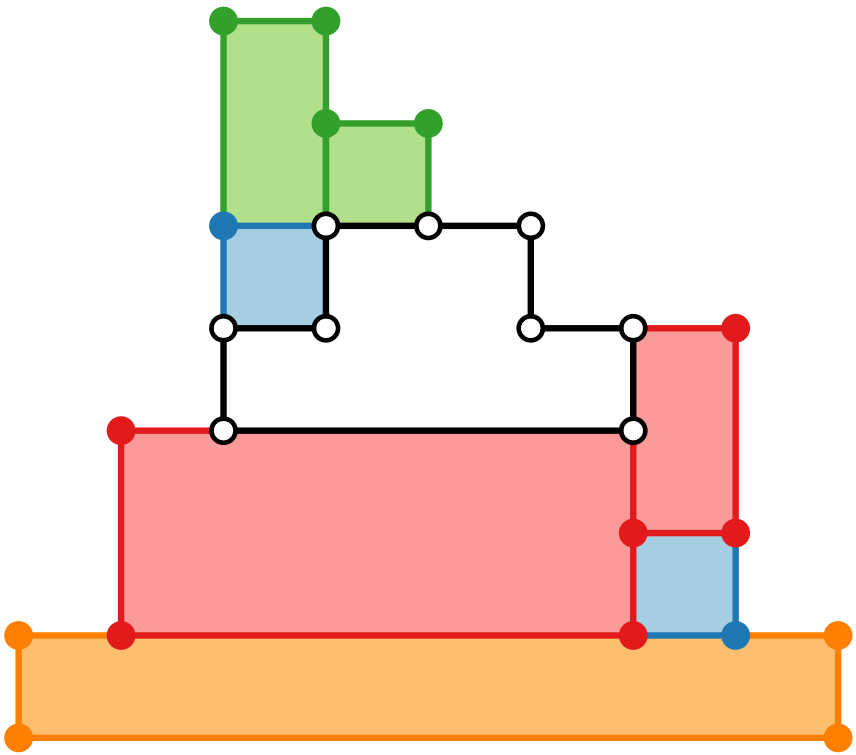

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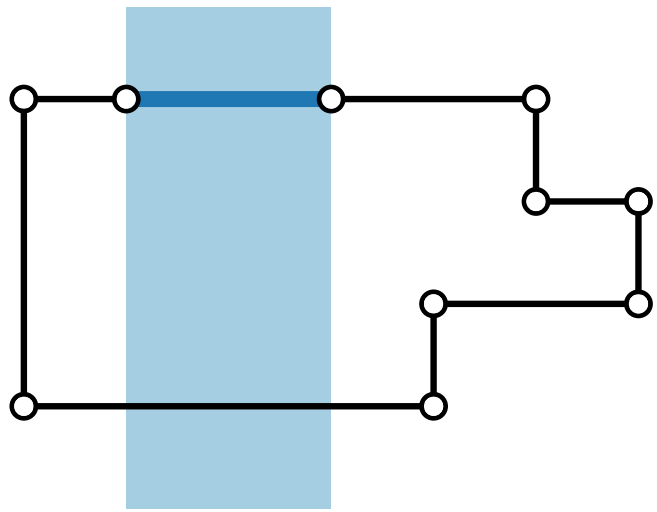

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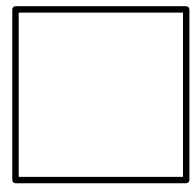
generative scheme: start with rectangle 

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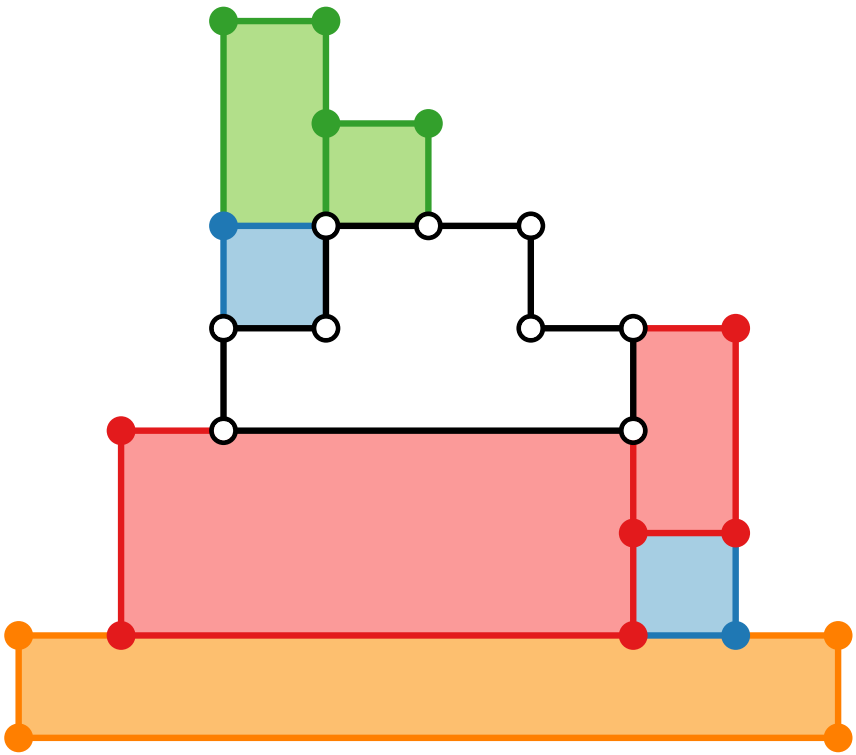

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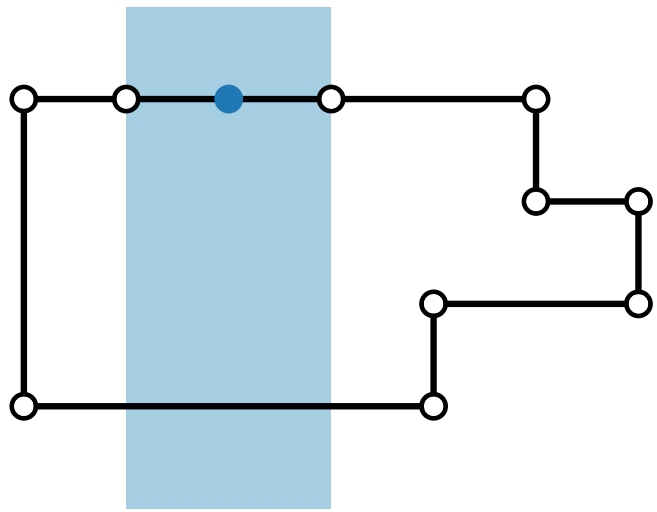

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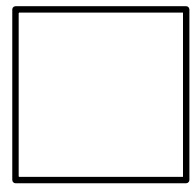
generative scheme: start with rectangle 

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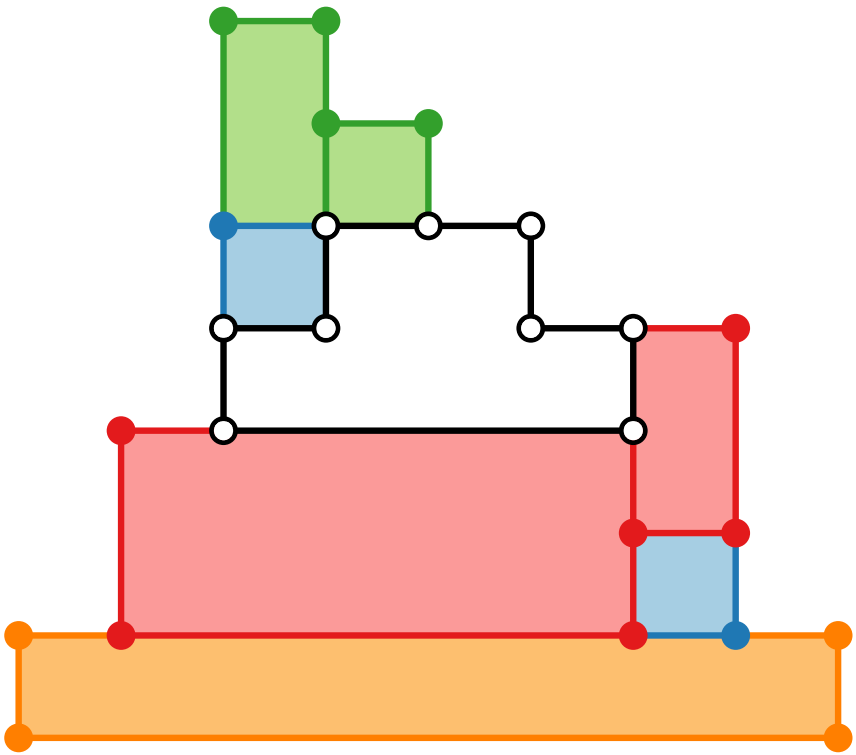

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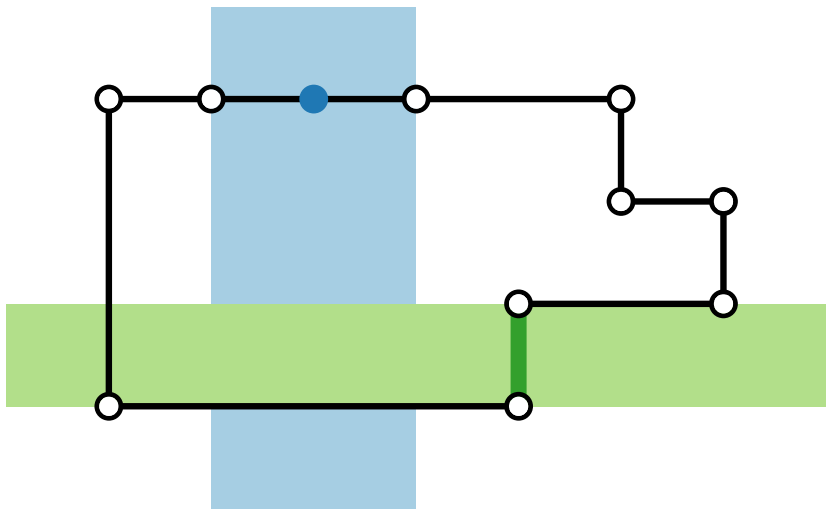

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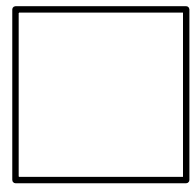
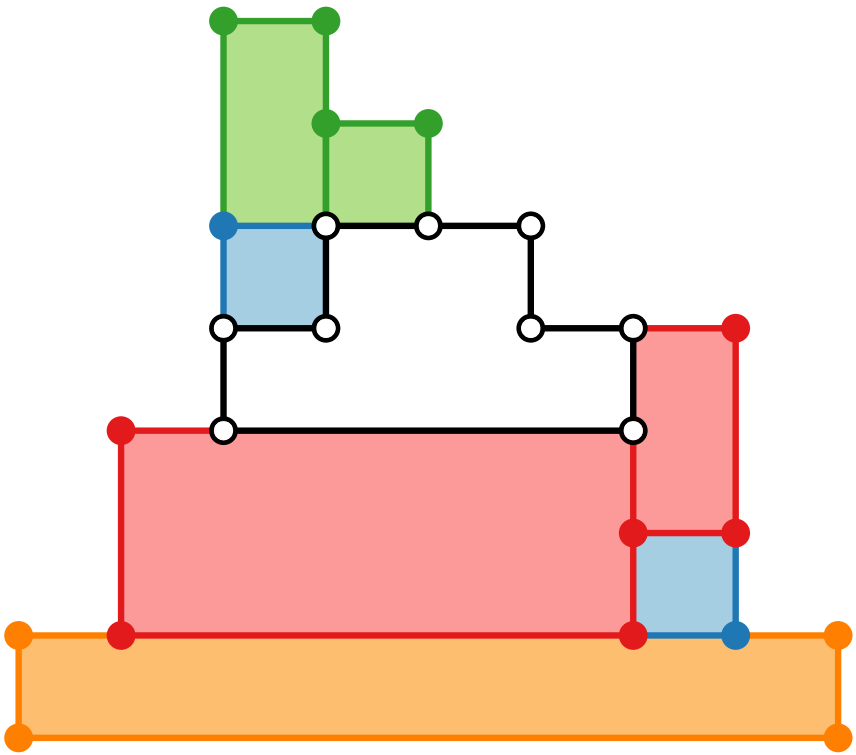
universal greedy: *every* drawing is greedy

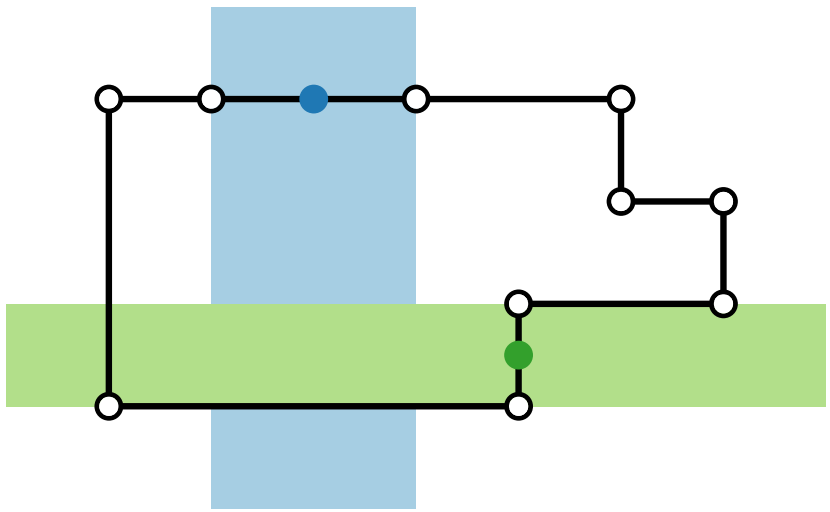
universal greedy ⇔ no conflicts

generative scheme: start with rectangle 

{1,2,3,4}-reflex vertex addition:



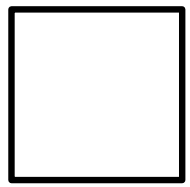
flat vertex addition:



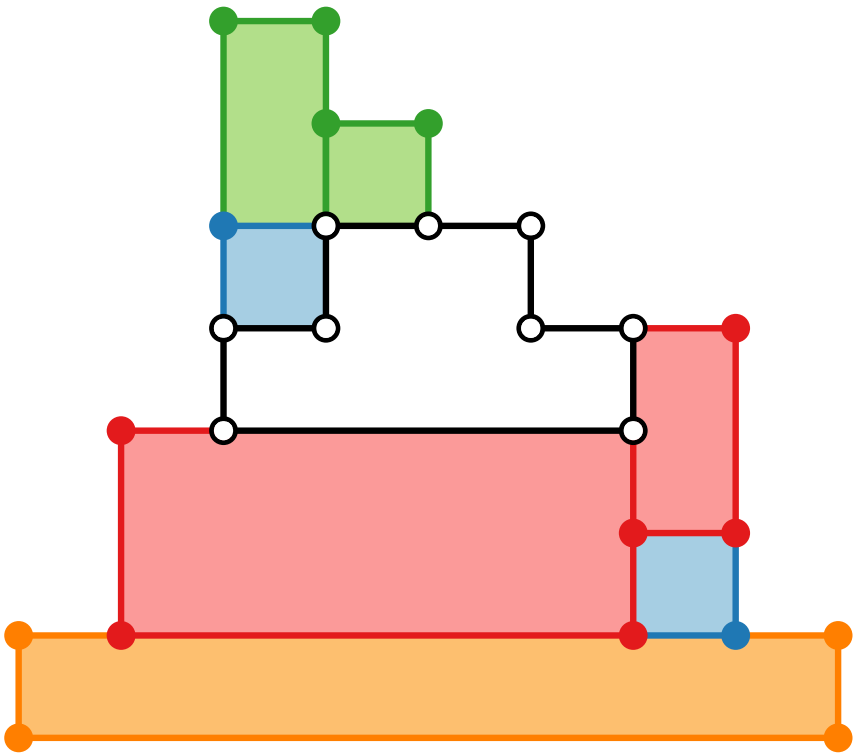
Universal Greedy Rectilinear

universal greedy: *every* drawing is greedy

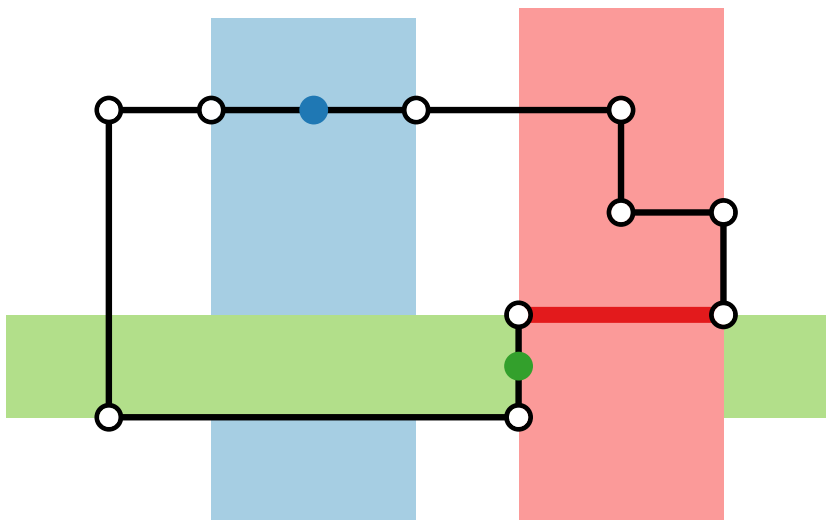
universal greedy ⇔ no conflicts

generative scheme: start with rectangle 

{1,2,3,4}-reflex vertex addition:



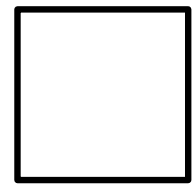
flat vertex addition:



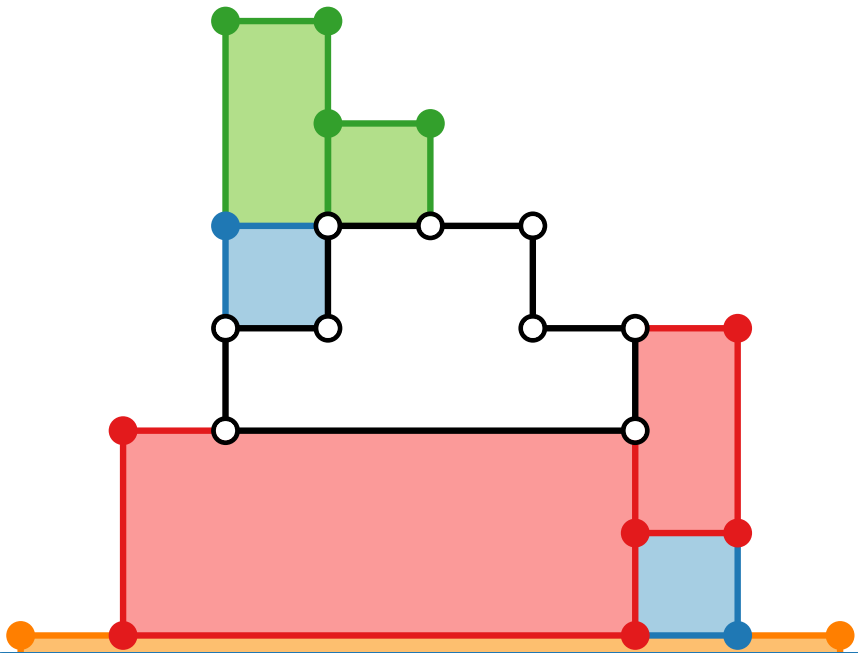
Universal Greedy Rectilinear

universal greedy: *every* drawing is greedy

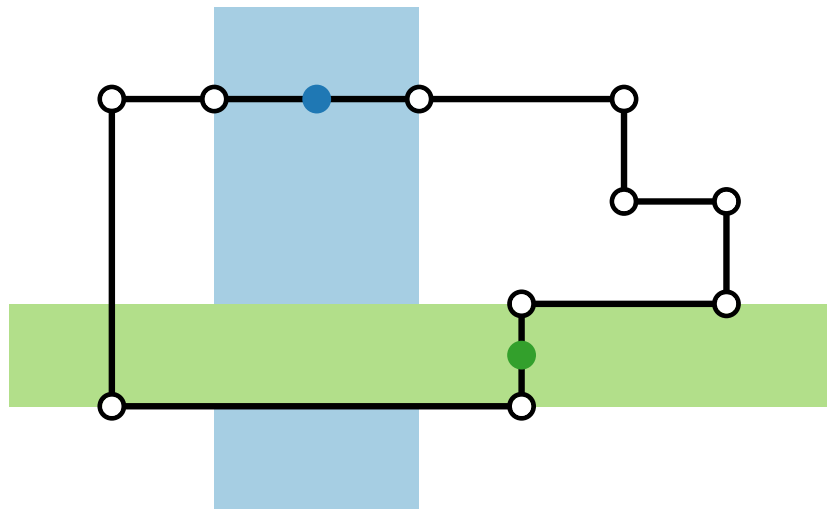
universal greedy ⇔ no conflicts

generative scheme: start with rectangle 

{1,2,3,4}-reflex vertex addition:

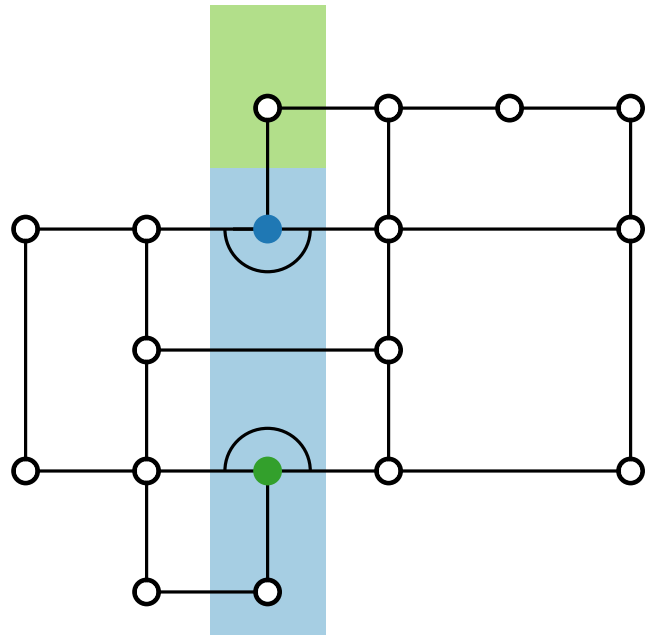


flat vertex addition:

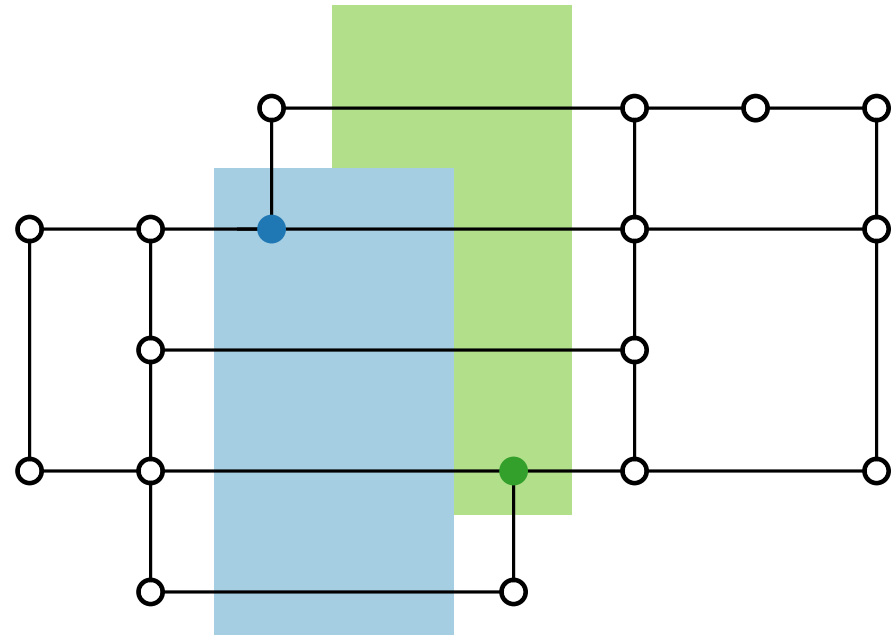


Test and gen. all universal greedy rectilinear graphs in $O(n)$ time

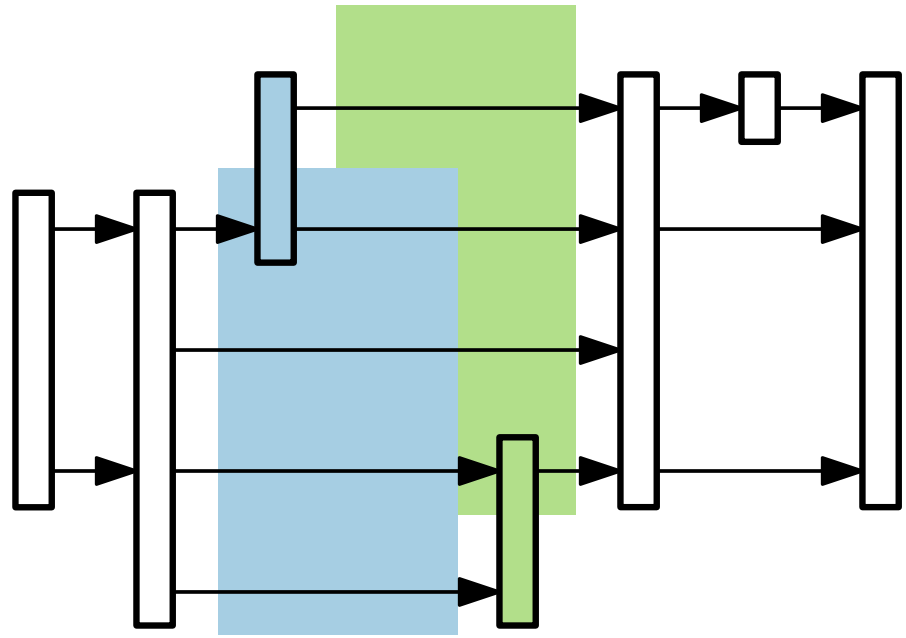
Resolving Conflicts



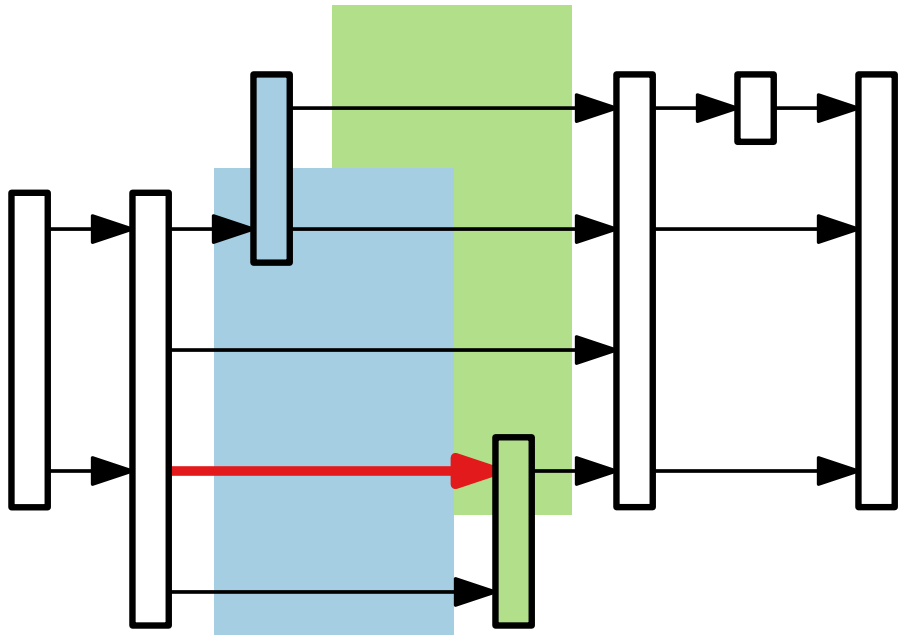
Resolving Conflicts



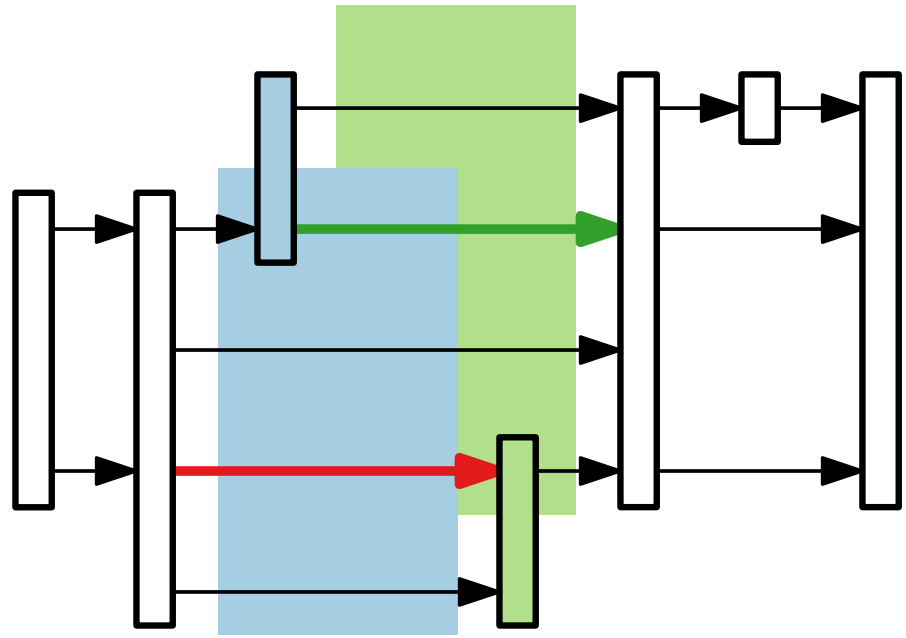
Resolving Conflicts



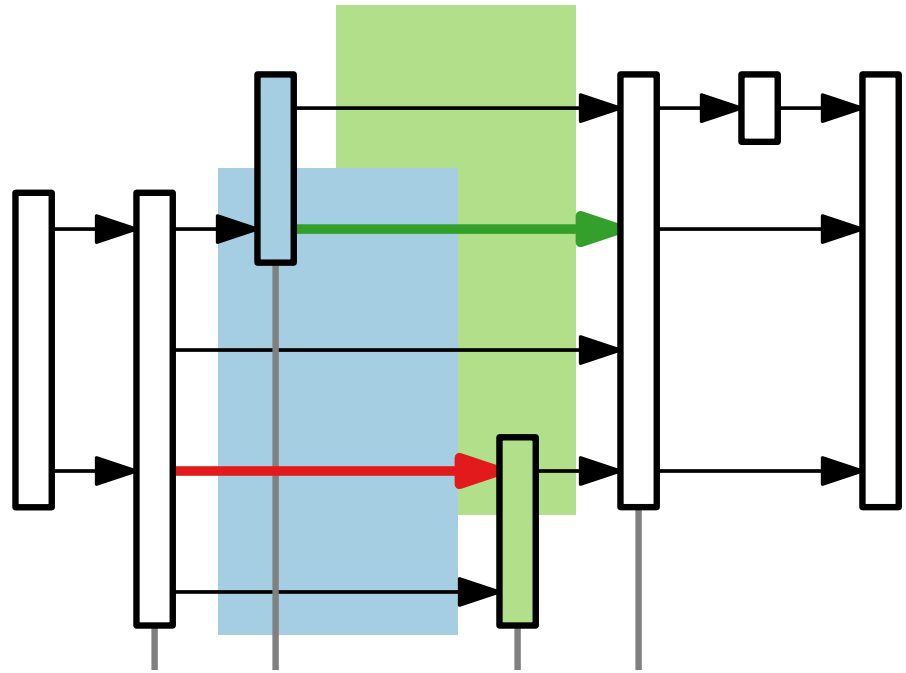
Resolving Conflicts



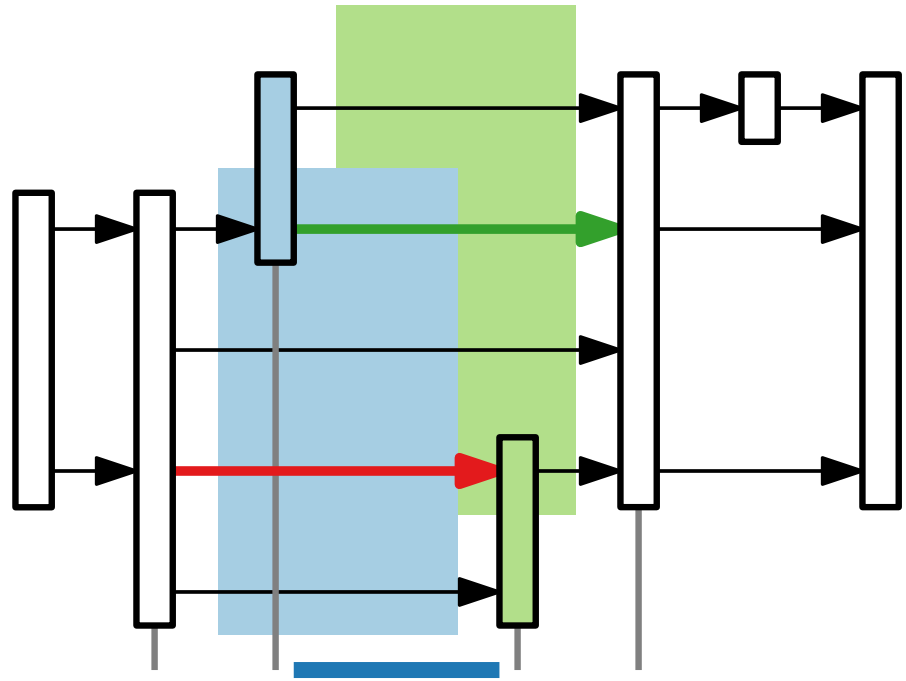
Resolving Conflicts



Resolving Conflicts



Resolving Conflicts



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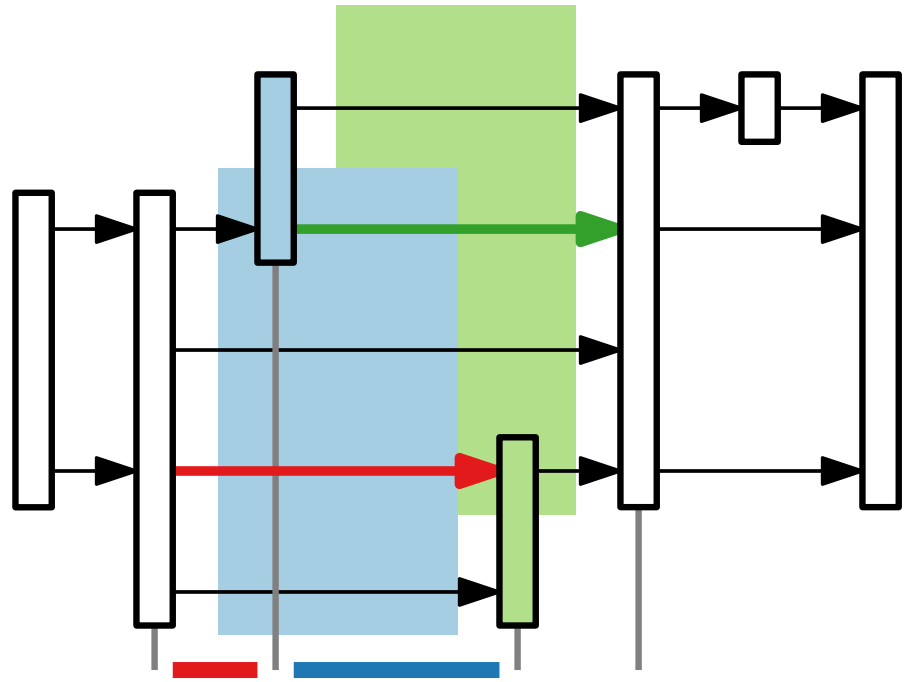
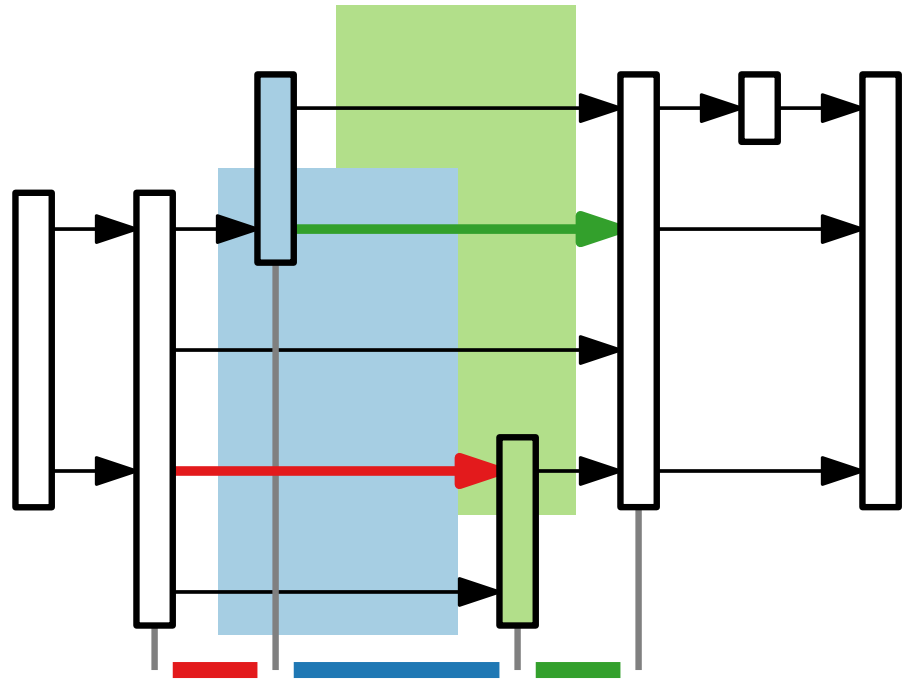
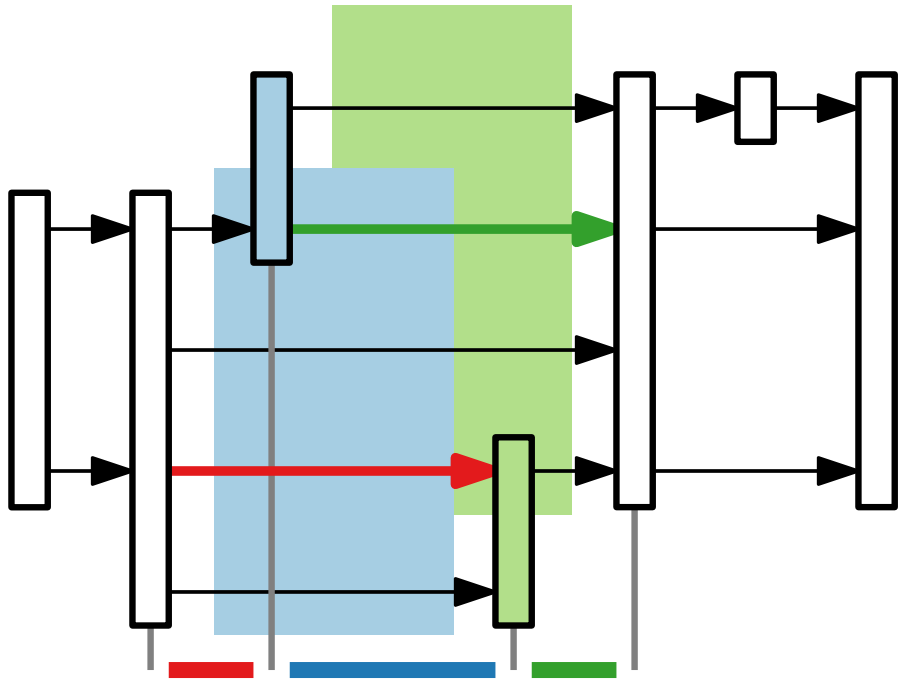


Resolving Conflicts



Resolving Conflicts

Conflict resolved: | > | and | > |



Resolving Conflicts

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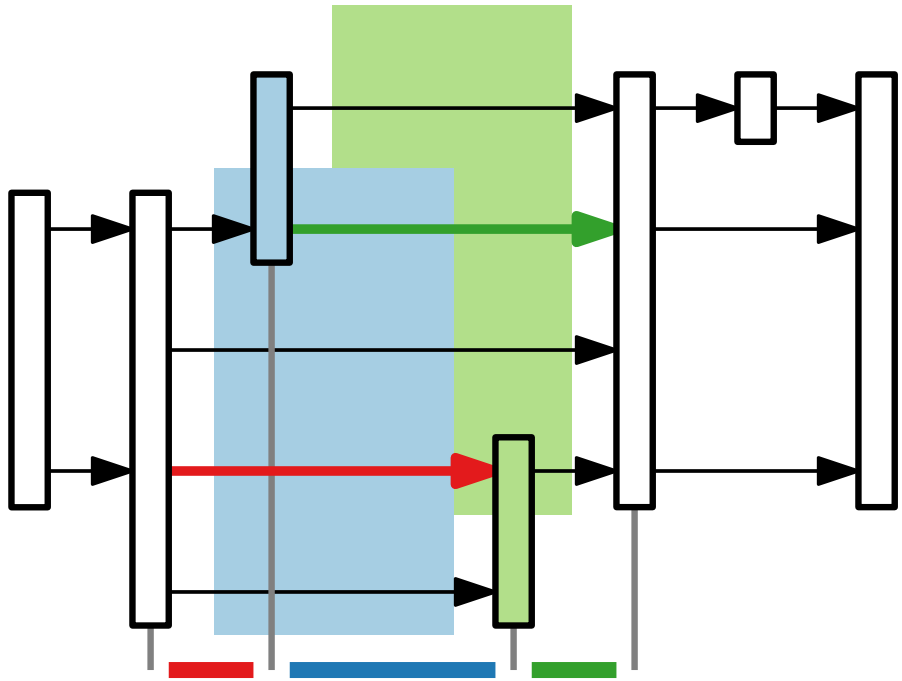
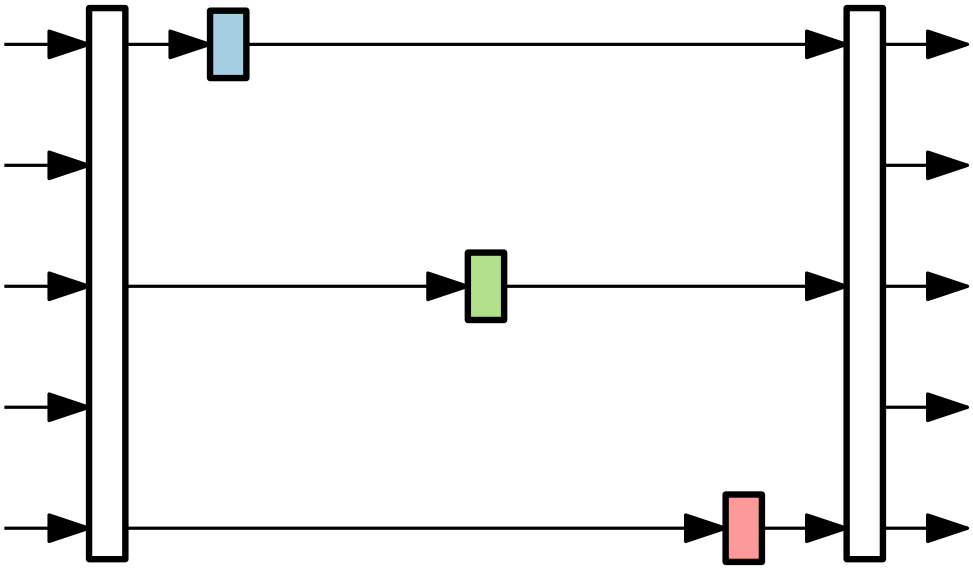
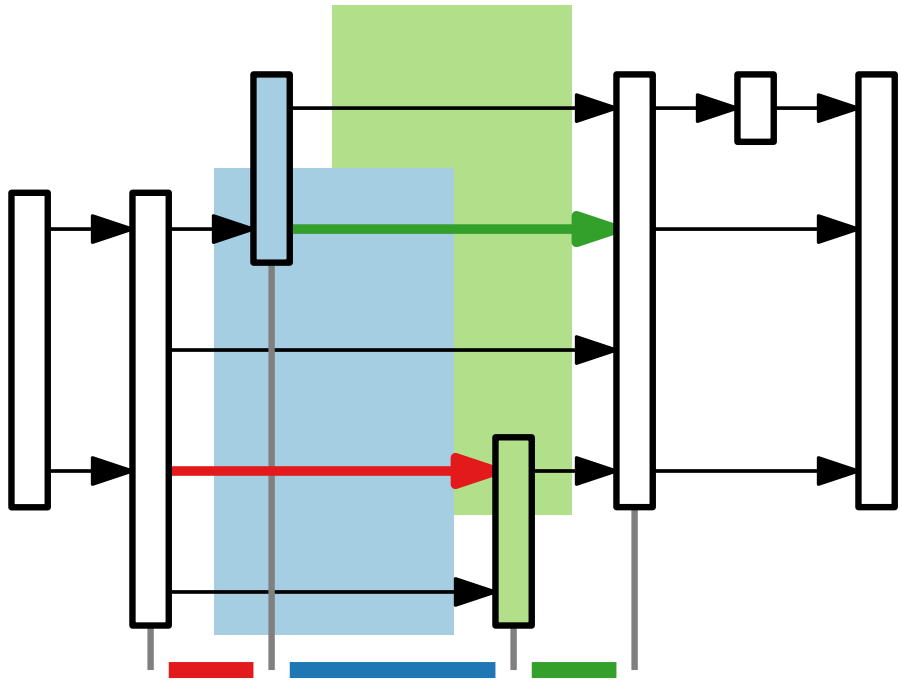
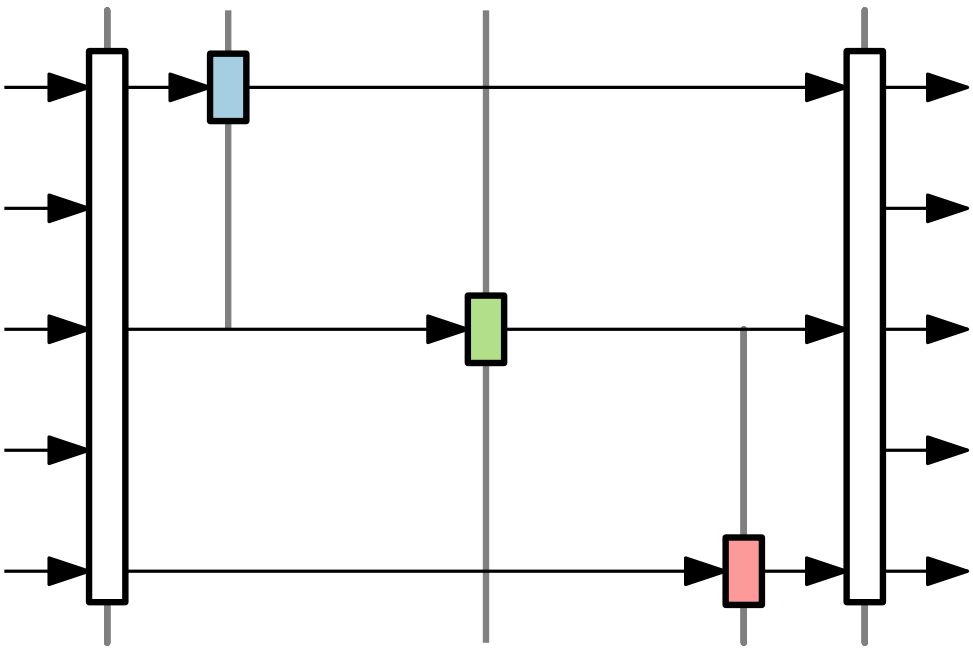




Resolving Conflicts

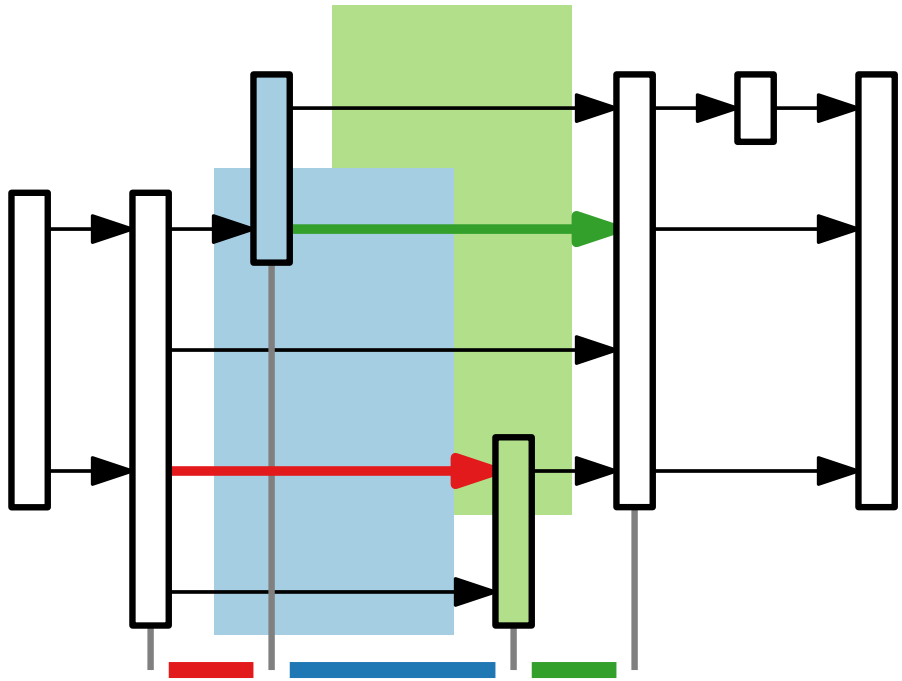
Conflict resolved: | > | and | > |

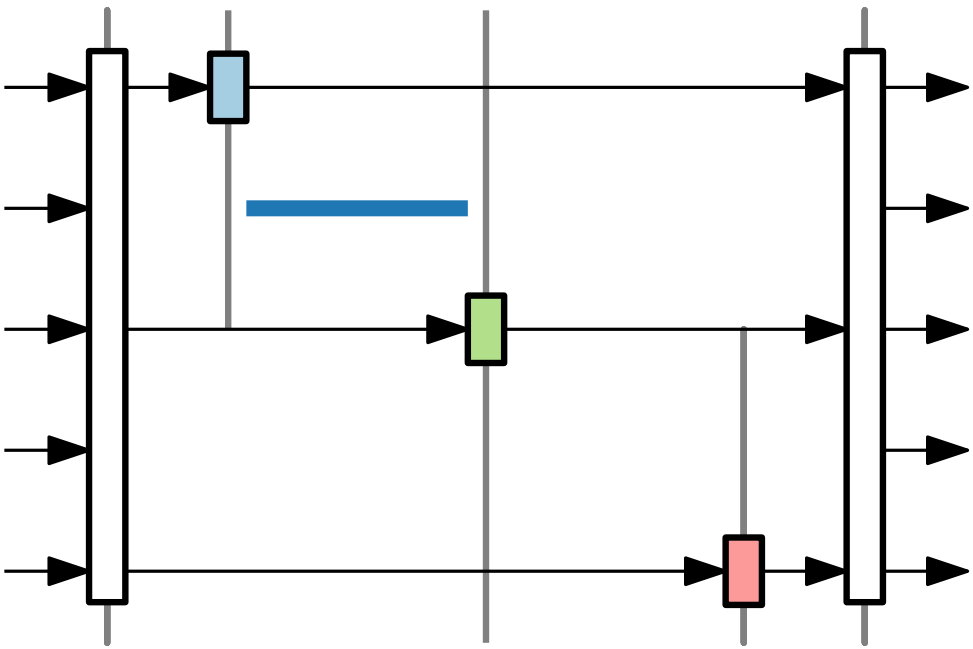




Resolving Conflicts

Conflict resolved: | > | and | > |





Resolving Conflicts

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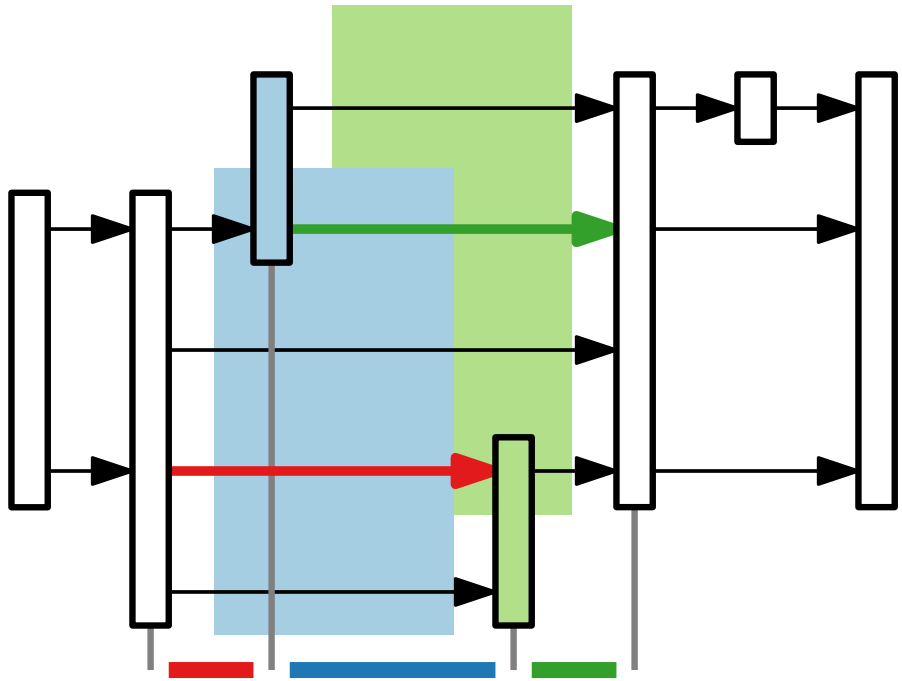

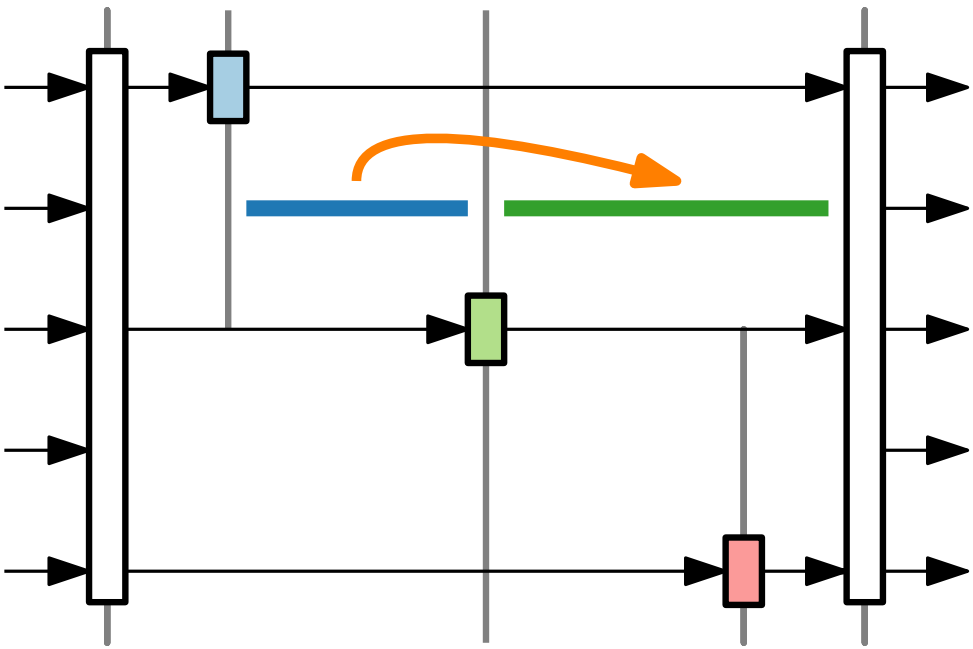

Resolving Conflicts

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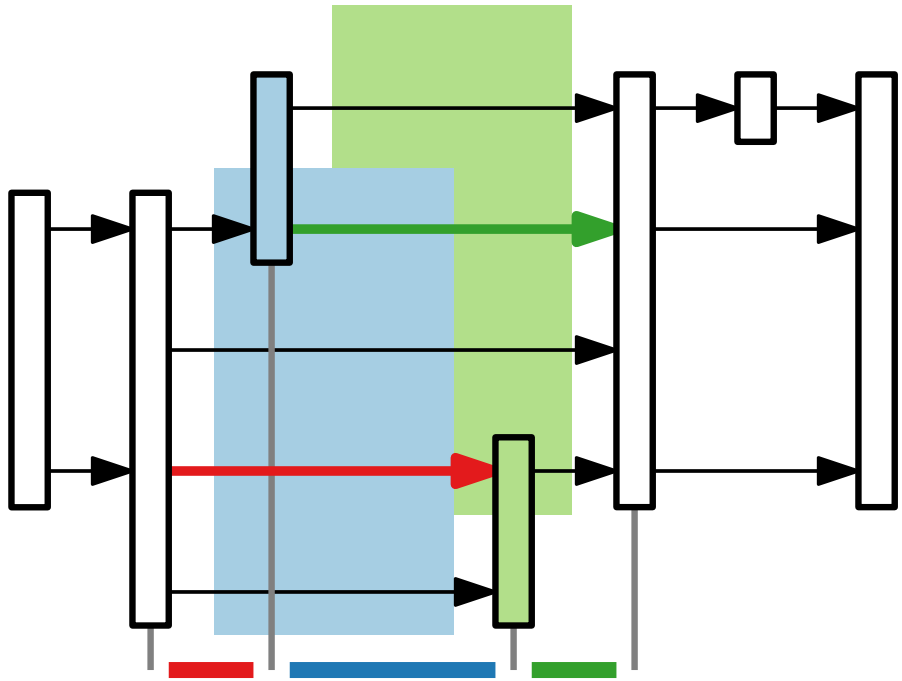

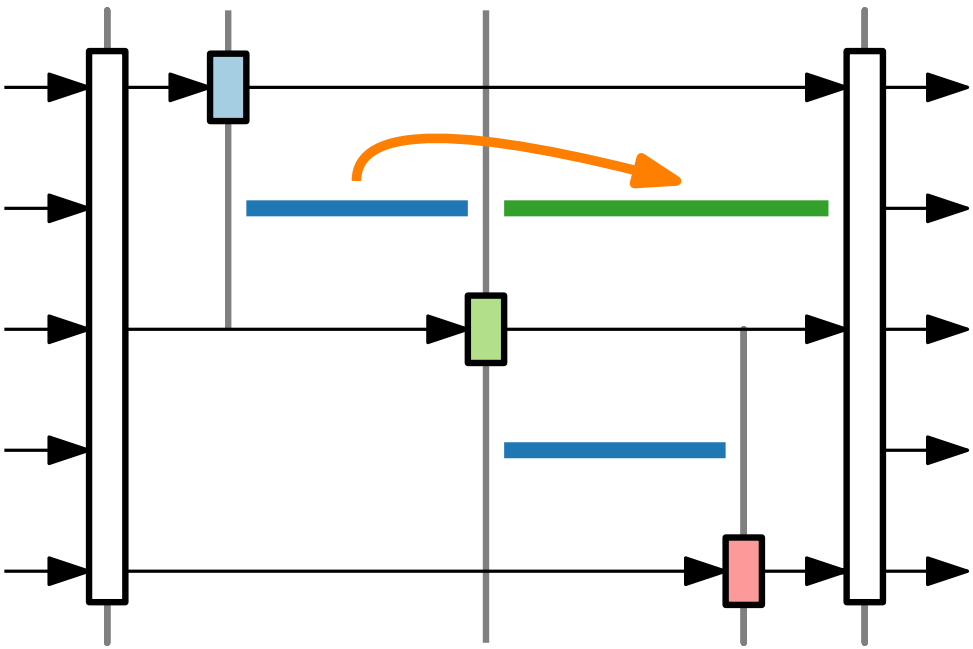

Resolving Conflicts

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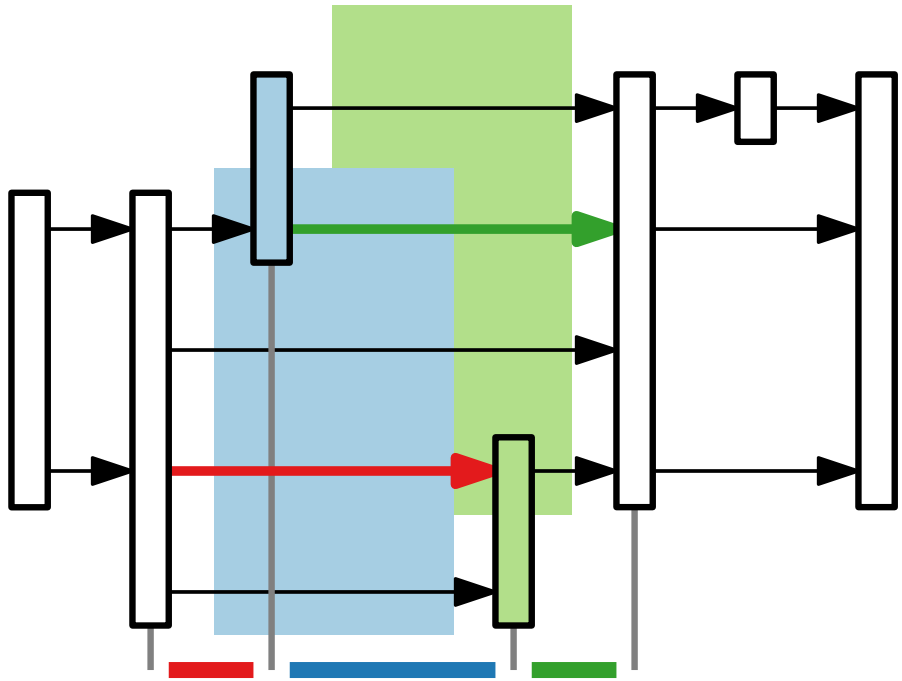

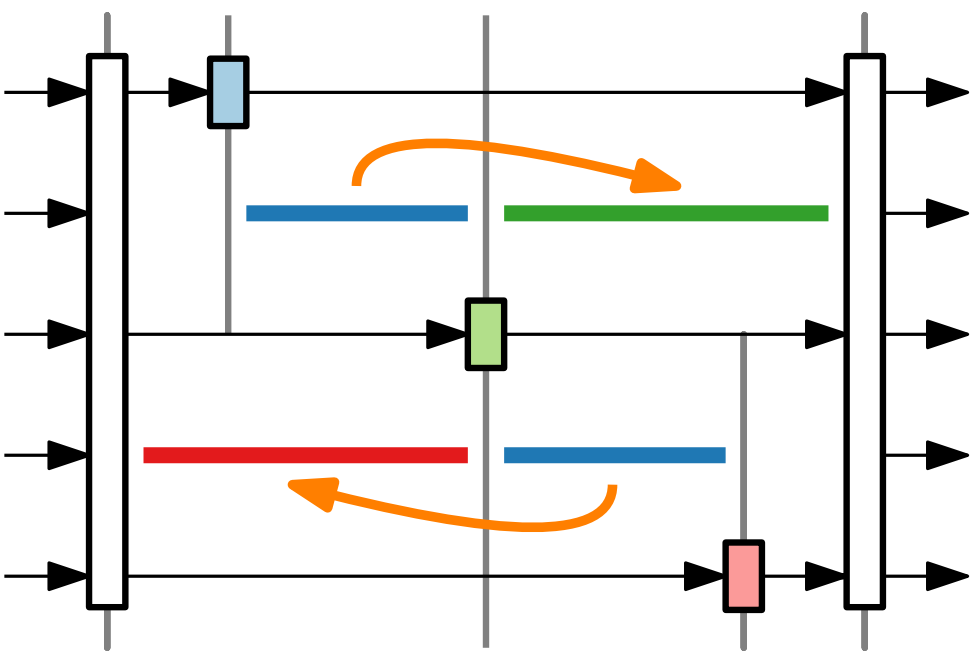

Resolving Conflicts

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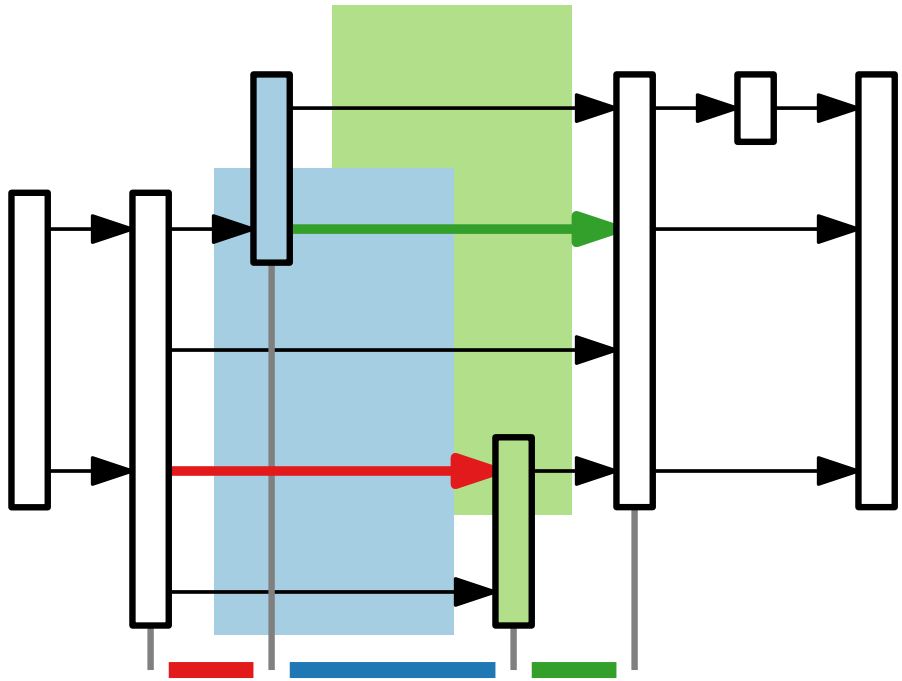

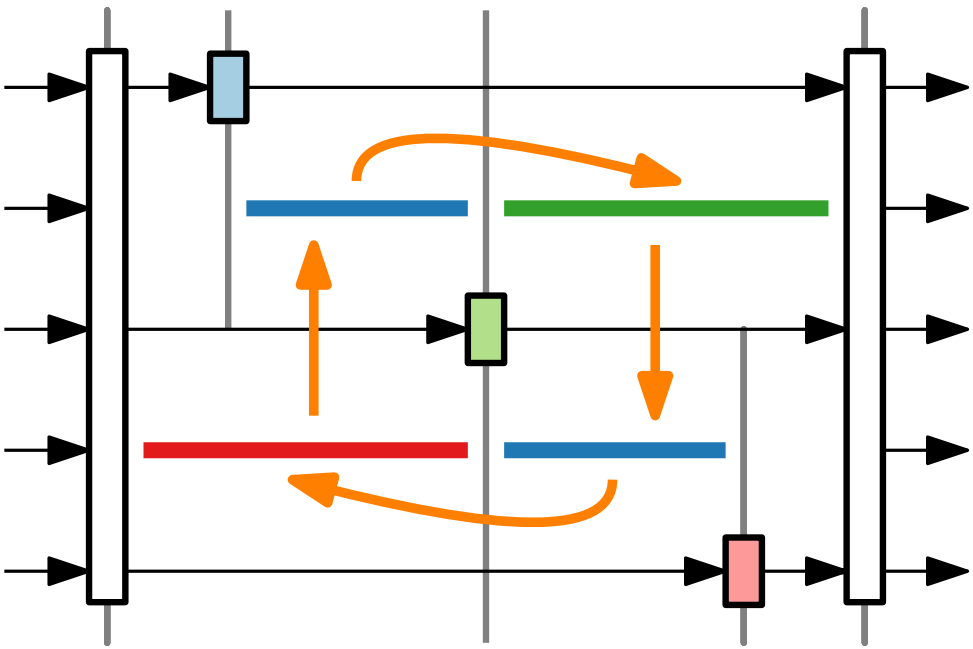

Resolving Conflicts

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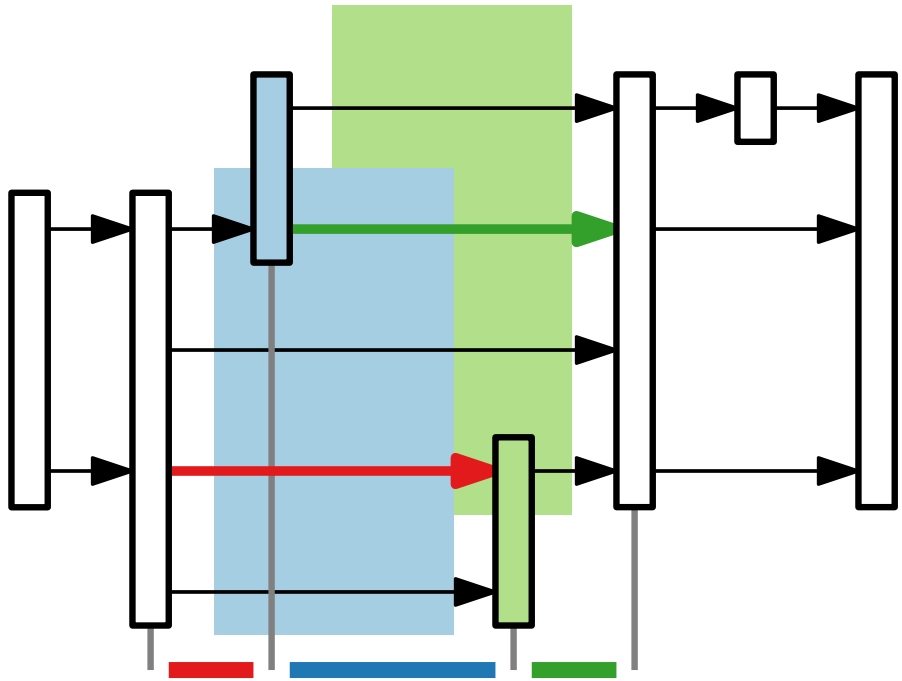

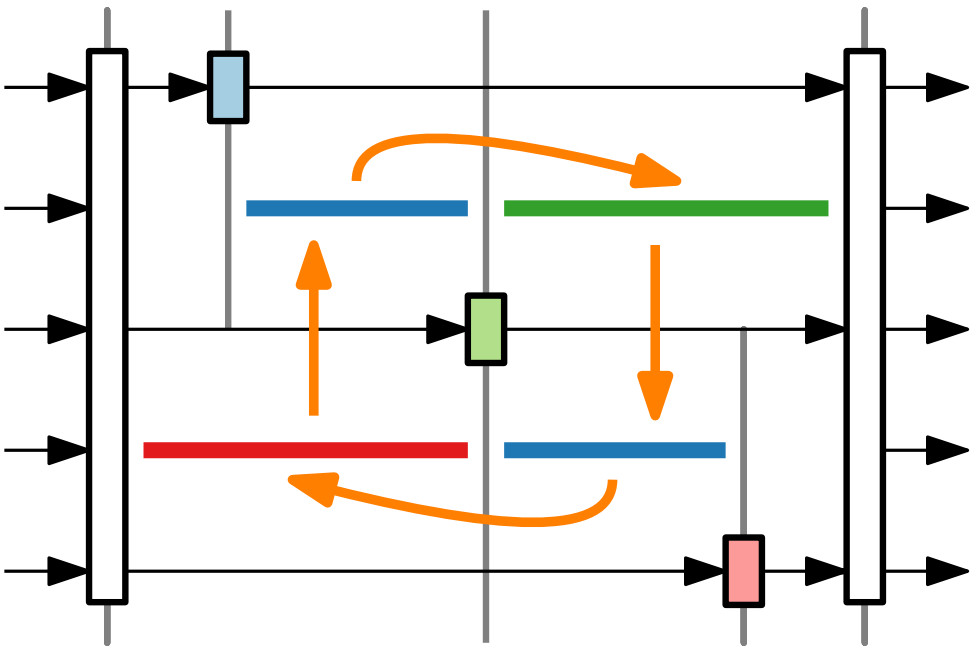

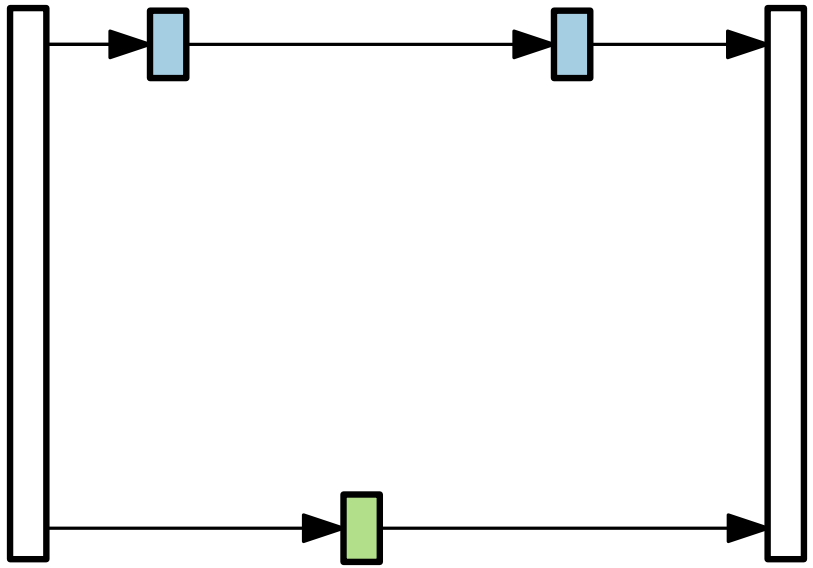

Resolving Conflicts

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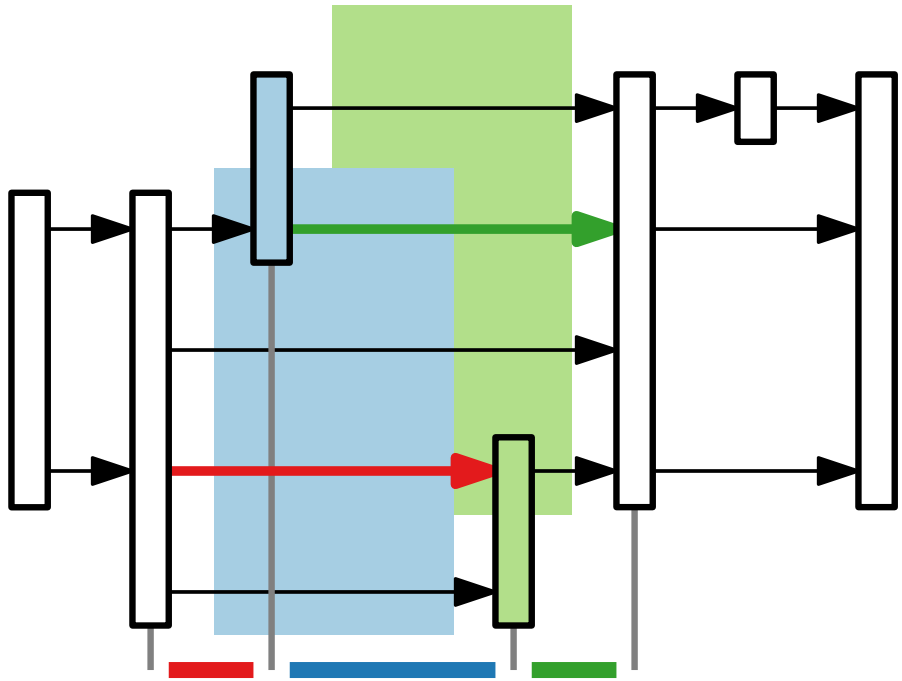

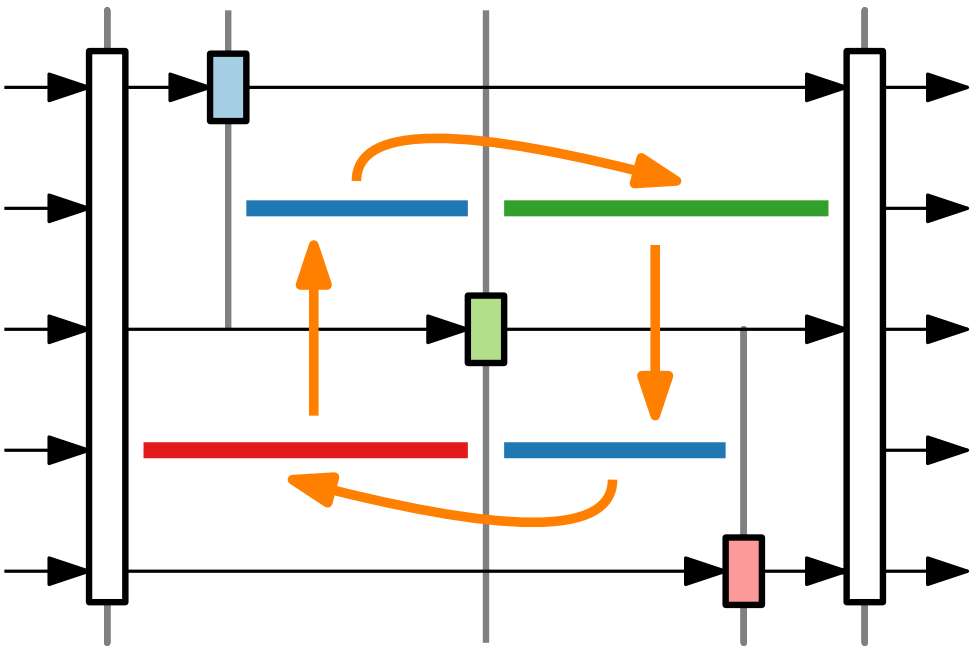

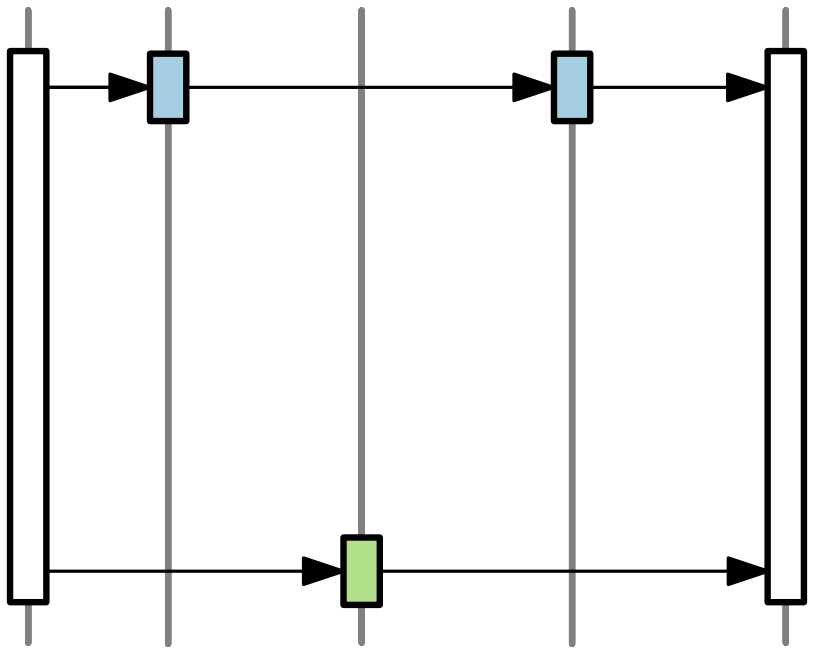

Resolving Conflicts

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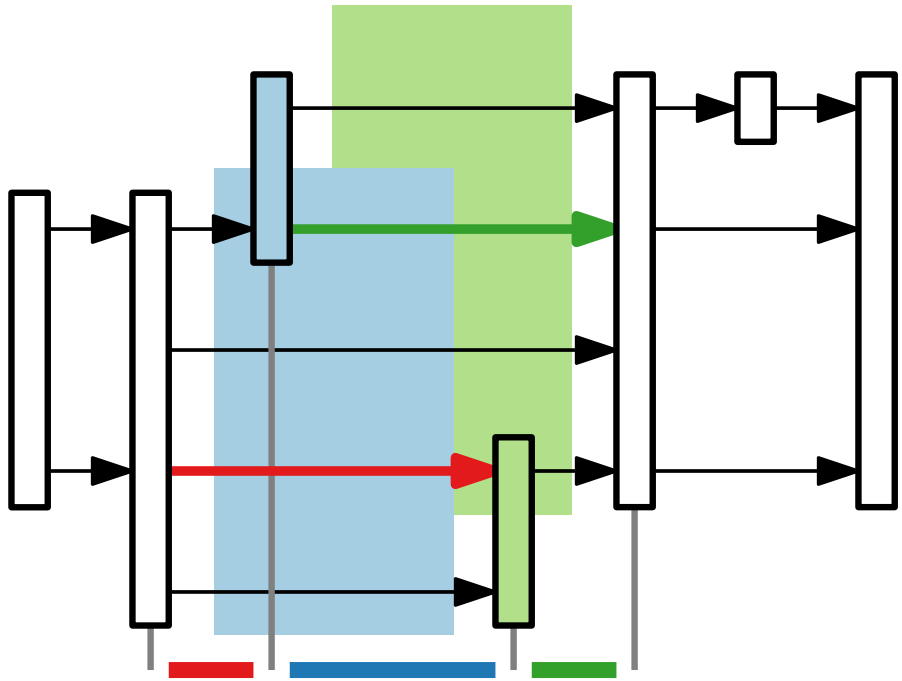

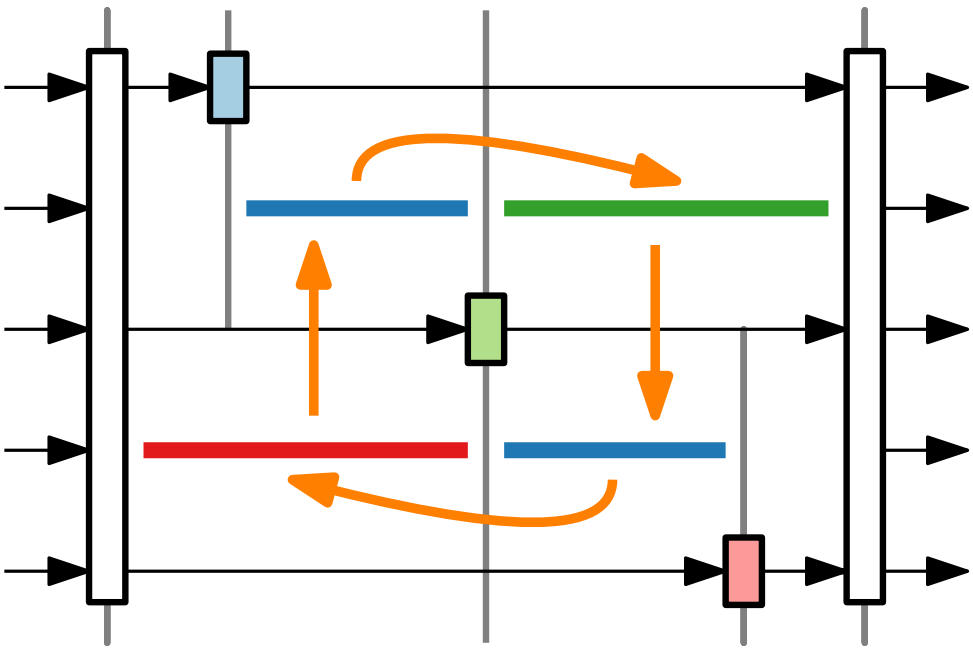

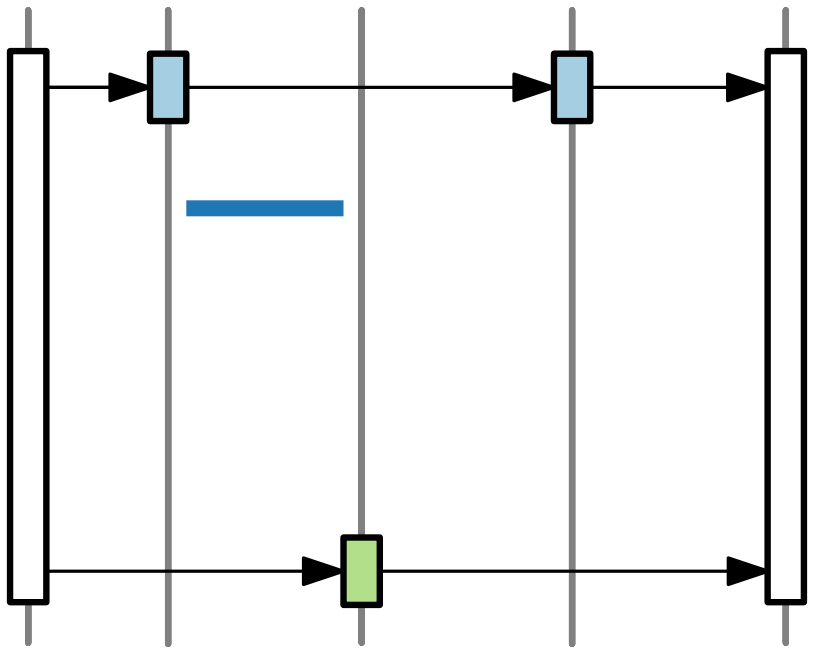

Resolving Conflicts

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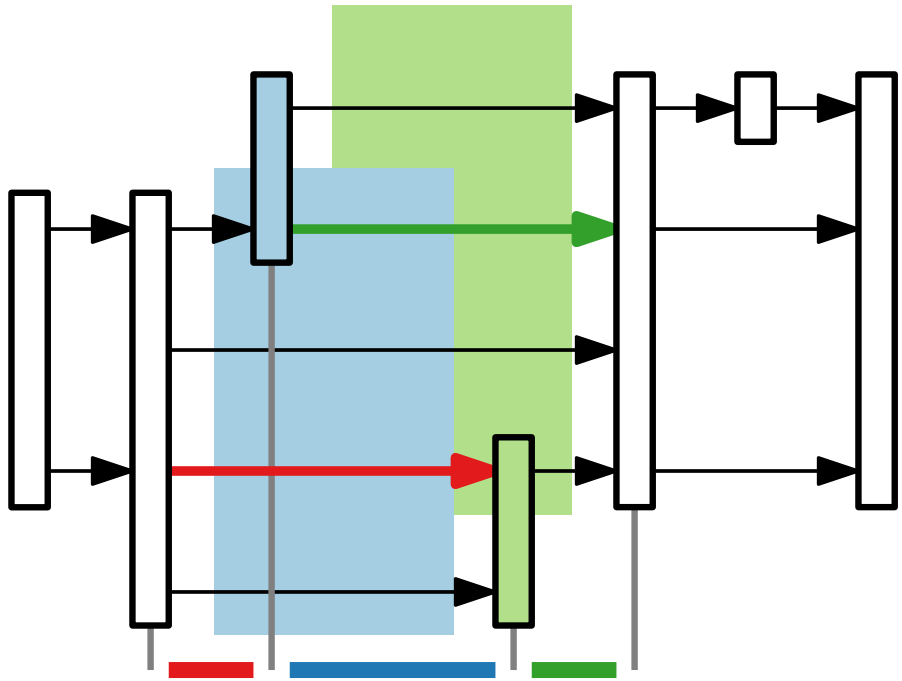

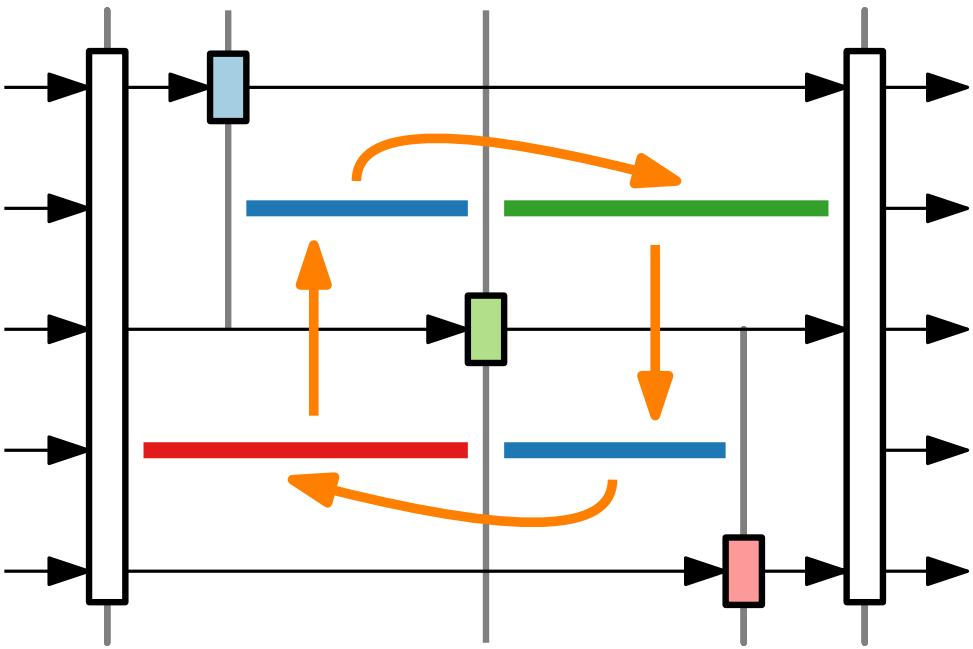

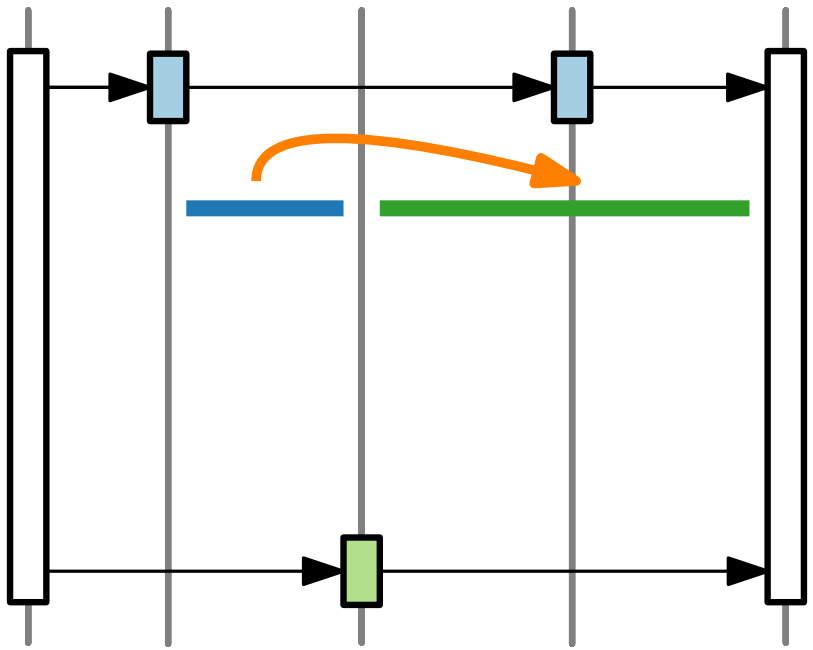

Resolving Conflicts

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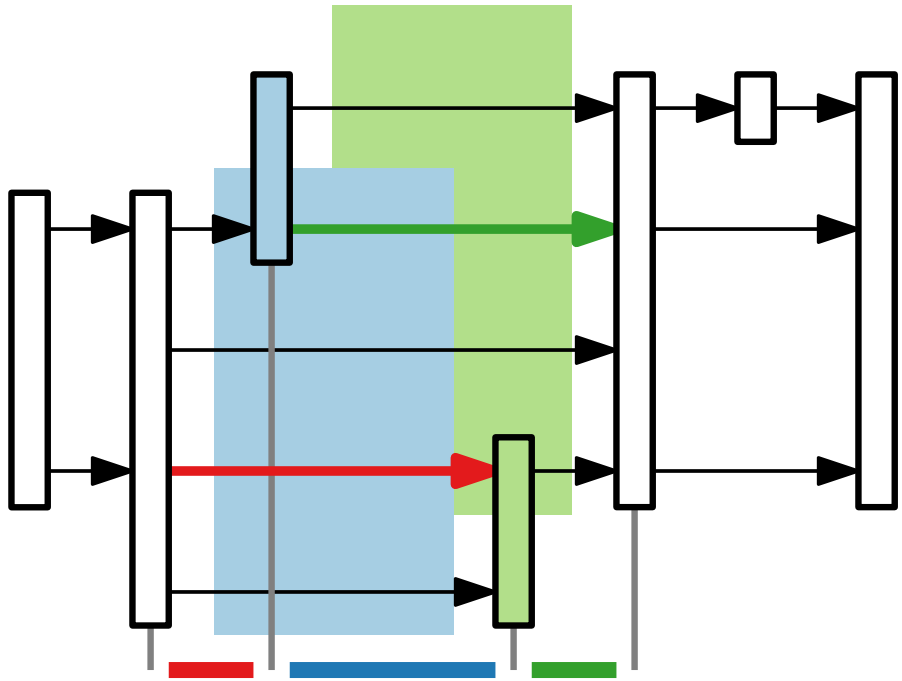

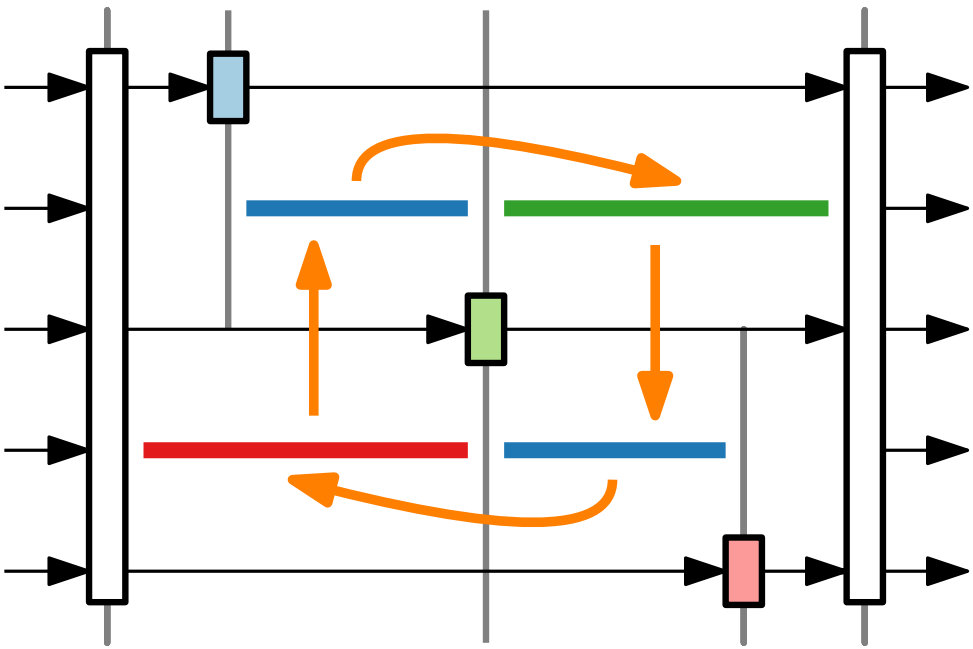

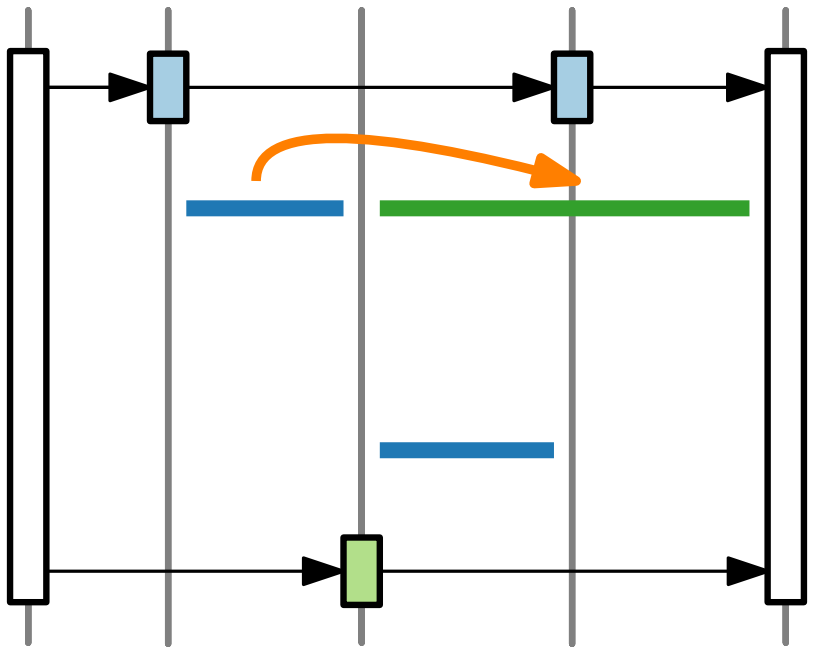

Resolving Conflicts

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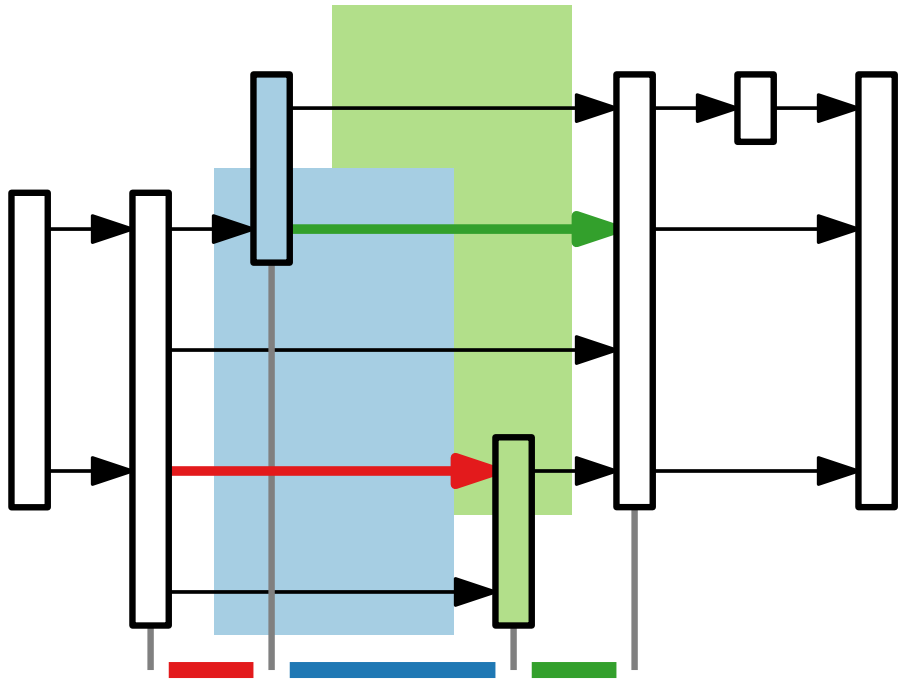
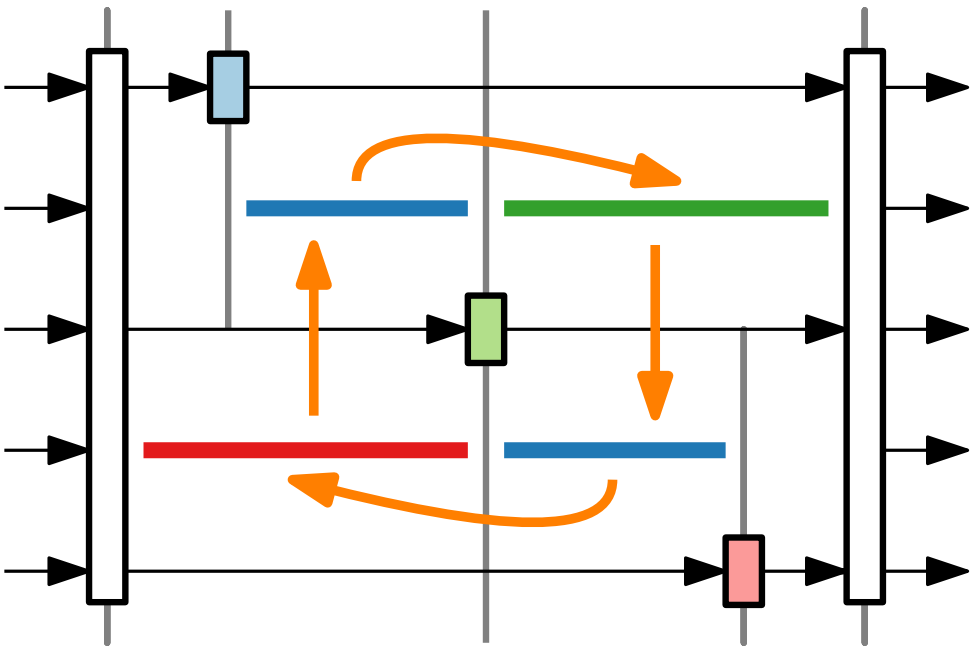
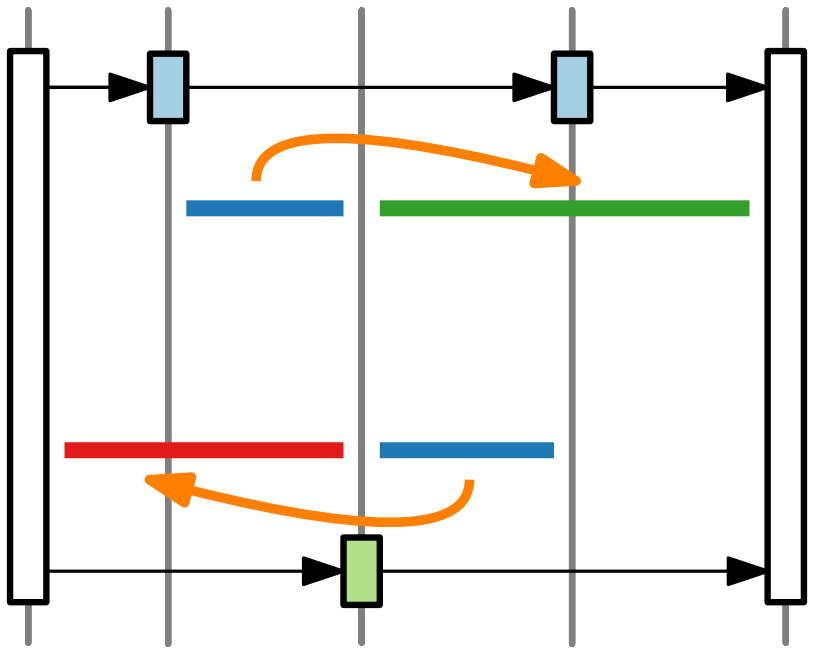
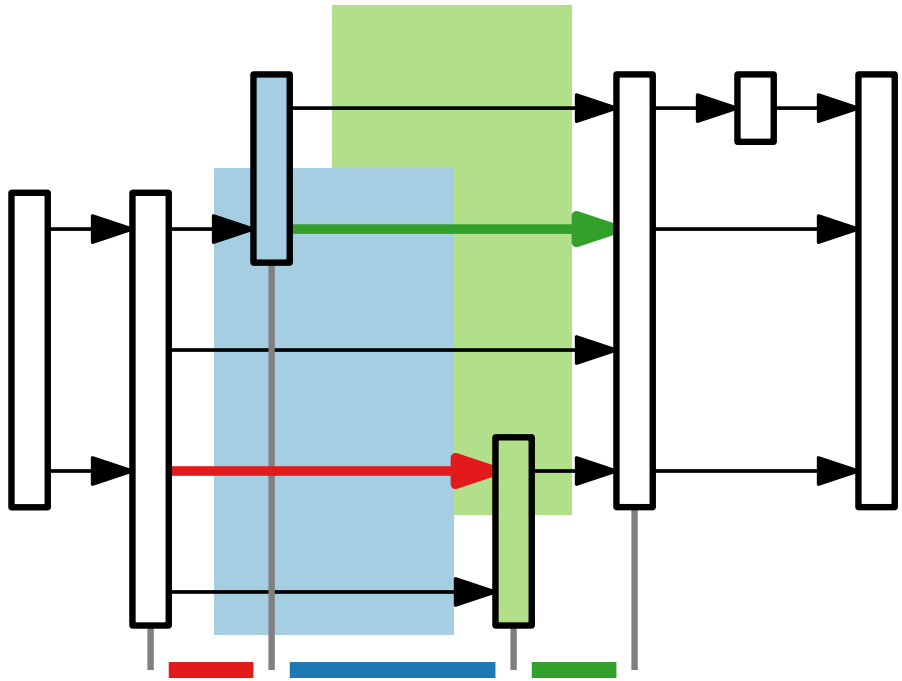


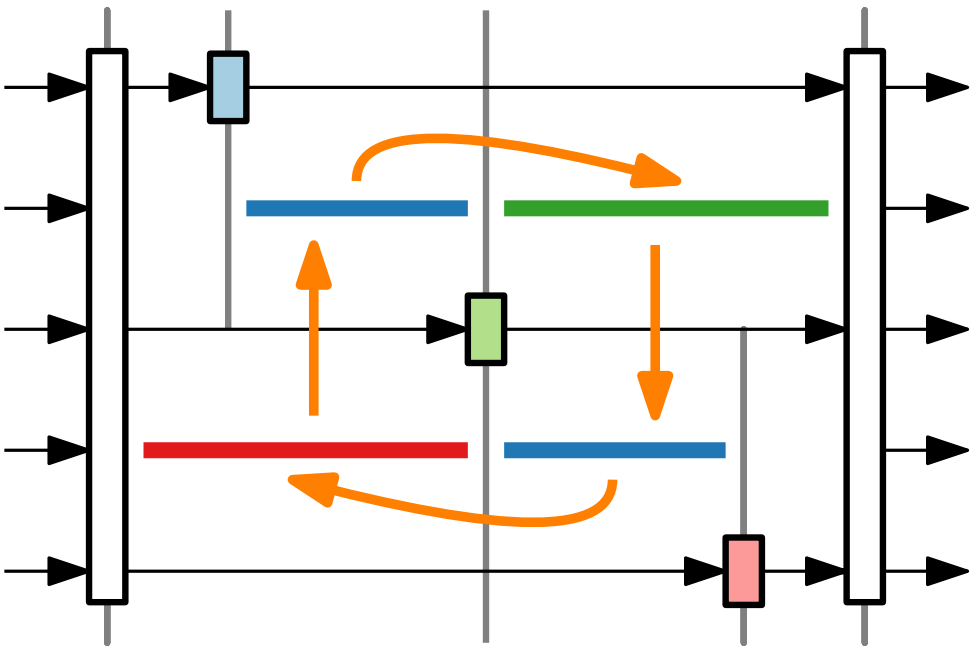


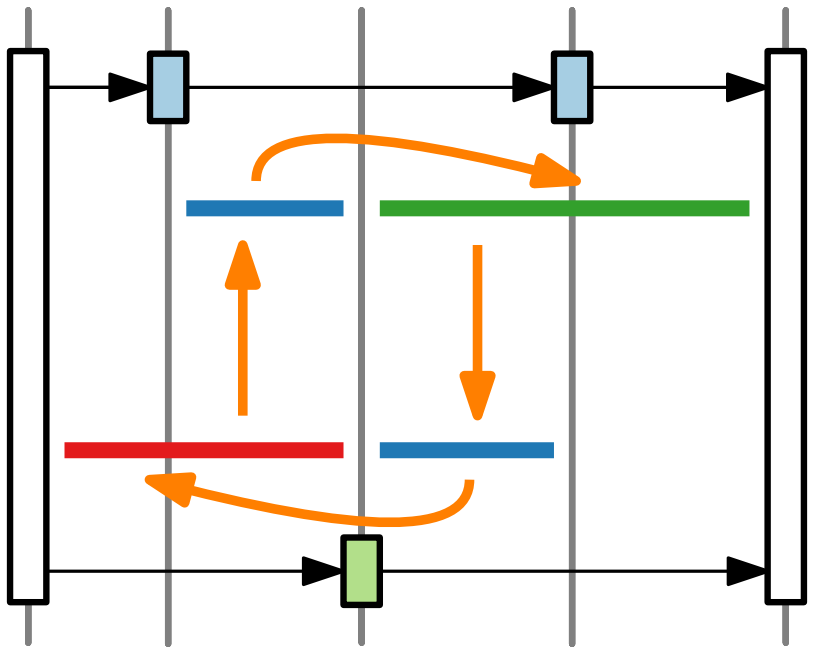


Resolving Conflicts

Conflict resolved: | > | and | > |

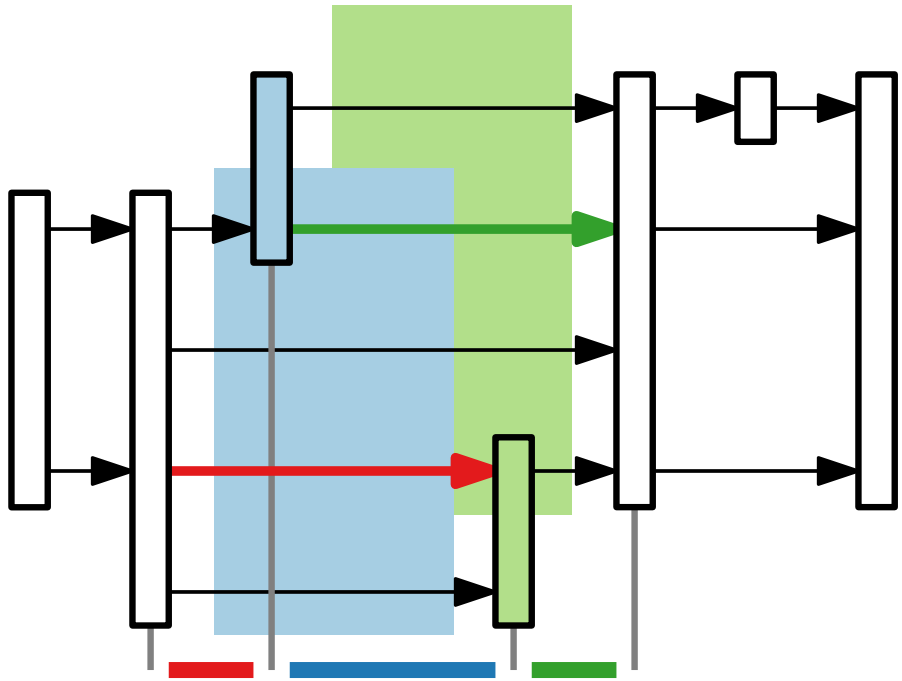




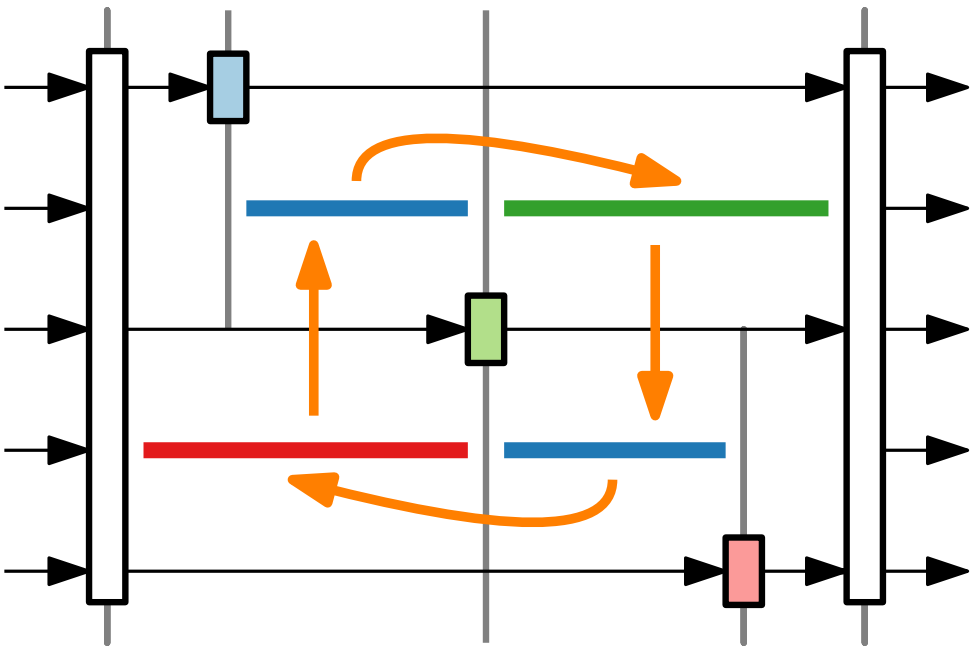


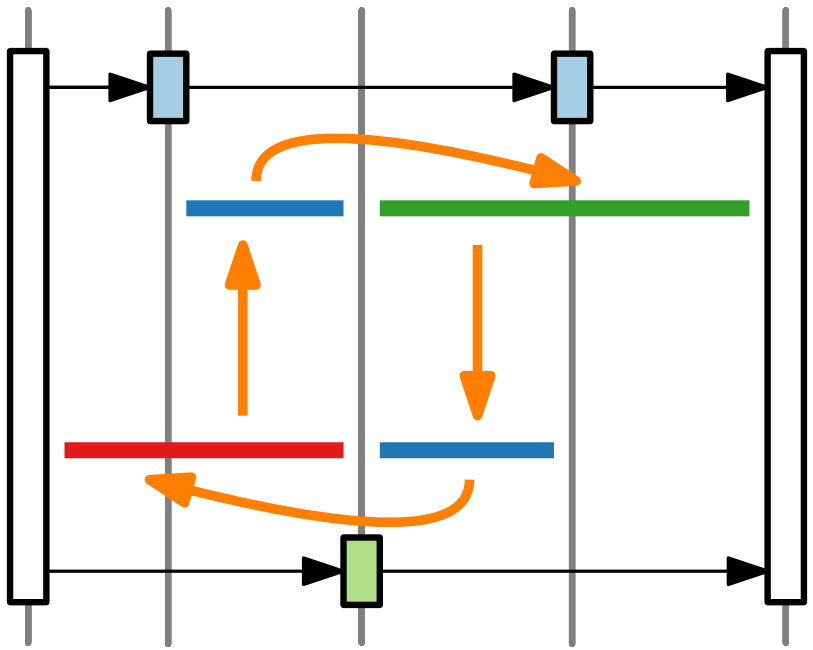
Resolving Conflicts

Conflict resolved: | > | and | > |



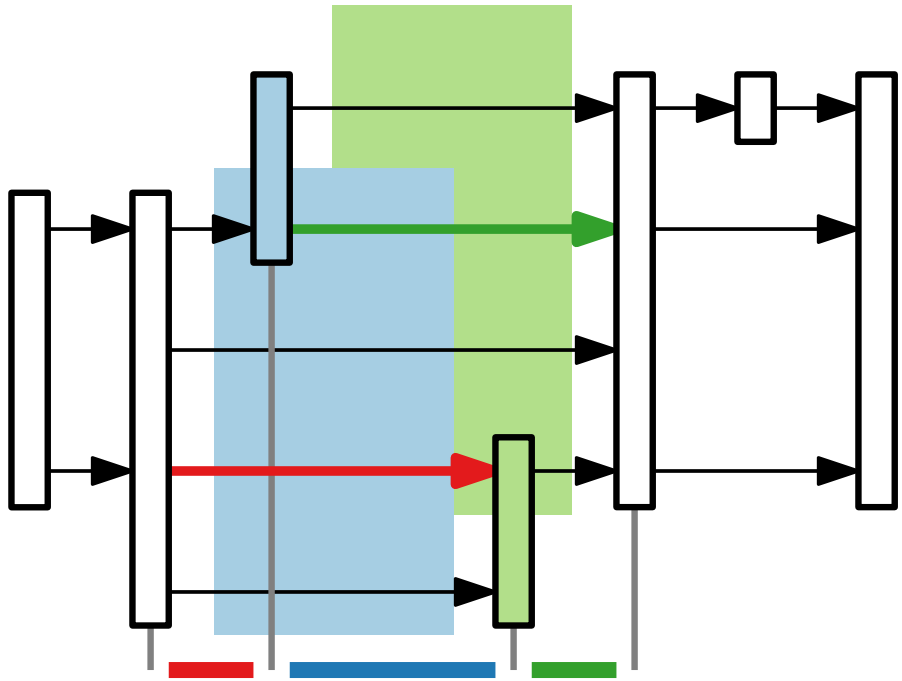
Need a *good st*-order:



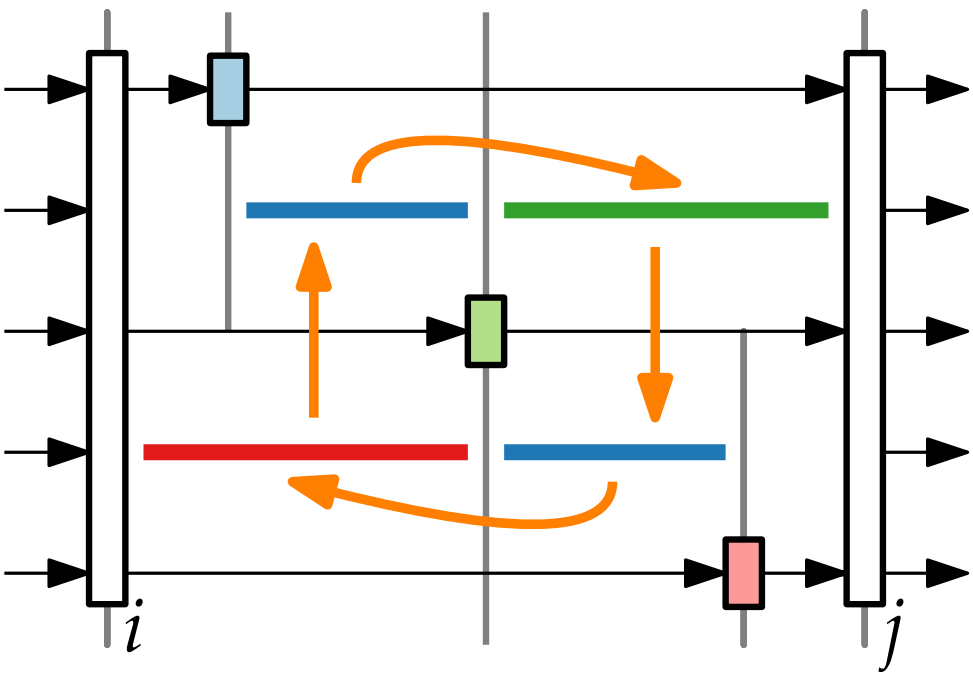


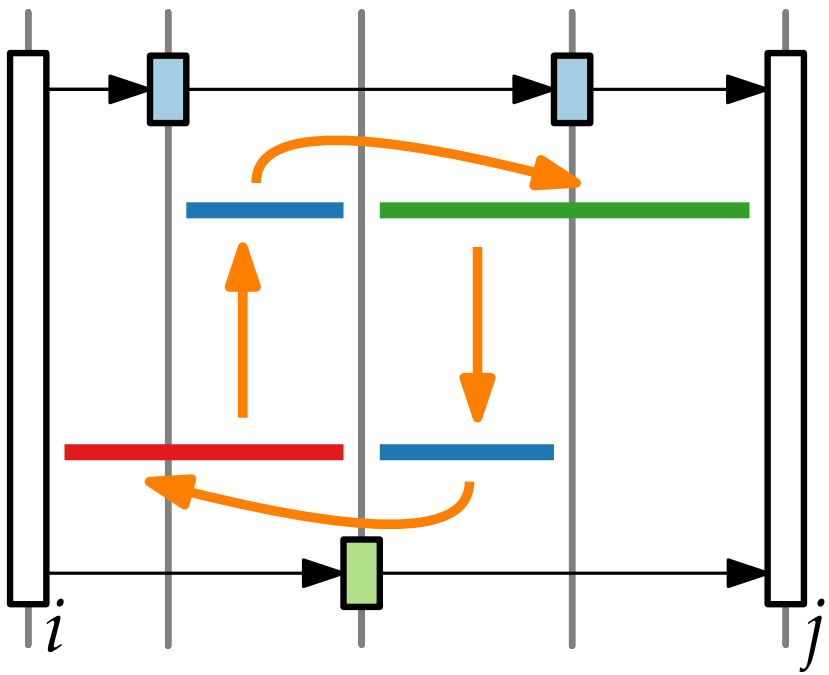
Resolving Conflicts

Conflict resolved: | > | and | > |



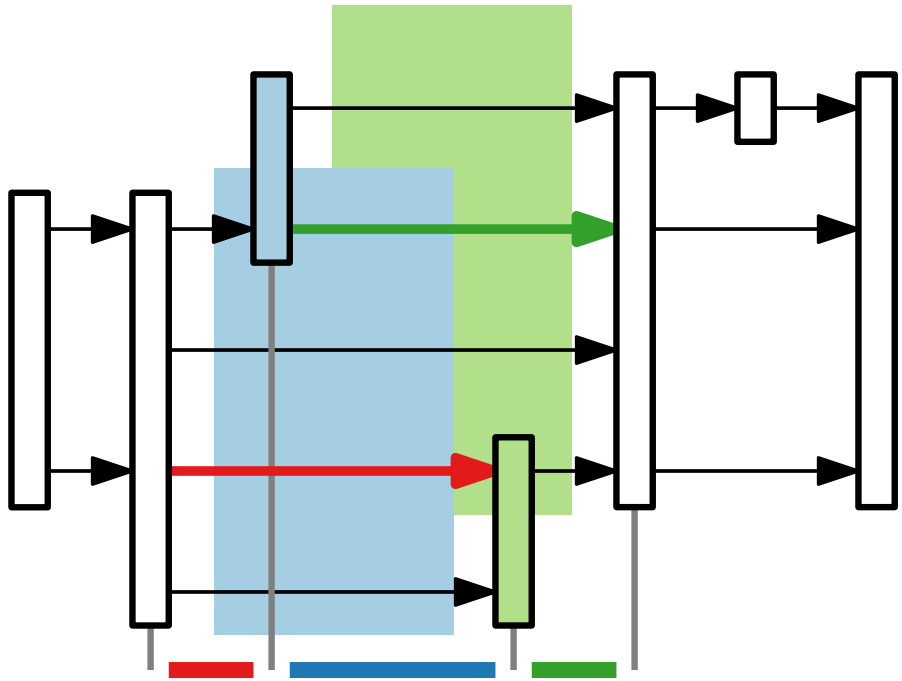
Need a *good st*-order:
for every interval $i, \ldots, j$:



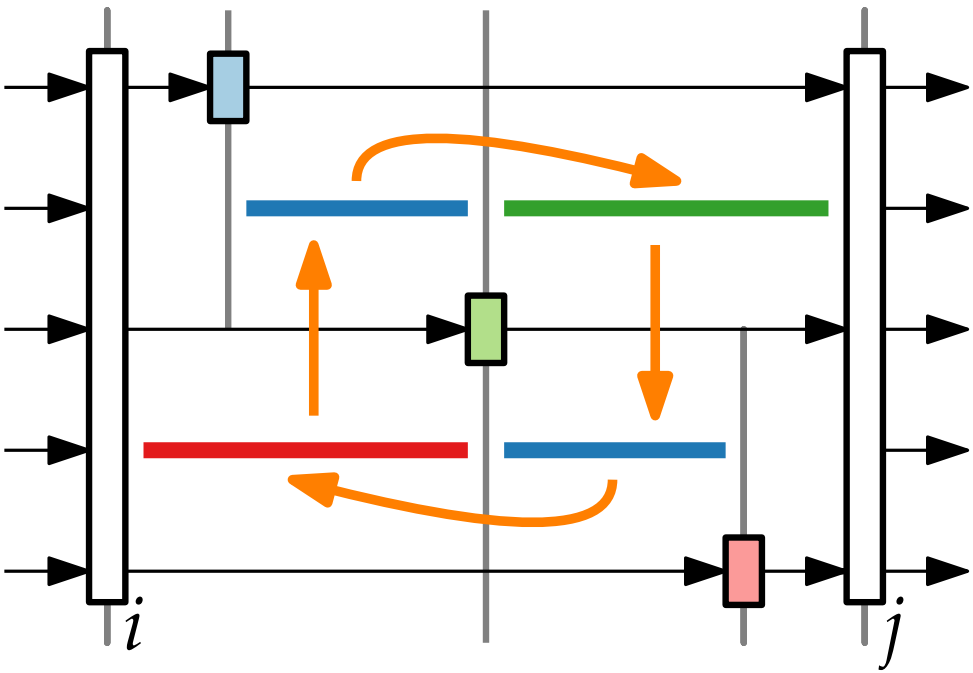


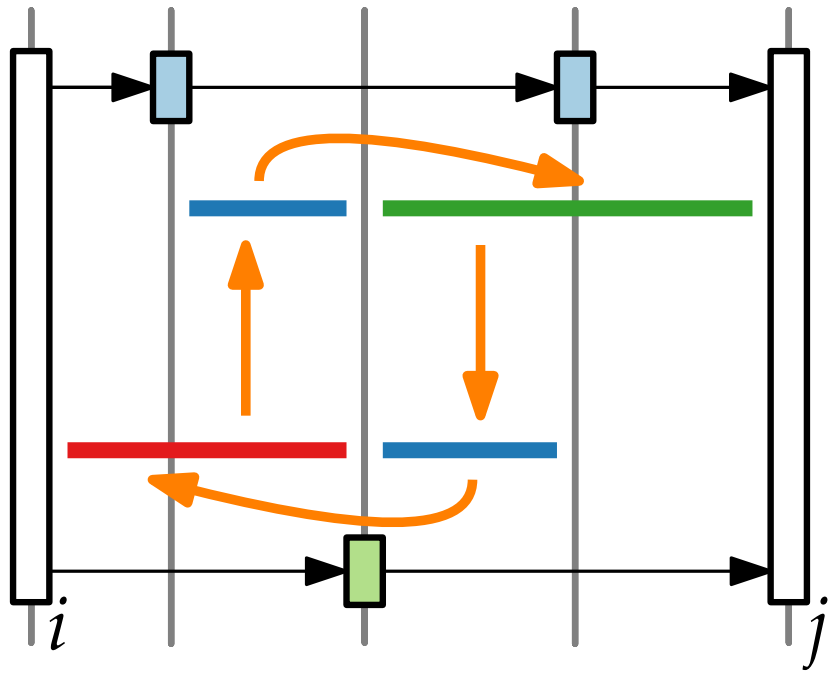
Resolving Conflicts

Conflict resolved: | > | and | > |



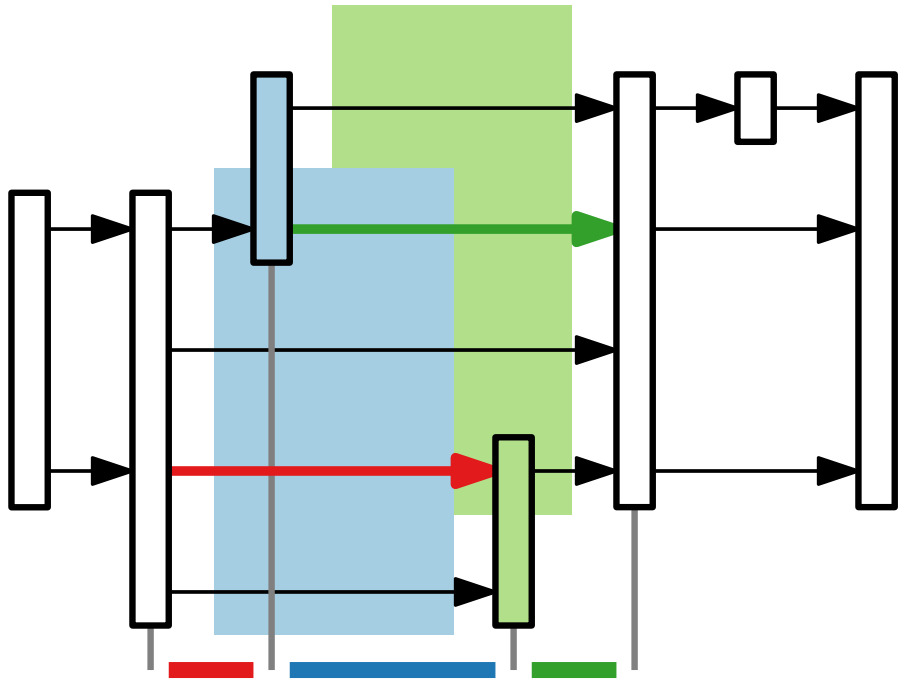
Need a *good st*-order:
for every interval $i, \ldots, j$:
– no 3 conn. comp.





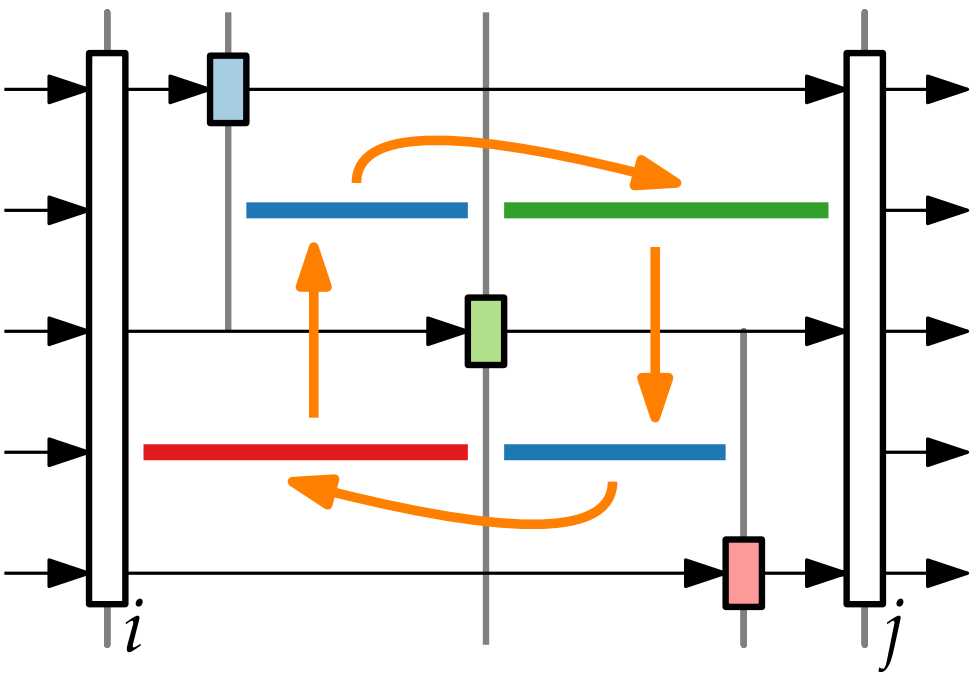
Resolving Conflicts

Conflict resolved: | > | and | > |

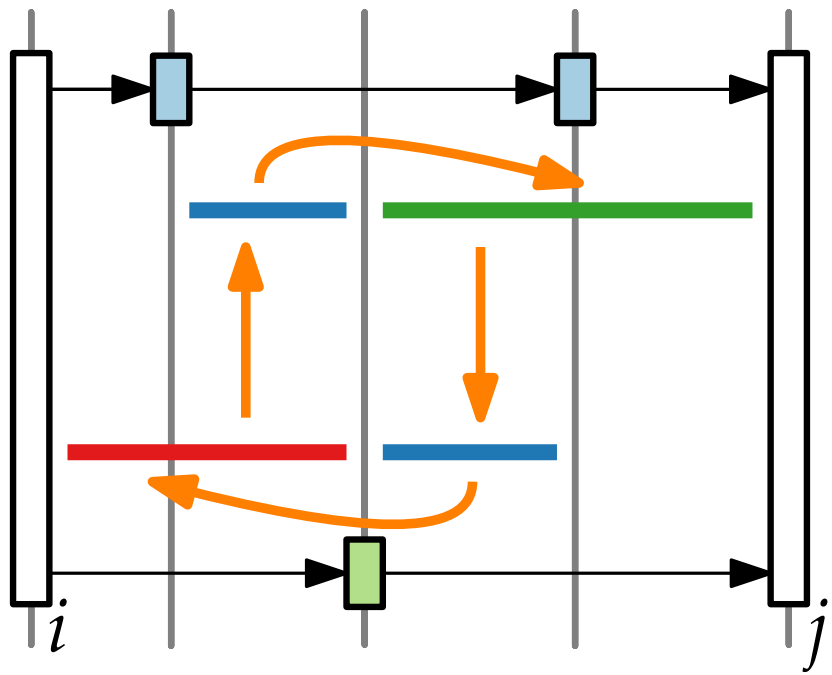


Need a *good st*-order:
for every interval $i, \ldots, j$:

– no 3 conn. comp.

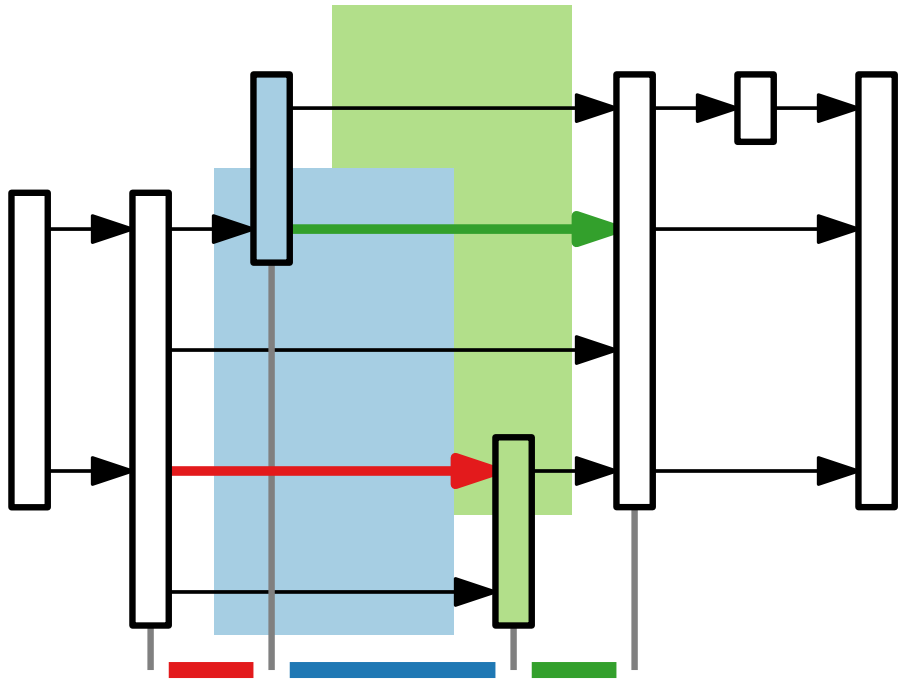


– if 2 conn. comp., then disjoint



Resolving Conflicts

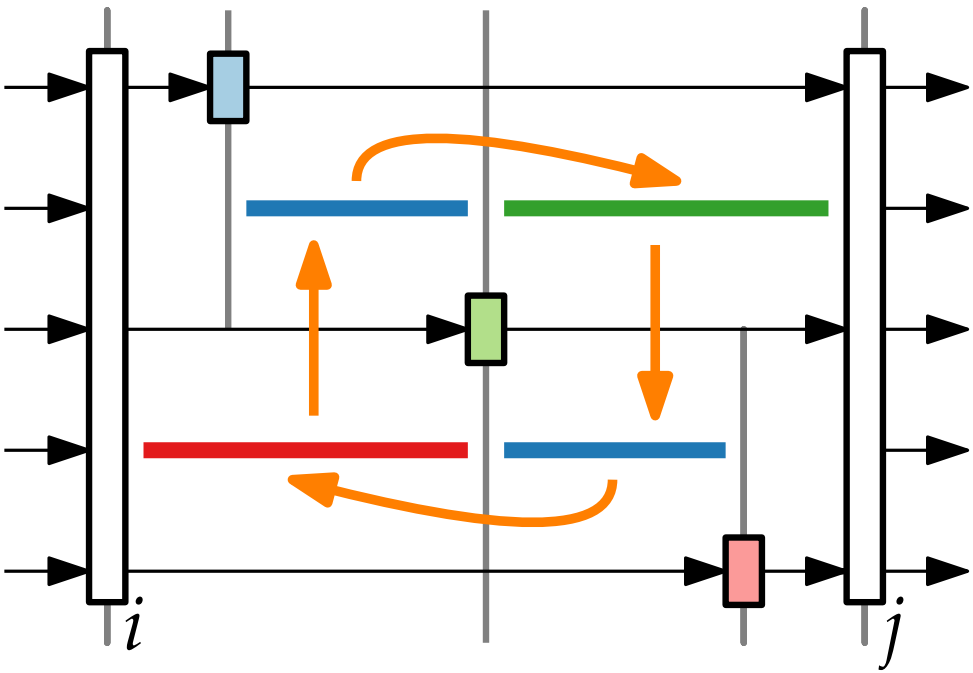
Conflict resolved: | > | and | > |



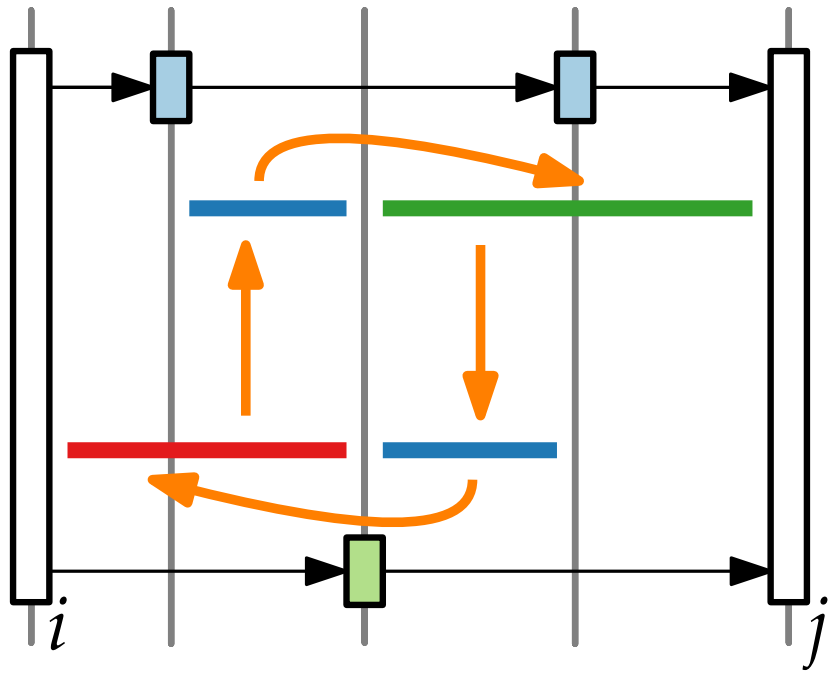
sufficient?

Need a *good st*-order:
for every interval $i, \ldots, j$:

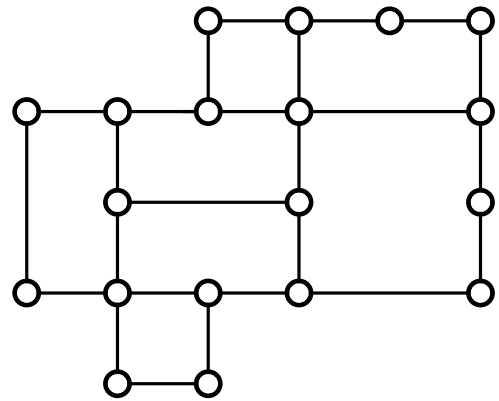
– no 3 conn. comp.



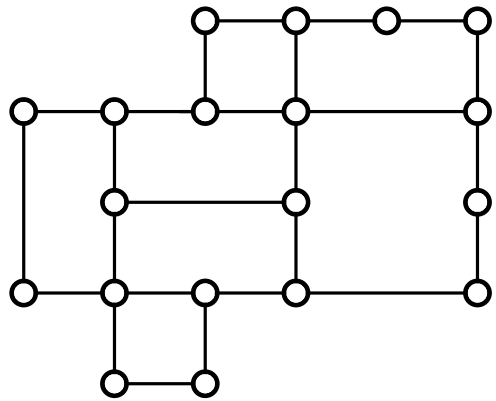
– if 2 conn. comp., then disjoint

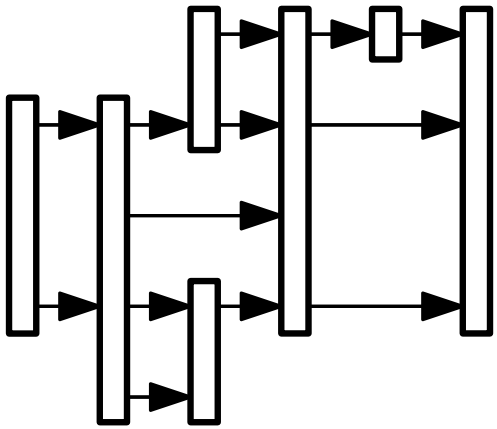


x- and y-conflicts independent

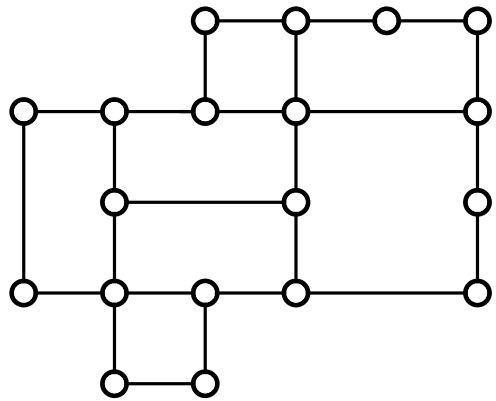


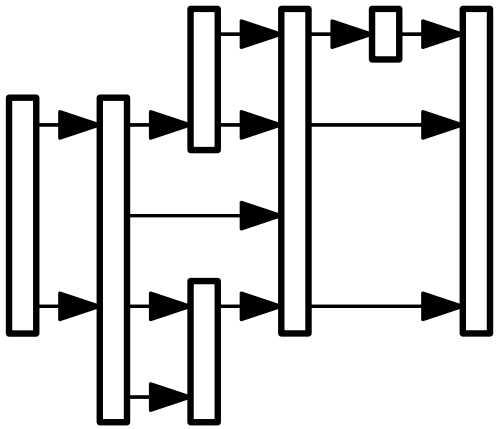
x- and y-conflicts independent

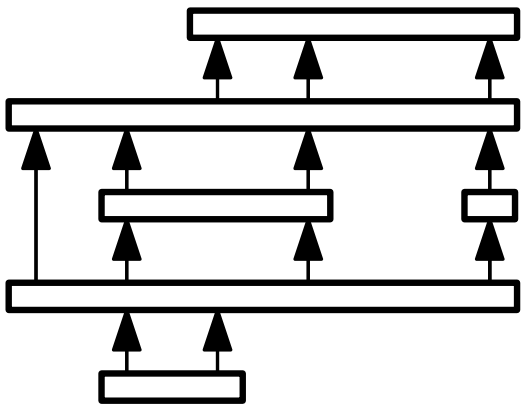




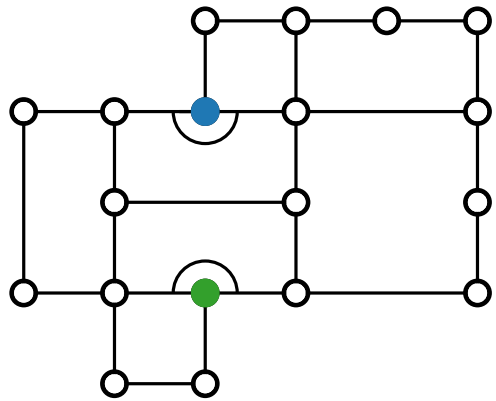
x- and y-conflicts independent

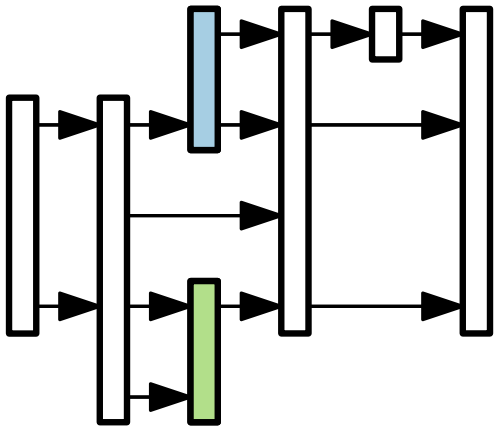


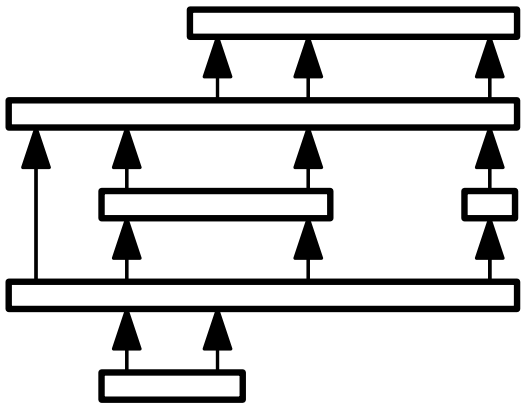




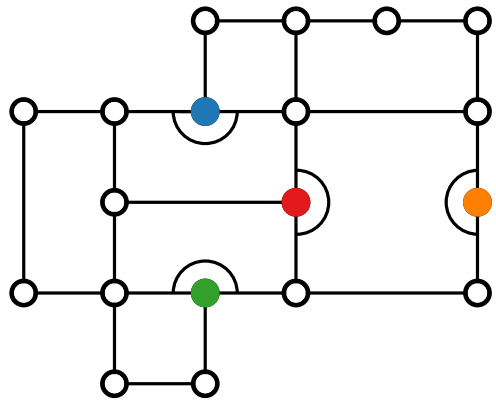
x- and y-conflicts independent

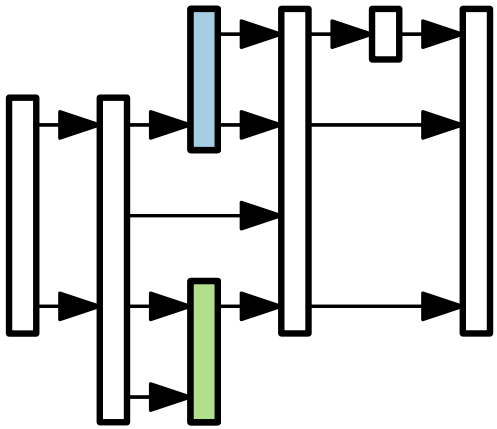


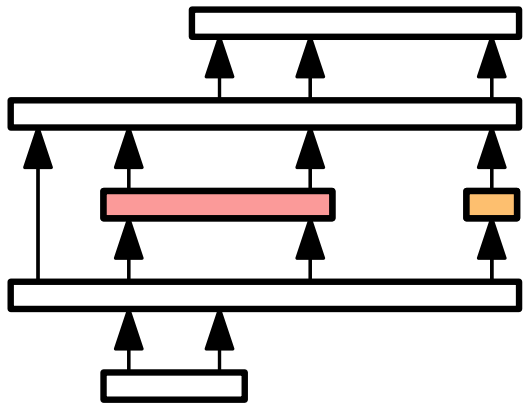




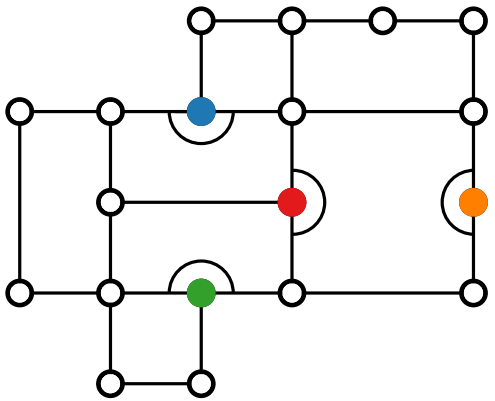
x- and y-conflicts independent

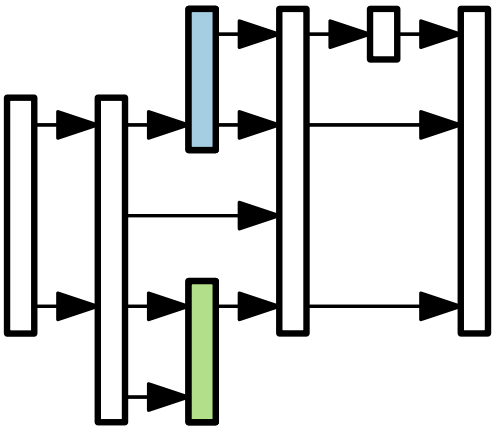




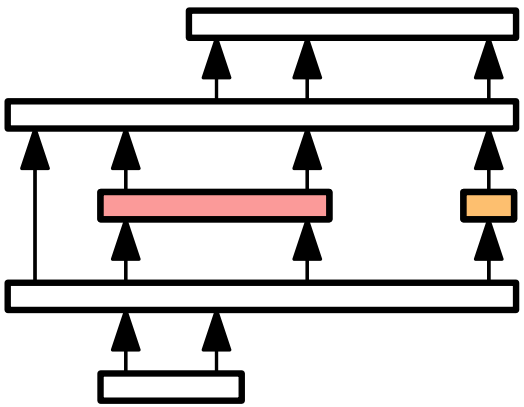


x- and y-conflicts independent

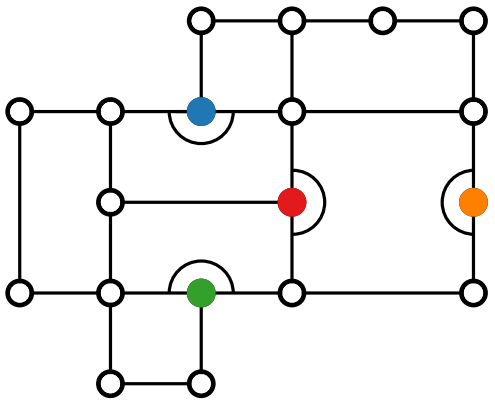


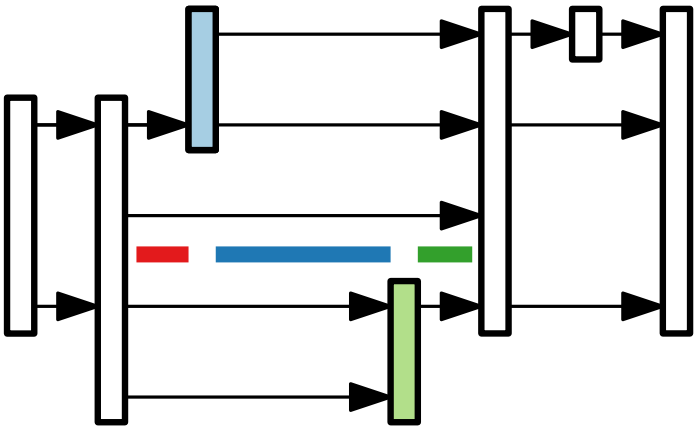


resolve x-conflicts

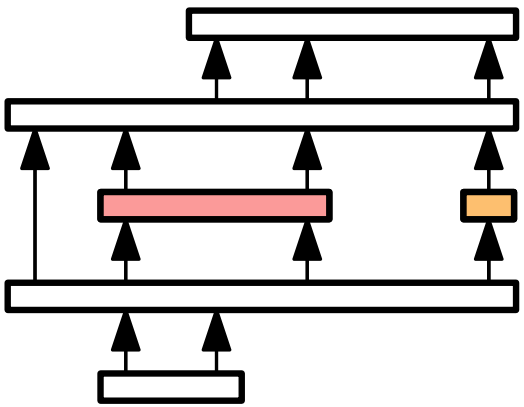


x- and y-conflicts independent

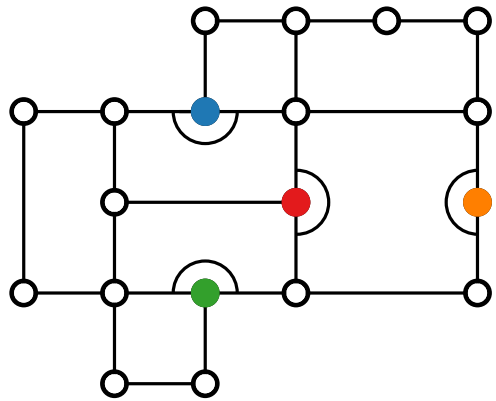


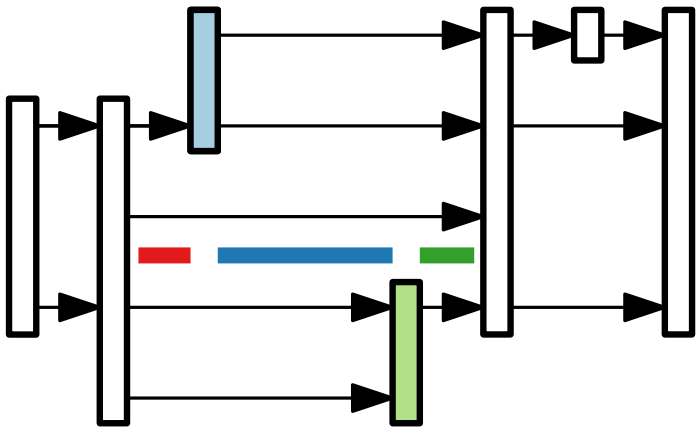


resolve x-conflicts

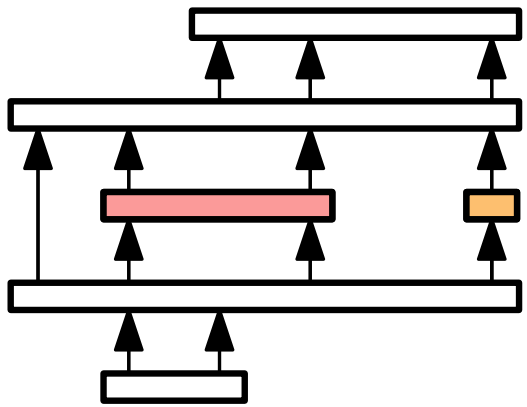


x- and y-conflicts independent



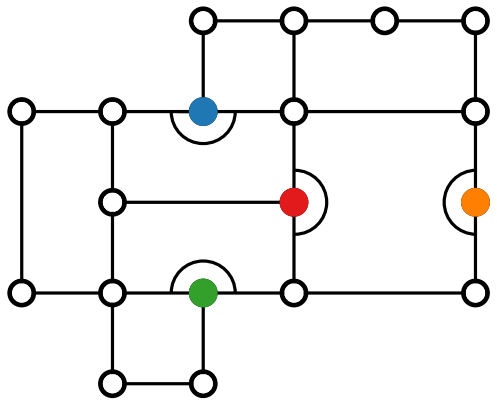


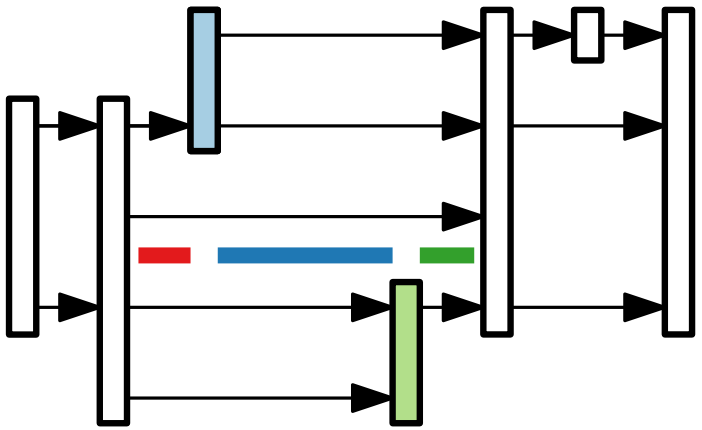
resolve x-conflicts



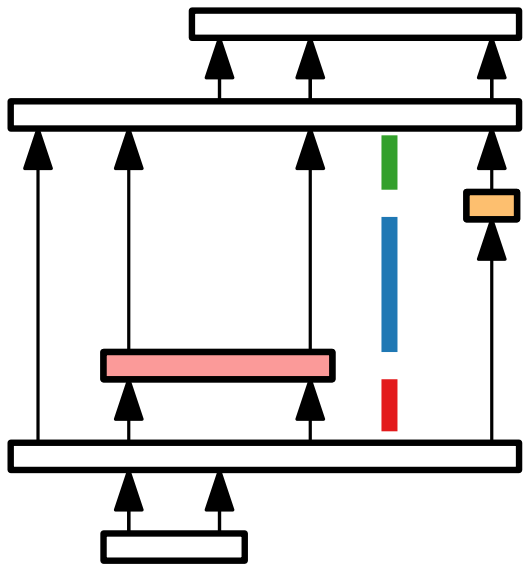
resolve y-conflicts

x- and y-conflicts independent



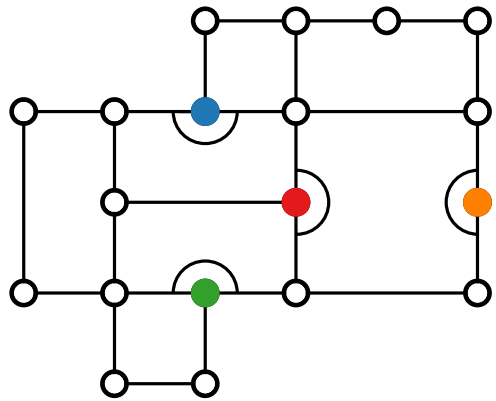


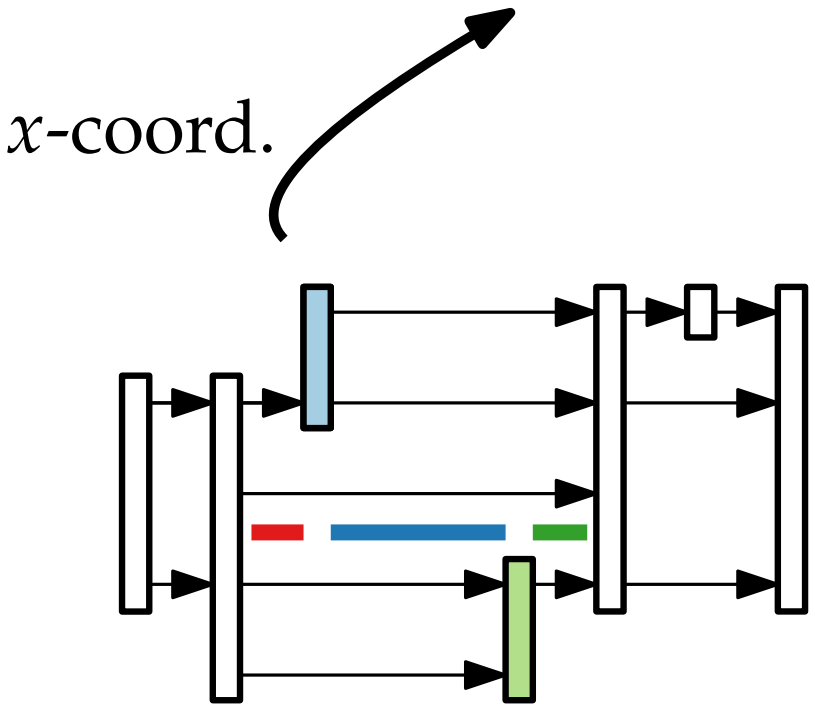
resolve x-conflicts



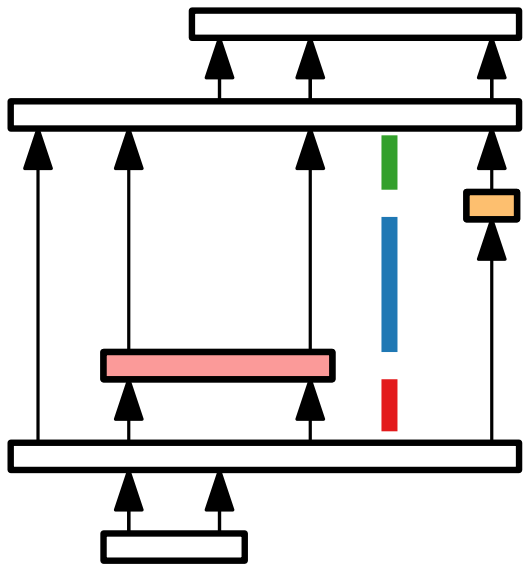
resolve y-conflicts

x- and y-conflicts independent



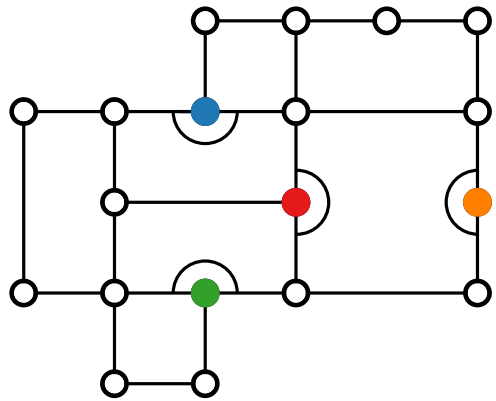


resolve x-conflicts

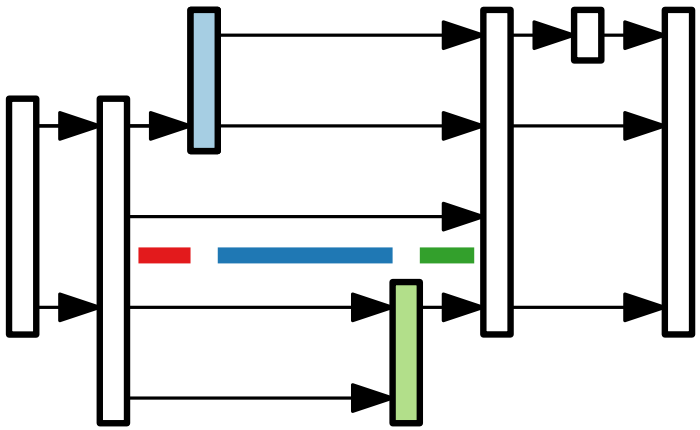


resolve y-conflicts

x- and y-conflicts independent

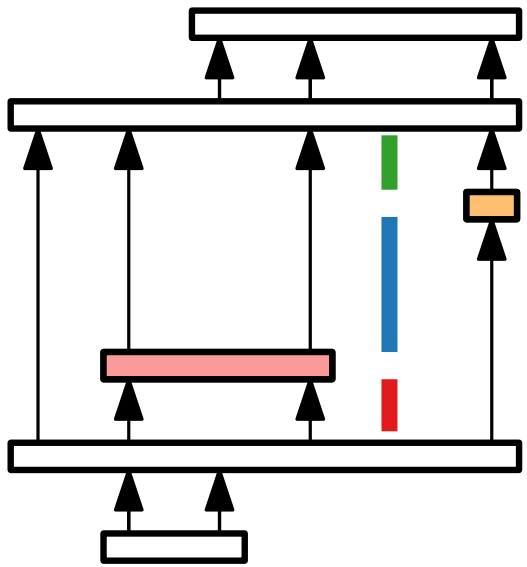


x-coord.



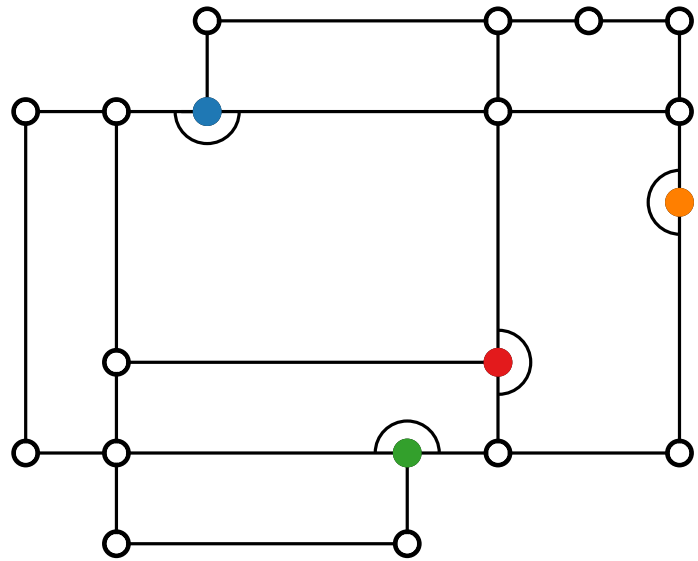
resolve x-conflicts

y-coord.

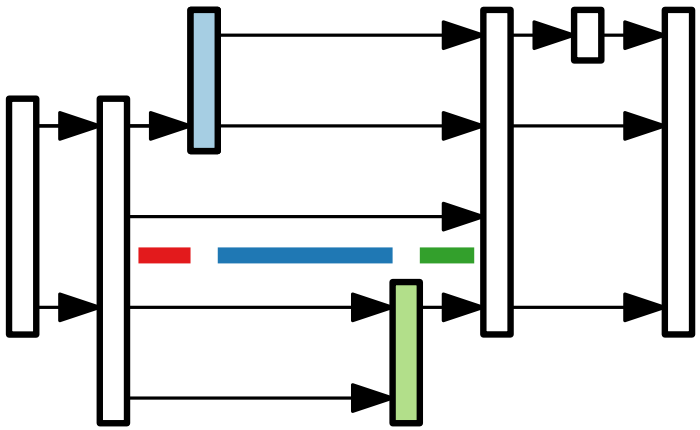


resolve y-conflicts

x- and y-conflicts independent

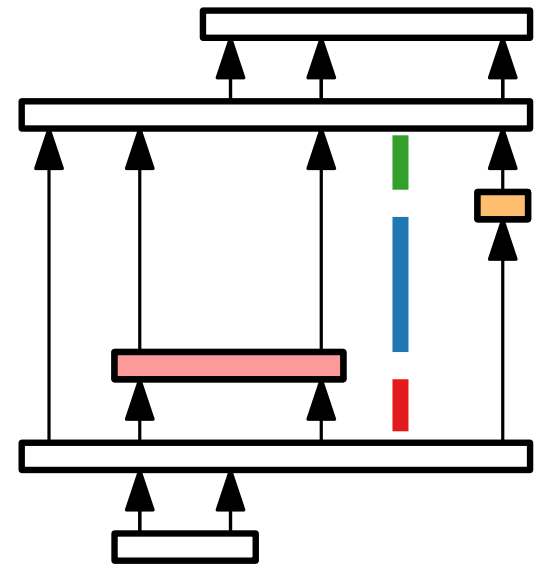


x-coord.



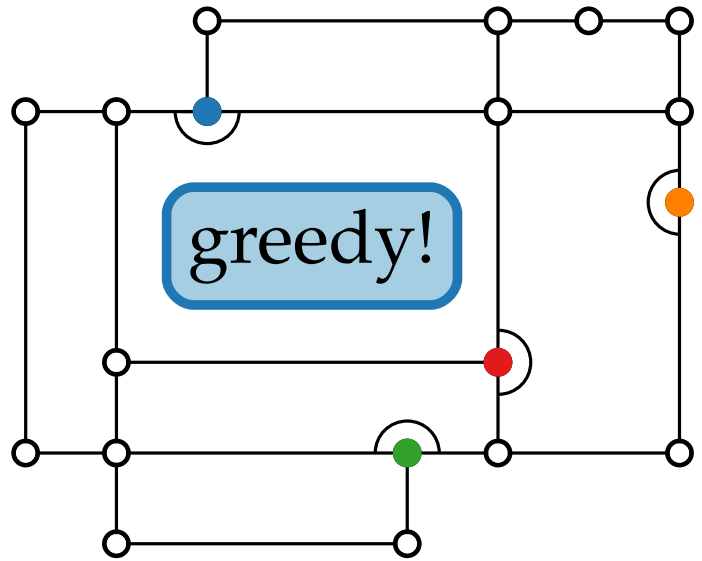
resolve x-conflicts

y-coord.

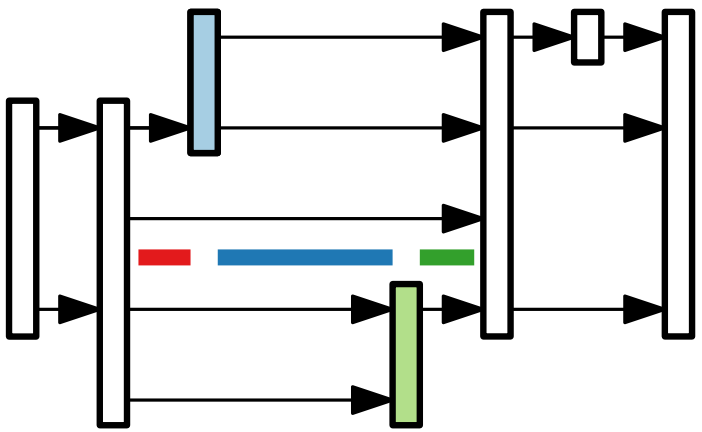


resolve y-conflicts

x- and y-conflicts independent

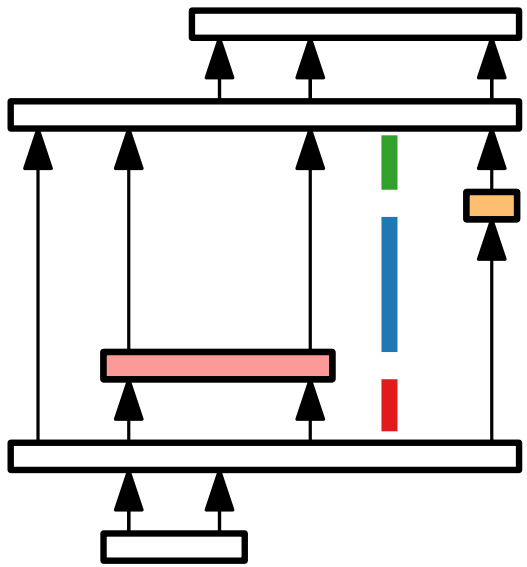


x-coord.



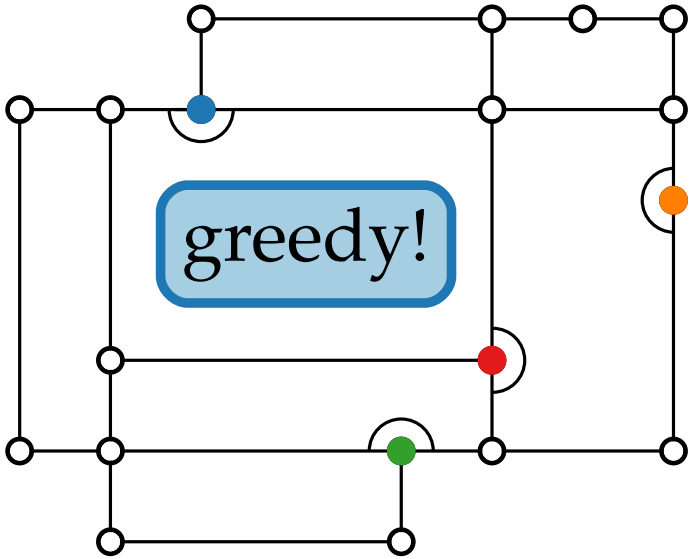
resolve x-conflicts

y-coord.



resolve y-conflicts

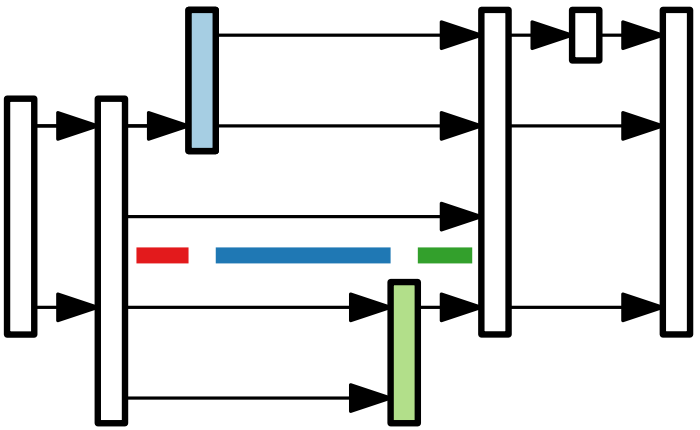
x- and y-conflicts independent



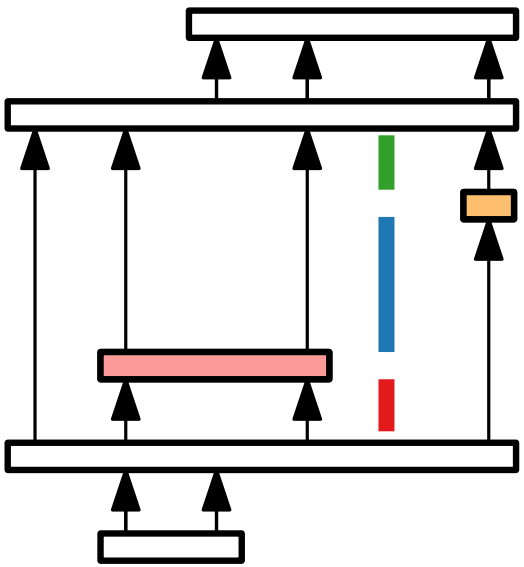
$\Rightarrow$ only consider x-conflicts

x-coord.

y-coord.

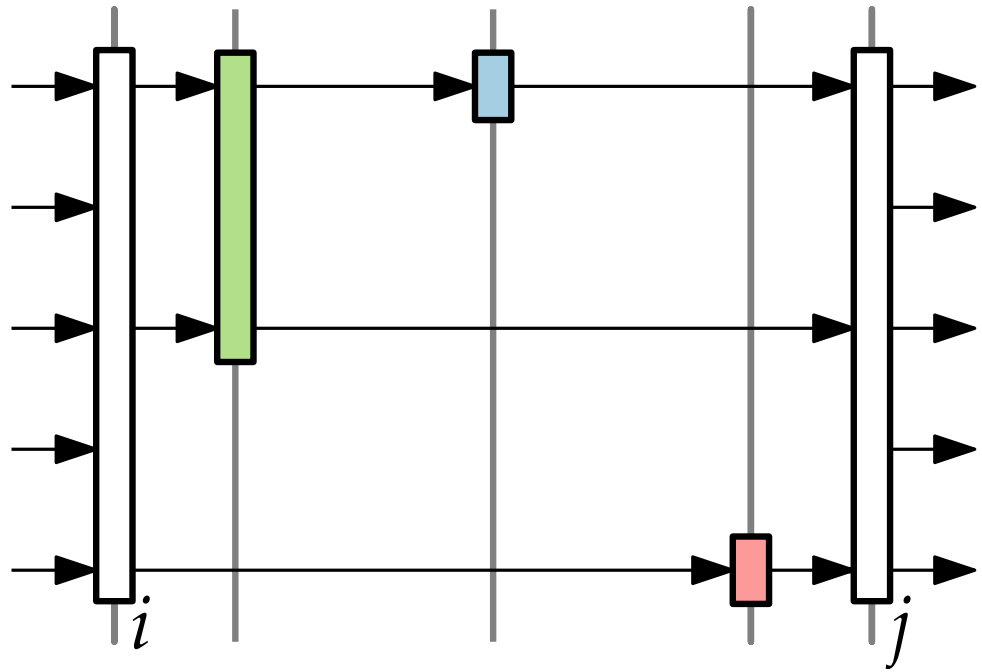


resolve x-conflicts

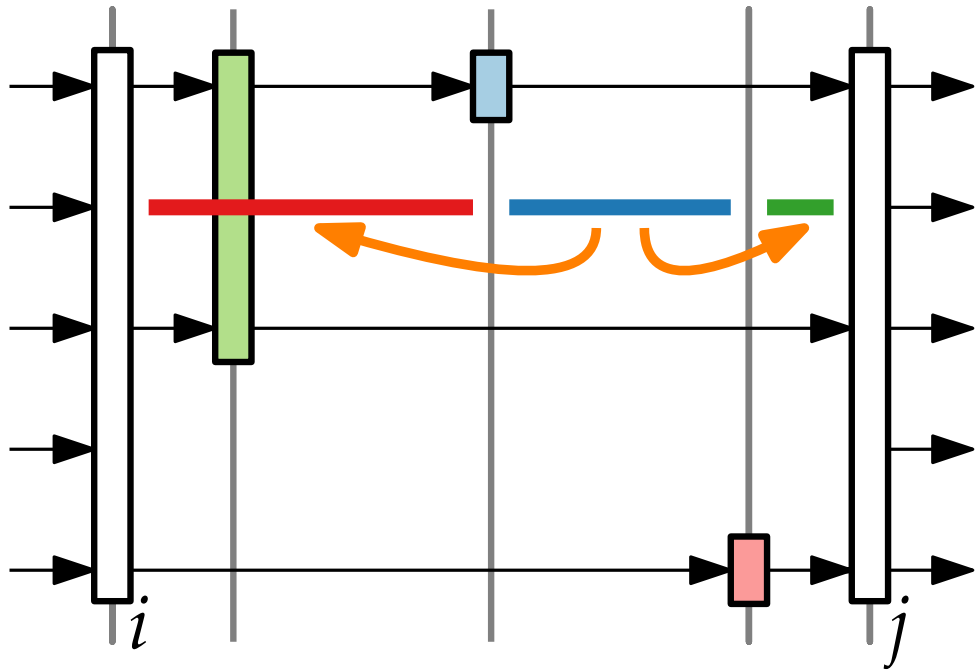


resolve y-conflicts

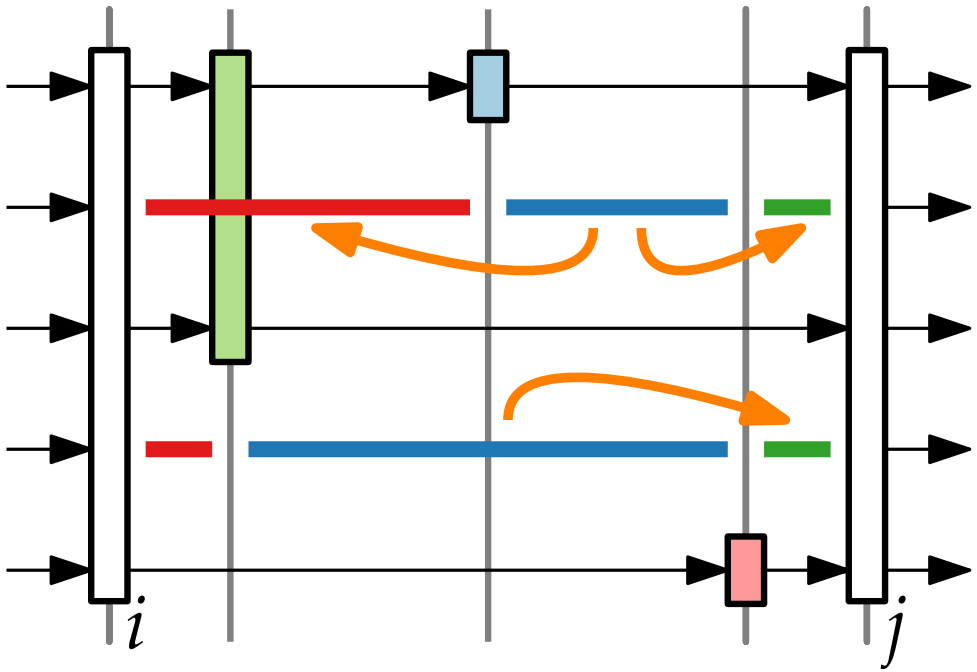
ALL conflicts?



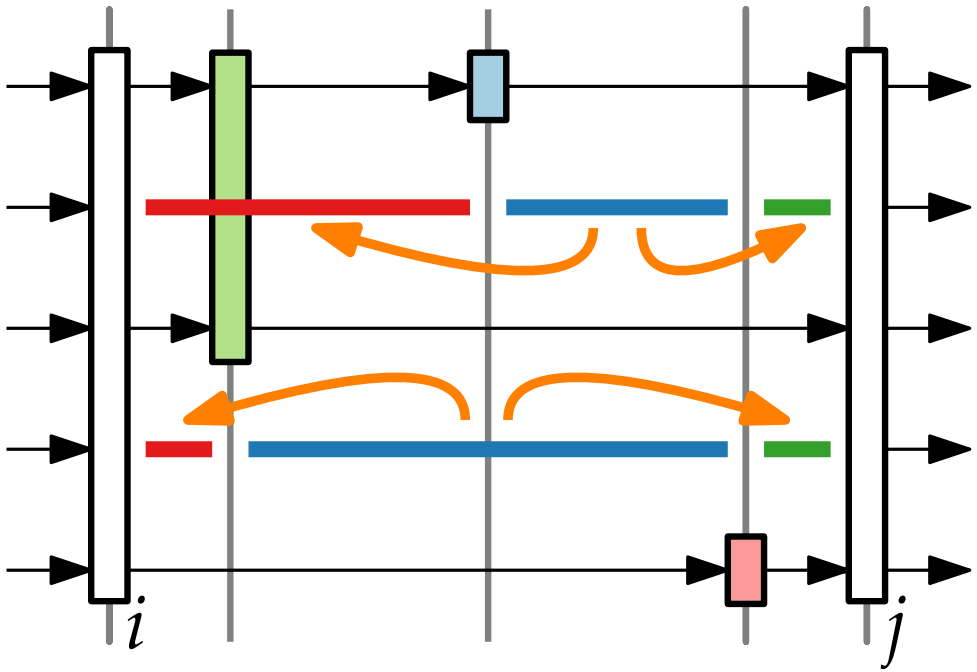
ALL conflicts?



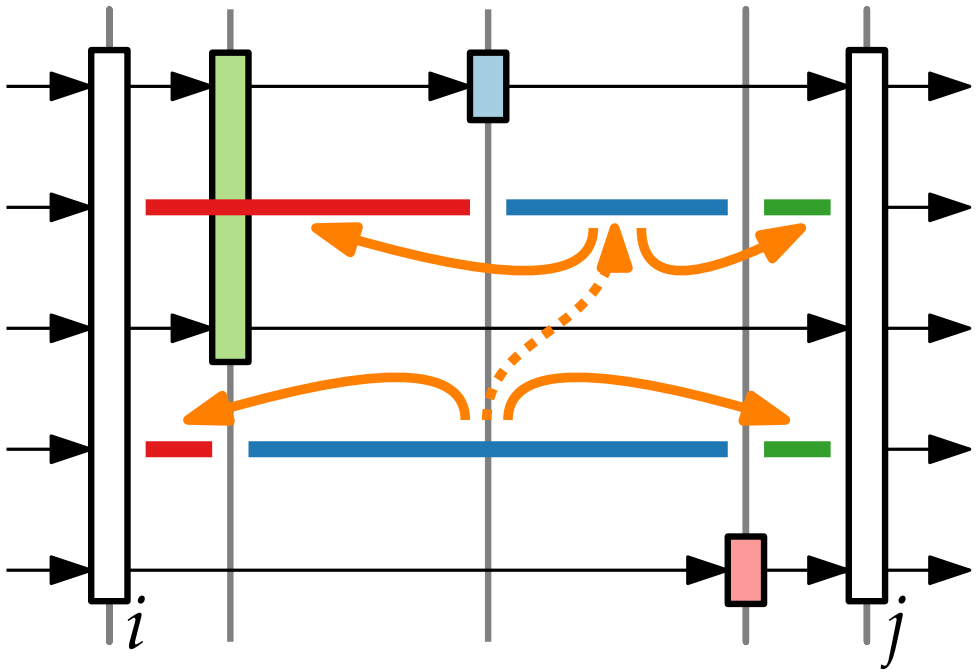
ALL conflicts?



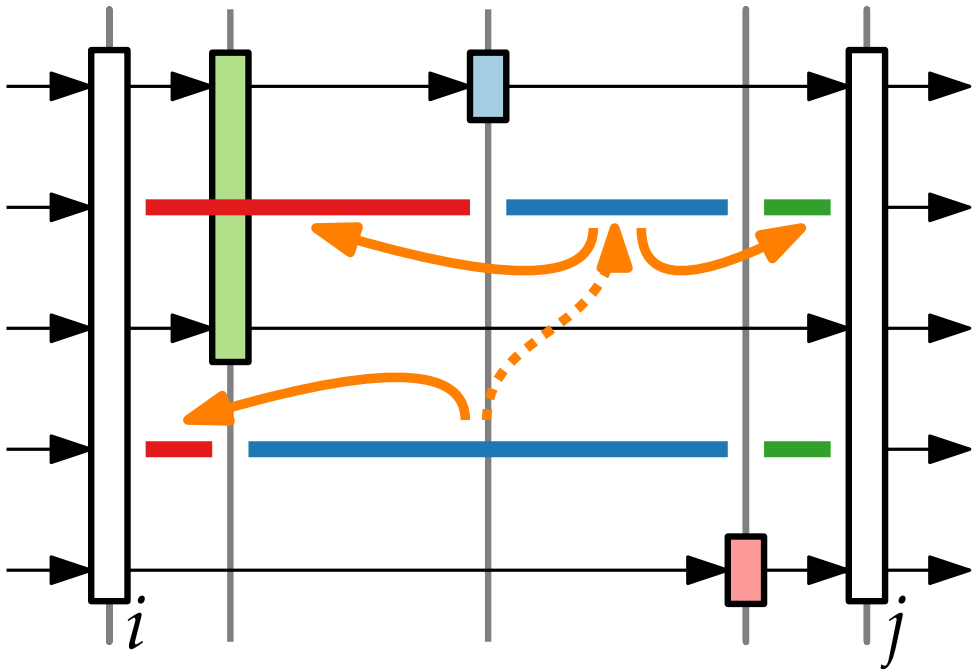
ALL conflicts?



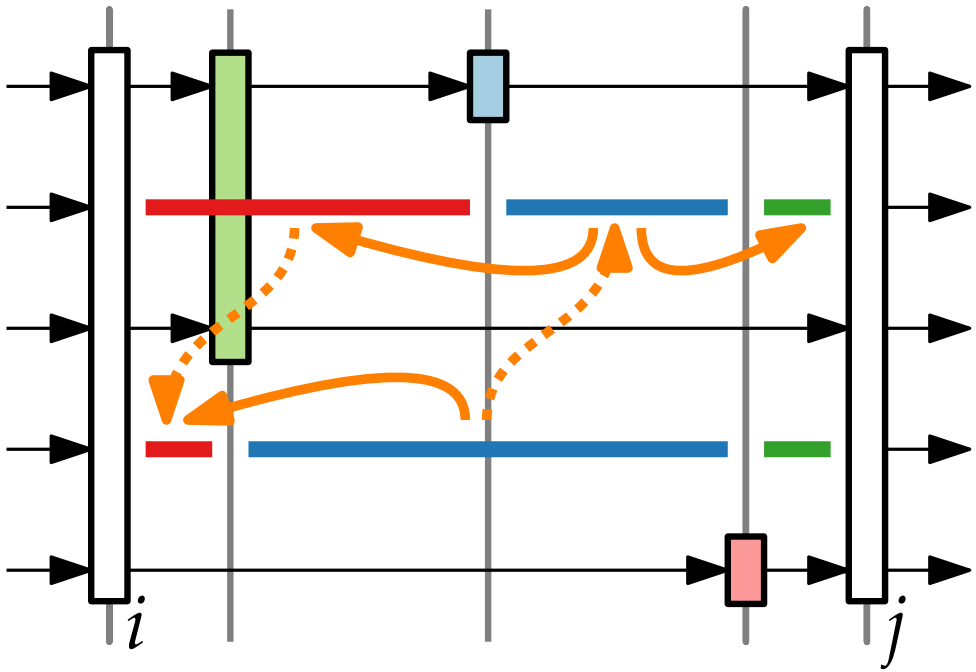
ALL conflicts?



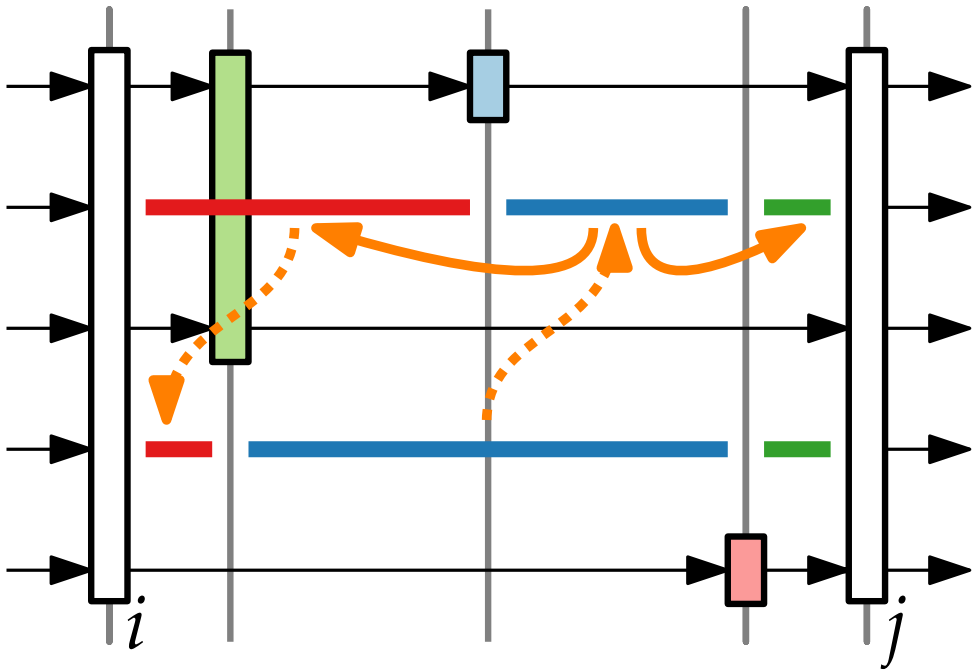
ALL conflicts?



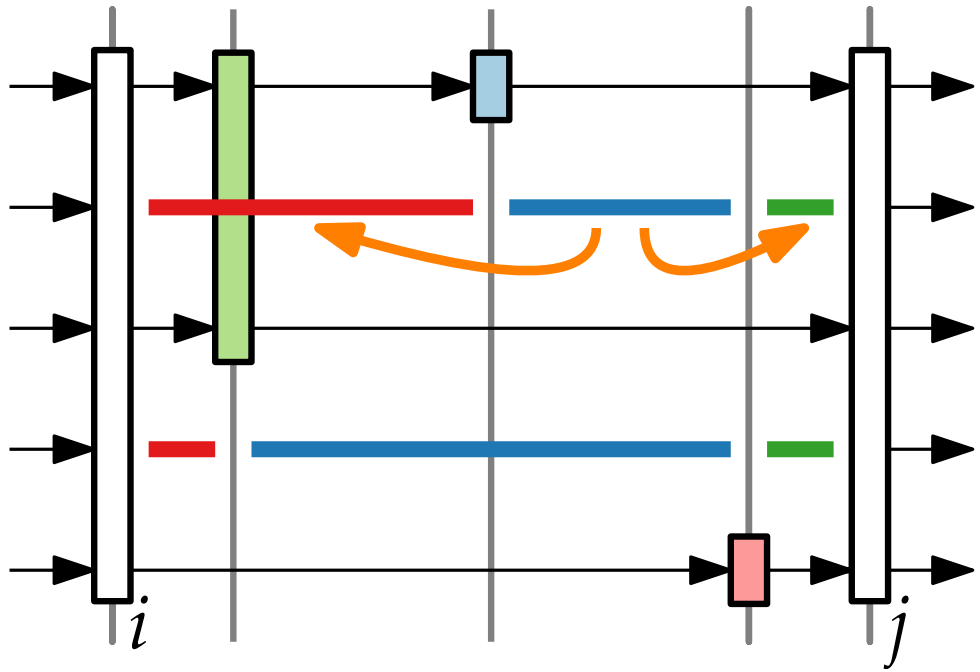
ALL conflicts?

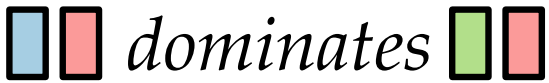


ALL conflicts?

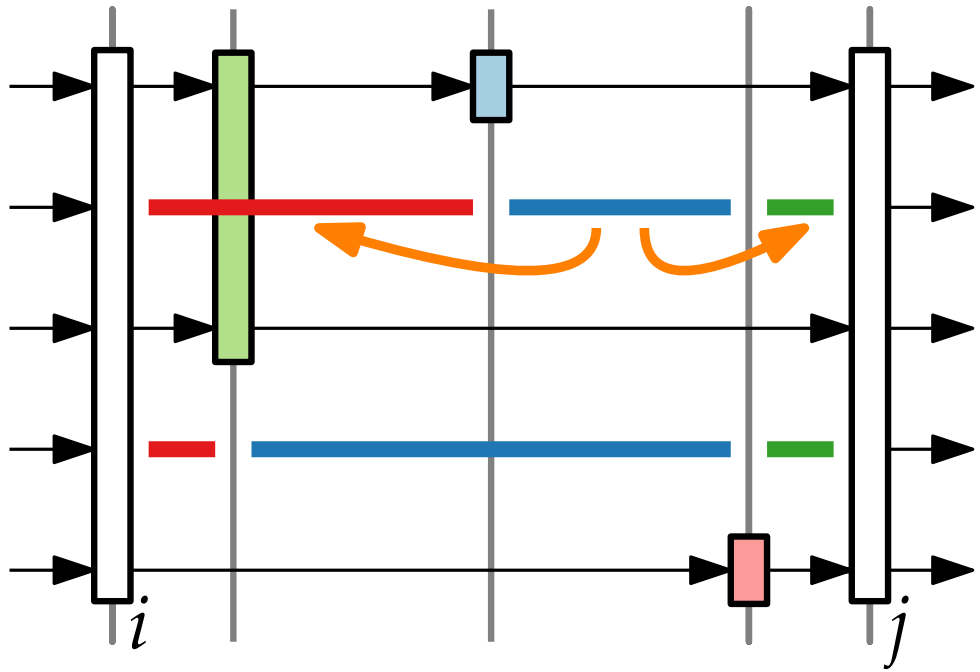


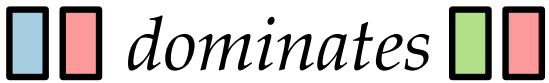
ALL conflicts?

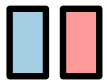
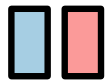




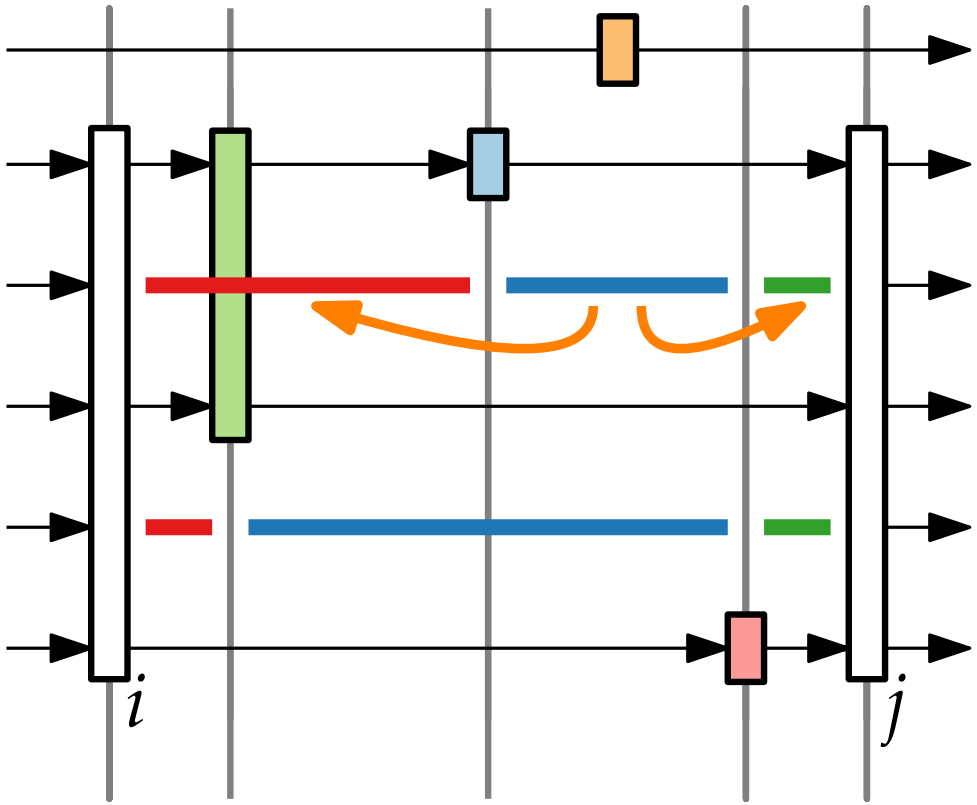
ALL conflicts?

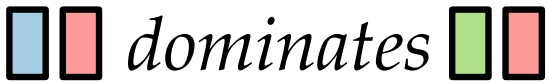


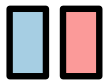
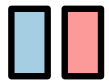
 *dominates*

Nothing dominates  ⇒  is *dominating*

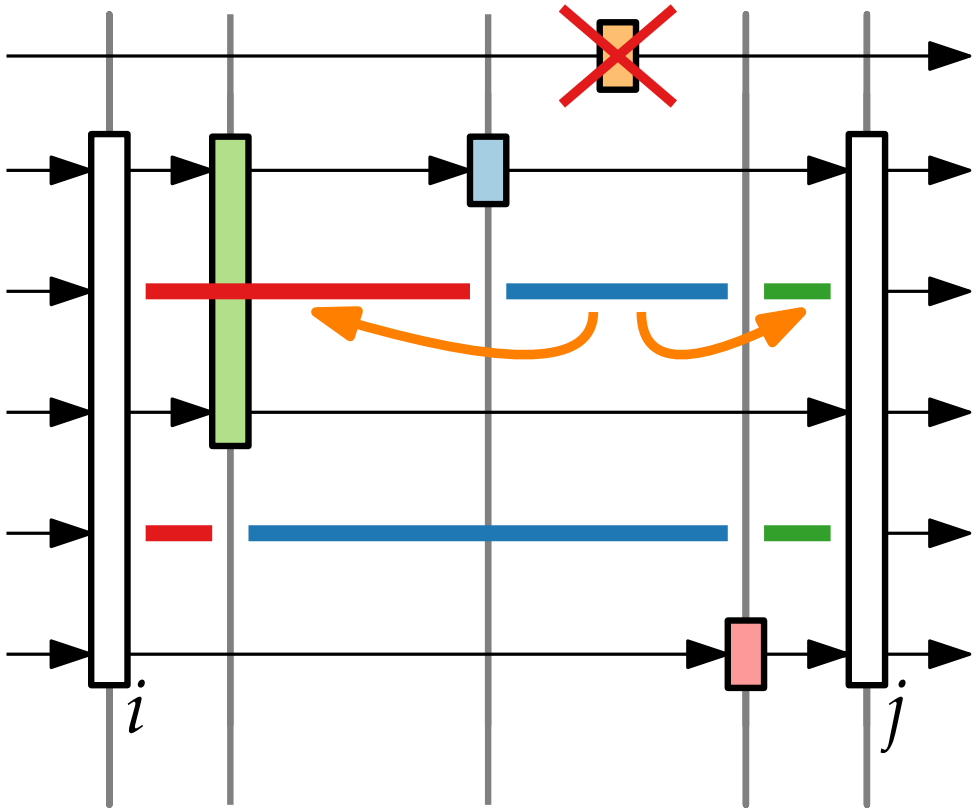
ALL conflicts?

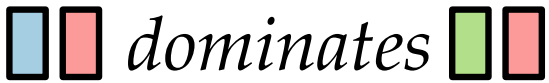


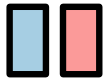
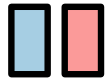
 *dominates*

Nothing dominates  ⇒  is *dominating*

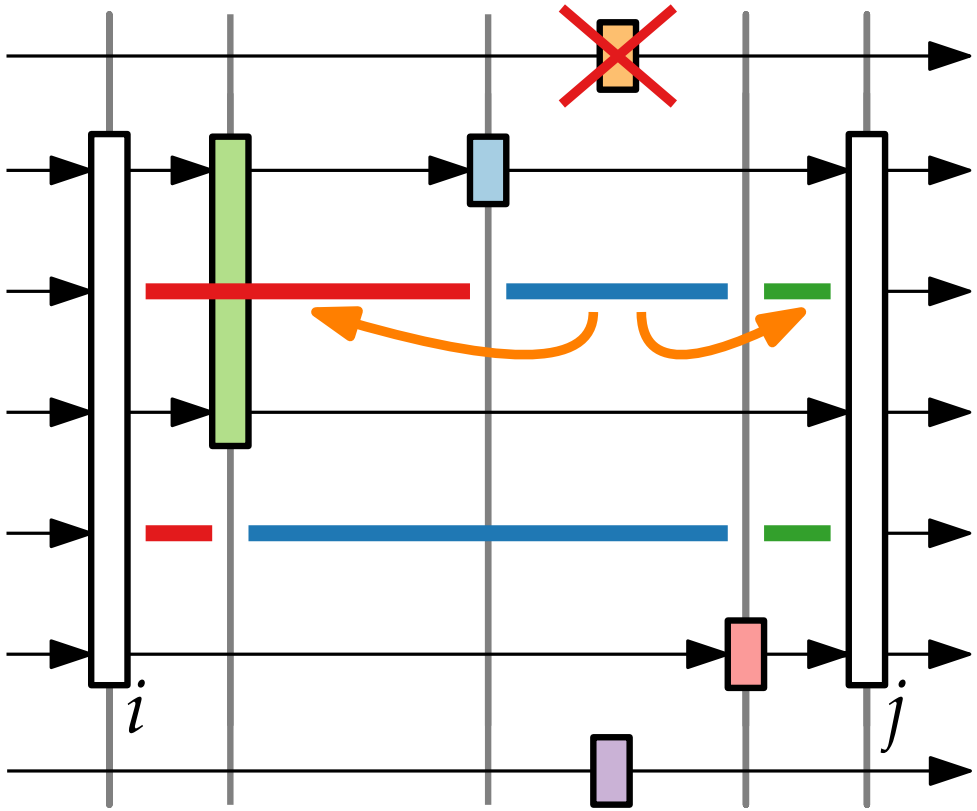
ALL conflicts?

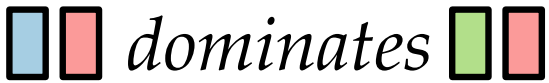


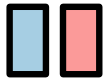
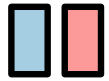
 *dominates*

Nothing dominates  ⇒  is *dominating*

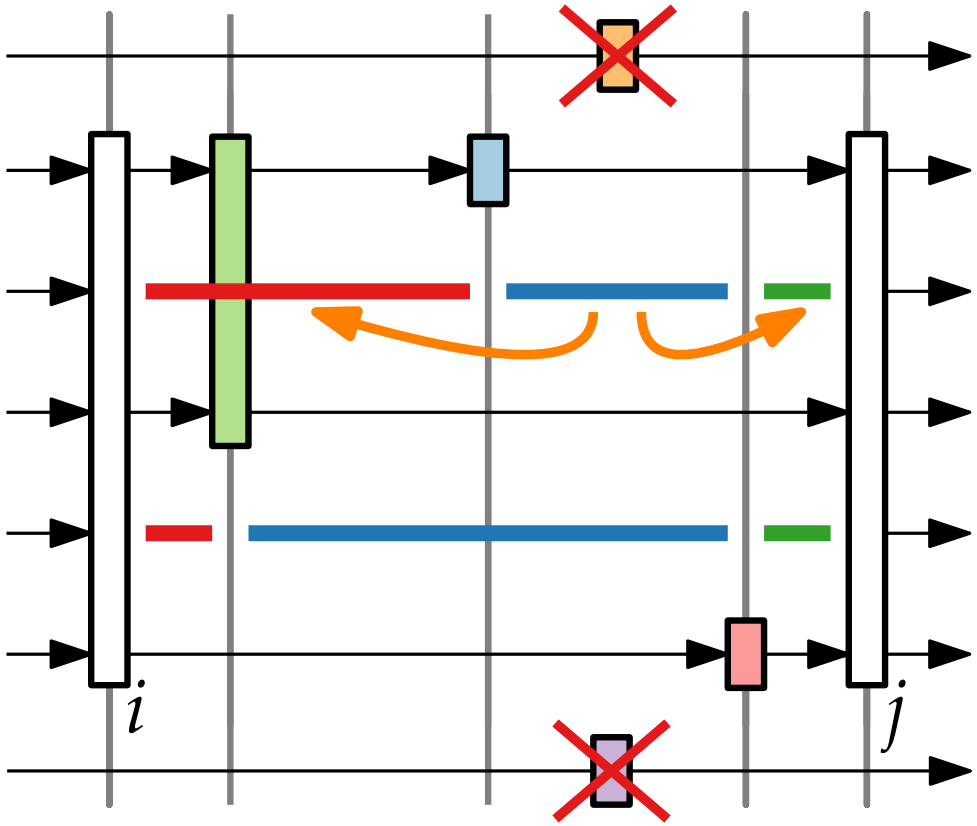
ALL conflicts?

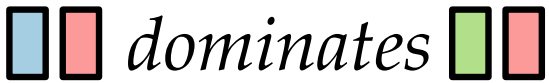


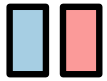
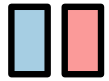
 *dominates*

Nothing dominates  ⇒  is *dominating*

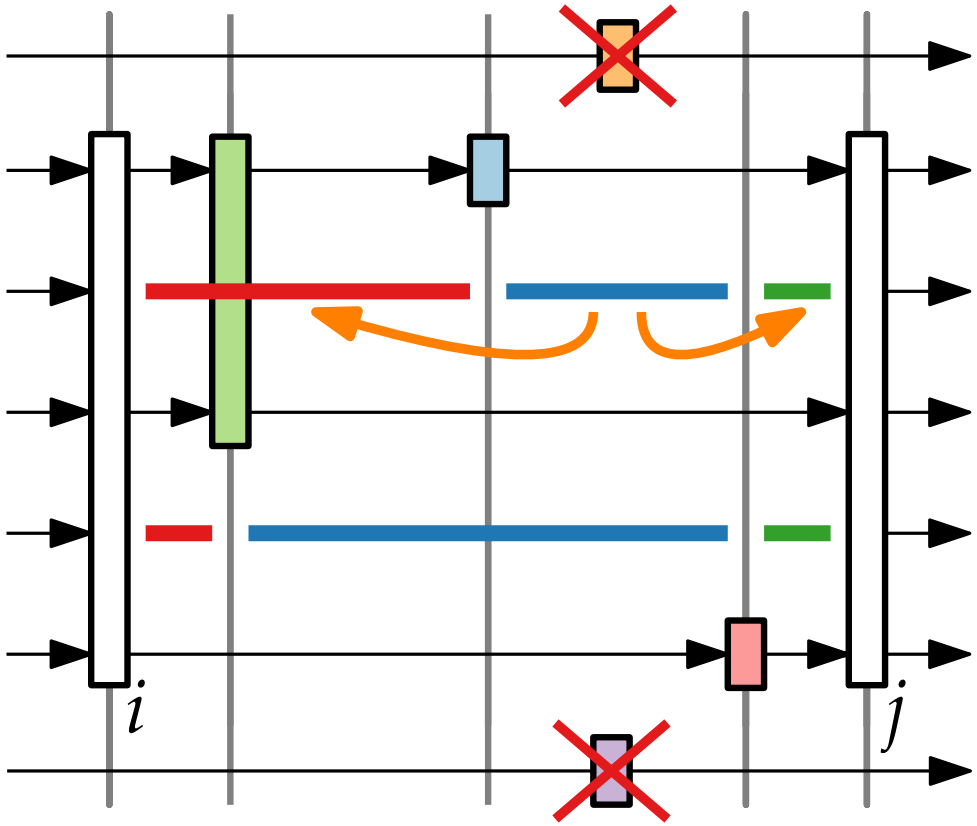
ALL conflicts?

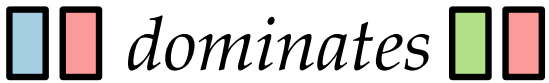


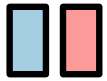
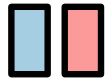
 *dominates*

Nothing dominates  ⇒  is *dominating*

ALL conflicts?

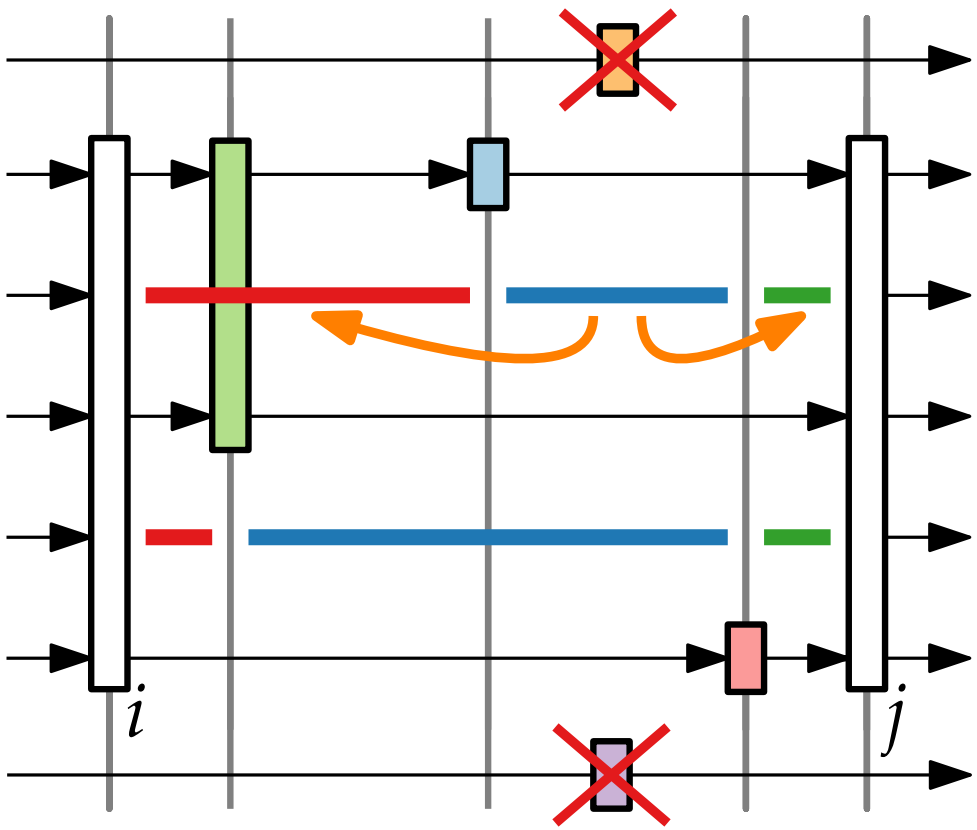


 *dominates*

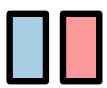
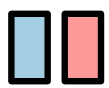
Nothing dominates  $\Rightarrow$  is *dominating*

Dominating conflicts are consecutive in *st*-order

ALL conflicts?



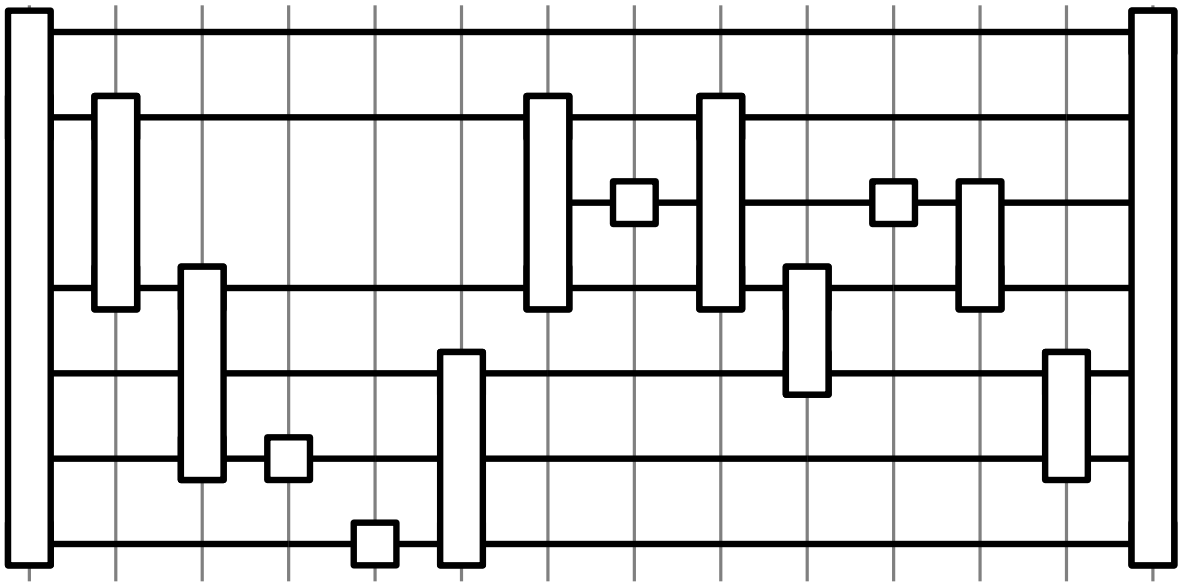
 *dominates*

Nothing dominates  ⇒  is *dominating*

Dominating conflicts are consecutive in *st*-order

At most 1 dominating conflict per vertex

Constraints



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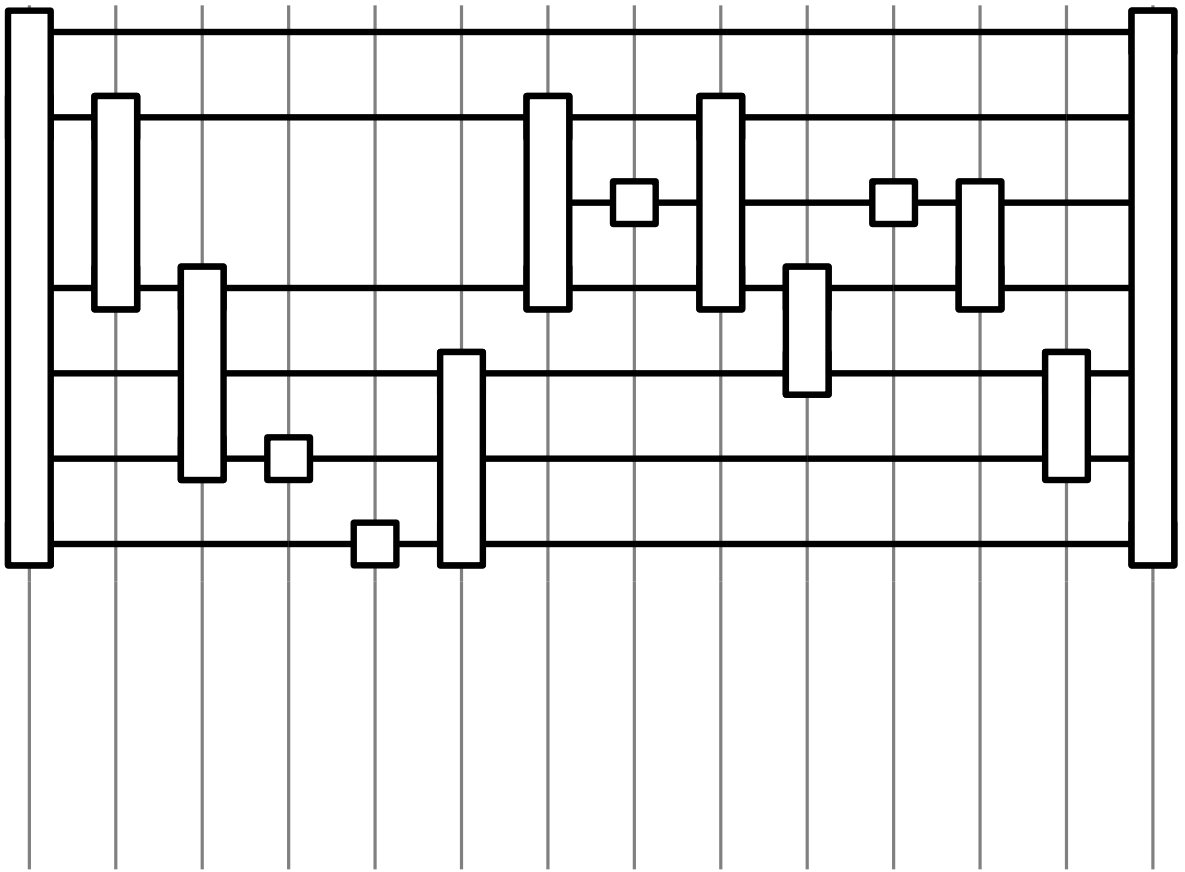

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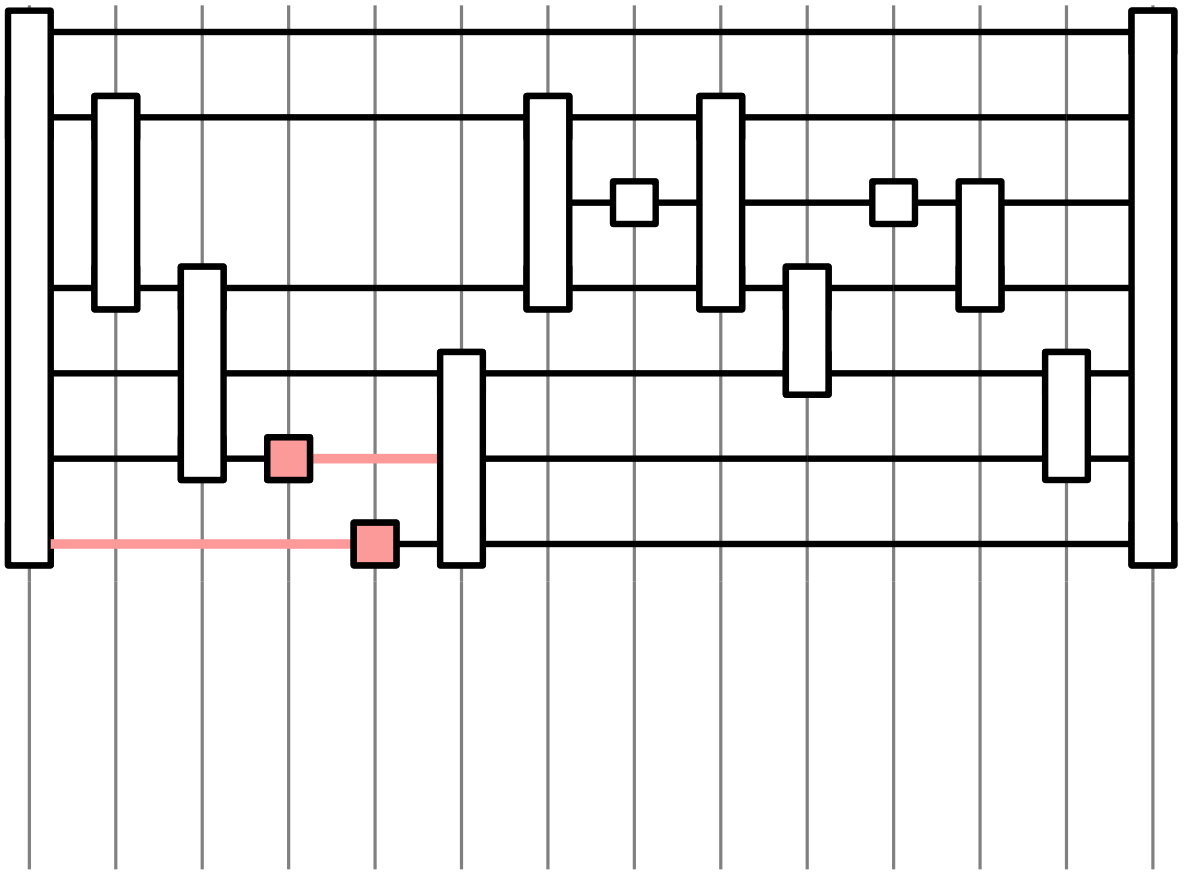

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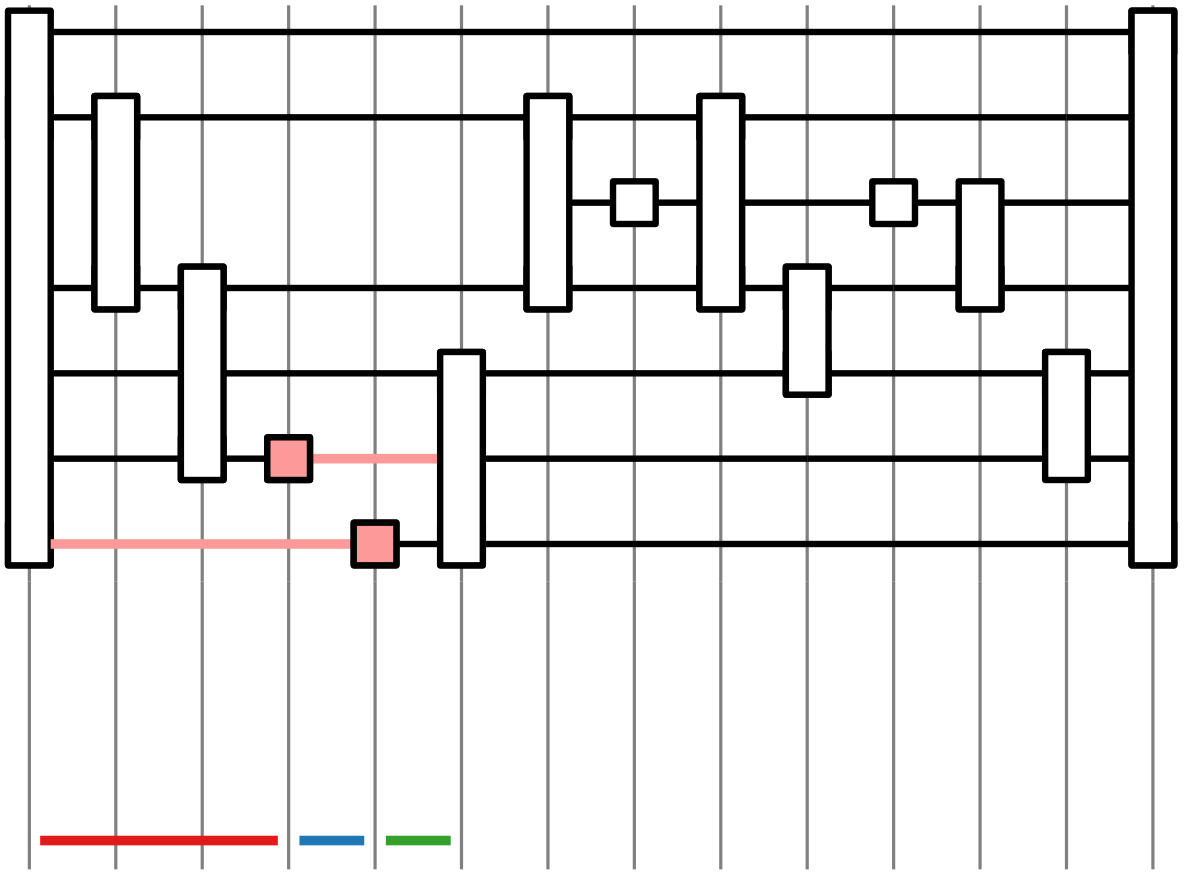

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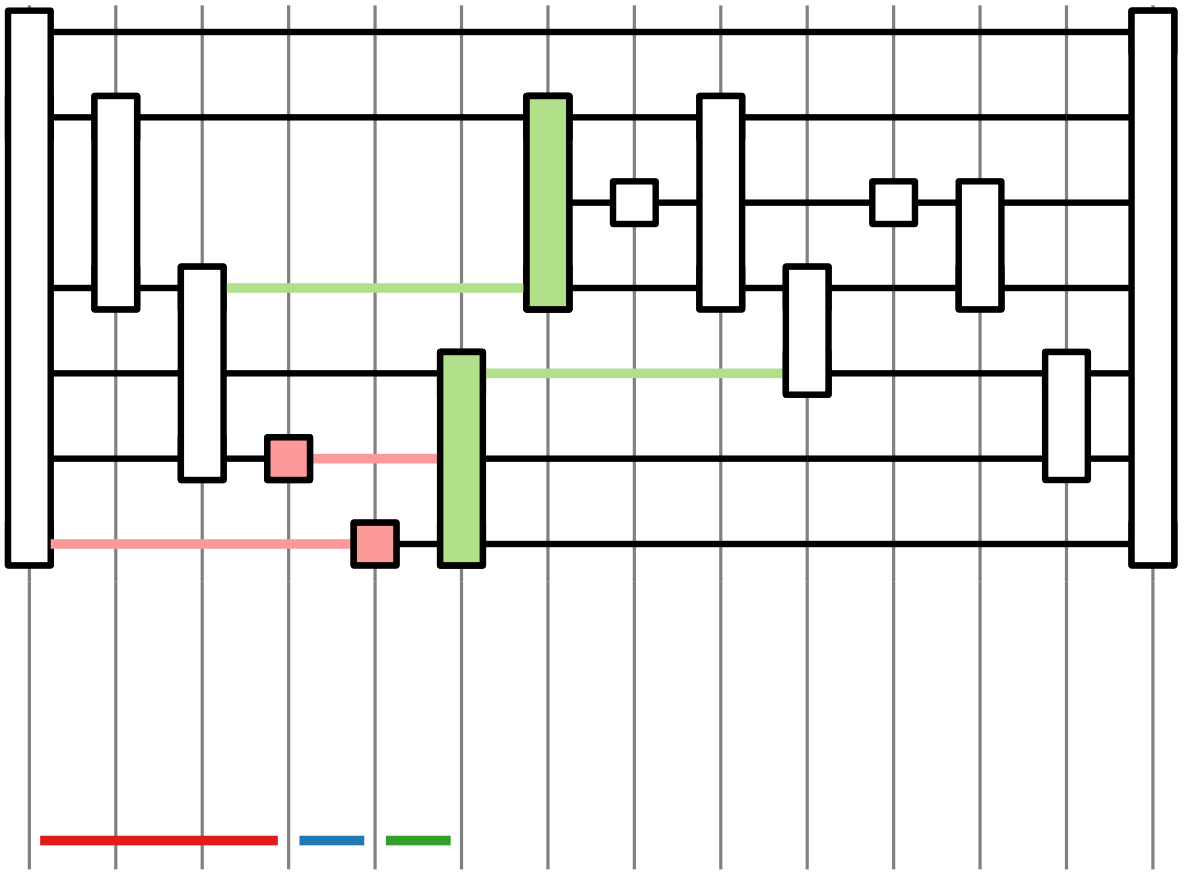

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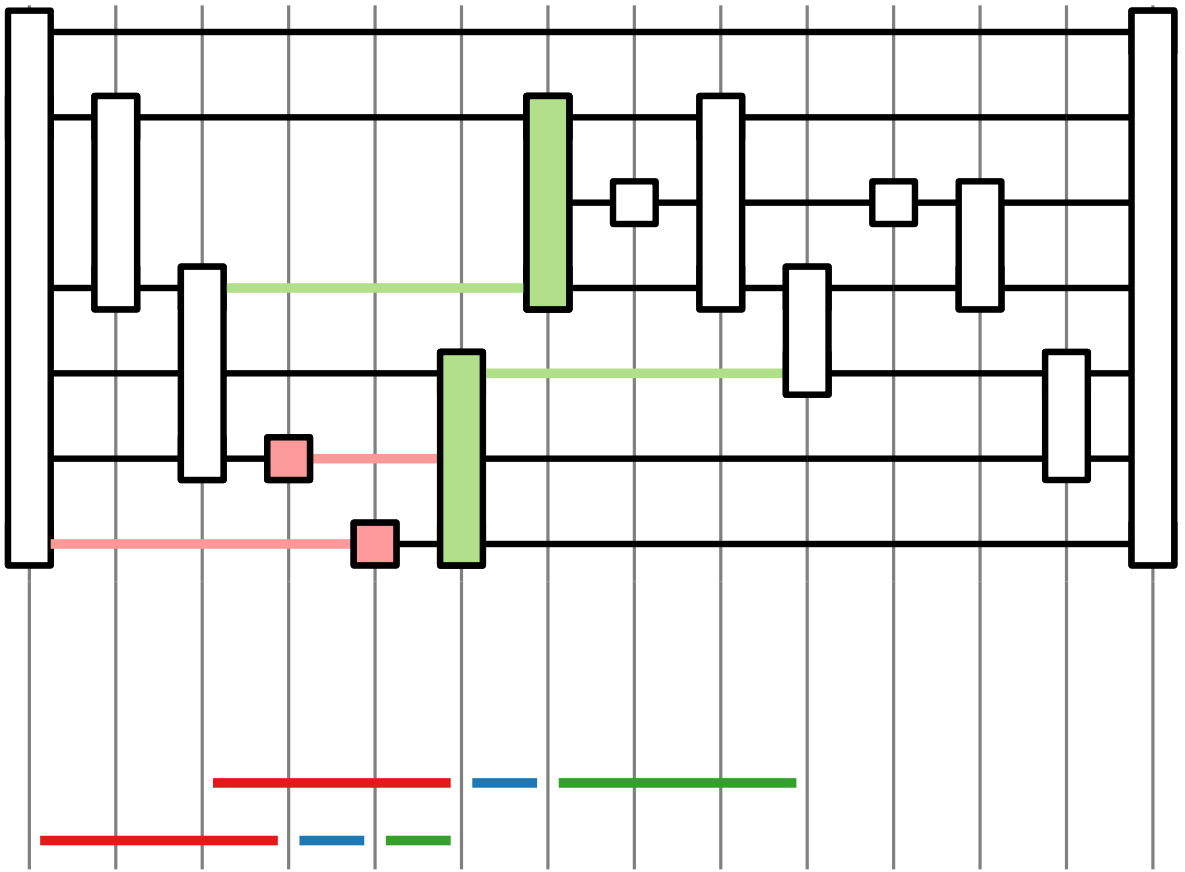

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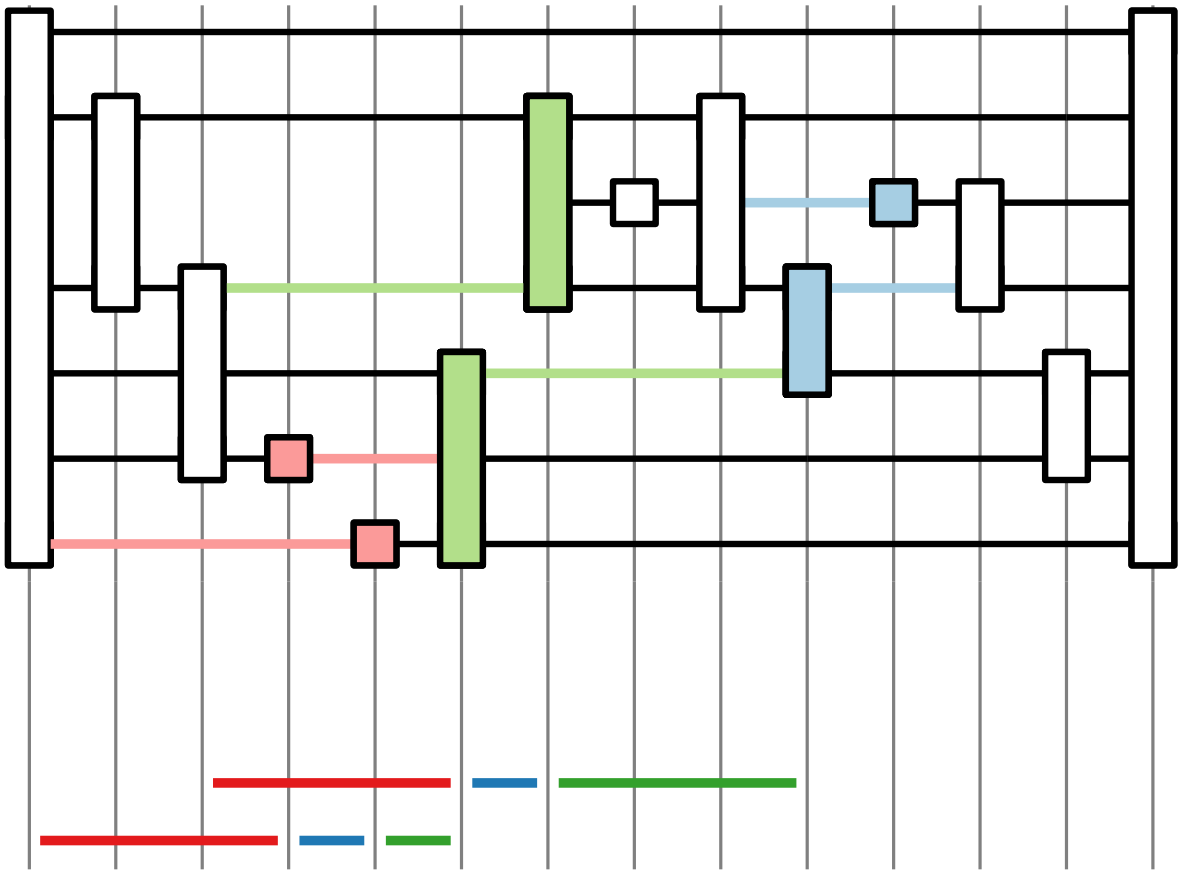

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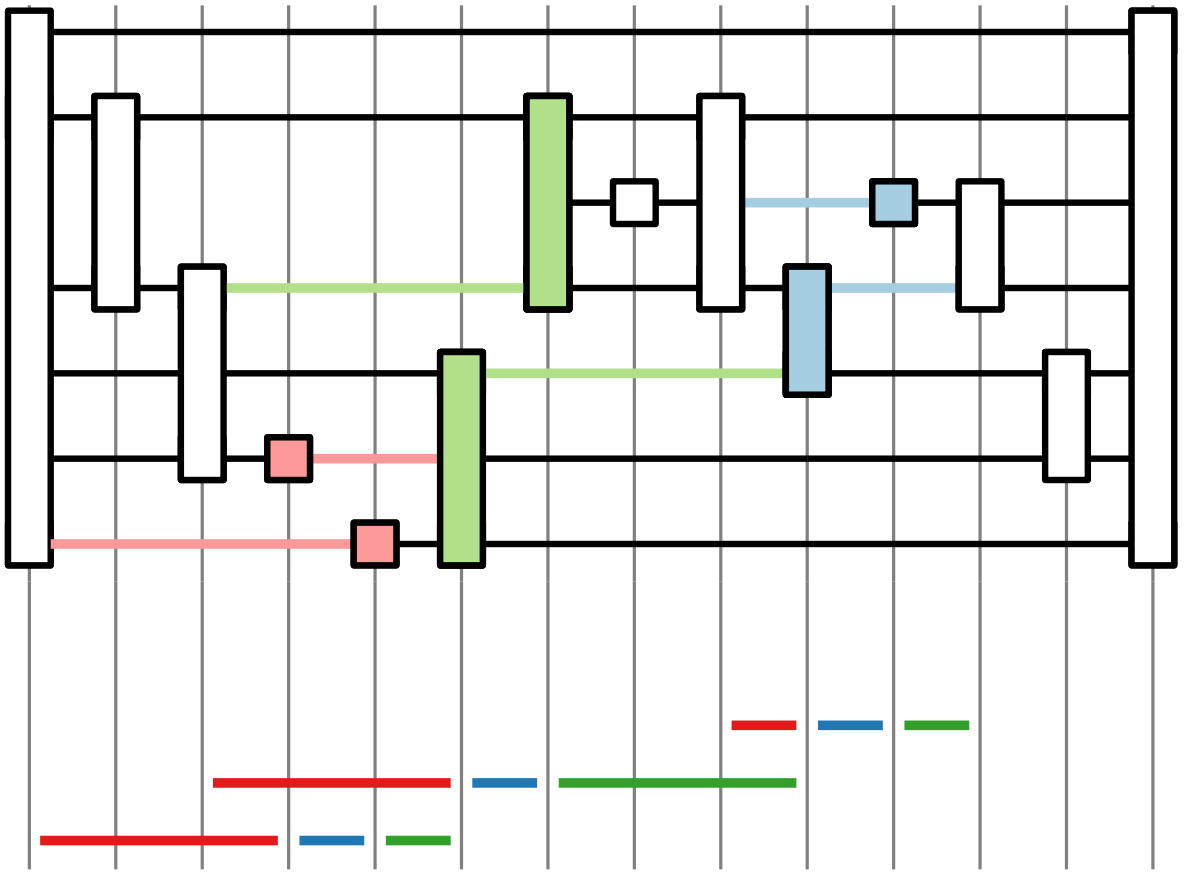

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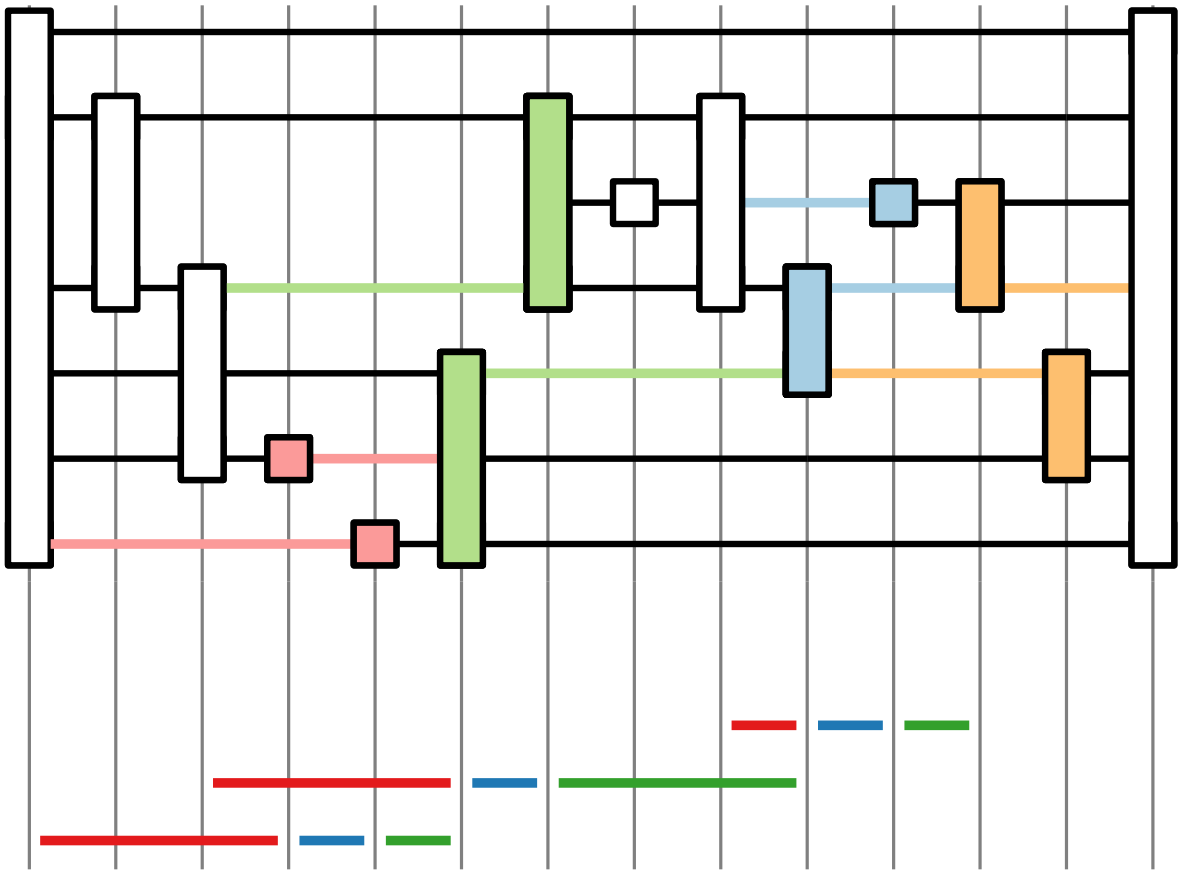

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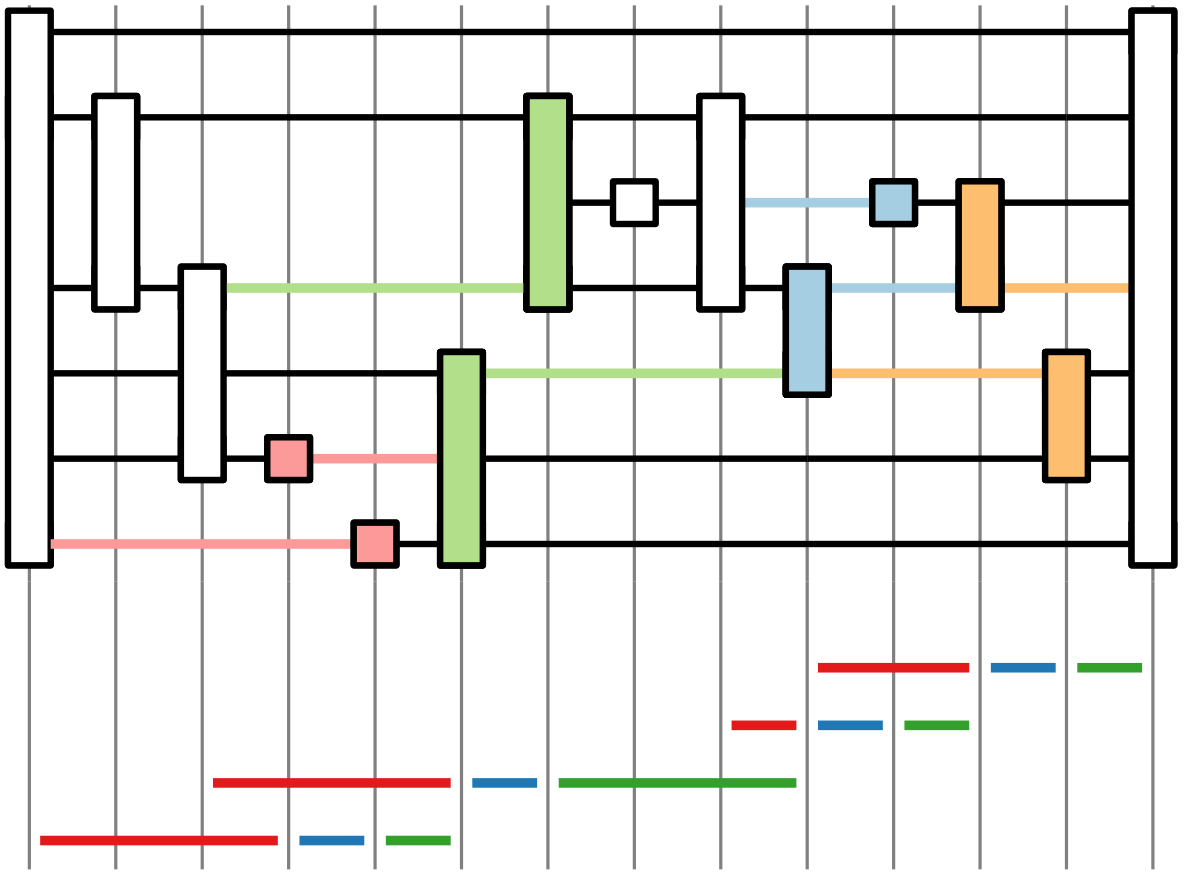

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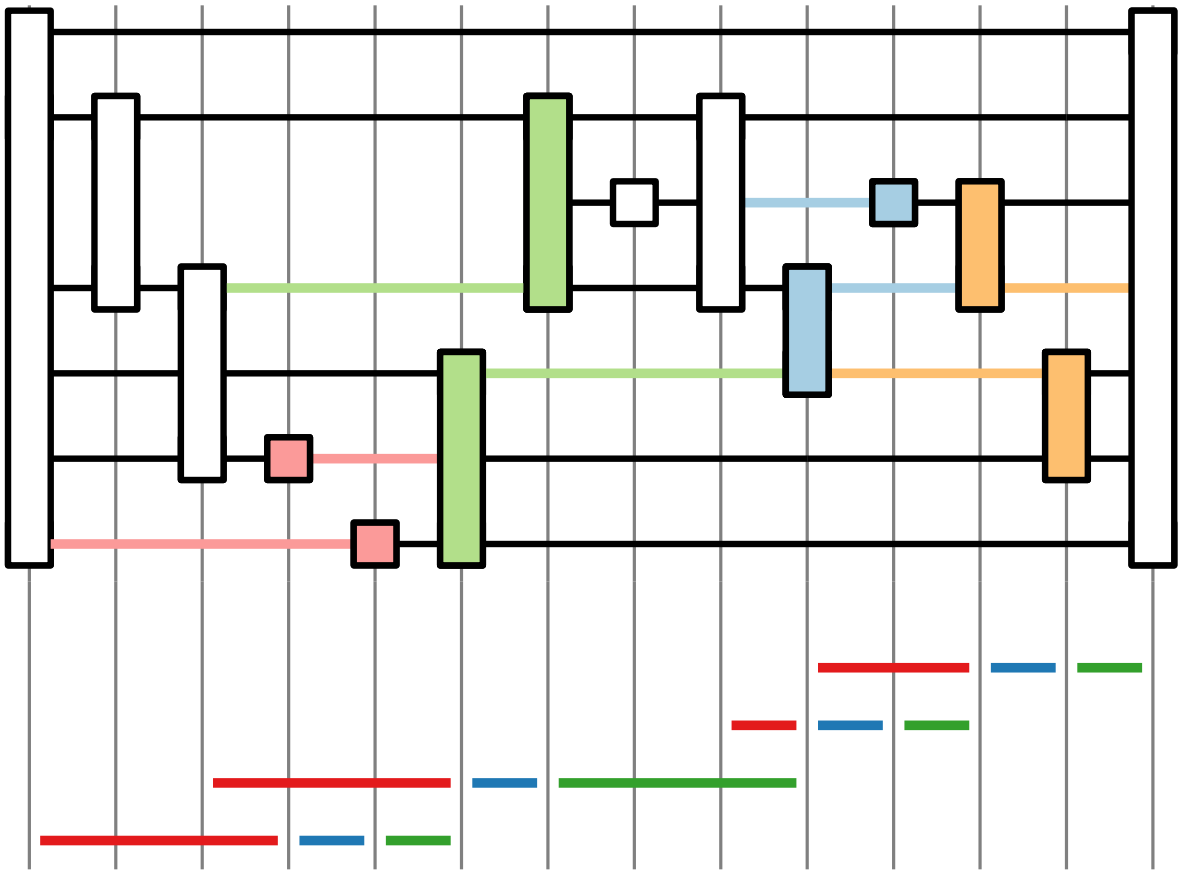
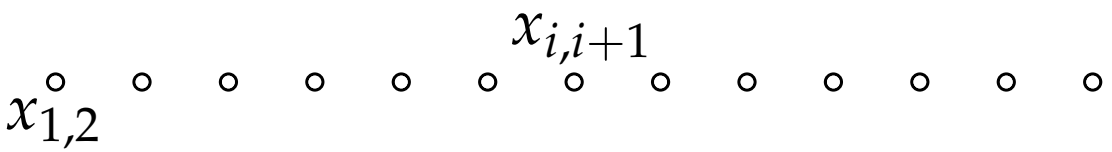
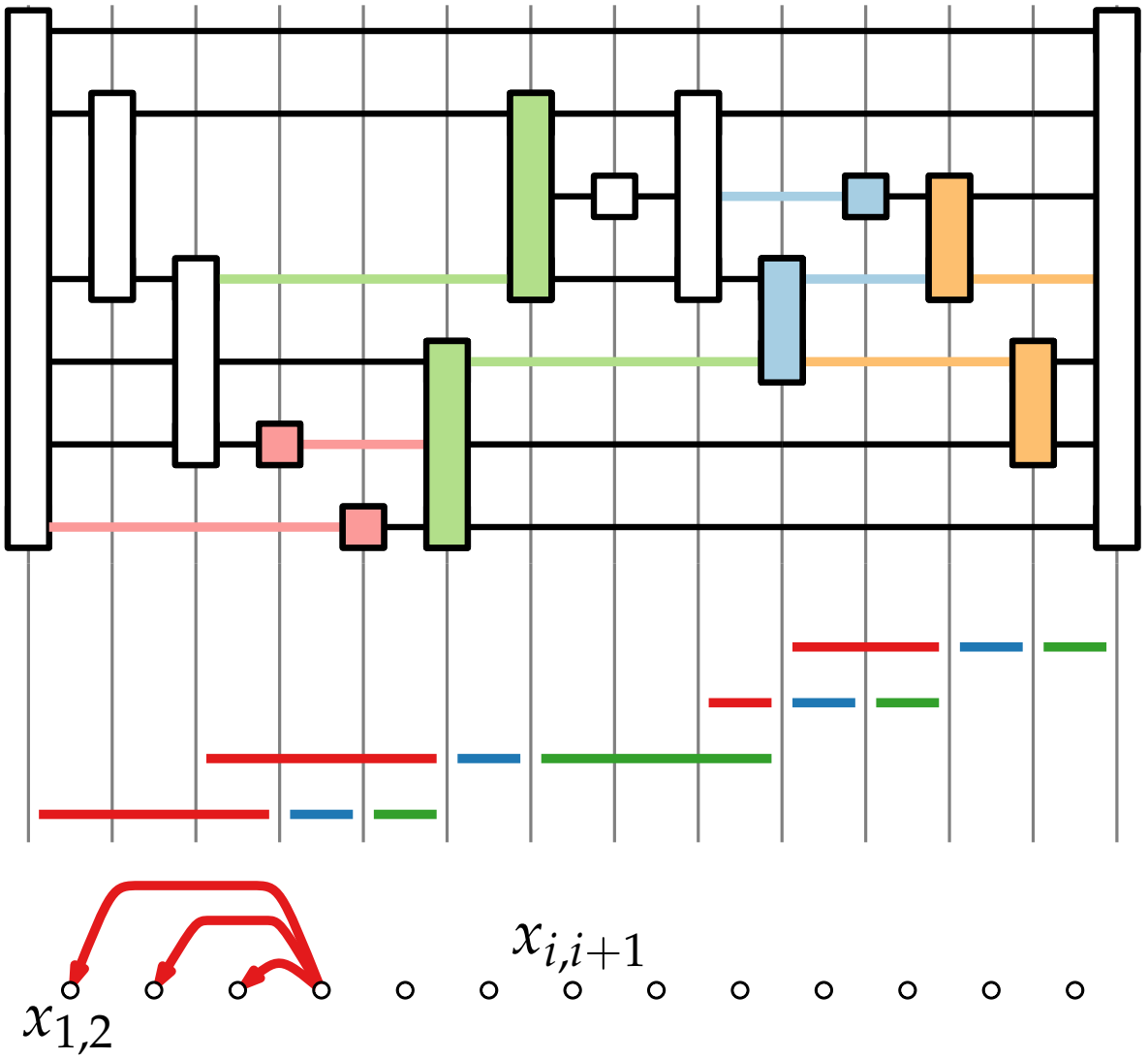




Relation Graph

Constraints



Relation Graph

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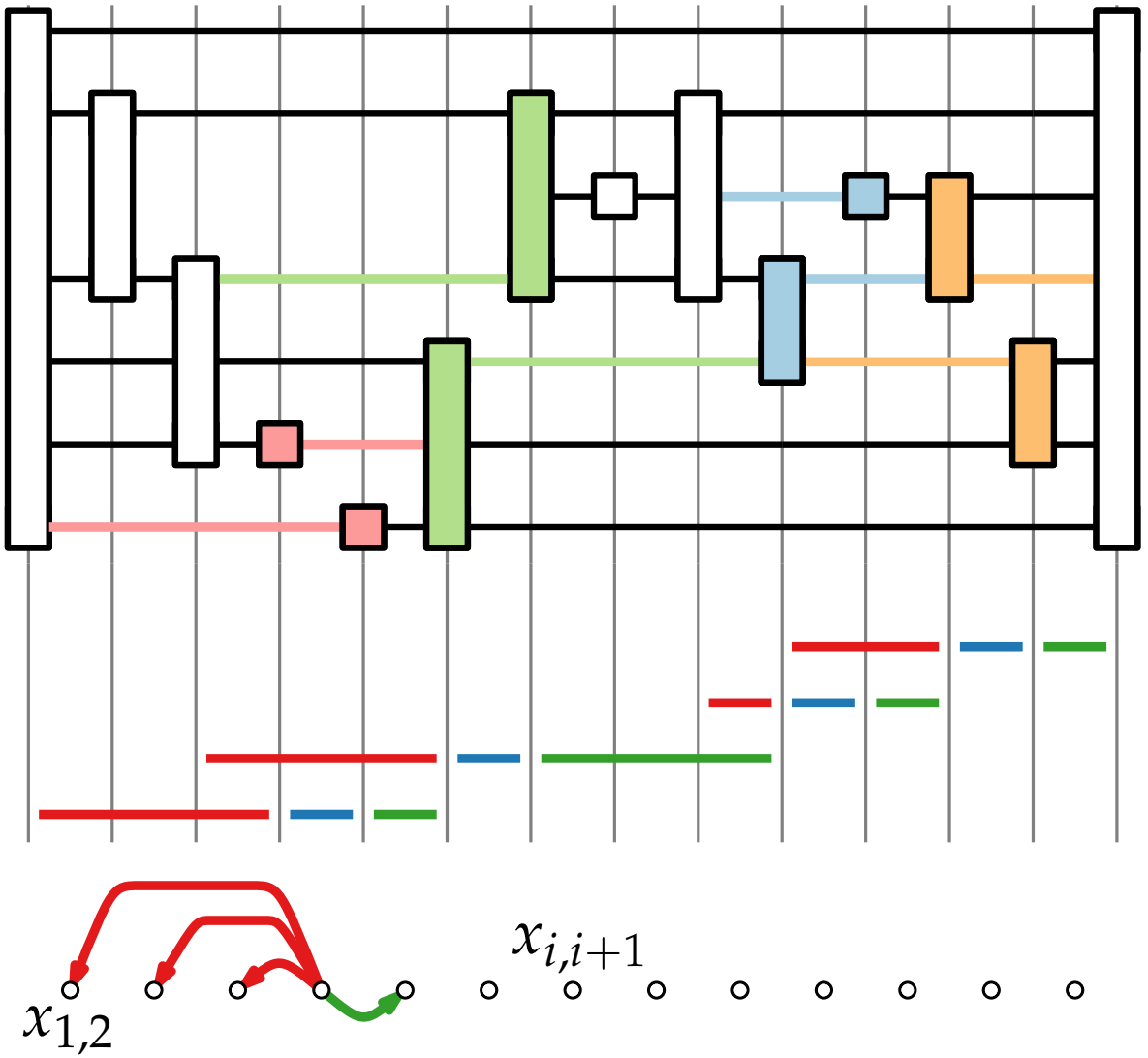

Relation Graph

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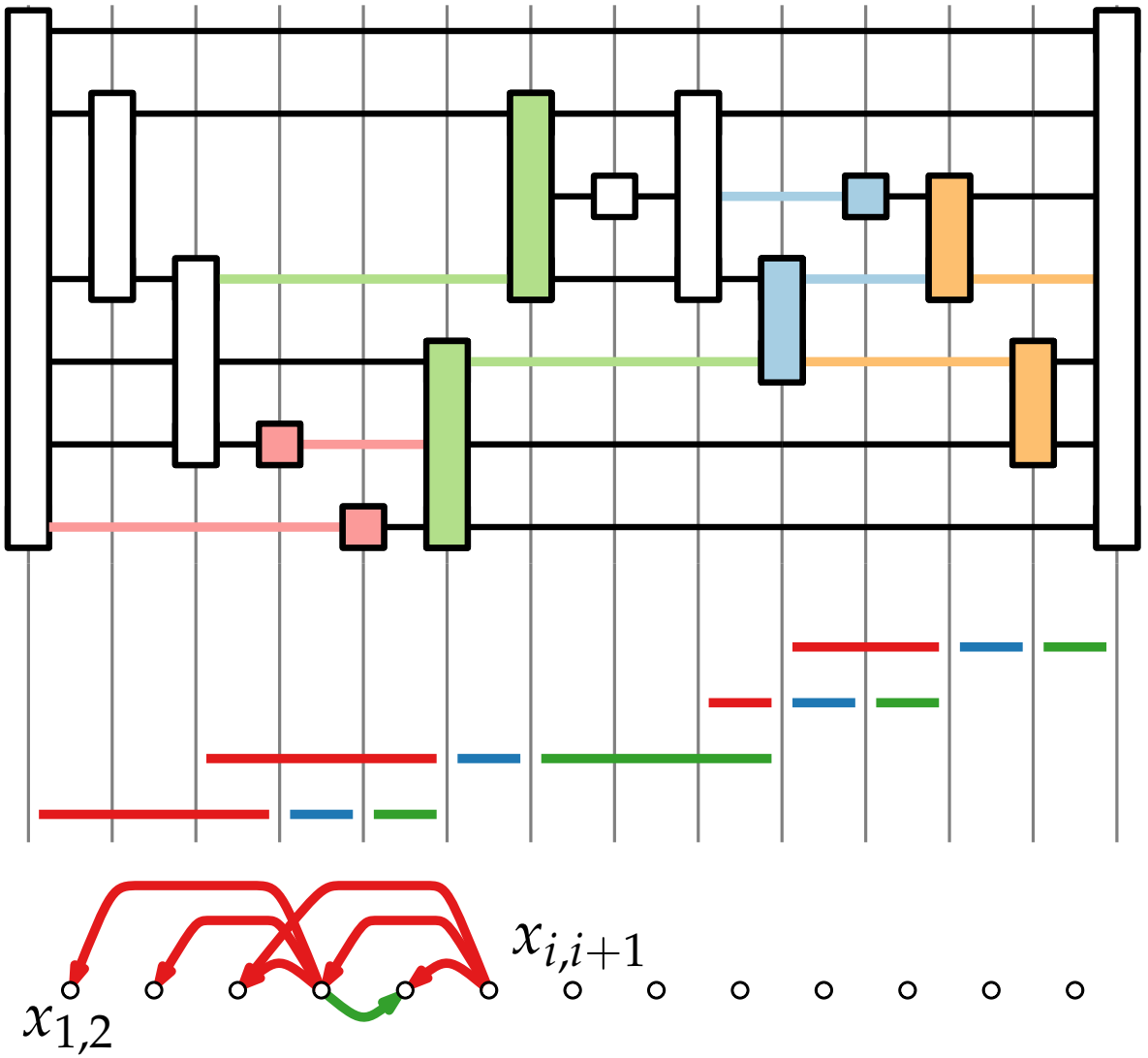

Relation Graph

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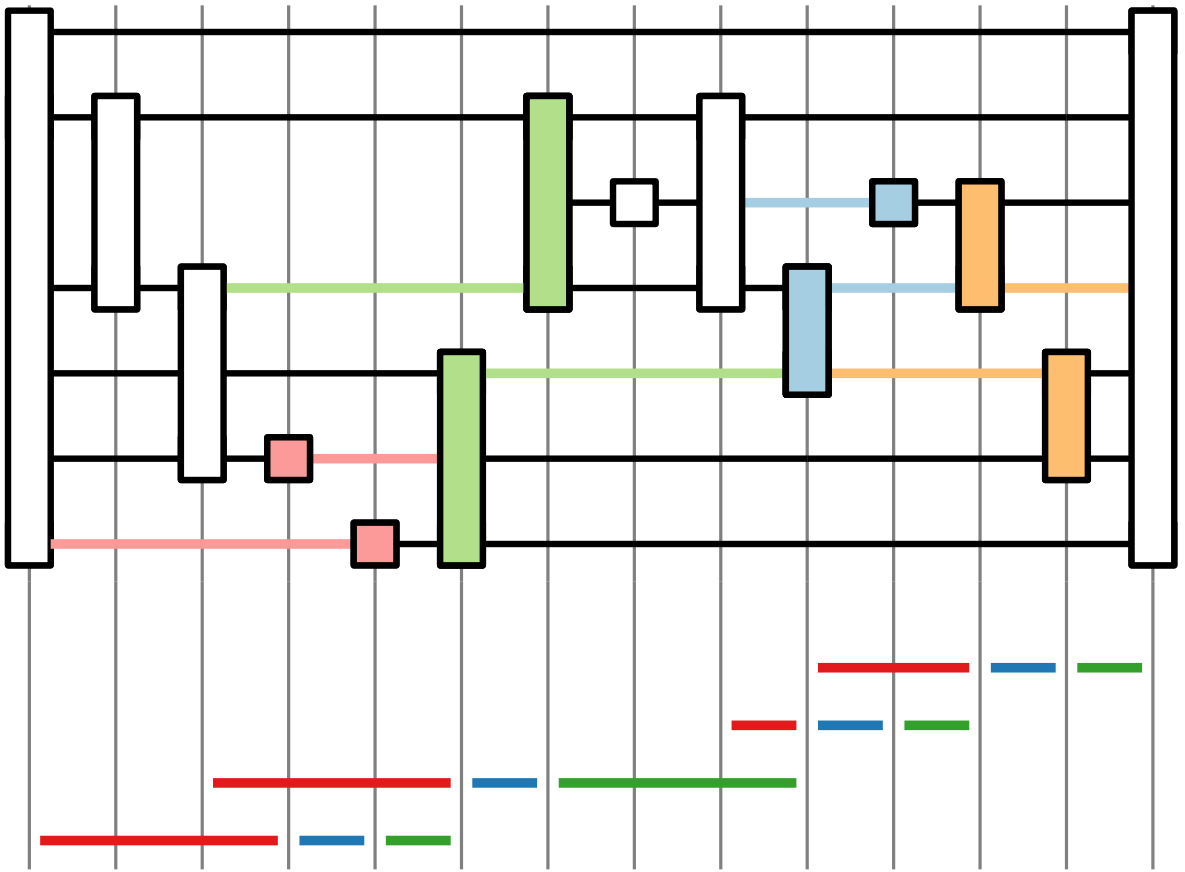

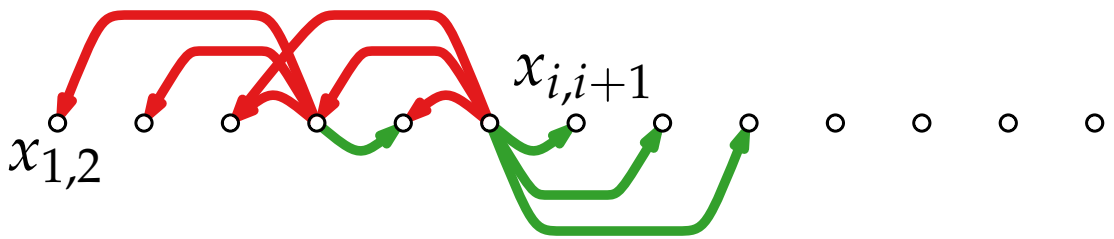

Relation Graph

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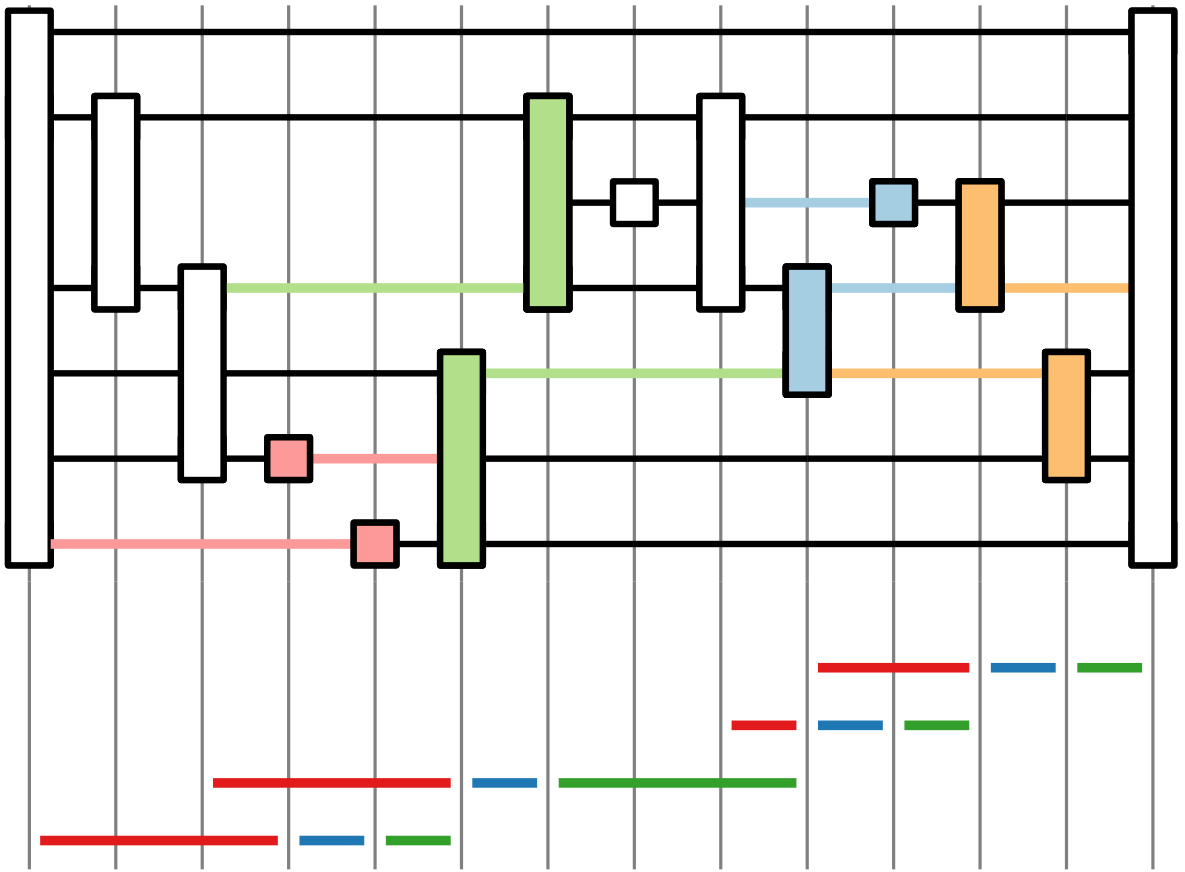

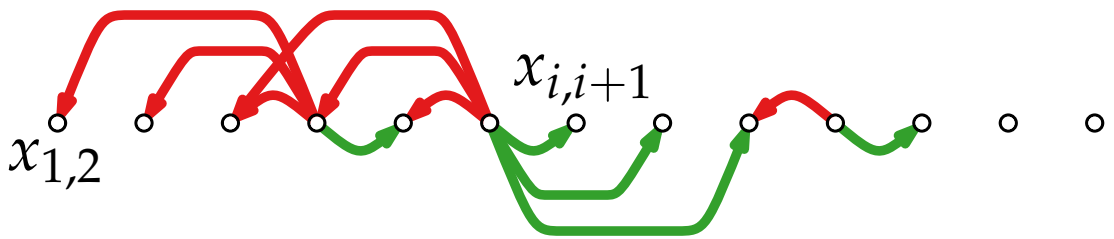

Relation Graph

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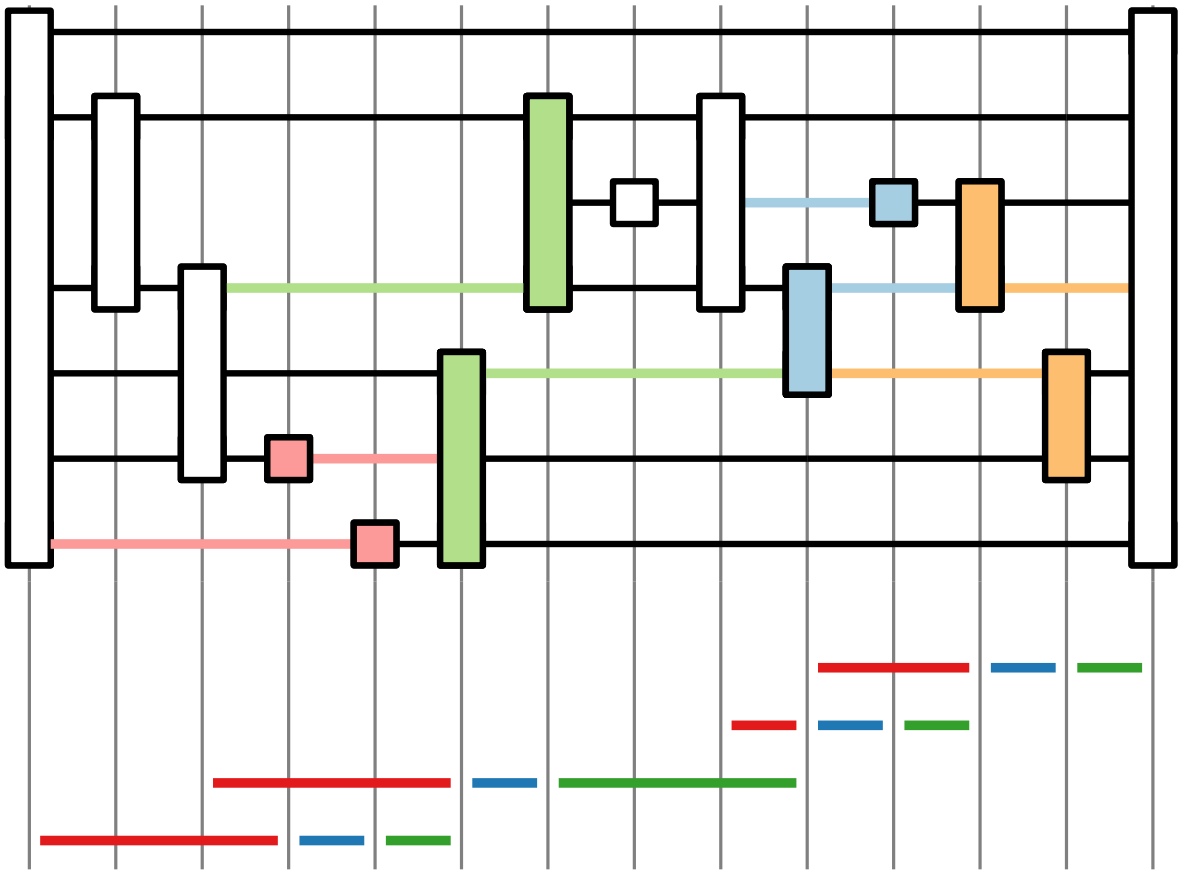

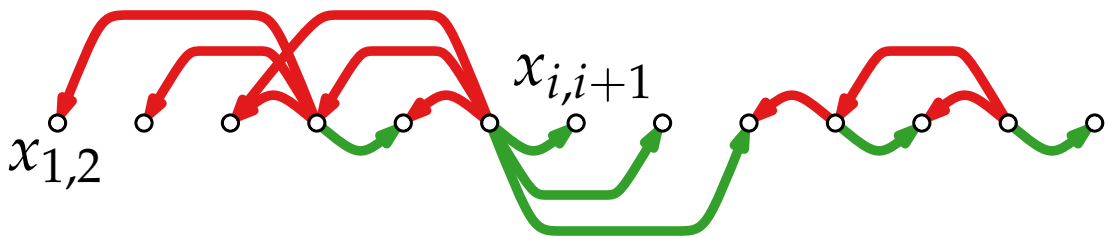

Relation Graph

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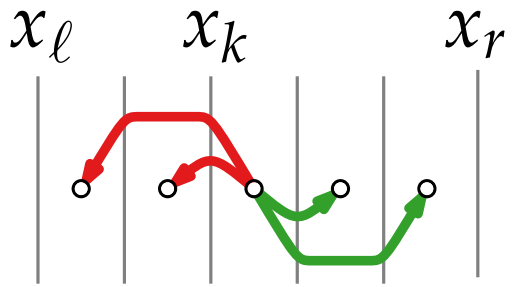

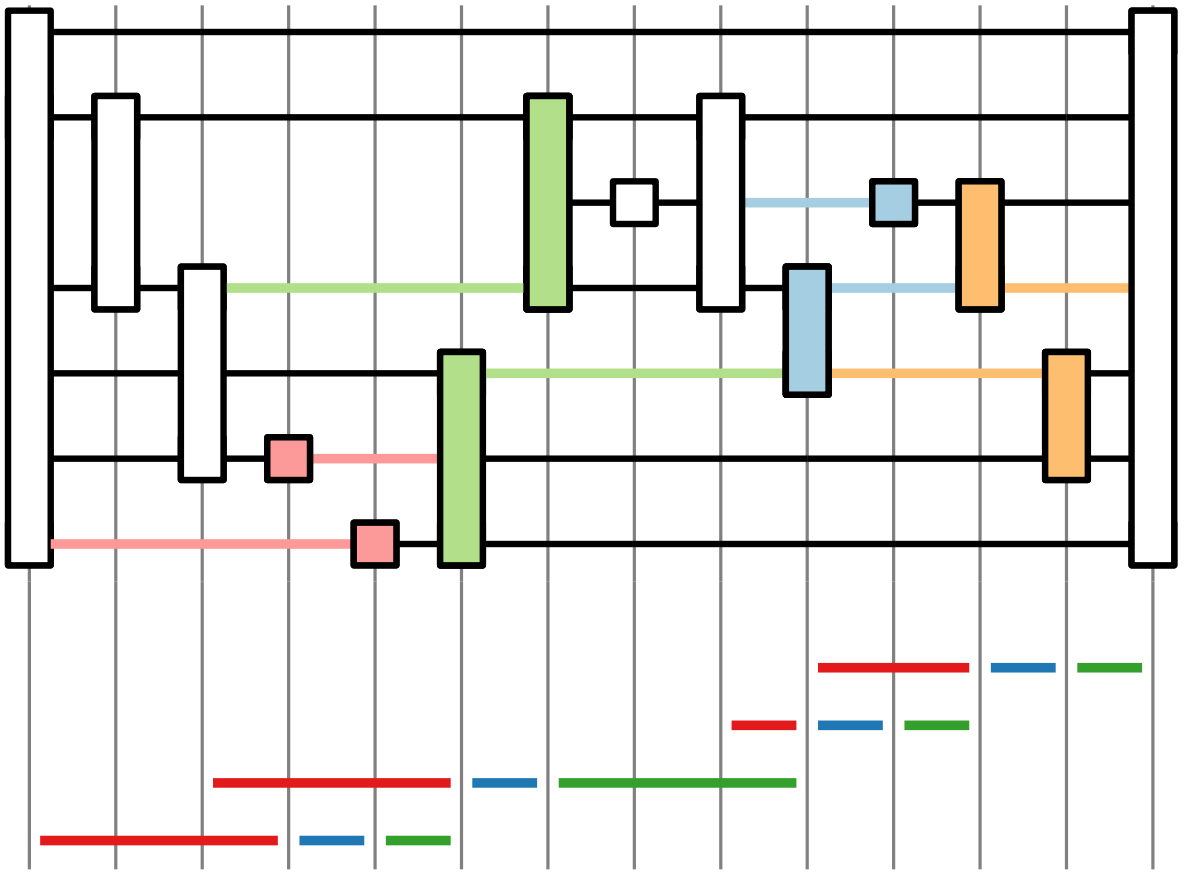

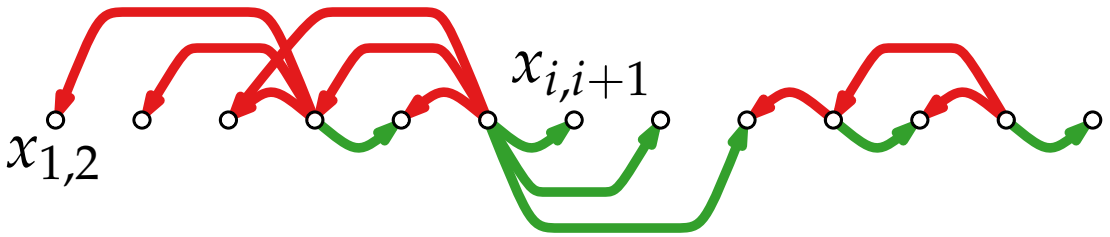

Relation Graph

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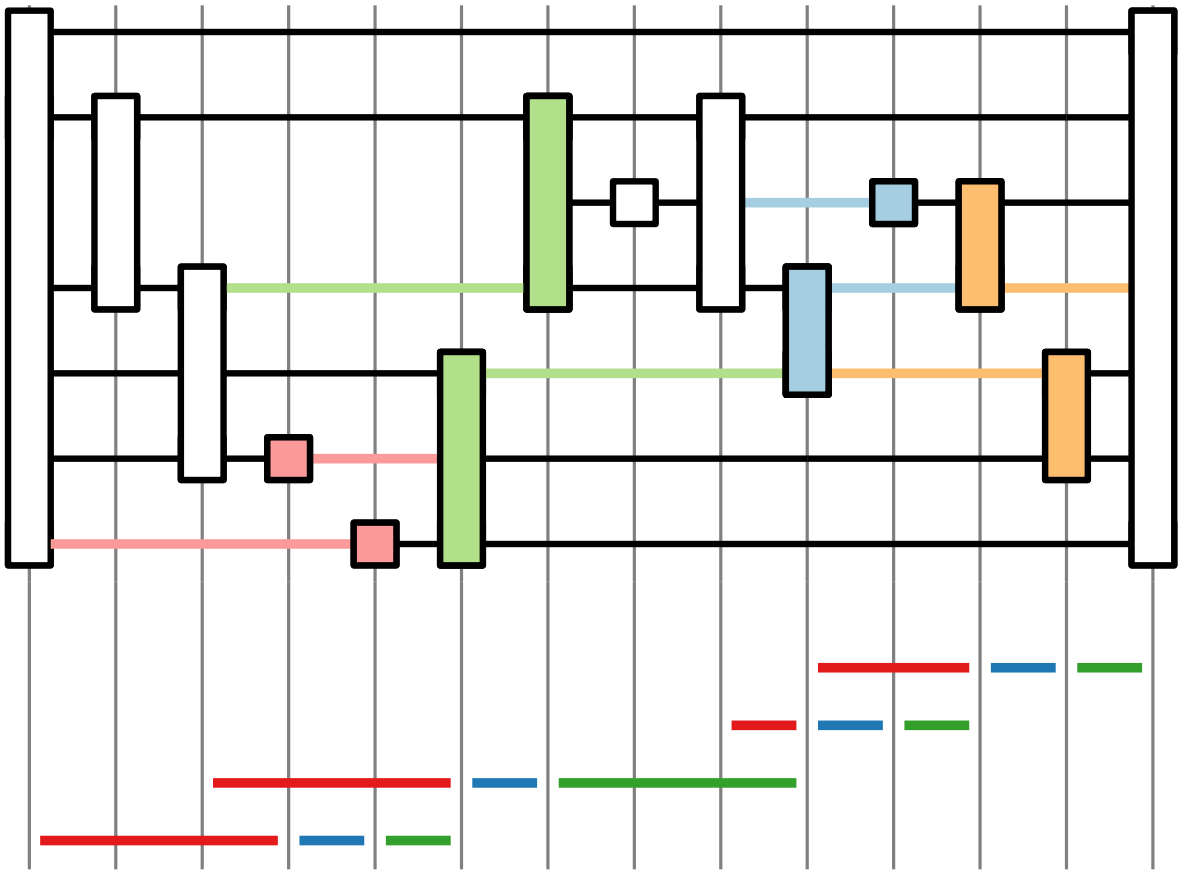
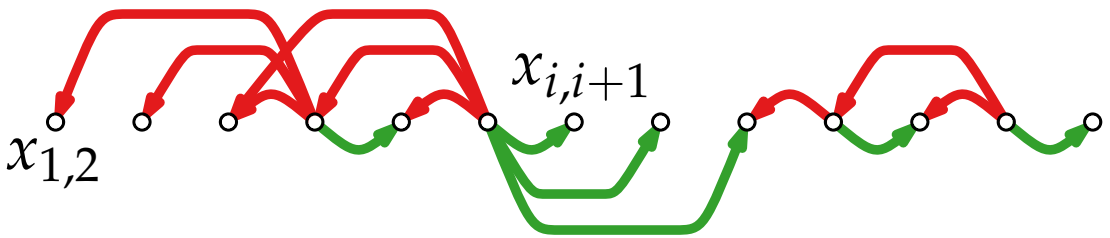
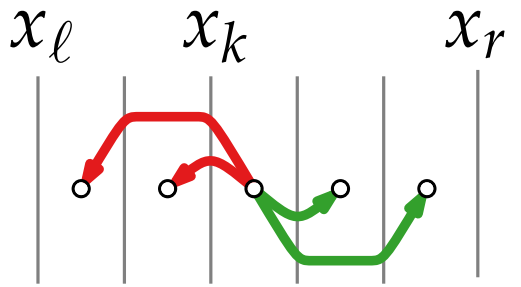


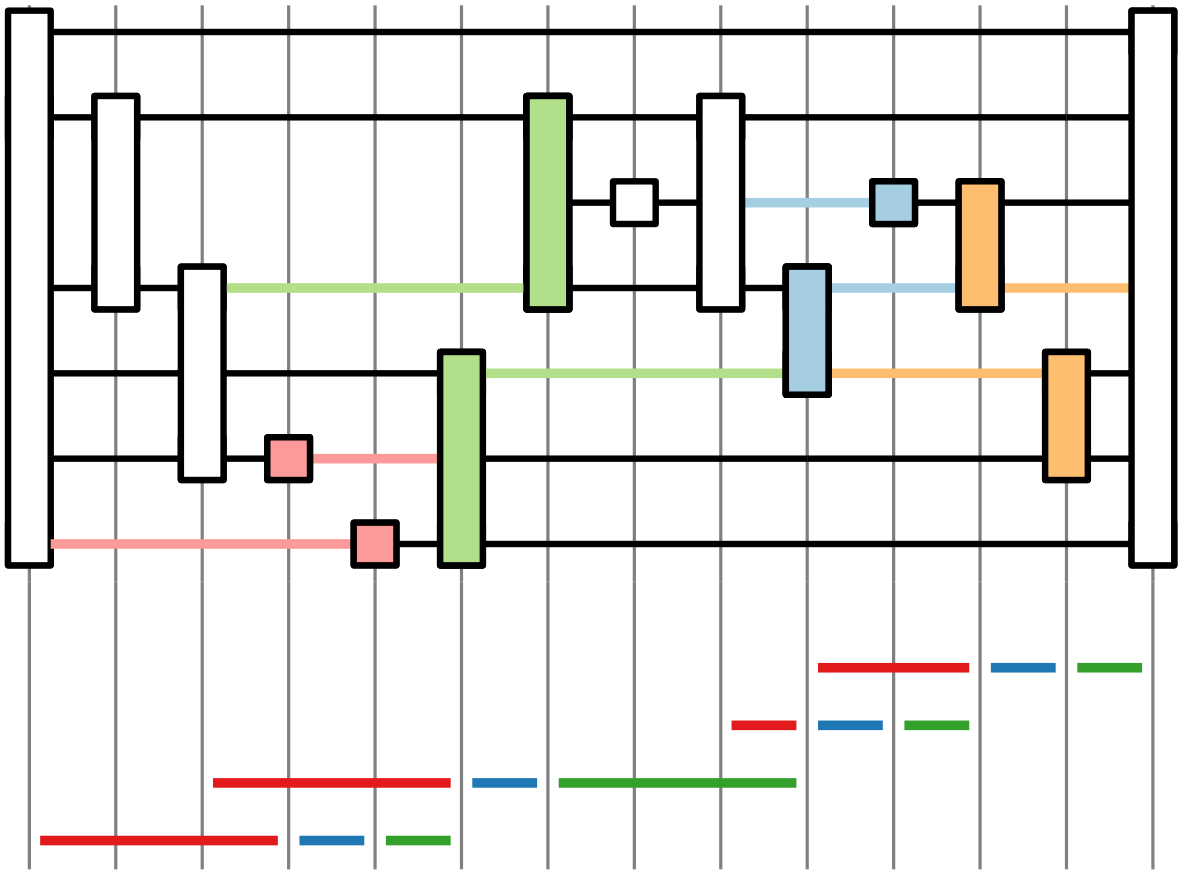


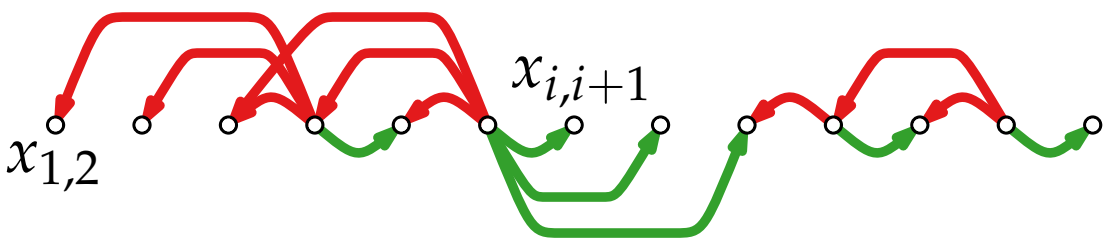
Relation Graph



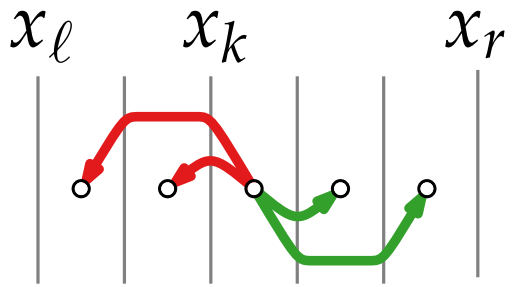
$$x_{k,k+1} > \sum_{i=\ell}^{k-1} x_{i,i+1}$$

Constraints





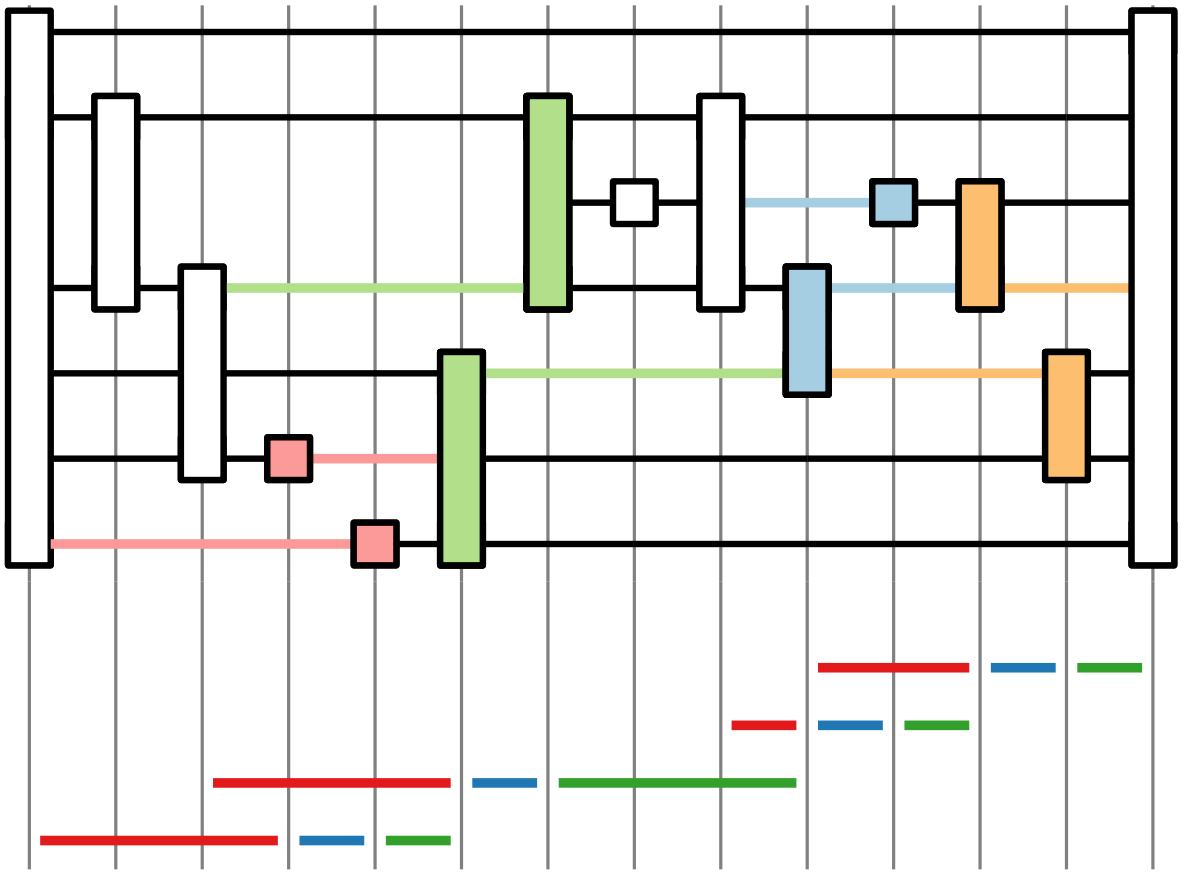
Relation Graph

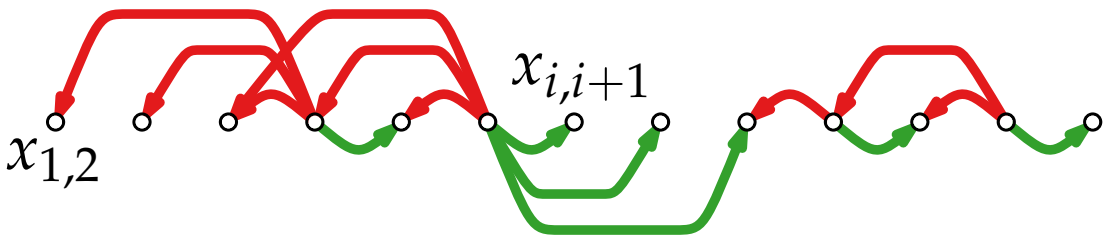


$$x_{k,k+1} > \sum_{i=\ell}^{k-1} x_{i,i+1}$$

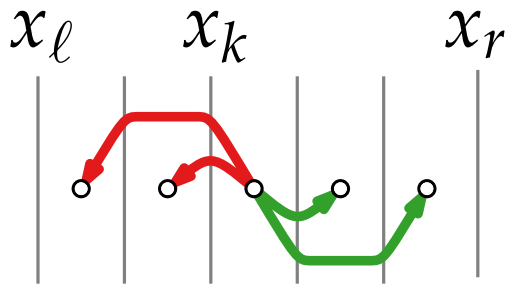
$$x_{k,k+1} > \sum_{i=k+1}^{r-1} x_{i,i+1}$$

Constraints





Relation Graph

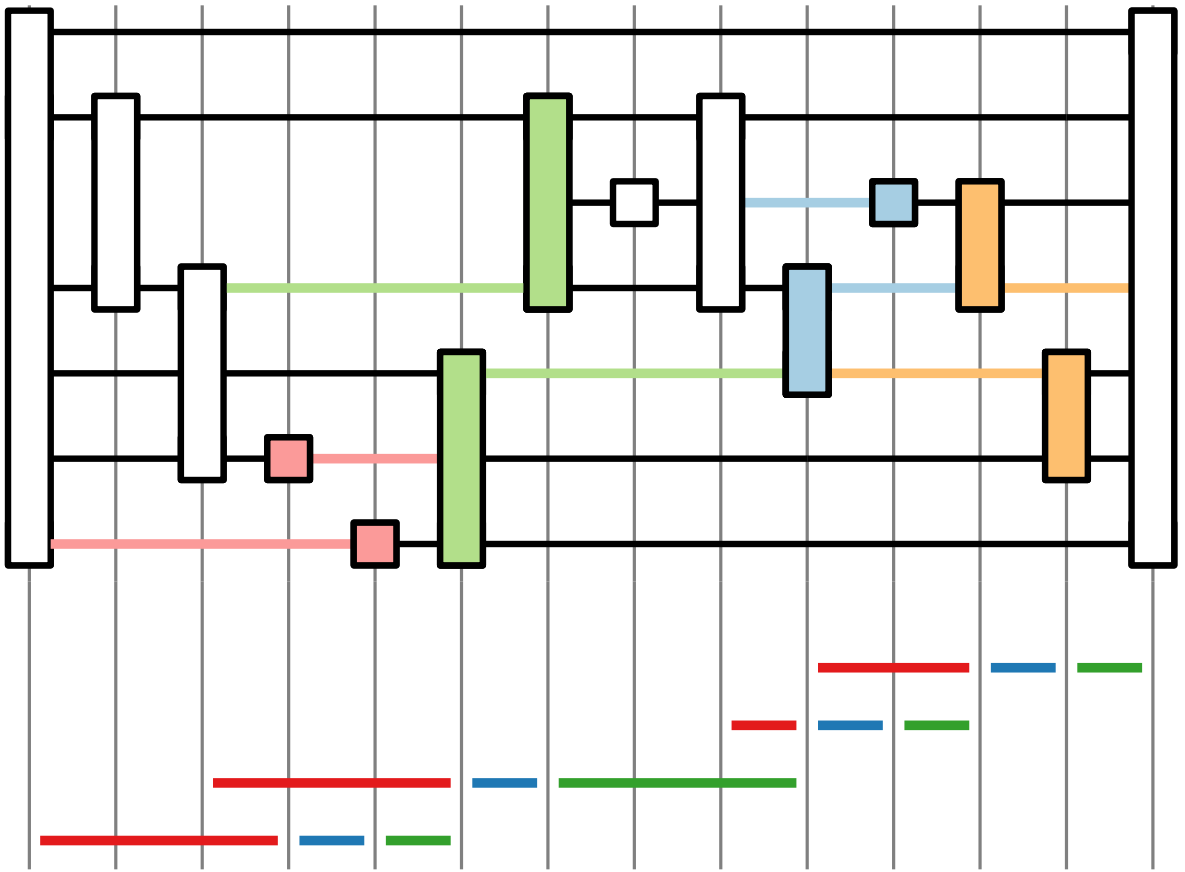


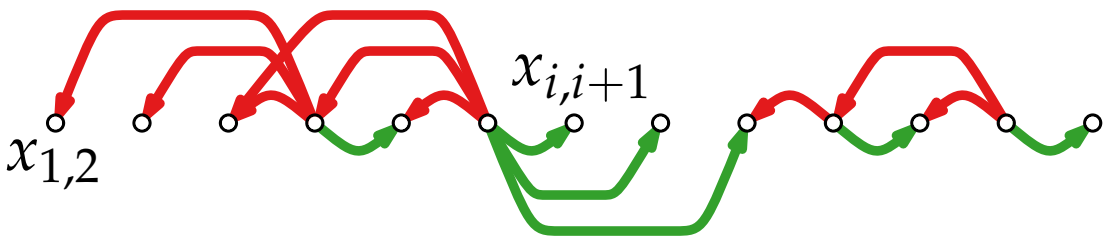
$$x_{k,k+1} > \sum_{i=\ell}^{k-1} x_{i,i+1}$$

$$x_{k,k+1} > \sum_{i=k+1}^{r-1} x_{i,i+1}$$

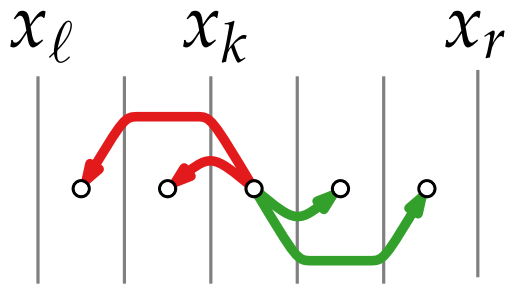
$\Rightarrow$ LP

Constraints





Relation Graph is acyclic



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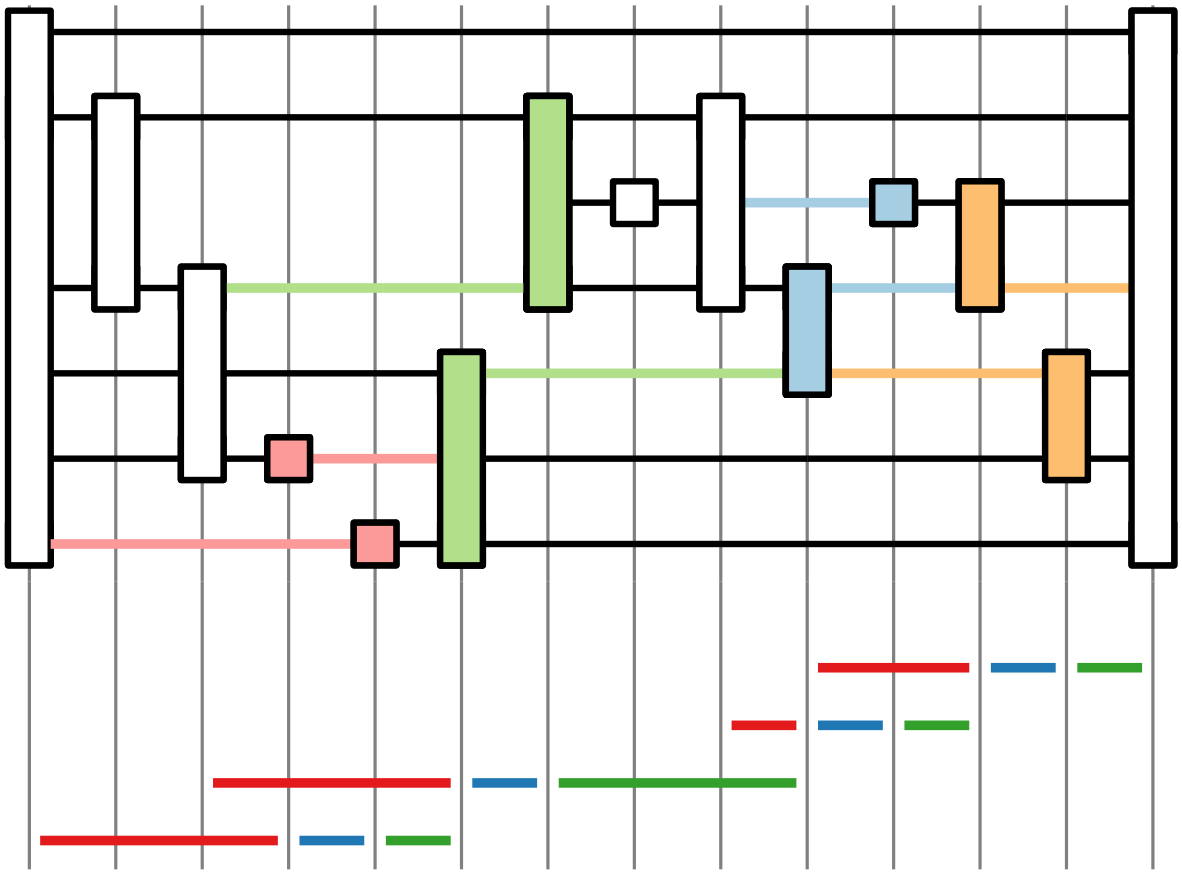
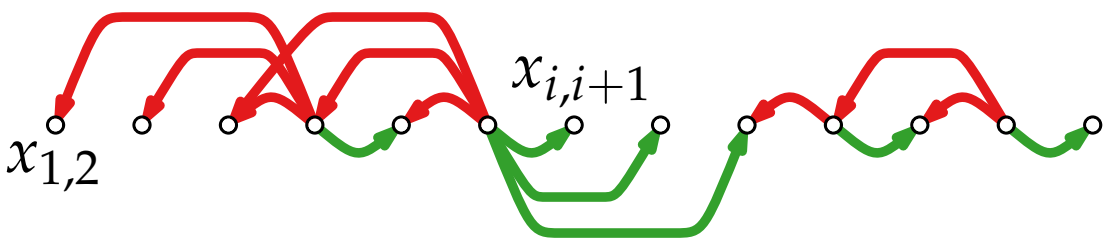
Constraints





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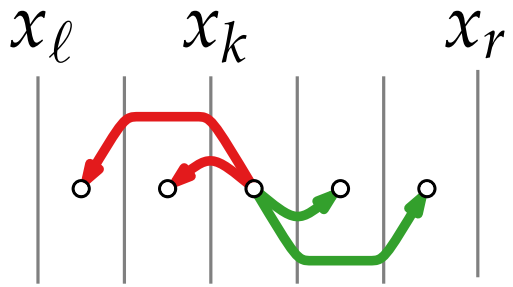

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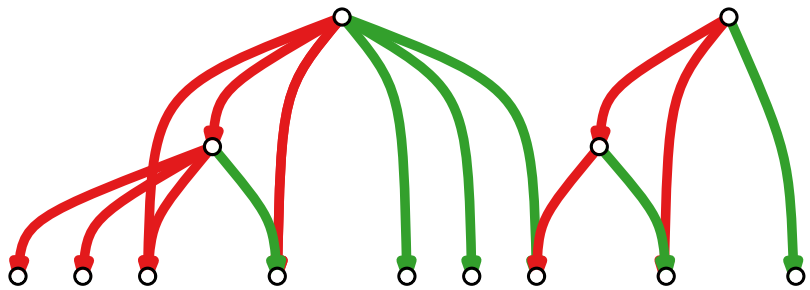
$\Rightarrow$ LP

Topological Sort



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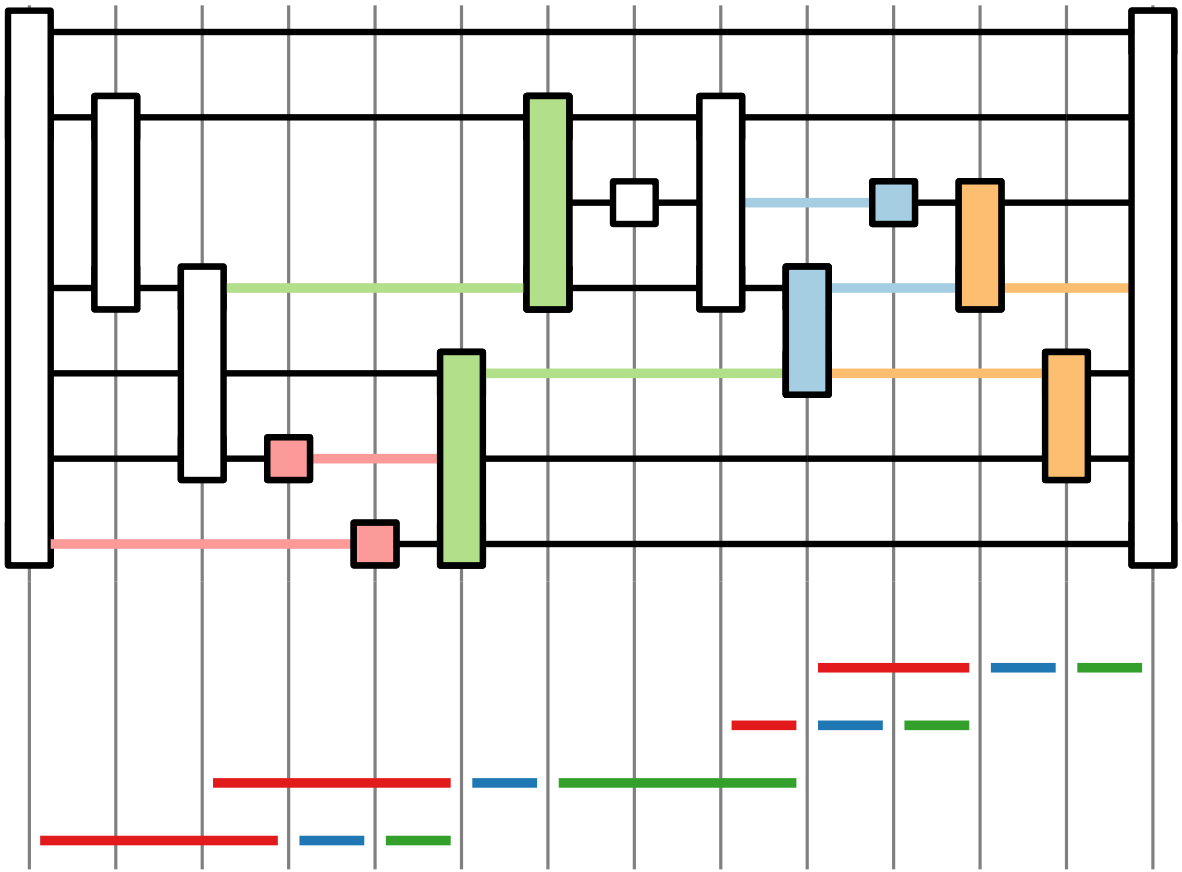

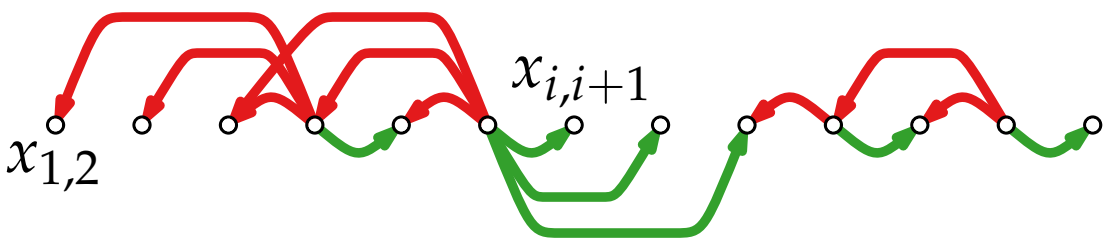

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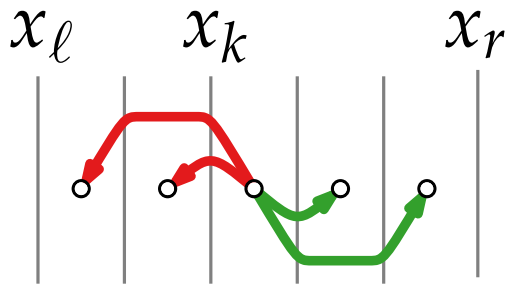

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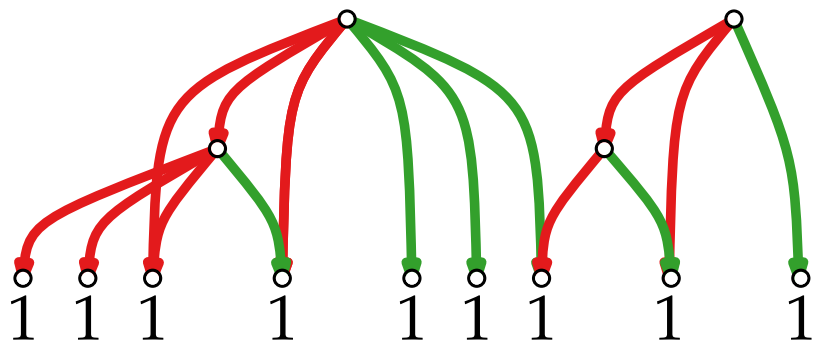
Topological Sort



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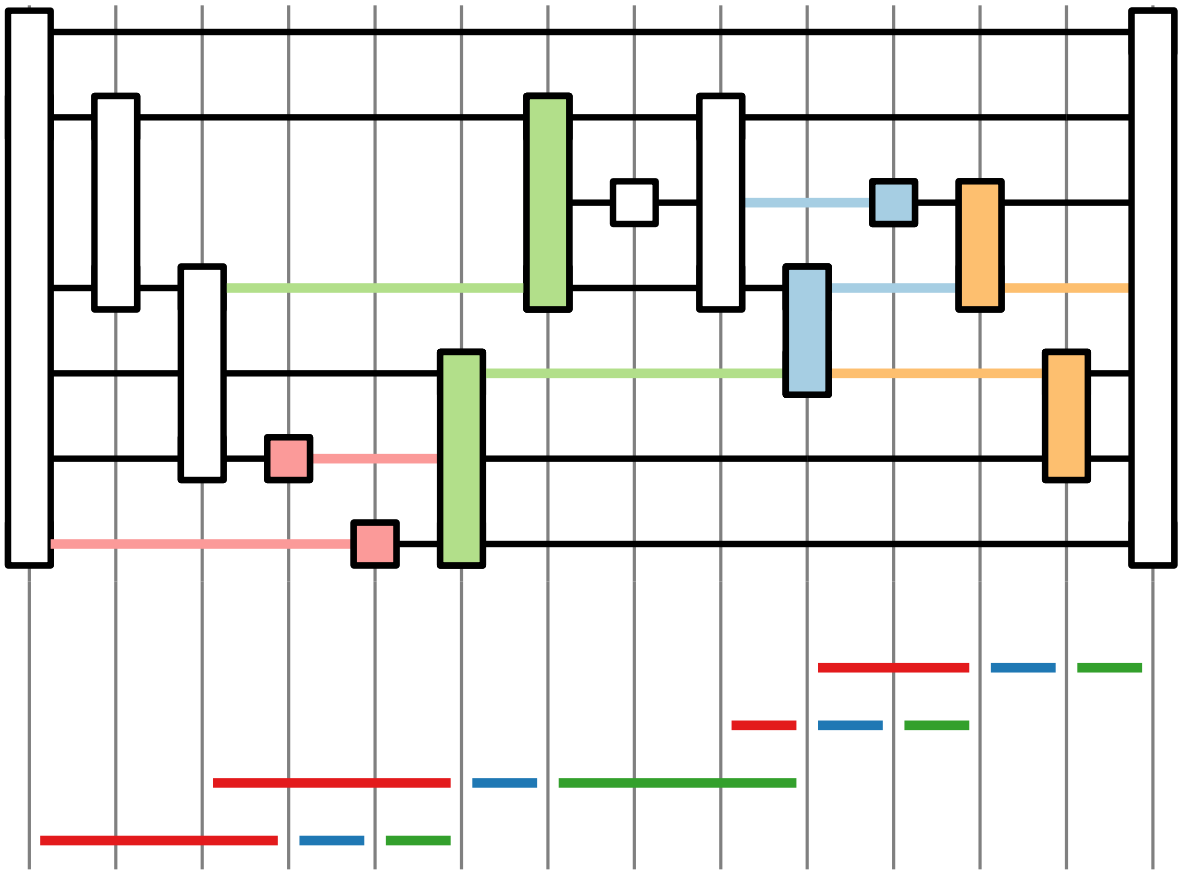
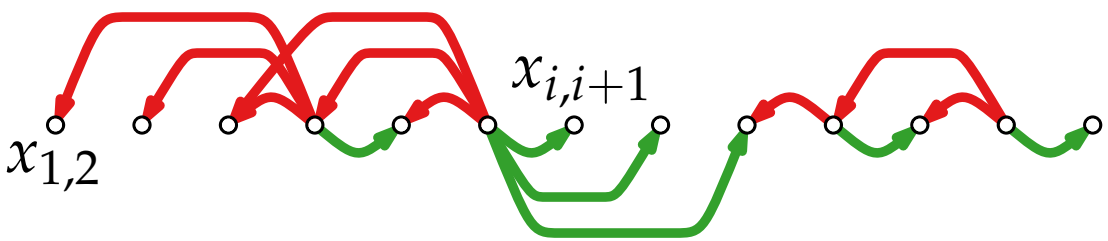
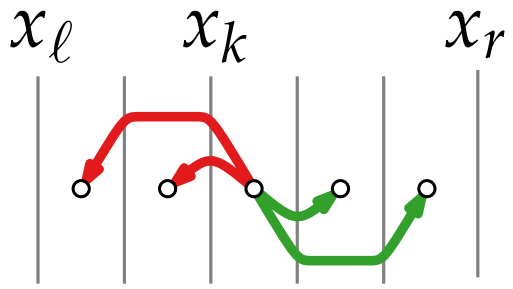




Relation Graph is acyclic



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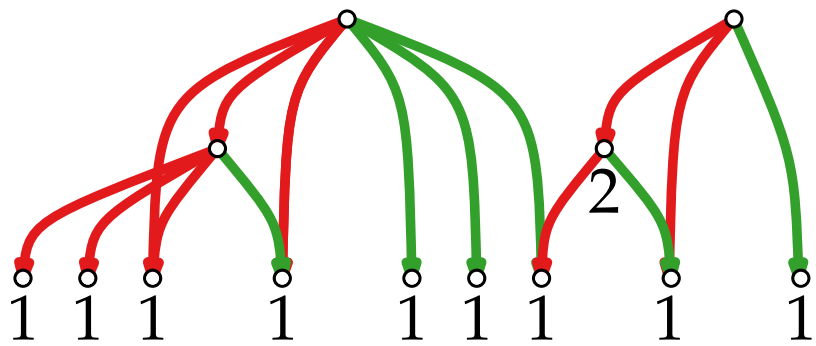

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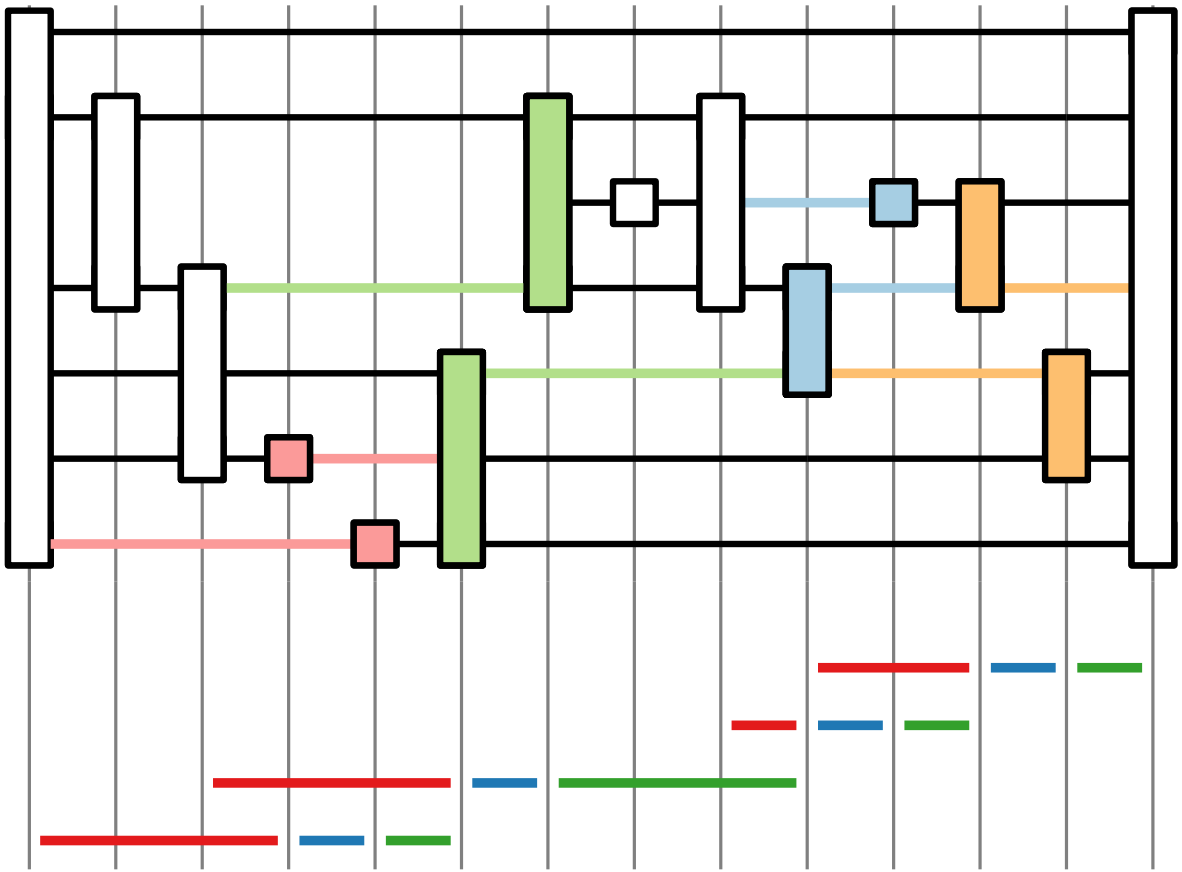
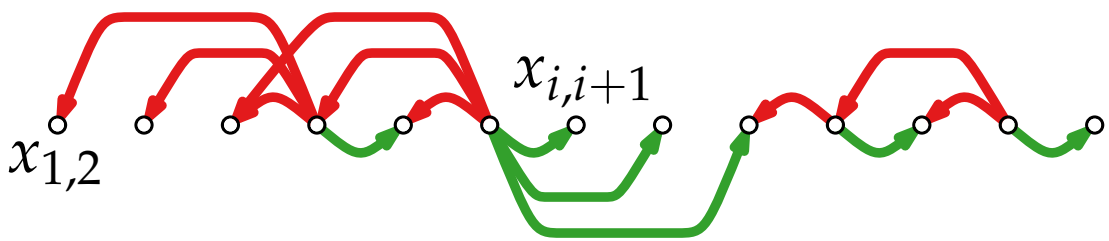
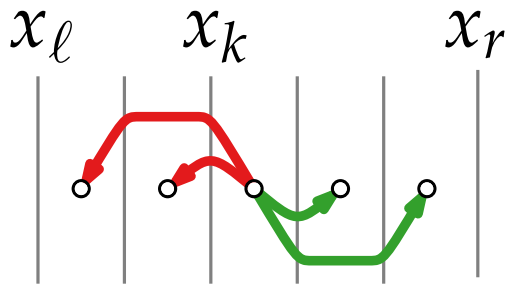




Relation Graph is acyclic



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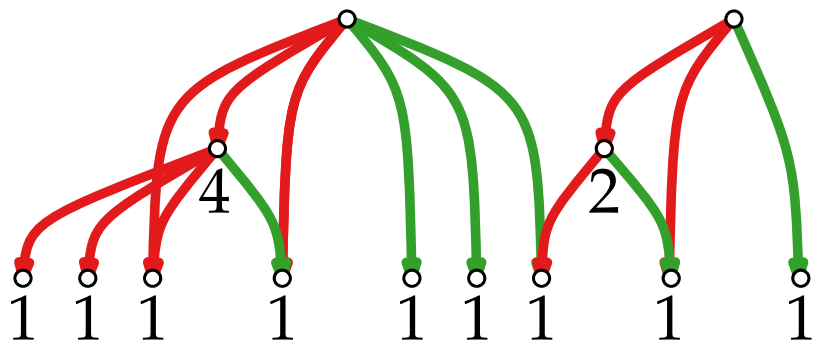

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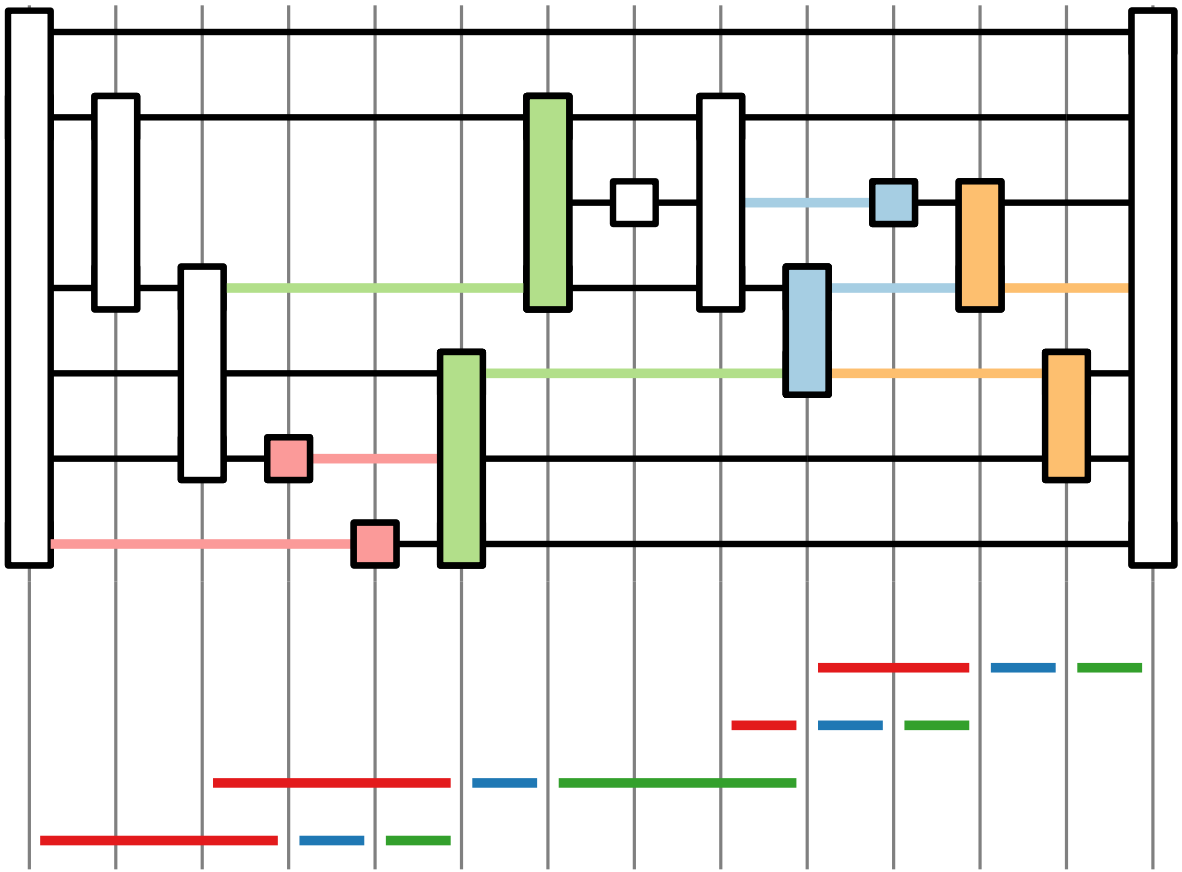
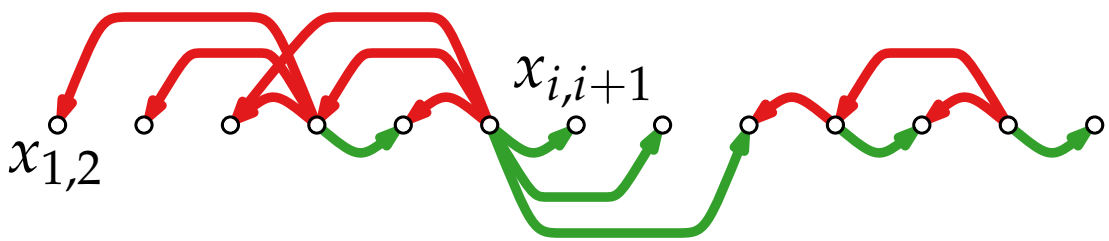
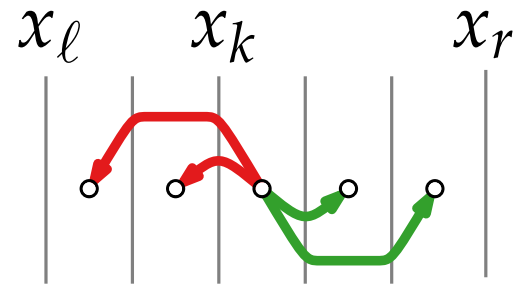




Relation Graph is acyclic



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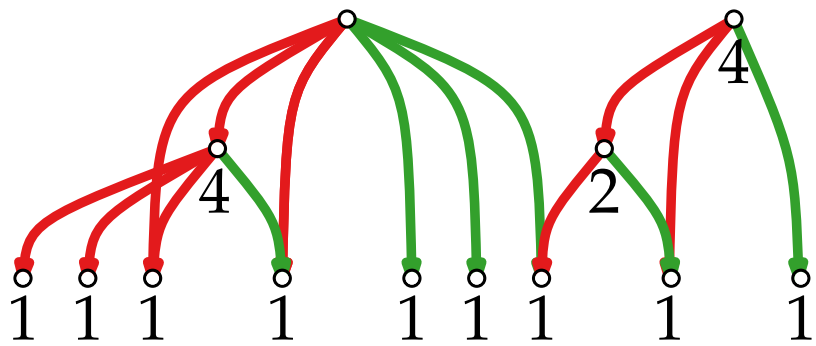

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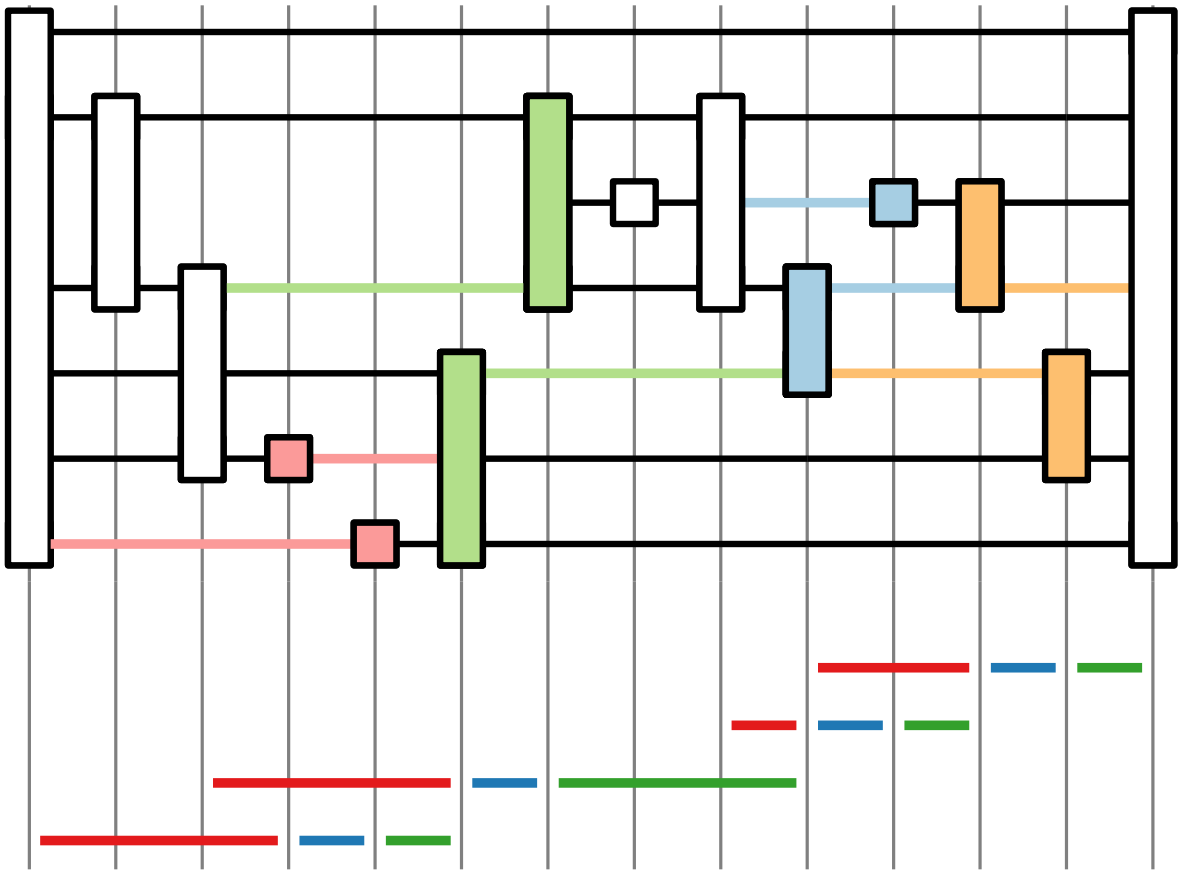

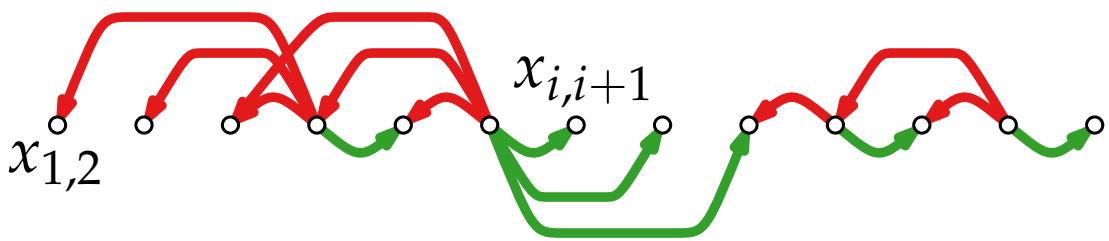

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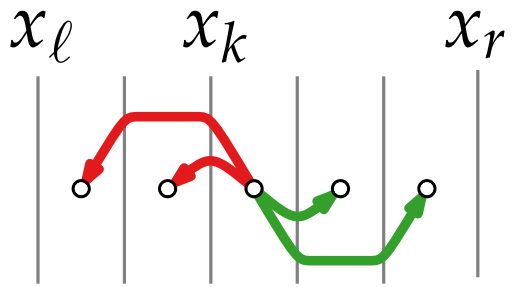

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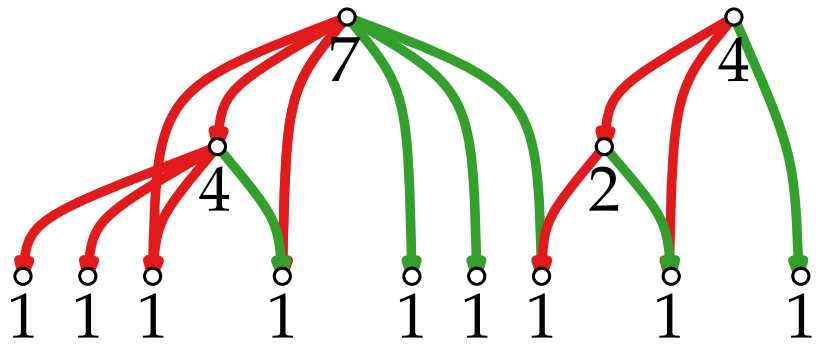

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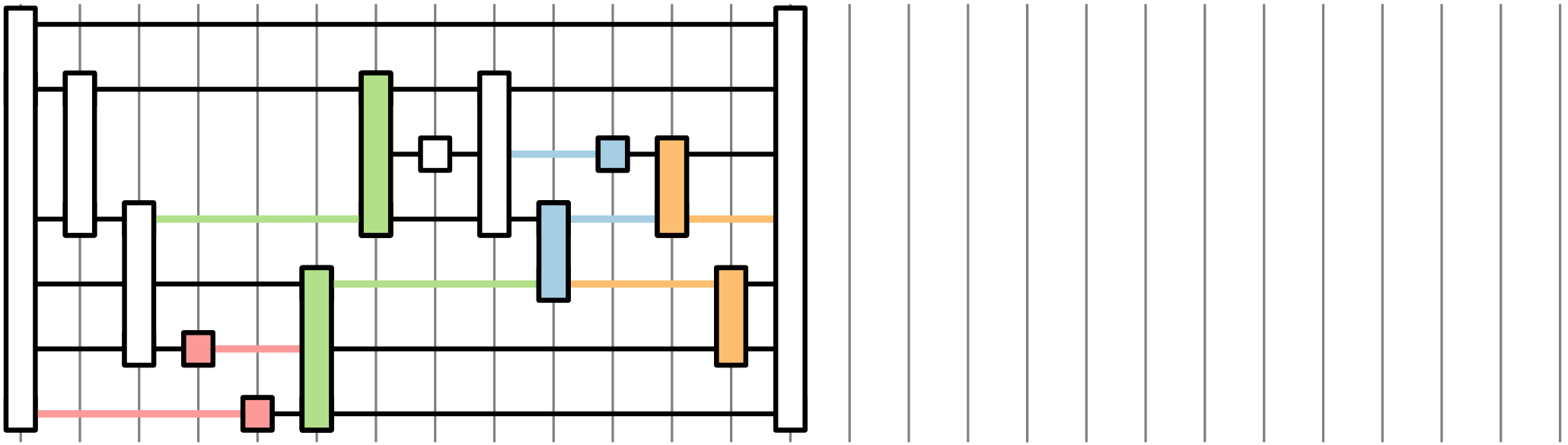
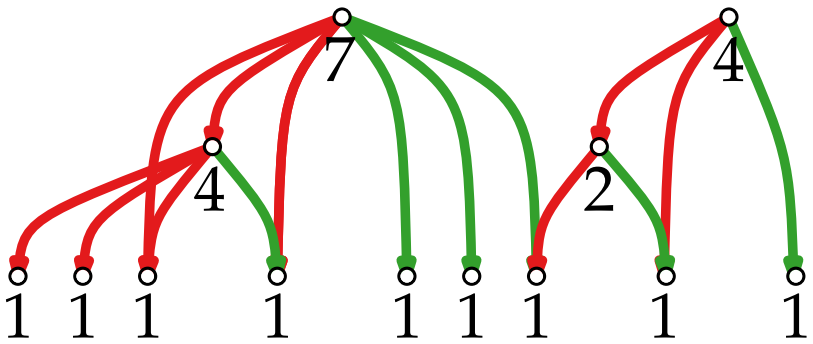


Topological Sort



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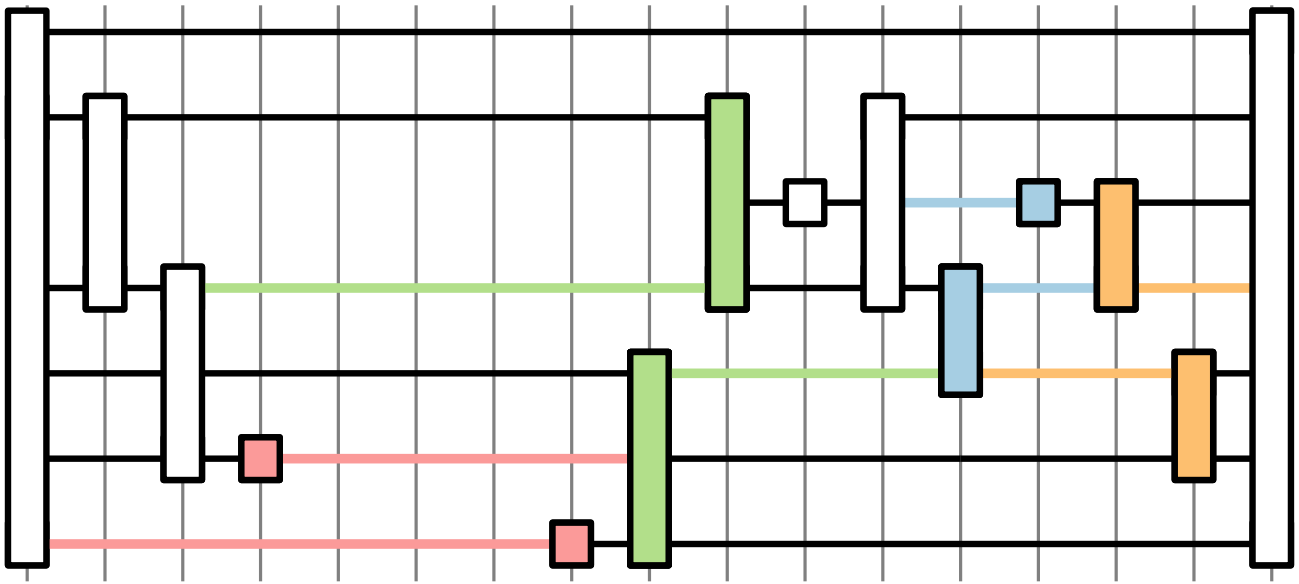

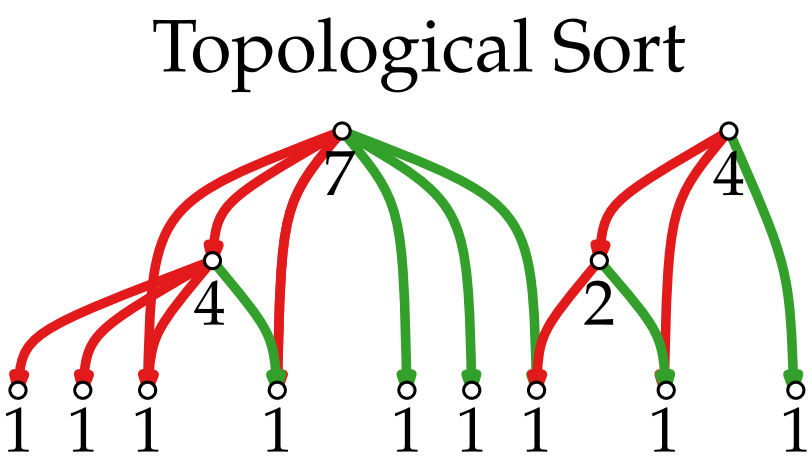

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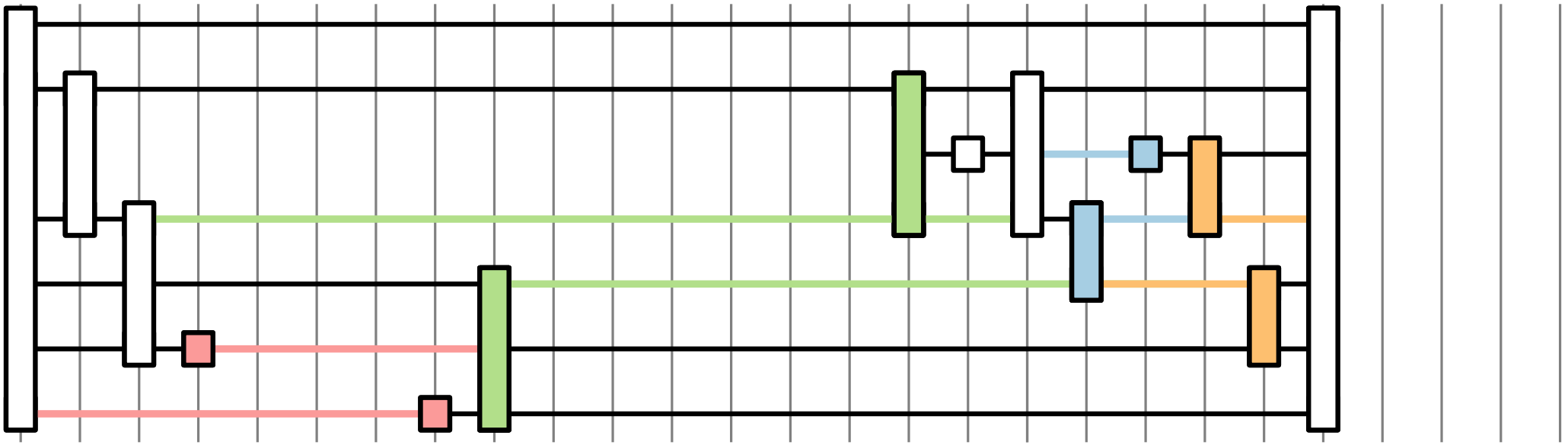
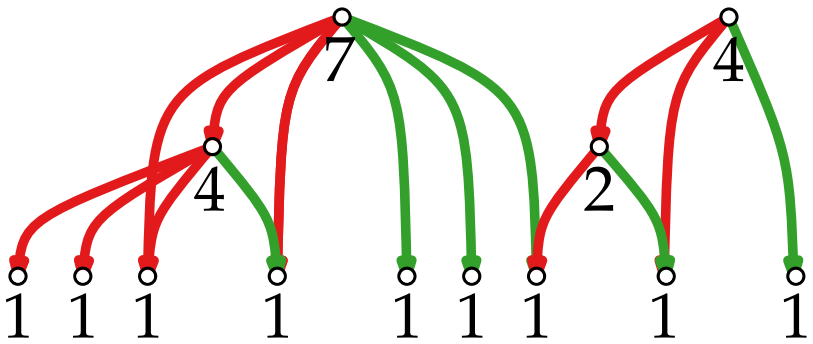


Topological Sort



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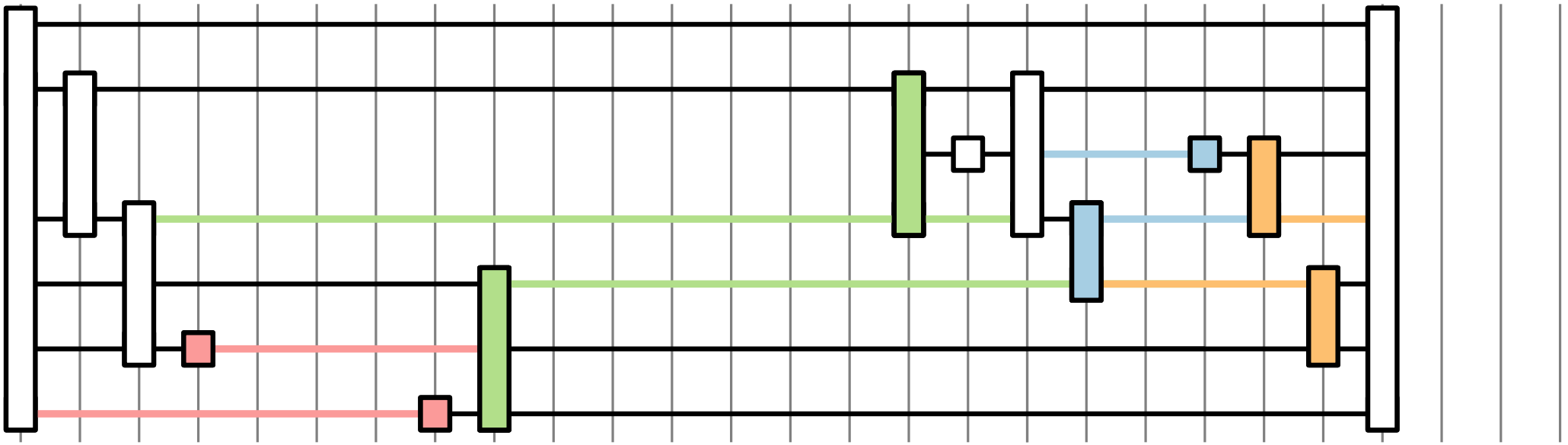
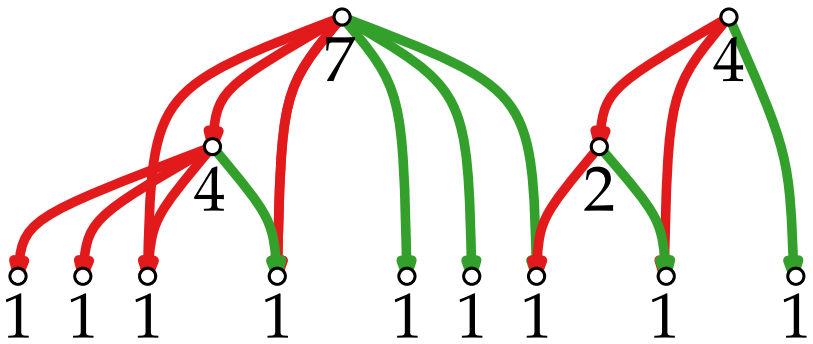


Topological Sort



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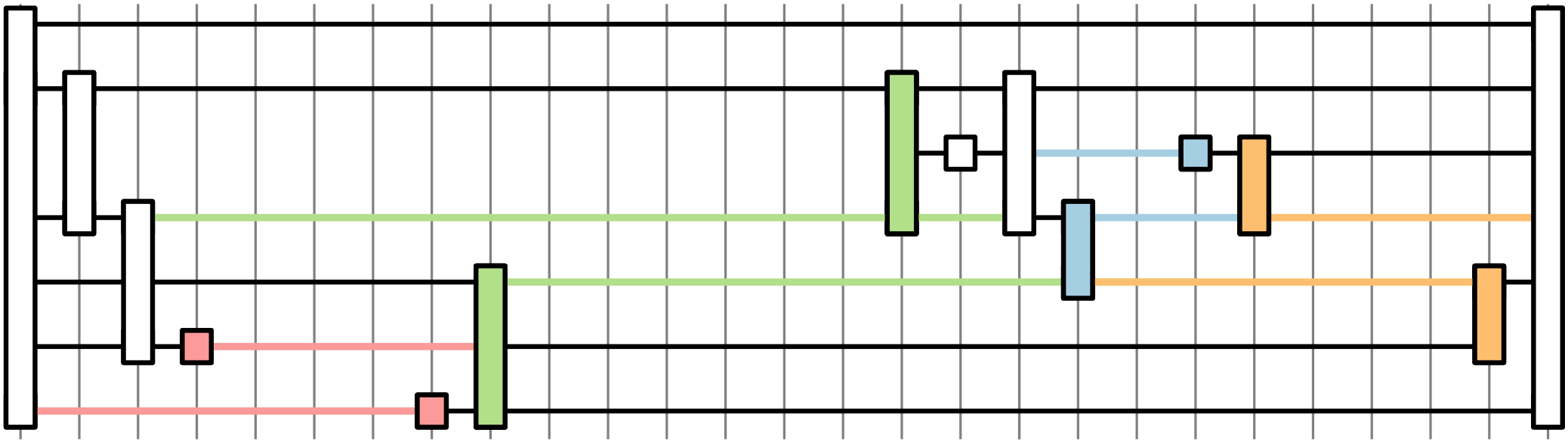
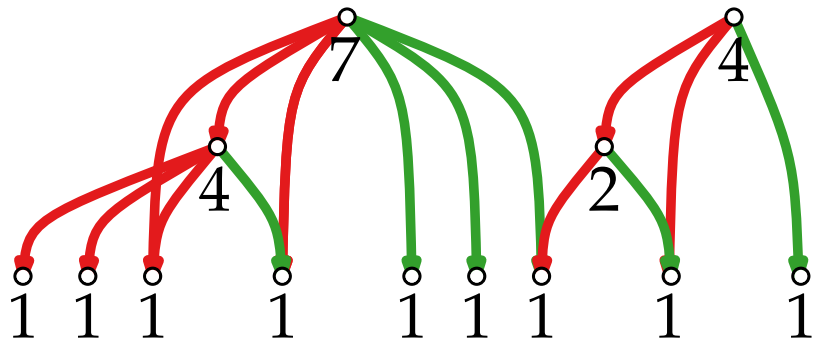


Topological Sort



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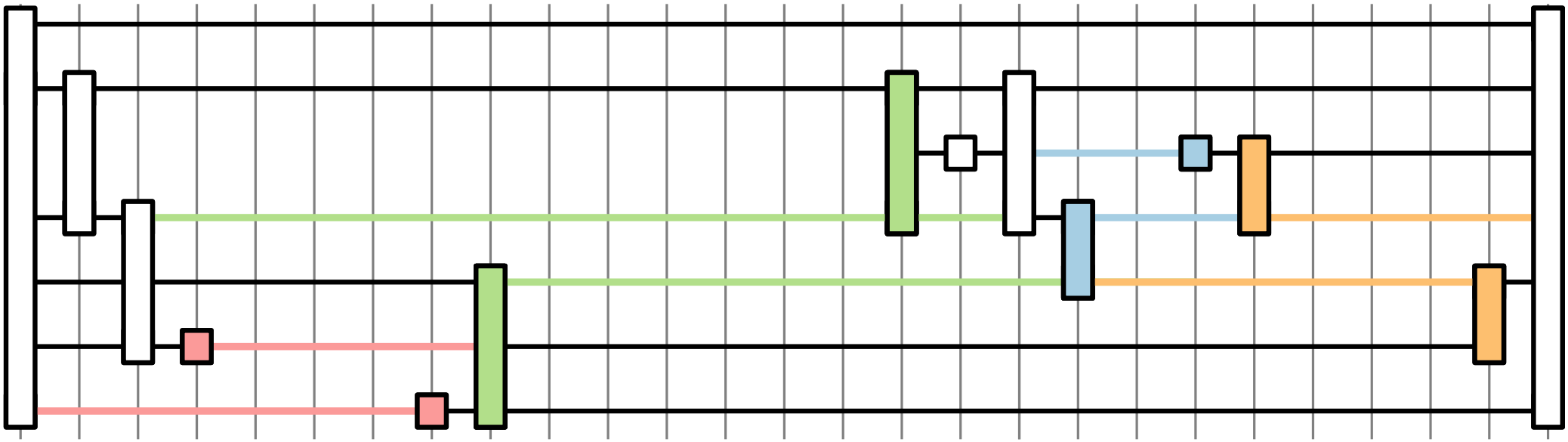
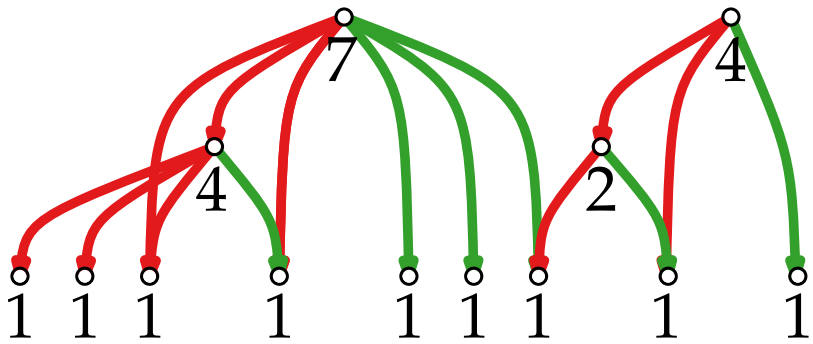


good *st*-orders ⇔ rectilinear greedy

Topological Sort



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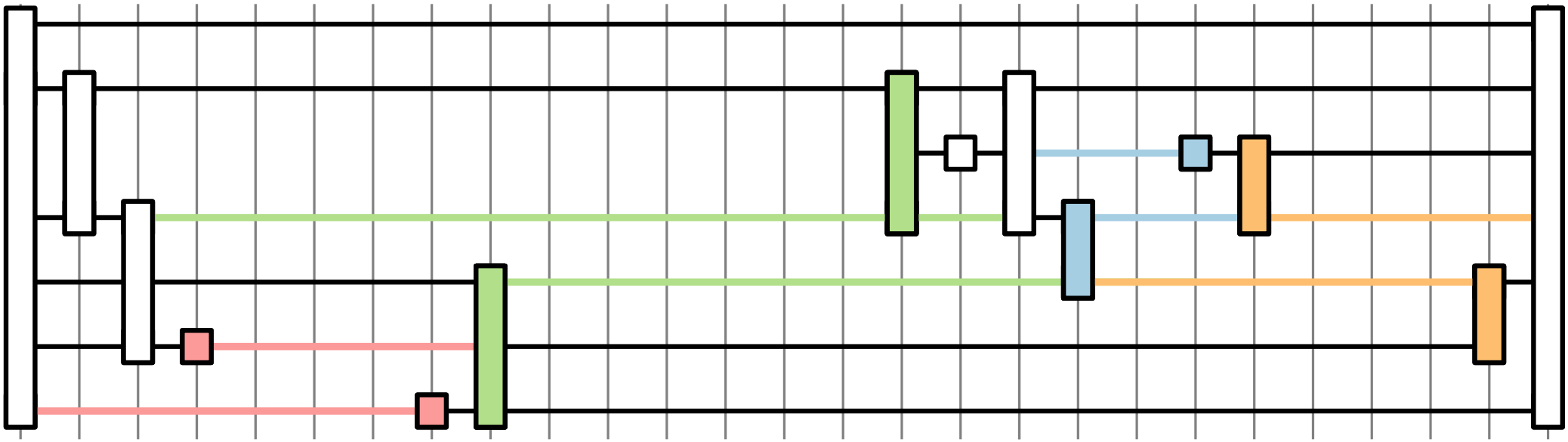
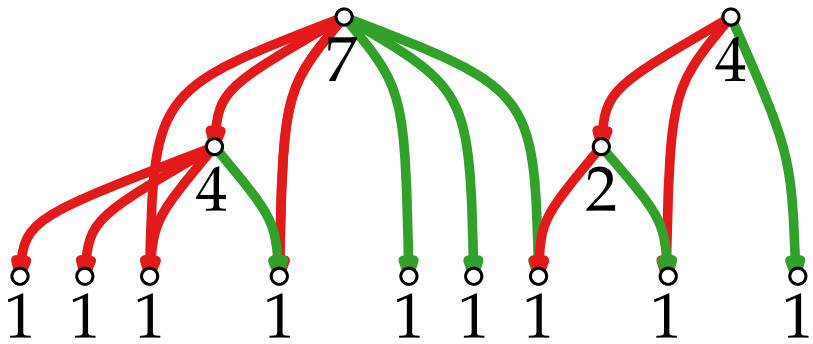


good st-orders $\Leftrightarrow$ rectilinear greedy

compute drawing with min. area in $O(n^2)$ time

Topological Sort



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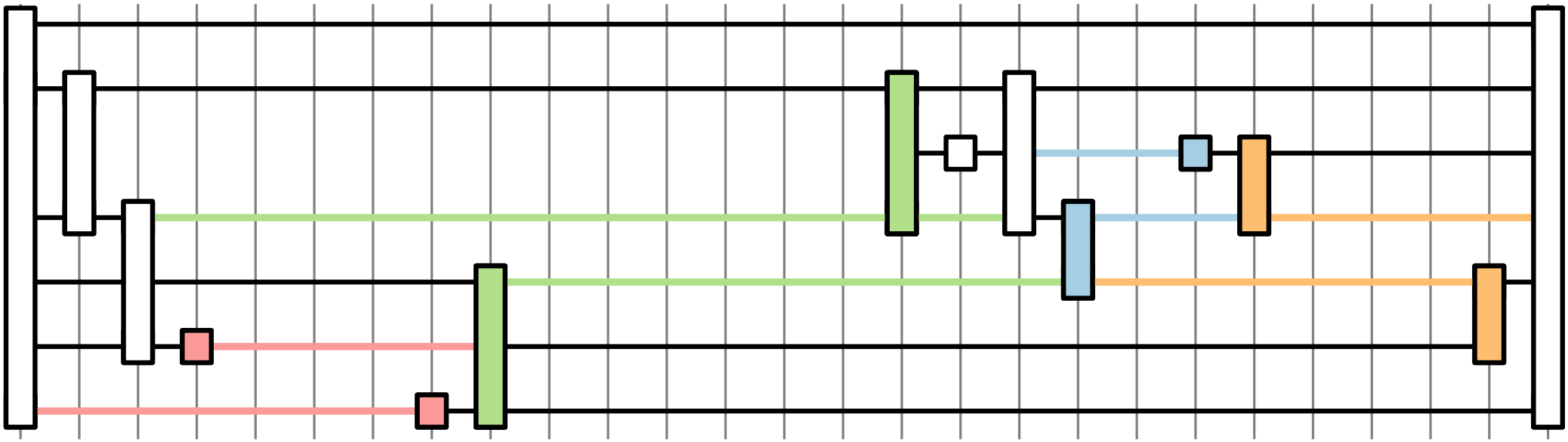
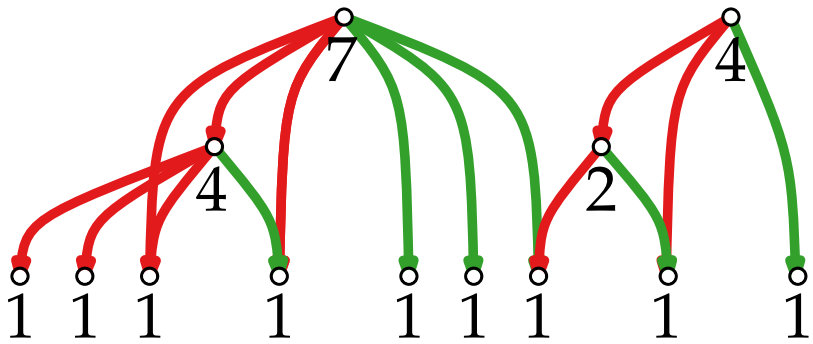


good st-orders $\Leftrightarrow$ rectilinear greedy

compute drawing with min. area in $O(n^2)$ time (area can be exp.)

Topological Sort



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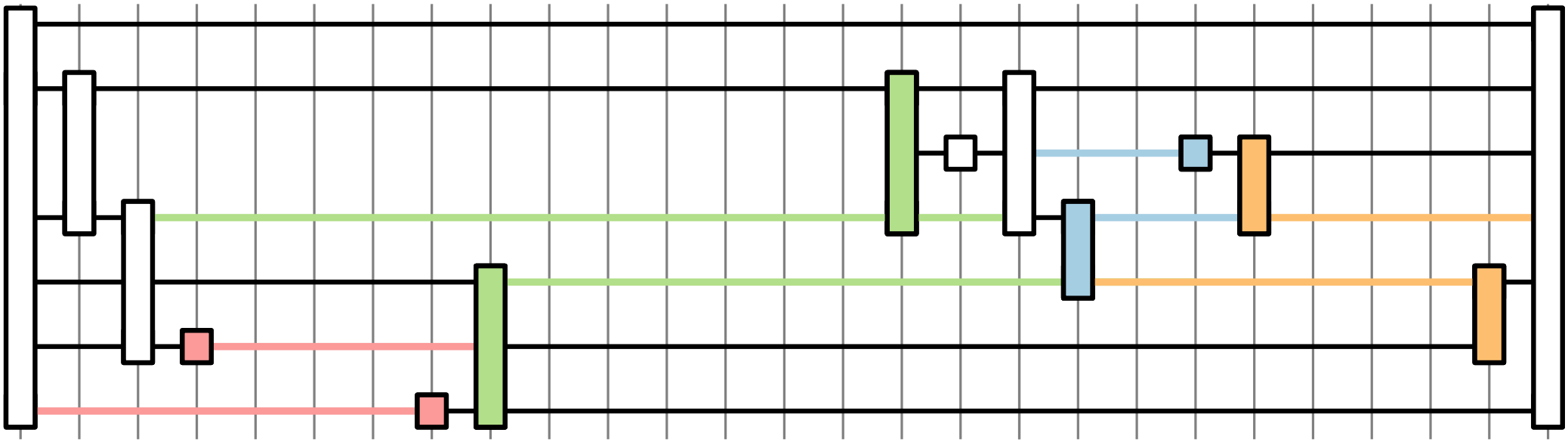
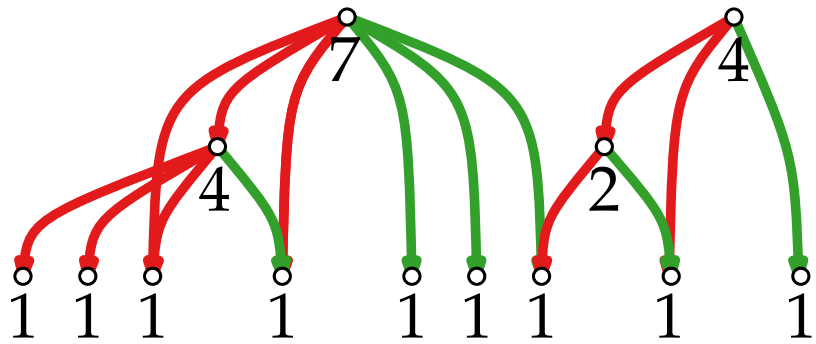


good st-orders $\Leftrightarrow$ rectilinear greedy

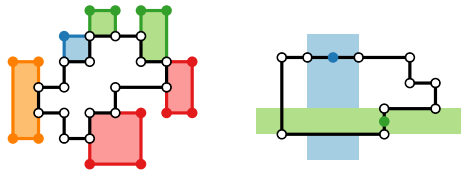
compute drawing with min. area in $O(n^2)$ time (area can be exp.)

find good st-order?

Topological Sort

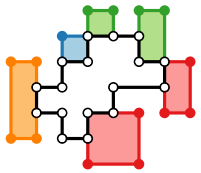


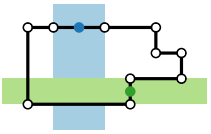
Conclusion



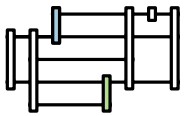
Test and gen. all universal greedy rectilinear graphs in $O(n)$ time

Conclusion

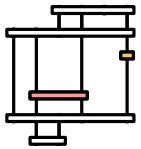




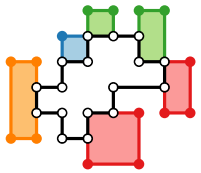
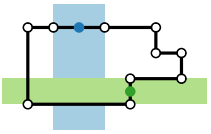
Test and gen. all universal greedy rectilinear graphs in $O(n)$ time



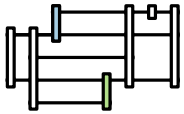
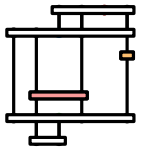
hor. and vert. *st*-digraphs



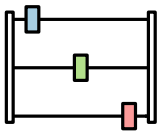
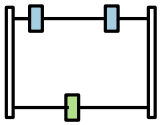
Conclusion

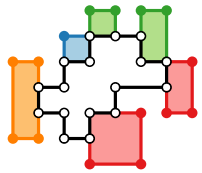
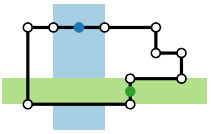
Test and gen. all universal greedy rectilinear graphs in $O(n)$ time


hor. and vert. *st*-digraphs


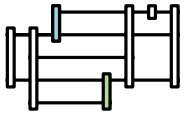
good st-order: for every interval $i, \ldots, j$:


– no 3 conn. comp. – if 2 conn. comp., then disjoint


Conclusion

Test and gen. all universal greedy rectilinear graphs in $O(n)$ time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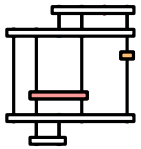

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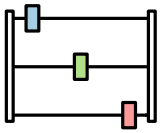
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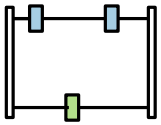

good *st*-orders $\Leftrightarrow$ rectilinear greedy

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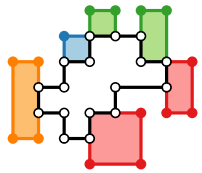
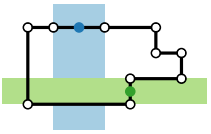

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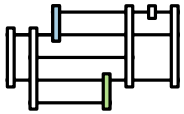
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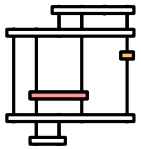

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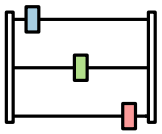
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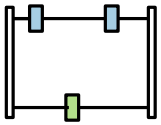
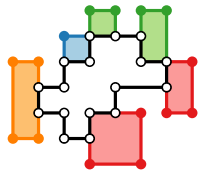
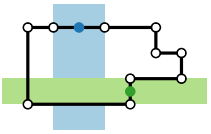


good st-orders $\Leftrightarrow$ rectilinear greedy


compute drawing with min. area in $O(n^2)$ time (area can be exp.)

Conclusion

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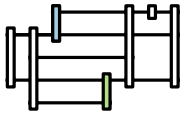
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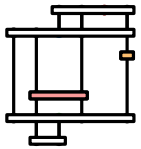

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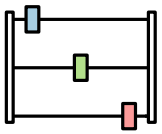
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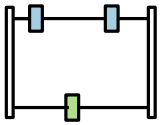

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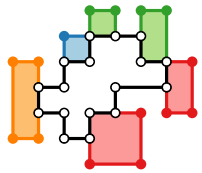
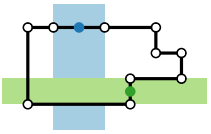
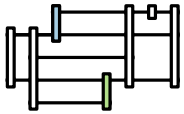
Conclusion

Test and gen. all universal greedy rectilinear graphs in $O(n)$ time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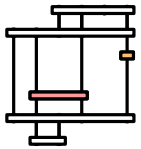

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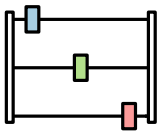
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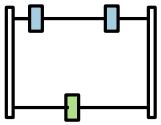

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st-digraph series-parallel $\Rightarrow$ find good st-order in $O(n)$ time