

4. GREEDY ALGORITHMS II

► Red-rule blue-rule demo

Lecture slides by Kevin Wayne

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<http://www.cs.princeton.edu/~wayne/kleinberg-tardos>

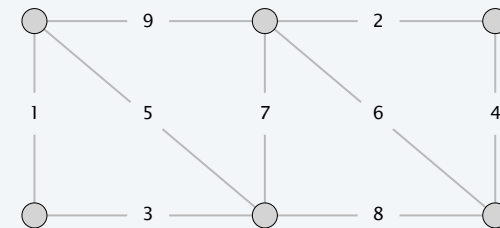
Last updated on Sep 8, 2013 6:20 AM

Red-rule blue-rule demo

Red rule. Let C be a cycle with no red edges. Select an uncolored edge of C of max weight and color it red.

Blue rule. Let D be a cutset with no blue edges. Select an uncolored edge in D of min weight and color it blue.

the input graph

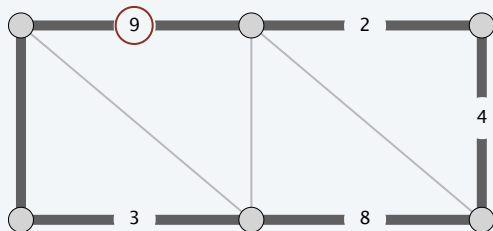


2

Red-rule blue-rule demo

Red rule. Let C be a cycle with no red edges. Select an uncolored edge of C of max weight and color it red.

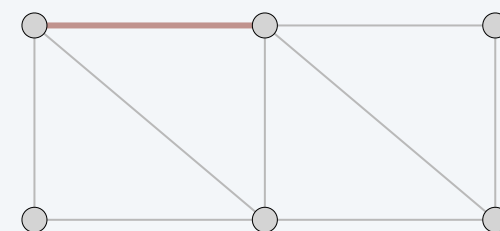
apply the red rule to the cycle



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Red-rule blue-rule demo

current set of red and blue edges

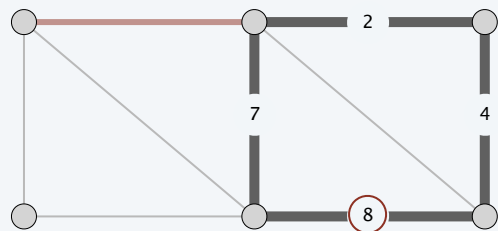


4

Red-rule blue-rule demo

Red rule. Let C be a cycle with no red edges. Select an uncolored edge of C of max weight and color it red.

apply the red rule to the cycle

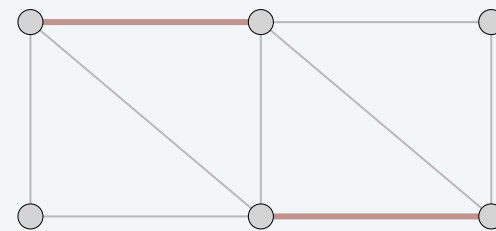


5

Red-rule blue-rule demo

Red rule. Let C be a cycle with no red edges. Select an uncolored edge of C of max weight and color it red.

current set of red and blue edges

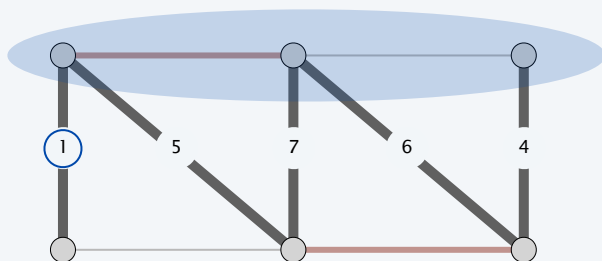


6

Red-rule blue-rule demo

Blue rule. Let D be a cutset with no blue edges. Select an uncolored edge in D of min weight and color it blue.

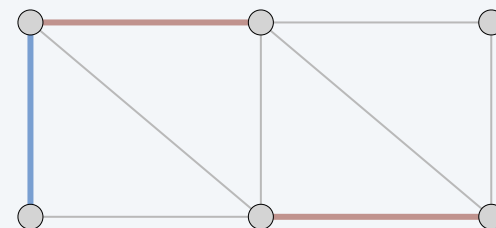
apply the blue rule to the cutset



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Red-rule blue-rule demo

current set of red and blue edges

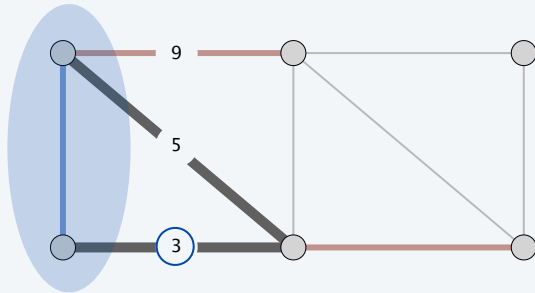


8

Red-rule blue-rule demo

Blue rule. Let D be a cutset with no blue edges. Select an uncolored edge in D of min weight and color it blue.

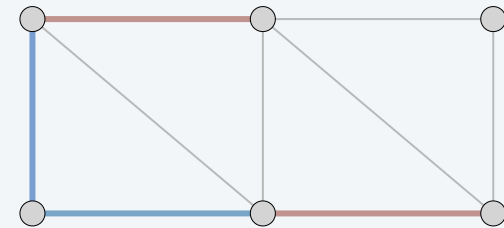
apply the blue rule to the cutset



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Red-rule blue-rule demo

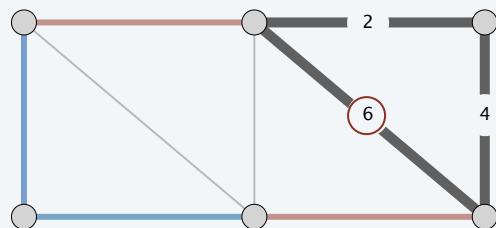
current set of red and blue edges



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Red-rule blue-rule demo

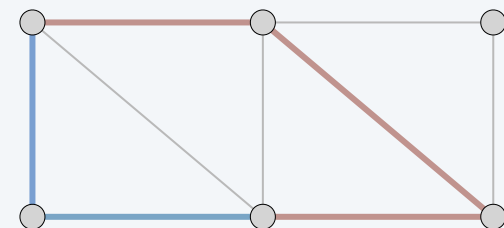
apply the red rule to the cycle



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Red-rule blue-rule demo

current set of red and blue edges

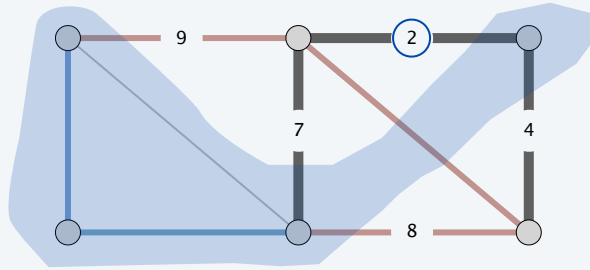


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Red-rule blue-rule demo

Blue rule. Let D be a cutset with no blue edges. Select an uncolored edge in D of min weight and color it blue.

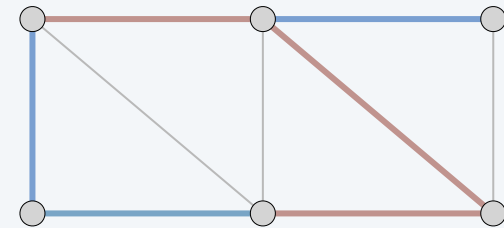
apply the blue rule to the cutset



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Red-rule blue-rule demo

current set of red and blue edges

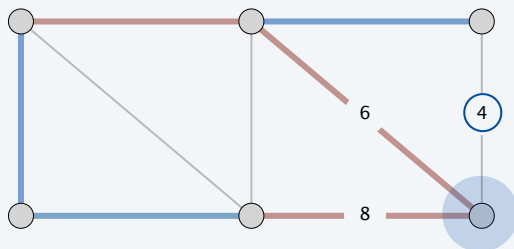


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Red-rule blue-rule demo

Blue rule. Let D be a cutset with no blue edges. Select an uncolored edge in D of min weight and color it blue.

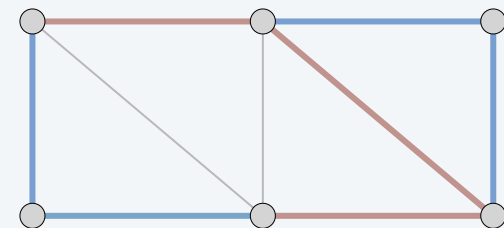
apply the blue rule to the cutset



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Red-rule blue-rule demo

current set of red and blue edges

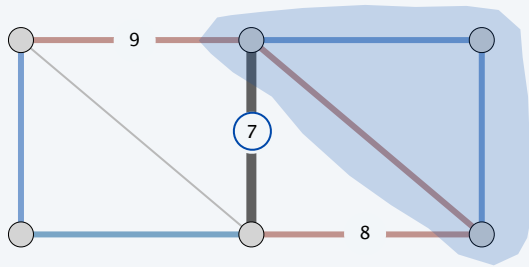


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Red-rule blue-rule demo

Blue rule. Let D be a cutset with no blue edges. Select an uncolored edge in D of min weight and color it blue.

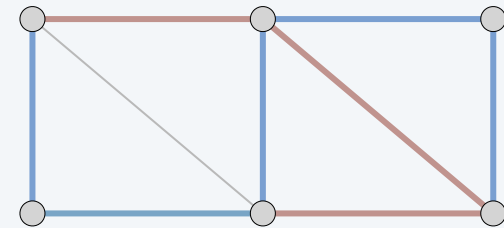
apply the blue rule to the cutset



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Red-rule blue-rule demo

current set of red and blue edges

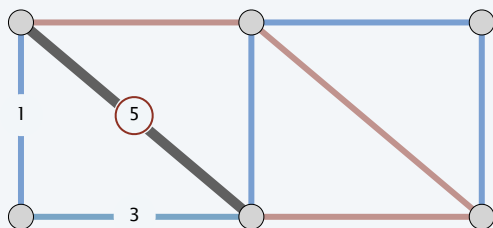


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Red-rule blue-rule demo

Blue rule. Let D be a cutset with no blue edges. Select an uncolored edge in D of min weight and color it blue.

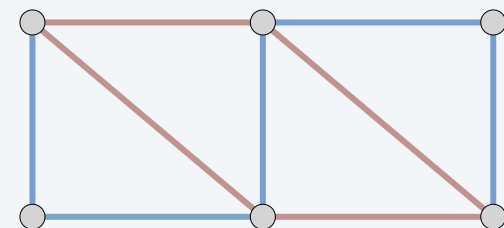
apply the red rule to the cycle



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Red-rule blue-rule demo

current set of red and blue edges



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Red-rule blue-rule demo

Greedy algorithm. Upon termination, the blue edges form a MST.

a minimum spanning tree

